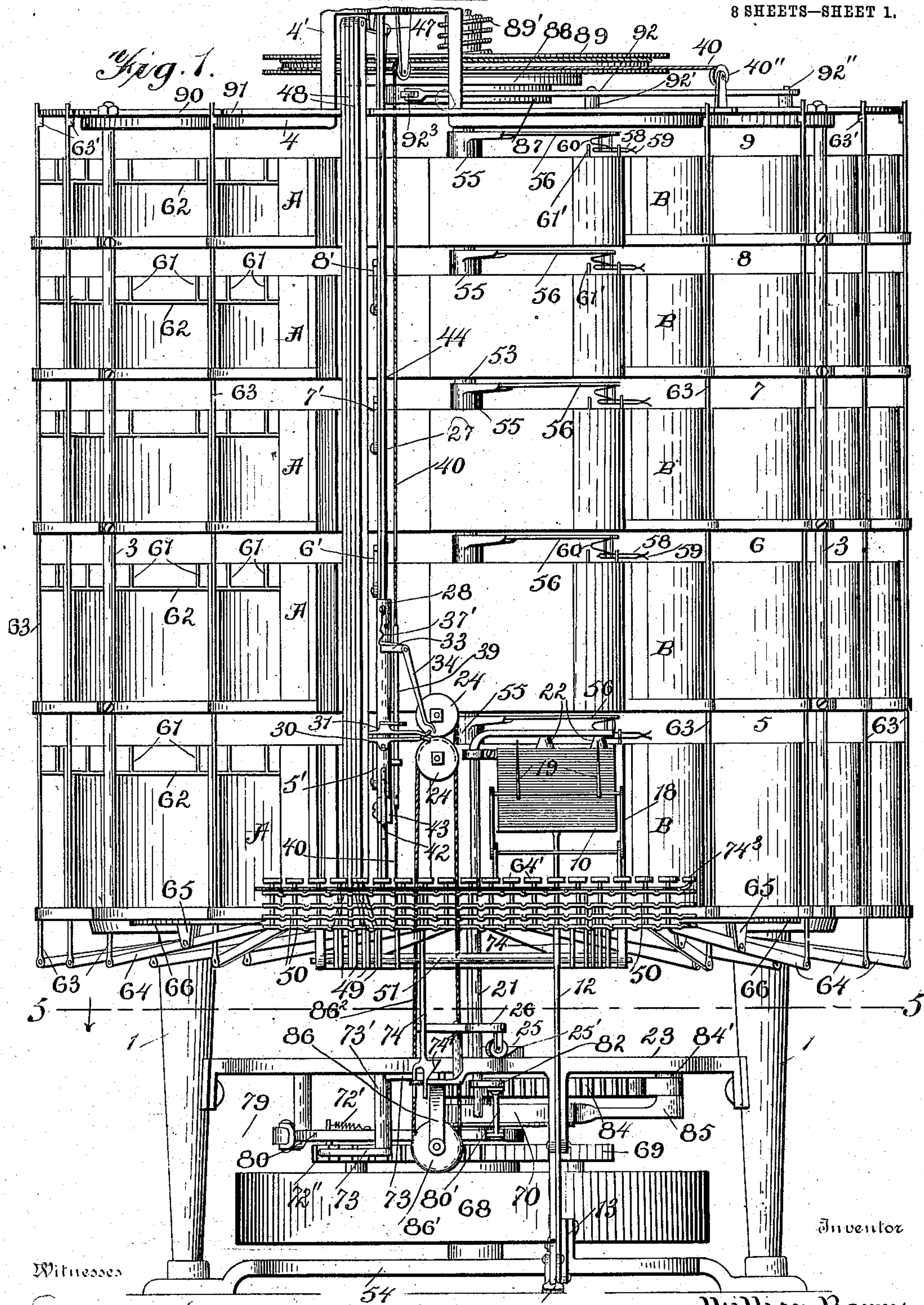


W. BARRY.  
MAIL DISTRIBUTING APPARATUS.  
APPLICATION FILED JUNE 11, 1900.

919,809

Patented Apr. 27, 1909.

8 SHEETS—SHEET 1.



Witnesses  
Geo. E. Prech.  
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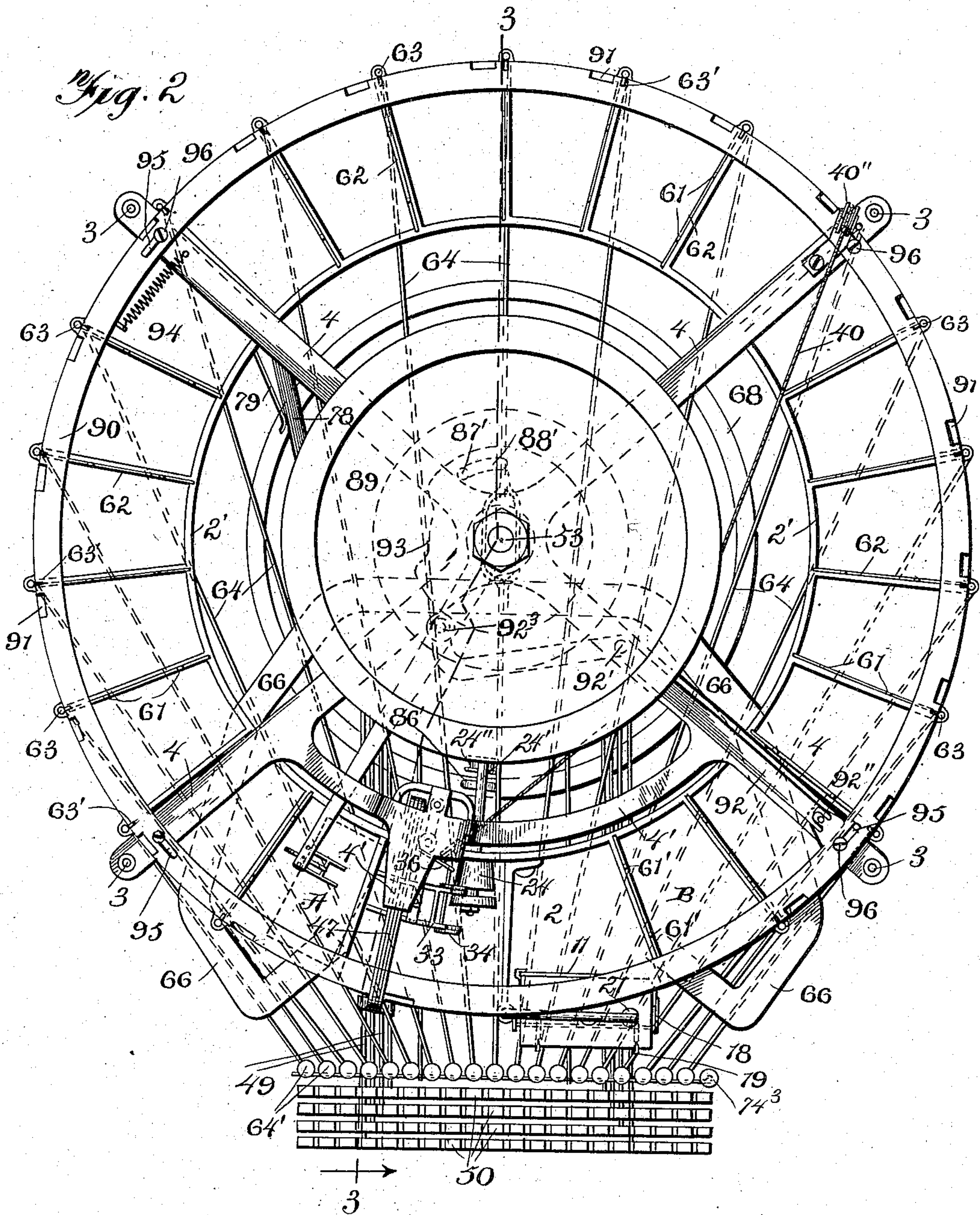


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8 SHEETS—SHEET 2.



Witnesses

*Geo. E. Prech.*  
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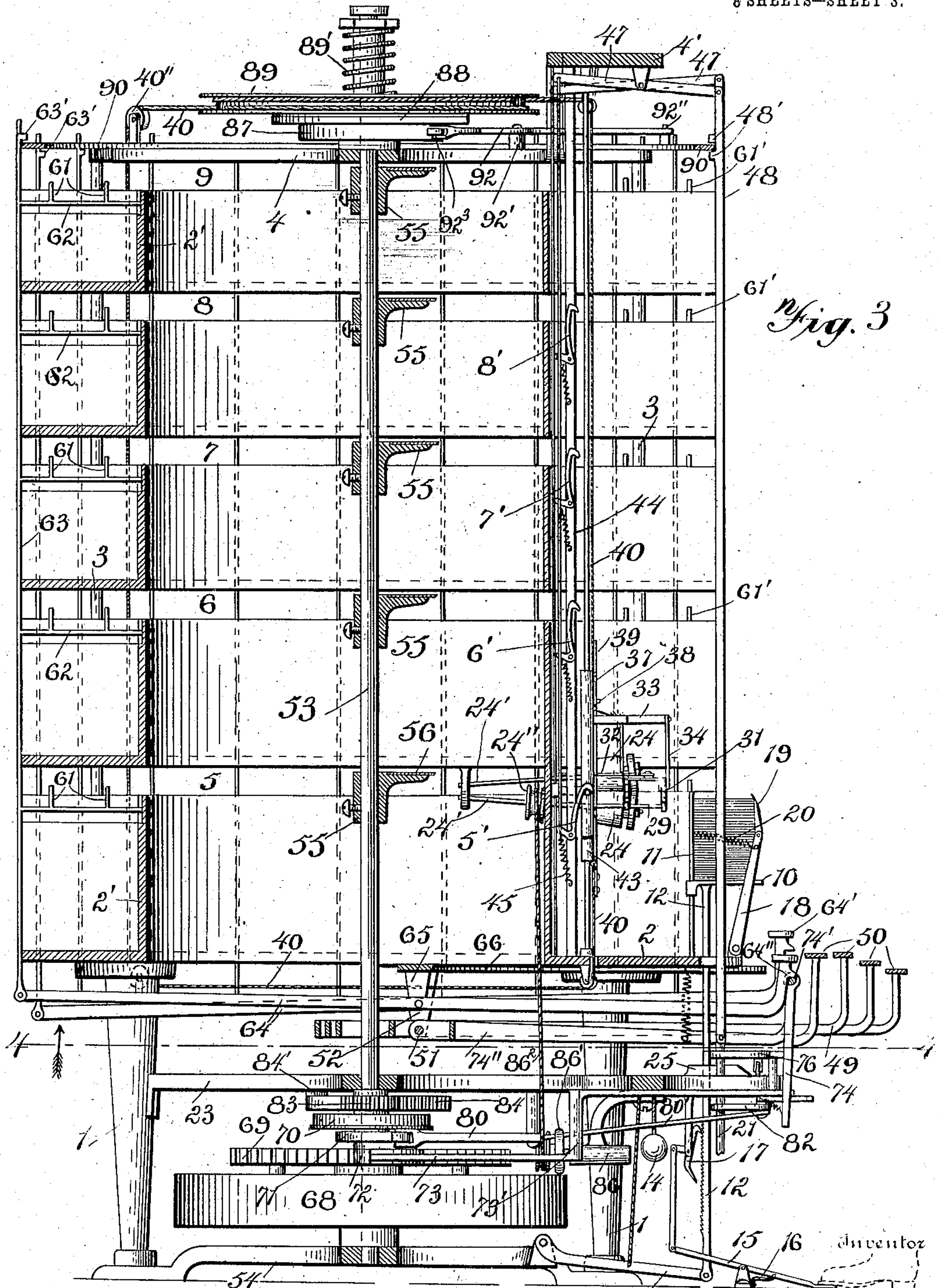


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8 SHEETS—SHEET 3.



Witnesses

Geo. E. Trech.  
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334

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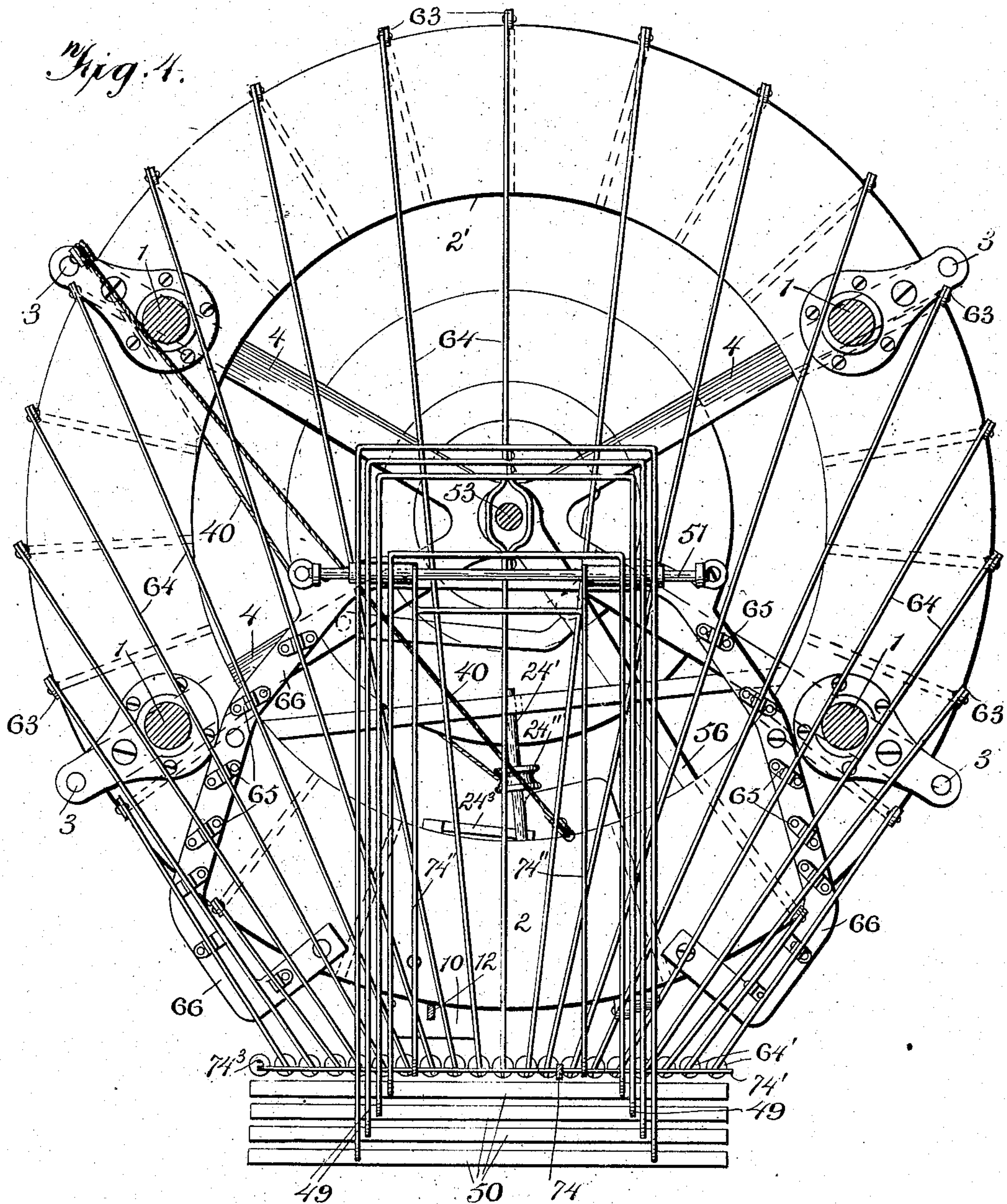


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Patented Apr. 27, 1909.

8 SHEETS—SHEET 4.



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Witnesses

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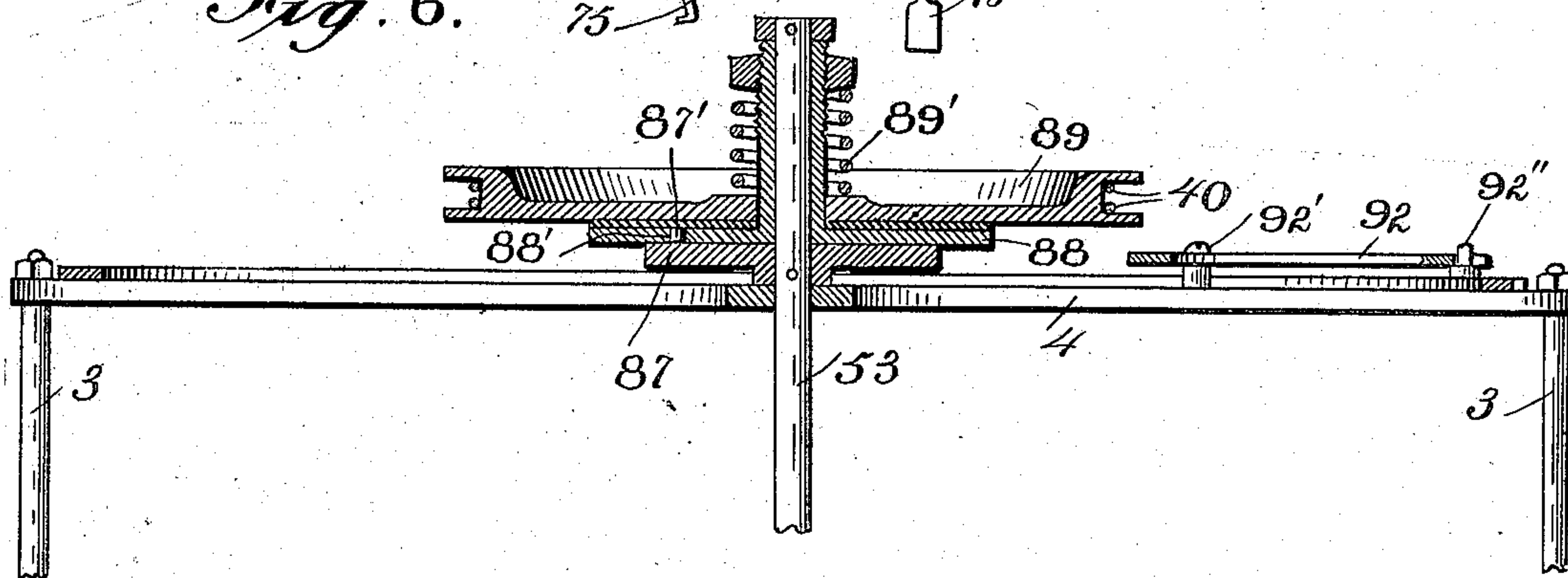
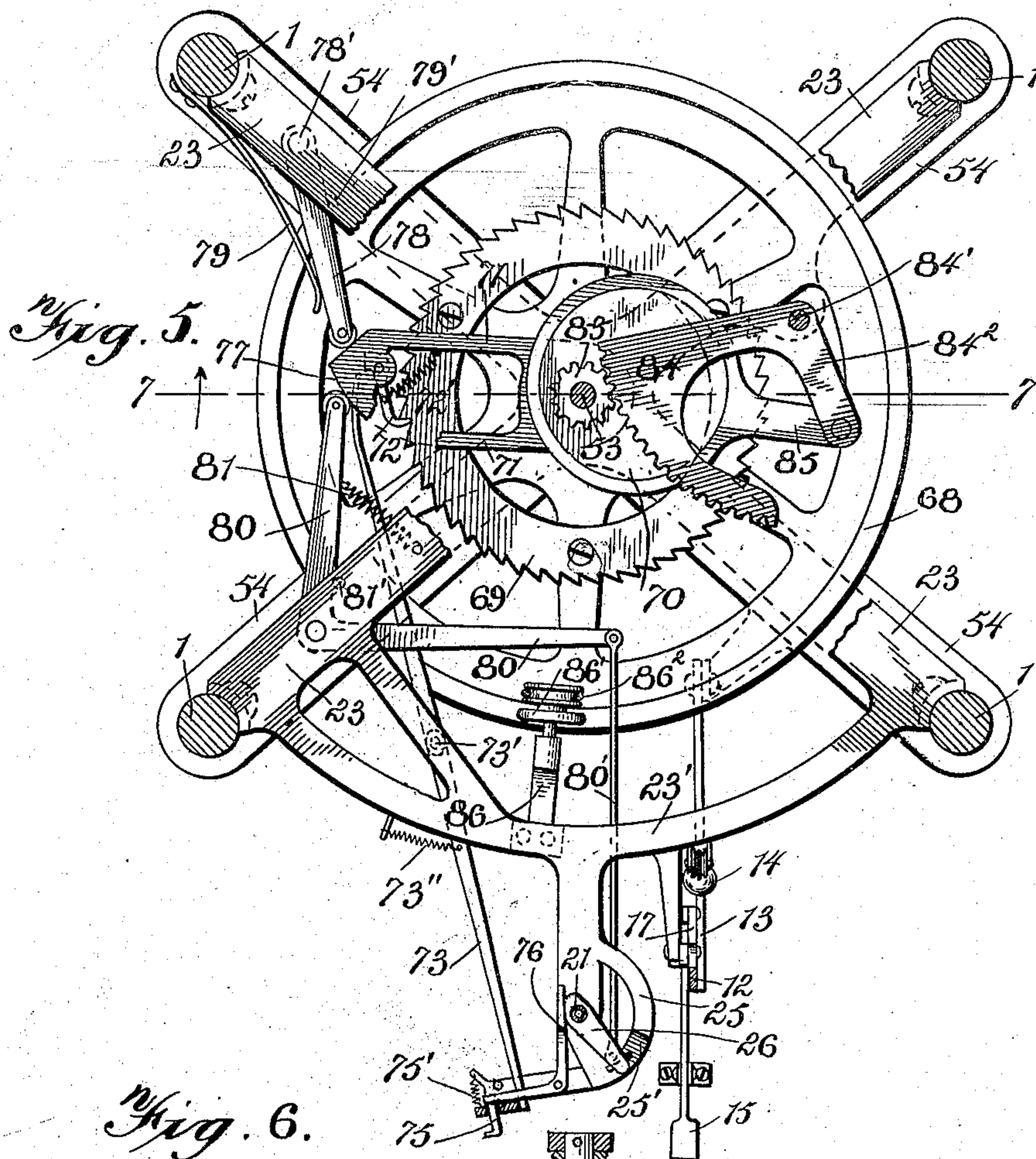


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8 SHEETS—SHEET 5.



Witnesses

*Geo. E. Fuch*  
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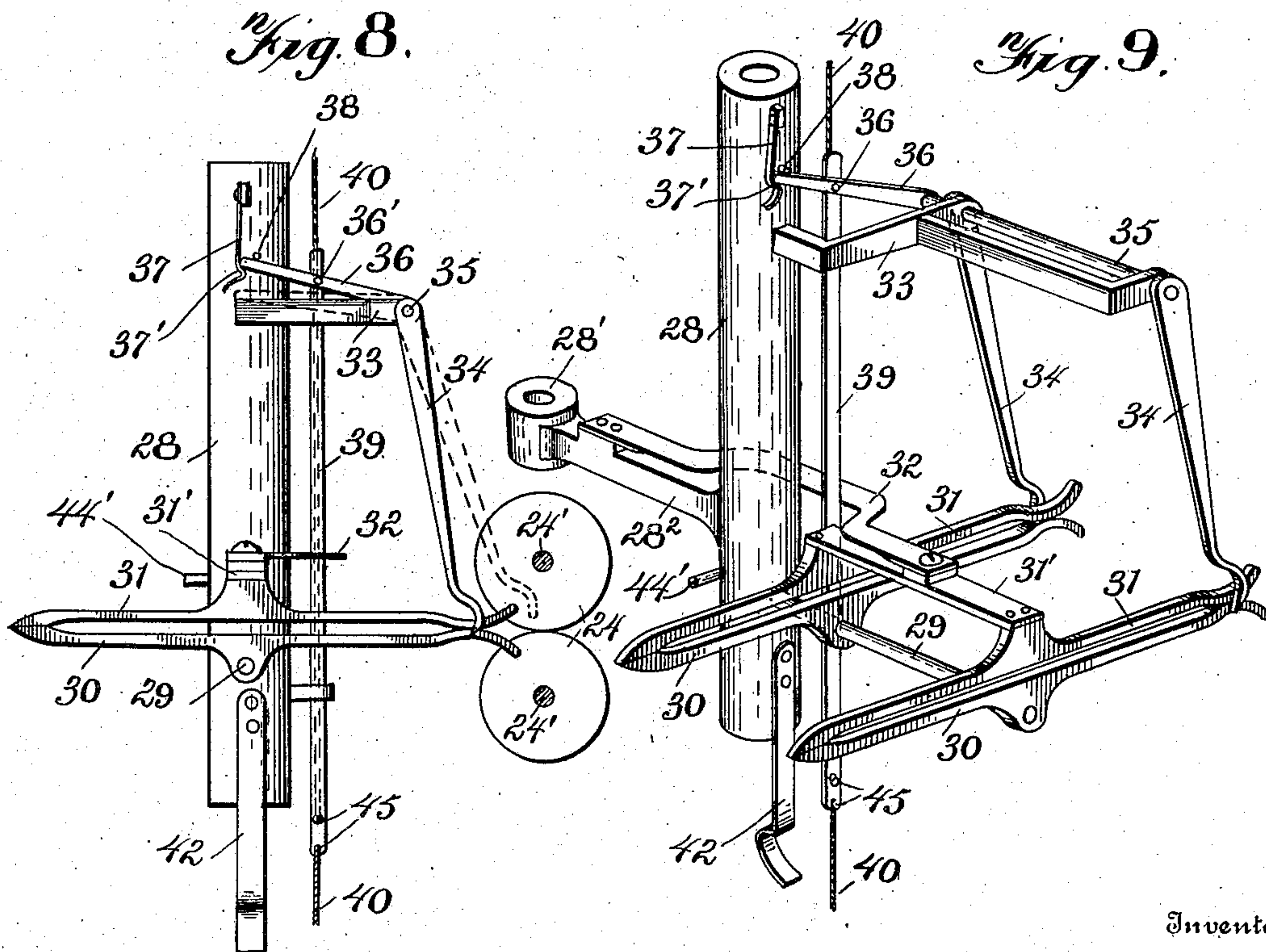
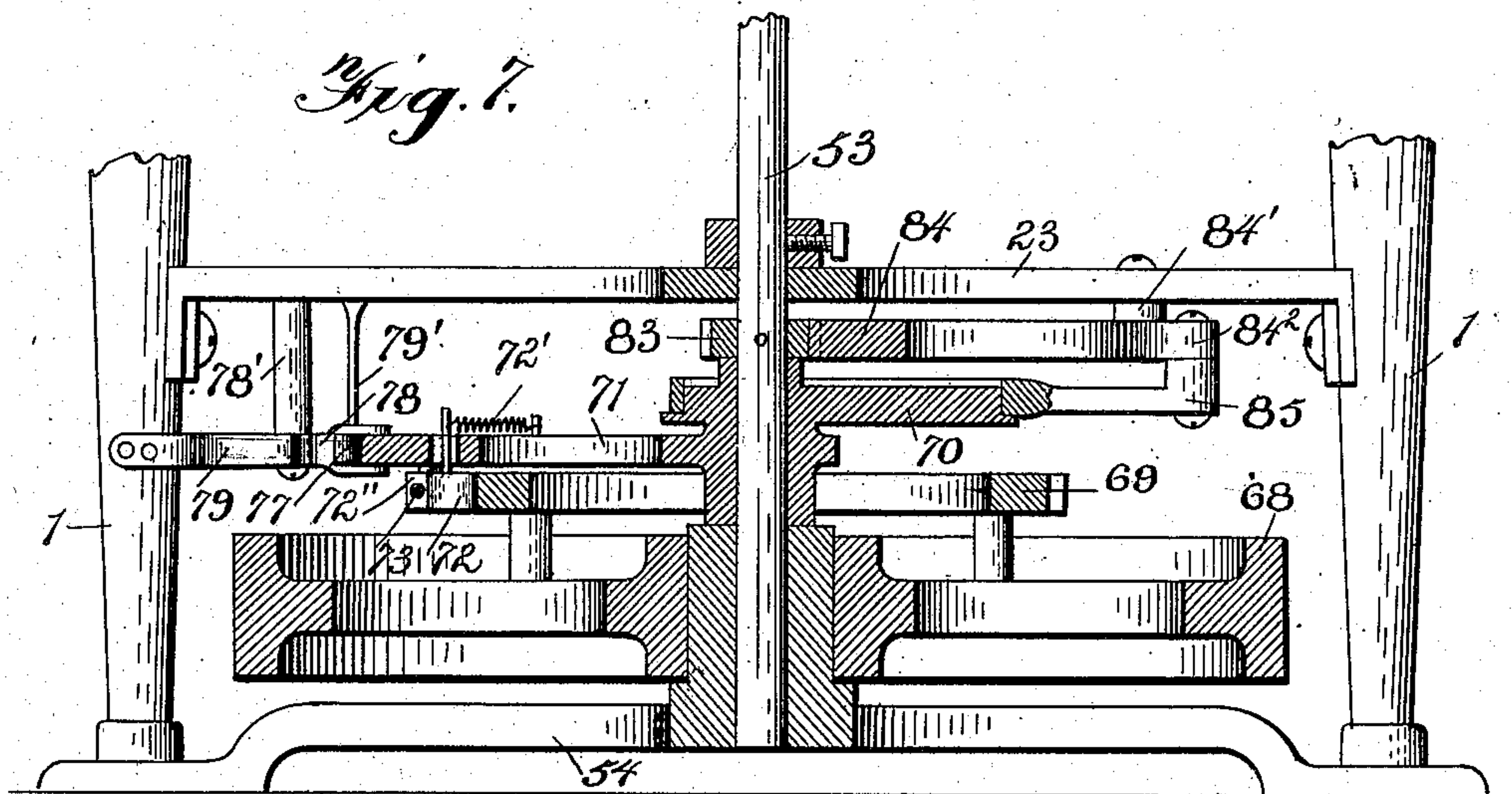
By

W. BARRY.  
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APPLICATION FILED JUNE 11, 1900.

919,809.

Patented Apr. 27, 1909.

8 SHEETS—SHEET 6.



Witnesses

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W. BARRY.  
MAIL DISTRIBUTING APPARATUS.  
APPLICATION FILED JUNE 11, 1900.

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Patented Apr. 27, 1909.

8 SHEETS—SHEET 7.

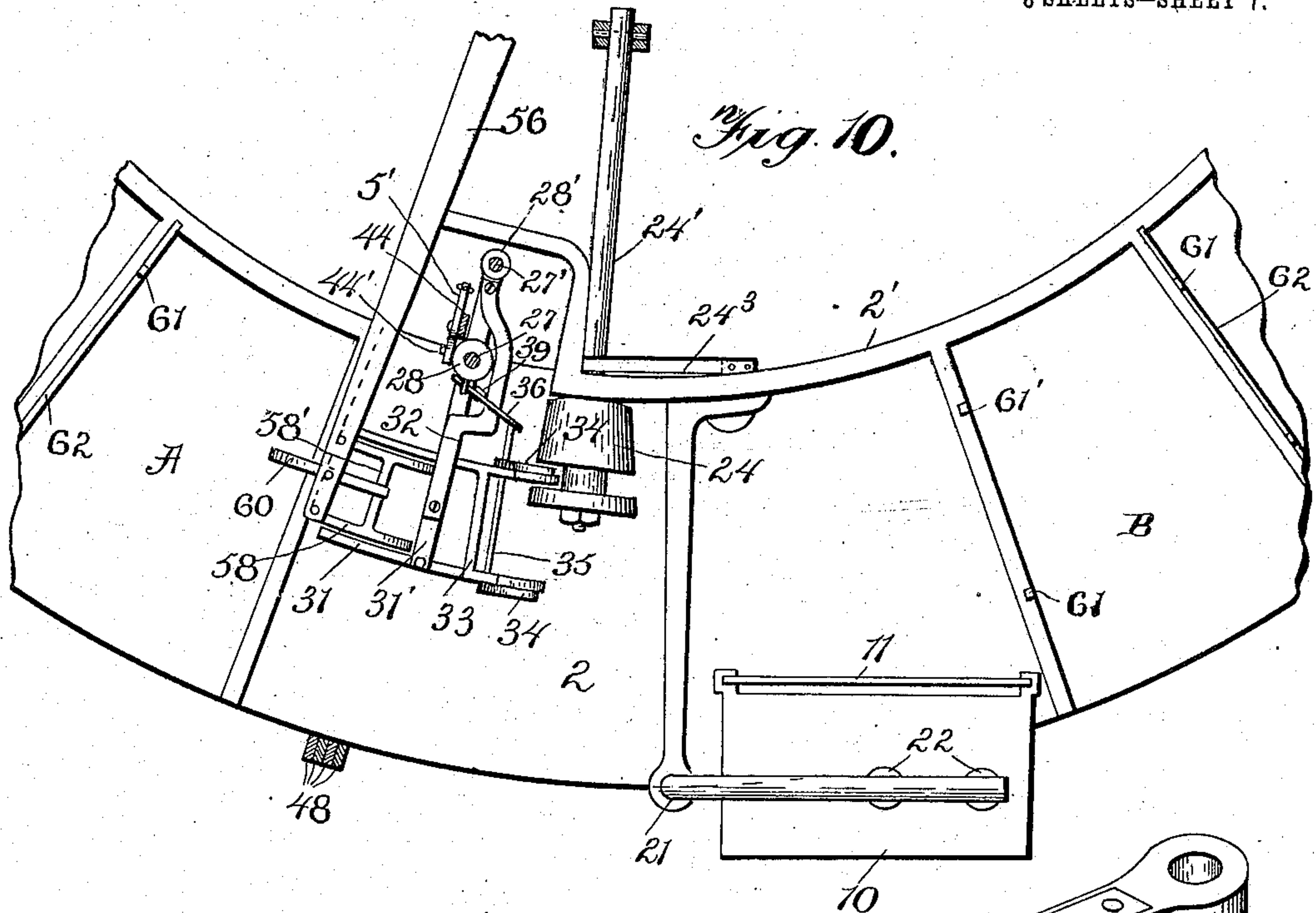
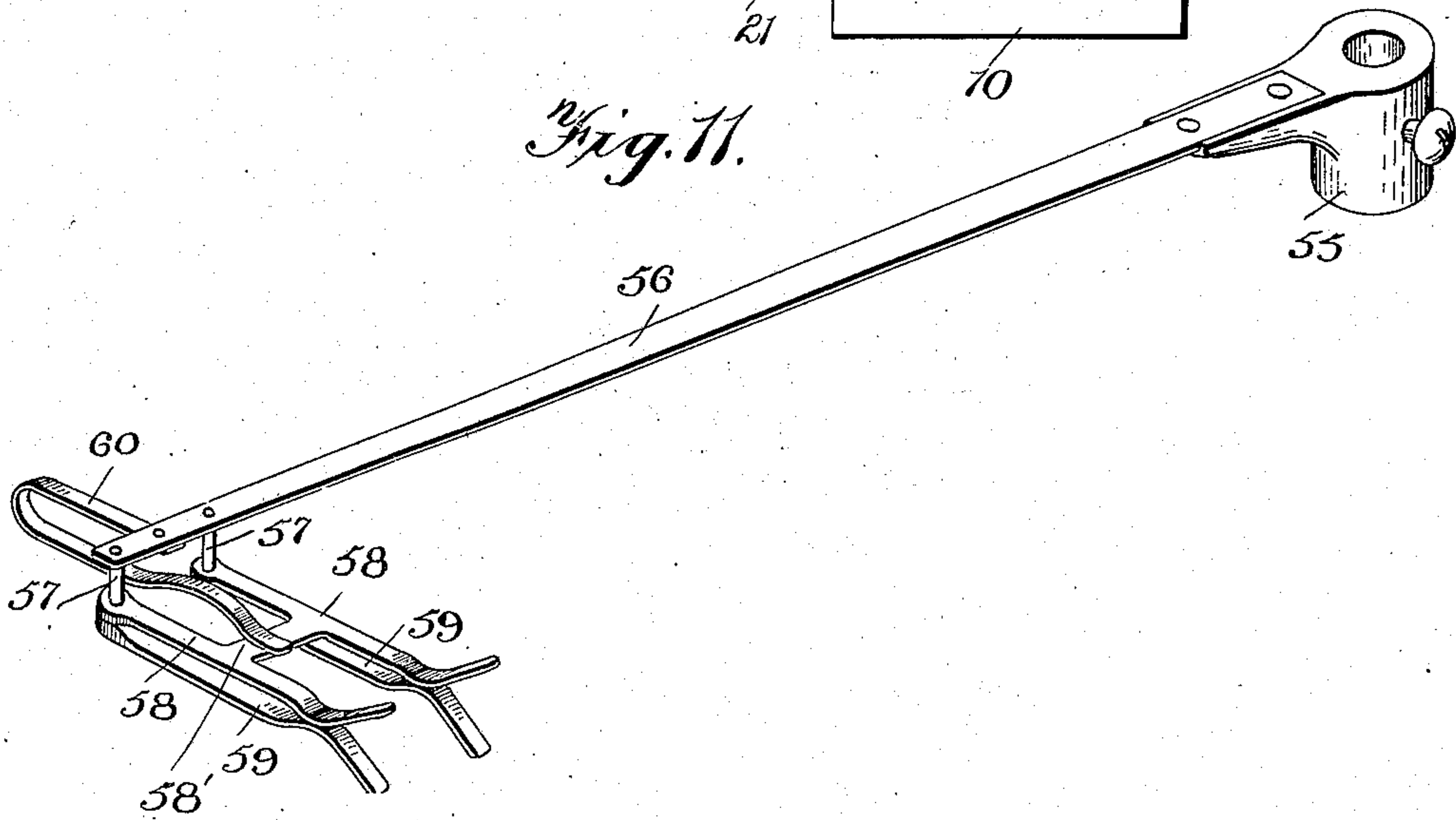


Fig. 11.



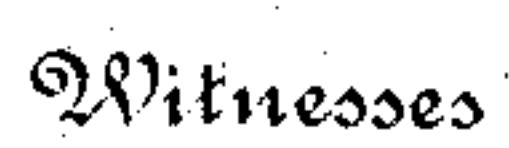
Witnesses  
Geo. C. Frech.  
Chas. R. Wright Jr.

334

Inventor  
William Barry.  
Hubert E. Peck  
Attorney

919,809.

8 SHEETS—SHEET 8.



Geo. C. Frick.  
Chas. R. Wright Jr.

၁၆၃

William Barry

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Attorney



# UNITED STATES PATENT OFFICE.

WILLIAM BARRY, OF OSWEGO, NEW YORK.

## MAIL-DISTRIBUTING APPARATUS.

No. 919,809.

Specification of Letters Patent.

Patented April 27, 1909.

Application filed June 11, 1900. Serial No. 19,895.

*To all whom it may concern:*

Be it known that I, WILLIAM BARRY, a citizen of the United States, residing at Oswego, county of Oswego, State of New York, have  
5 invented certain new and useful Improvements in Mail-Distributing Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to  
10 which it appertains to make and use the same.

This invention relates to certain improvements in mail distributing apparatus; and the objects and nature of the invention will be clearly understood by those skilled in the art in the light of the following explanations  
15 of the accompanying drawings, which merely show an example from among various constructions within the spirit and scope of my invention, for the purpose of explaining the  
20 broad features of my invention involved.

My invention consists in certain novel features in construction and in combinations, and in arrangements of parts and details, as more fully and particularly pointed out and  
25 specified hereinafter.

Referring to the accompanying drawings:—Figure 1, is a front elevation of an apparatus constructed in accordance with my invention, the parts being shown in their  
30 normal inactive positions, certain parts at the top of the machine being shown broken away. Fig. 2, is a top plan view of the apparatus, certain parts being shown in the positions they assume in action, one of the  
35 branch way conveyers being shown receding from the main letter conveyer, having just received a letter therefrom, certain parts being shown in dotted lines. Fig. 3, is a vertical section through the apparatus on the line  
40 3—3, Fig. 2, looking toward the right; one key and one finger bar being shown depressed, the letter strippers or gates at the left hand side of the view being raised, the main letter conveyer or lift being shown  
45 locked or stopped at the first branch letter passage over the first row or tier of boxes. Fig. 4, is a horizontal cross section taken in the plane of the line 4—4, Fig. 3, looking up. Fig. 5, is a horizontal cross section taken in the plane of the line 5—5, Fig. 1, looking down,  
50 certain parts being broken away, the parts being shown however in the positions they assume immediately on the depression of a key, the clutch or dog having just been released to catch the ratchet wheel, and the dog controlling trip lever not yet having been re-

leased to assume its normal position in the path of the heel of the dog. Fig. 6, is a detail vertical section through the top part of the frame and the top driving connections  
60 for the main letter conveyer, certain parts being broken away. Fig. 7, is a detail central vertical section through the driving, and make and break mechanisms, taken in the plane of the line 7—7, Fig. 5. Fig. 8, is a detail  
65 side elevation of the main letter conveyer and its carriage, the letter pusher being shown in the position it assumes when the conveyer is moving upwardly, the conveyer being shown in its normal position with re-  
70 spect to the feed rolls indicated generally with their shafts shown in section, dotted lines show the position of the pushers before the conveyer starts on its upward movement. Fig. 9, is a detail perspective view  
75 of the main letter conveyer and its carriage and parts carried thereby and removed from the guide rods, the parts thereof being shown in the same relative positions as shown in Fig. 8. Fig. 10, is a detail enlarged sectional  
80 plan view of the feed rolls, main letter conveyer and a branch letter conveyer, the branch letter conveyer shown in the act of entering and removing a letter from the main letter conveyer, parts of the apparatus  
85 being broken away. Fig. 11, is a detail perspective view of one of the branch letter conveyers. Fig. 12, is a detail enlarged vertical section through part of the box case, an intermediate part in the length of said case  
90 being broken away, the section being taken in the same plane as that of Fig. 3, parts of the apparatus being broken away.

In the specific construction illustrated, shown merely as an example to enable those  
95 skilled in the art to understand the various broad features of my invention through the medium of the following explanation, I employ a circular case of boxes or letter receptacles.  
100

The case is mounted in or carried by a suitable rigid frame comprising the lower legs or supports 1. The letter boxes of said case carried by said legs 1, are arranged in circular rows or tiers, with intervening spaces or  
105 branch letter passages. In the specific example shown, there are five tiers or rows of boxes, each tier arranged in a horizontal plane, the several tiers arranged one above the other so that, in effect, a large cylindrical case of boxes is formed. The boxes in  
110 each row are arranged radially with open let-



ter receiving tops, and open letter removing outer ends. Merely as a matter of illustration, I show twenty boxes in each row. Each row of boxes is rigid with and supported on a circular ring or base plate 2. The several tiers of boxes are rigidly secured together by the vertical rods or supports 3, arranged at the outside of the case and secured to all the base plates of the respective rows or tiers of boxes. The base plate of the bottom row of boxes is secured directly on the upper ends of the legs 1. It will thus be observed that the rows of boxes are properly spaced and supported by the vertical supports 3, and that the entire case is carried by the legs 1. Each circle or row of boxes, preferably, consists of the curved flat base 2, forming the floors of all the boxes, and the inner vertical ring 2', forming the inner closed ends of all of the boxes. The boxes or letter receptacles are often formed on said base and ring by radial partitions.

4, is a rigid horizontally disposed spider frame arranged above the case of boxes and rigidly secured to the upper ends of the vertical supporting rods 3, to which the respective rows of boxes are secured. If desirable, the rows of boxes, excepting the bottom row, can be adjustably secured to the several parallel rigid vertical supports 3, so that the respective rows of boxes can be vertically adjusted to properly space them.

A branch letter way or passage is arranged horizontally above the open tops of the boxes of each row. Each branch passage is below the base plate 2, of the row of boxes above, excepting the top most branch passage is below the top rigid spider frame 4. I have indicated the various branch passages, by 5, 6, 7, 8, 9, from the bottom branch passage upwardly. It will be observed that the large vertical cylindrical case of boxes has the vertical central opening or well extending there-through. The box case, shown, is in the form of a hollow vertical cylinder, the wall of which is as thick as the length of any letter box or compartment.

Each row of boxes does not form a complete circle, but at the front of the apparatus, the end boxes of each row are separated a suitable distance, to form the vertical main letter way or passage extending throughout the length of the box case and crossing all of the box rows and all of the branch passages above the same. The base plates 2, of the box rows do not extend across said vertical main letter passage, although the base plate 2, of the bottom row of boxes forms a complete circle or ring and extends across the lower end of said main passage and forms a supporting part of the main frame-work of the apparatus. The upright back rings 2', of the boxes are each formed continuous and form an inner or back wall for said main passage, the proper spaces being provided be-

tween the edges of said back rings for the branch passages and movement of the various branch passage letter conveyers over the open tops of the boxes.

The boxes of the various rows are arranged one above the other in vertical lines, as the curved rows of boxes are all of the same diameter and concentric, and as the boxes are all shown as similar in construction I have not applied reference characters thereto, except that the first boxes (those nearest the path of the main letter conveyer) of each horizontal row, are indicated by A, and the last boxes of each horizontal row by B. The A, boxes form a vertical row on one side of the main letter passage, and the B, boxes form a vertical row on the opposite side of the said passage.

At one side of the lower portion of said main letter way or passage, I provide a suitable support for the initial or common pile of faced up mail matter. In the specific example shown, 10, is a horizontal table or letter support on which a pile or bundle of letters is placed with their addressed faces upwardly. The letters are arranged flatly or horizontally on said table and on each other with their inner longitudinal edges aligned and pressed against the vertical wall 11. The inner corners of said table can be provided with any suitable guides sliding on the vertical end edges of the wall 11. Suitable mechanism is provided to move said table vertically.

In the drawings, I show a vertically disposed rod or leg 12, extending downwardly from and secured to the table 10, and at its lower end pivotally joined to a vertically movable link or lever 13, at its rear end fulcrumed to the main frame of the machine. 14, is a weight acting on and connected to said lever 13, to yieldingly draw the same upwardly and hence constantly press upwardly on the table 10, carrying the pile of letters. This leg or rod 12, is shown formed with a longitudinal series of upwardly inclined ratchet teeth, and a pawl and ratchet mechanism is provided to prevent upward movement of the table 10, under the action of its heavy impelling weight 14, except as such movement is permitted by said pawl and ratchet.

17, is a double pointed or escapement pawl mounted between its ends to a suitable support from the lower frame work of the apparatus. This pawl has a rearwardly extending rigid crank arm to which a link is pivotally joined, the opposite end of the link being pivotally joined to a treadle or foot lever 15, suitably mounted at the base of the machine to rock vertically. The pawl is so arranged that one of its toothed ends is normally in mesh with the ratchet teeth of the rod 12, and holding the table 10, against upward movement. The pawl is usually held



with its upper toothed end in this position by the foot of the operator pressing down the lever 15, against the tension of a spring 16, which constantly tends to rock said foot lever in the opposite direction. When the operator desires to permit upward movement of the bundle of letters on the table 10, he releases his foot from the lever 15, and thereupon the escapement pawl will rock vertically and allow the rod 12, to move up a tooth or two before the lower toothed end of the pawl engages and locks the ratchet teeth of said rod or bar 12. It will thus be observed that the table 10, can be allowed upward movement by rocking said escapement pawl back and forth which allows the upward movement, tooth by tooth, as the letters are removed from the top of the pile on the table. If so preferred, the normal position of the foot lever or treadle 15, can be in its position when held up by the spring 16, so that the rocking of the pawl 17, is effected by a depression and release of said lever 15, by the foot of the operator. However, my invention is not limited in this respect to any particular mechanism controlling the upward movement of the table 10, carrying the common pile of letters, and I merely describe the specific construction shown as an example of what might be employed.

Suitable mechanism is provided to yieldingly hold the pile of letters in place on the table 10, and yet permit the ready withdrawal of the top most letter of the pile through the medium of the initial feeder hereinafter described.

For the purpose of yieldingly holding the letters on the table 10, I show a vertically disposed swinging frame 18, fulcrumed at its lower end to a suitable rigid part of the frame work so that the upper end of the frame can swing toward and from the pile of letters on the table 10. I show the upper cross bar of this frame provided with the upwardly projecting fingers 19, arranged to extend up at the front edges of the letters on the table and lap over the top most letter to a slight extent to hold the same down.

20, is a coiled retractive spring secured to the frame 18, and yieldingly holding the same and the fingers 19, against the front edges of the letters on the table 10, and yieldingly holding said letters to the rear vertical wall 11, to properly aline the letters and hold them in place.

Any suitable initial feeding mechanism is provided to successively remove the top most letter from the pile or common source and carry the letter laterally and horizontally into a pair of feed rolls which deliver the same into the main letter conveyer or lift.

I do not wish to limit my invention to any particular construction of initial feeder, but for the sake of convenience, I show a pneu-

matic or suction device for this purpose consisting of the vertical hollow or tubular shaft 21, suitably mounted in the frame work of the machine and having the laterally bent horizontal upper end arranged to extend over the pile of letters on the table 10. This horizontal upper end of the rocking or oscillating vertical tubular shaft 21, is provided with the suction cups 22. These cups are secured on the under portion of the horizontal end of said shaft and depend therefrom so that their lower open ends can engage the top most letter of the pile on the table 10.

Any suitable air suction or exhausting mechanism can be connected with the tube 21, and as such forms no part of my invention I do not show the same, but merely show the lower end of said tube broken away. Usually the suction device such, as an exhaust fan, is constantly acting through the tube 21, on the usually flexible suction mouths 22. As hereinafter described suitable mechanism is provided to cause said tubular shaft 21, to rock and swing the upper end thereof forwardly and horizontally over the top most letter of the pile and then drop down thereon and draw said letter up against the suction mouths 22, and then lift and swing rearwardly and laterally to the rotating coacting feed rolls 24. The tubular feeder shaft extends vertically beside one end of the letter supporting table 10, and the pile of letters thereon, and said shaft is suitably mounted to slide vertically in a support at its intermediate upper portion, and also at its lower portion in the rigid horizontal spider frame 23, secured to the legs or supports 1, at a point below the case of boxes. The lower portion of said feeder shaft 21, passes vertically through a horizontal forwardly extending arm of said spider frame 23, and said arm is formed with a segmental track 25, having a curved or cam shaped portion 25', at one end. The feeder shaft 21, is provided with a rigid horizontal arm 26, over said segmental or circular track 25, and said arm has a vertically disposed roller carried by its free end and moving on said track. The arrangement is such that when said arm is swung forward to its limit of stroke in that direction it will be at the lower front end of the curved or cam portion 25', of the track, and the upper feeding end of the shaft 21, will be located down on the top most letter of the pile. In this position the top most letter of the pile has been drawn up to the suction cups or mouths 22, and when the proper operating mechanism is set to work, said shaft 21, is rocked and the wheel of the arm 26, travels up said cam or curved track 25', and thereby elevates the shaft and elevates the upper letter feeding end thereof and at the same time said end swings rearwardly and carries the letter rearwardly over the upper end of the wall 11,



and into the feed rolls 24. The curved portion 25', of the track 25, is sufficiently high to carry the letter over the upper edge of the wall 11, and the remainder of the length of the track is flat or horizontal to carry the letter in a horizontal plane into the rolls 24. When said feeder shaft 21, moves in the opposite direction to return to its normal position over the pile of letters, the roller of arm 26, moves forwardly over the rear horizontal portion of the track 25, and then down the inclined portion 25', of said track to lower the suction cups or mouths 22, onto the top most letter of the pile.

The two feed rolls 24, 24, are arranged on axes which extend radially of the cylindrical box case. The bite between these two rolls is in approximately the same horizontal plane as that in which the letter moves into the rolls. The two rolls are mounted on shafts 24', 24'. The lower shaft is mounted in suitably arranged fixed bearings carried by a rigid part of the frame work, and the shaft of the upper roll is suitably mounted so as to yield vertically as the rolls receive letters of various thicknesses. The lower roll shaft 24', is provided with a pulley 24<sup>2</sup>, driven by some suitable mechanism, as hereinafter set forth. The two co-acting feed rolls are circumferentially slotted or divided as shown more clearly in Figs. 2, and 3, to receive the jaws of the main letter conveyer or lift as hereinafter set forth, and said two rolls are held yieldingly together by a suitable spring mechanism 24<sup>3</sup>, as shown. The upper roll is preferably driven by friction, that is the upper roll is an idler while the lower roll is positively driven, although of course if desired, the two rolls can be both positively driven.

In the construction illustrated, the main letter conveyer or lift reciprocates practically throughout the length of the vertical main letter way or passage and thus intersects the planes of the respective horizontal branch letter ways.

The main letter conveyer or lift, as shown, consists of a carrier provided with a letter holder or clamp. The carrier consists of a vertically disposed sliding sleeve 28, having a rigid arm 28<sup>2</sup>, projecting laterally therefrom and provided with a vertical guide, ring or tube 28', as the case may be. The sleeve or slide 28, and the ring 28', are confined to slide vertically on two vertical rigid rods or guides 27, and 27'. These two parallel rigid rods 27, and 27', extend throughout the length of the main letter way and at their lower ends are shown secured to the base ring or support of the bottom row of boxes, and at their upper ends are secured rigidly to the upwardly deflected portion of the arm or bracket 4', connecting two of the arms of the rigid top spider frame 4, above the case of boxes.

The letter clamp or holder of the main let-

ter conveyer is arranged in front of and a distance from the sliding sleeve 28, so that the letter passing from the feed rolls into said clamp of the main letter conveyer will not engage the sleeve 28, of said conveyer. The letter clamp is carried by a rod or support 29, extending horizontally and forwardly from, and rigid with the sleeve 28.

30, 30, are two parallel separated horizontal jaws rigidly secured to the support or rod 29. These jaws are made of light material and are in length greater than the width of any letter which is delivered there-to from the feed rolls. The rigid lower jaws 30, are opposed by the correspondingly formed and arranged movable spring held jaws 31. The upper jaws 31, are secured together by a cross bar 31', arranged centrally of the lengths of said jaws. 32, is a spring secured at its rear end to the rigid arm 28<sup>2</sup>, and at its front end to said cross bar 31', and yieldingly holding the movable jaws 31, down to the rigid jaws 30, so as to permit vertical yielding of the movable jaws 31, to accommodate letters of various thicknesses and sizes. This spring in connection with its point of attachment to the yielding jaws is so arranged as to permit said jaws to rock vertically to accommodate small or narrow letters and also bulky letters of different thicknesses at different points. It will thus be observed that the clamp, as shown, consists of two pairs of opposing jaws, with the jaws of each pair arranged in the same vertical plane one above the other. I show the jaws engaging only at their ends, their intermediate portions being concaved or reduced for the purpose of gripping the thin edges of the letters or supporting said edges to prevent bending or crumpling thereof, and so as to accommodate the intermediate thick portions of bulky letters.

The bites between the horizontally arranged pairs of jaws composing the letter clamp of the main letter conveyer are, when the letter conveyer is in its normal position, arranged behind and in approximately the same horizontal plane with the bite between the two feed rolls 24, 24. The said letter clamp is arranged on the opposite side of the feed rolls 24, from the initial feeding device so that the letter placed in the feed rolls by the initial feeding device is carried between said rolls and moved horizontally into the letter clamp of the main letter conveyer. The inner ends of the jaws 30, 31, are flared or beveled to guide the advancing edge of the letter as it leaves the feed rolls, properly into and between said jaws. Also the front ends of the letter clamp of the main letter conveyer are so arranged with respect to said feed rolls as to lap the same, as more clearly shown in Fig. 8. To permit this, the feed rolls are circumferentially grooved or recessed so that the front end of the letter



clamp will approach closely to the bite between the feed rolls. Hence it is obvious that mechanism must be provided to move the letter rearwardly into the letter clamp after it has left the feed rolls so that when the main letter conveyer starts on its upward movement the edge of the letter is free to pass the rear portion of the periphery of the top feed roll. For this purpose, I show swinging pusher fingers 34, depending from a rock shaft 35, mounted in a frame or support 33, a distance above the letter clamp of the lift and extending laterally from and rigid with the upper portion of the sleeve 28. The lower ends of these swinging pusher fingers 34, lap the front ends of the jaws of the letter clamp and are curved or otherwise formed to engage the rear edge of the letter which has been forced into the spring clamp, and has advanced beyond the bite between the rapidly driven feed rolls 24, and push said letter into the clamp so that its edge is rearwardly beyond the vertical plane including the rearmost portion of the periphery of said top roll.

Suitable mechanisms are provided to operate said pusher fingers 34, at the proper time with respect to the advancing letter. To this end I show the rock shaft 35, provided with a rearwardly extending rigid crank arm 36, at an intermediate point, 36', pivotally joined to and crossing the vertical reciprocating bar 39. The rear free end of the crank arm 36, extends beside the sleeve 28, and is limited in its upward swing by a rigid stop 38.

The main letter conveyer is raised and lowered through the medium of a flexible endless connection 40, passing around suitable idler pulleys and properly coupled to a driving pulley as hereinafter set forth. The main letter conveyer is secured in this endless flexible connection 40, at the points 45, 45, located at the lower end of the rod 39, as seen more clearly in Figs. 8 and 9. When the main letter conveyer is in its normal position with the jaws opposite and immediately behind the two feed rolls, the said conveyer is locked against upward movement by the downwardly projecting spring finger 42, secured to the lower portion of the sleeve 28, and provided with the shouldered portion terminating in the downwardly and outwardly curved end. This spring finger catches under a collar or stop 43, secured on the lower portion of the guide rod on which the sleeve 28, slides. When the said sleeve moves downwardly the finger 42, slips past the collar 43, and the shoulder of the finger 42, catches under the collar 43, and thus holds the main letter conveyer against upward movement until the tension of the spring 42, is overcome, and said spring slips from the collar 43.

When the main letter conveyer is in its

normal position, as just described, with the finger 42, caught on the collar 43, the pusher fingers 34, are in their normal positions swung outwardly with their lower ends raised above and out of the path traveled by the letters passing from the rolls 24, into the letter clamp, see Fig. 1, and dotted lines Fig. 8. When the said pusher fingers 34, are in the normal positions the crank arm 36, is at its limit of downward movement resting on the frame 33, and said crank arm 36, is yieldingly held in its said downward position by a spring finger 37, at its upper end secured to the upper portion of the sleeve 28, and projecting downwardly beside said sleeve and arranged to engage the free end of the crank arm 36. The lower portion of said spring finger 37, is curved or beveled as shown, and the beveled portion terminates in an upwardly facing shoulder 37'. The bar 39, secured in the flexible connection 40, has a vertical longitudinal play independent of the sleeve 28, and the main letter conveyer, equal to the distance between the stop 38, and the portion of the frame 33, engaged by the crank arm 36, when in its lowest position. Thus when the main letter conveyer is in its normal position at its limit of downward movement the rod 39, is also at its limit of downward movement with the crank arm 36, resting on the frame 33.

When the letter has been moved into the clamp of the main letter conveyer by the feed rolls 24, and the proper mechanism has been set at work, tension is exerted upwardly on the rod 39, through the medium of flexible connection 40, and as the spring 42, has greater power than the spring 37, said rod will move upwardly and carry the crank arm 36, upwardly against the tension of spring 37, thereby swinging said spring to one side and allowing the crank arm 36, to move past the same and engage the rigid stop 38. This movement of the crank arm throws or swings the pusher 34, inwardly and moves the letter inwardly into the clamp so that it can push upwardly without engaging the top feed roll 24. When the crank arm 36, engages the stop 38, the pull of the flexible connection 40, is directly on the sleeve 28, and consequently the spring 42, is drawn past the collar 43, and the main letter conveyer starts on its upward movement. Said conveyer is stopped opposite the branch letter passage to which the letter carried by the conveyer belongs, by suitable mechanism as hereinafter set forth.

At the proper time in the operation of the machine, after the letter has been deposited in a box, the direction of pull of the flexible connection 40, on the main letter conveyer is reversed, and said conveyer is moved downwardly to its before mentioned normal position. During this downward movement



the crank arm 36, is maintained in its elevated position by shoulder 37', of the spring 37, but when the spring 42, engages the collar 43, the continued downward pull on the  
 5 bar 39, throws the spring 37, to one side and allows the crank arm 36, to drop onto the frame 33. The pull of the flexible connection 40, is then directly on the sleeve 28, and consequently the spring 42, is pressed  
 10 to one side and allowed to slip over the collar 43. When the crank arm 36, is thus swung downwardly the pusher fingers 34, are swung outwardly to assume their normal positions out of the letter path, as before  
 15 described, so that the letter from the feed rolls is free to move into the clamp of the main conveyer.

Suitable mechanisms are provided to stop the main letter conveyer opposite any one  
 20 of the branch letter passages. As a suitable means for this purpose, I show a vertical rod or bar 44, extending upwardly beside the carrier of the main letter conveyer and parallel with the bars on which said conveyer  
 25 moves. This support or bar 44, is provided with a series of swinging stops or catches 5', 6', 7', and 8', corresponding to the respective branch letter way passages 5, 6, 7, and 8. No movable stop is necessary for the top-  
 30 most branch letter passage as the main letter conveyer is limited at the upper end of its stroke so as to stop in the path of the branch passage conveyer of said topmost passage. If the letter carried by the main letter con-  
 35 veyer is intended for the topmost row of passages, said conveyer moves upwardly past all of the other branch passages and the stops corresponding thereto, and at its limit of upward movement the sleeve 28, abuts  
 40 against the upwardly deflected portion of the top frame 4', and thus automatically stops the lift at the necessary point to deliver its letter to the topmost branch passage conveyer. Each stop or catch 5', 6', etc. is com-  
 45 posed of the hook shaped swinging lever fulcrumed to the bar 44, with its upper hook-shaped or shouldered end arranged to swing into the path of a stop or projection 44', from the side of the tube or sleeve 28. Each  
 50 stop or catch is fulcrumed at its lower end and provided with the laterally extending crank arm to which a coiled retractive spring 45, is secured, constantly tending to hold the upper end of the catch out of the path of the  
 55 projection of the lift or main letter conveyer. Each catch or stop is provided with a setting or operating connection 46, to move the catch against the tension of its spring 45', and throw its shouldered upper end out-  
 60 wardly and into the path of the pin 44', rigid with the lift so as to stop the lift at the branch passage desired.

The various operating connections 46, extend upwardly from their respective catches  
 65 or stops to a point above the case of boxes,

where they are attached to the inner ends of the vertically rocking levers 47, each fulcrumed to a hanger depending from the upwardly deflected portion of the support 4'. The levers extend outwardly beyond the case  
 70 of boxes and each has its outer end pivotally joined to a pull connection 48. The various pull connections 48, extend vertically outside the case of boxes and at their lower ends, at a point below the case of boxes, are respec-  
 75 tively joined pivotally to the levers 49, hereinafter more specifically described. In the specific example illustrated, there are four catches or stops for the branch passages and consequently there are four pull connections  
 80 48, and four levers 49. It will thus be observed that when one of the levers 49 is depressed, the branch passage stop or catch corresponding thereto is thrown into the  
 85 path of the main letter conveyer, and that the main letter conveyer will be stopped in its upward movement at the proper point opposite or in the particular branch passage to which said stop corresponds. The operat-  
 90 ing mechanism for the main letter conveyer is so timed that the stop is thrown into the path of said conveyer before the conveyer starts on its upward movement.

Mechanism is provided to lock the stop setting devices, and when such devices are  
 95 released the spring 45, of the particular stop set will return the parts to their normal positions with the shouldered or catch end of the stop out of the path of the main letter conveyer.  
 100

Suitable mechanisms are provided to remove the letter from the main letter conveyer and deposit the same in any box of the particular row at which the main letter conveyer has stopped. As a convenient form  
 105 for this purpose I show radial arms rigid with a central vertical rocking or oscillating shaft 53. This shaft 53, is arranged vertically and centrally within the well or opening of the cylindrical case of boxes and extends  
 110 above and below the same. The lower end of this shaft is mounted in the rigid horizontal frame 54, and the upper end of the shaft is mounted in the top spider frame and projects above the same. The lower portion  
 115 of the shaft is also mounted in and passes through the rigid horizontal frame 23, secured to the legs 1, and located below the case of boxes.

Suitable driving mechanism, as hereinafter  
 120 set forth, is applied to the lower part of the vertical shaft 53, usually between the supporting frames 23, and 54. The actuating mechanism for the main letter conveyer is applied at the upper end of the shaft 53, at  
 125 a point usually above the spider frame 4.

55, are collars rigidly secured to the vertical shaft 53, opposite the branch letter passages, respectively. These collars can be adjustably secured on the shaft by set 1:



screws, if desired, to render the radial arms 56, carried thereby vertically adjustable. The radial arms 56 are rigidly secured to said collars and extend horizontally therefrom into the branch passage ways over the rows of letter boxes. These arms 56, can be formed of thin light material and at their outer ends carry suitable clamps or conveyers adapted to remove the letters from the main letter conveyer and carry the same over the open tops of the boxes. One horizontally swinging letter conveyer is provided for each branch passage, so that in the present instance there will be five radial arms 56, each radial arm being arranged to move over the open upper ends of the row of boxes which it is adapted to serve with letters. Each radial arm 56, at its outer end carries a spring clamp horizontally disposed and extending forwardly from the arm, in the direction of movement of the arm when advancing to remove a letter from the main letter conveyer. Each clamp is arranged transversely with respect to the length of its arm 56, and consists of a pair of horizontal spring fingers rigidly secured to the lower ends of pins or studs 57, depending from and rigid with the arm 56. The pair of separated parallel spring fingers 59, are usually secured at their rear ends to said studs 57. The upper opposing, movable spring fingers 58, are arranged above and parallel with the lower fingers 59, so as to form in effect two pairs of spring clamping or gripping jaws. The fingers or jaws 58, usually have openings therethrough to loosely receive the studs 57, and permit vertical movement thereon, and said jaws or fingers 58, are secured together by a cross bar 58', arranged about at the centers of the lengths of the said fingers 58. Said fingers 58, are yieldingly pressed toward the fingers 59, by a spring 60, at one end secured to the arm 56, and at its free end pressing downwardly on the cross bar 58', to yieldingly hold the fingers 58, to the fingers 59, with a greater pressure or tension than that exerted by the spring of the main letter conveyer clamp. The spring clamps as just described, carried by the radial arm 56, are made of such a width as to pass between the pairs of jaws carried by the main letter conveyer and pull the letter therefrom by reason of the greater tension or strength of the springs 60, than that of the spring holding together the jaws of the main letter conveyer.

The normal positions of the horizontally movable branch letter conveyers are over the end boxes B, of the rows at the right hand side of the figure 1. That is the boxes B, at the end of the rows opposite the end boxes A, about at which the branch passage conveyers receive the letter from the main letter conveyer.

When the operating mechanism is set in

motion the central shaft 53, is turned or rocked in a direction to move all of the radial arms 56, forwardly over the various rows of boxes and beyond the front end boxes A, of each row, and into the main vertical letter passage. The main letter conveyer having been stopped opposite one of said passages with its letter clamp in the path of the particular branch passage conveyer, said branch conveyer moves forwardly and its forwardly projecting spring jaws enter the clamp of the main letter conveyer and grasp the letter therein, and the operating mechanism then reverses the direction of rotation of the vertical shaft 53, and the branch letter passage conveyers all move rearwardly and again pass over the boxes of their various rows, one of said branch conveyers carrying the letter which it removed from the main letter conveyer or lift. While the branch letter conveyers are making their return letter carrying strokes the letter clamps thereof extend rearwardly, but while said conveyers are making their forward or initial strokes the letter clamps extend forwardly from the respective arms 56, so as to remove the letters from the main letter conveyer.

Each letter box is provided with suitable mechanism at, or adjacent to its upper end, and arranged, when properly adjusted or actuated, to project into the path of a letter carried by a letter conveyer and strip the letter from said conveyer and cause it to fall into the box. To this end I show each box provided with one or more, usually two, vertically disposed fingers 61. The fingers of each box project, or are arranged to project, from the far side partitions of each box, upwardly and vertically into the branch letter passages above the boxes. The fingers are preferably so arranged as to permit the branch passage conveyers to pass between them, and yet so as to strike the advancing edge of the letter carried by one of said conveyers and thus strip the letter from the clamp of the conveyer and cause the same to drop into the box. In this connection it should be noted, as hereinbefore described, that when the branch letter conveyers are moving back from the main letter way, the letter clamps of said branch conveyer extend rearwardly, so that a set of fingers 61, can easily strip the letter from a clamp, while the clamp and letter are located over the particular box in which the letter is to be deposited.

The fingers or strippers 61', of the last or end letter boxes B, of the box rows are permanently or normally arranged in the letter path and projecting into the various branch letter passages, for if a letter carried by a branch passage conveyer has passed over all of the other boxes of the row it must belong in the end box thereof and hence the strippers 61', will always remove a letter and drop it into the end box B, if said letter has



not been previously deposited in some other box of the row.

The gate, stripper or switch fingers 61, are all normally depressed or withdrawn from the various branch passage ways, and mechanism is provided to project any vertical set of said fingers into the branch passages and hold them in such elevated position until a letter has been deposited into one of the boxes. I show, the pairs of stripper fingers carried by cross heads 62, arranged radially within the box case. Each cross head is arranged beside and usually in a recess in a partition of its box and carrying the two stripper fingers which project upwardly. The box, or some part thereof, is formed with a suitable vertical guide way for said cross head 62, and the projecting outer end of the cross head is secured to a vertical rod 63, arranged at the exterior of the case of boxes and passing through suitable guides carried by or rigid with the several base plates 2, of the rows of boxes. The vertical rods 63, extend throughout the length of the case of boxes and project above and below the same. There are as many vertical rods 63, as there are vertical rows of boxes, minus the row of boxes B. These vertical rods 63, extend upwardly along or adjacent to the outer vertical edges of the partitions between and forming the boxes, and each rod has all of the cross heads 62, of one vertical row of boxes secured thereto. Thus in the specific construction shown, each vertical rod 63, will have five cross heads 62, secured thereto and projecting inwardly and radially of the case of boxes therefrom. These rods 62, reciprocate vertically to project the stripper fingers carried thereby upwardly and to return said stripper fingers to their normal depressed positions.

Suitable mechanisms are provided to independently operate the various vertical rods 63, that is each lift rod 63, has its own elevating mechanism, so that said rods can be separately elevated to elevate the letter switches or strippers carried thereby. In the specific construction illustrated, there are nineteen vertical stripper operating lift rods 63, as there are twenty boxes in each row, the end boxes B, having permanent strippers. I show nineteen vertically swinging levers 64, loosely coupled to said lift rods, respectively, for operating the same, each rod having its own operating lever. These operating levers 64, are horizontally arranged beneath the case of boxes and above the rigid spider frame 23, and all radiate rearwardly and laterally from a point in front of the case of boxes. The lift bars 63, are pivotally joined at their lower ends to the rear ends of said levers 64, which levers are fulcrumed at points between their ends on horizontal pivots carried by the hangers 65, from the horizontal plate 66, of peculiar shape or

formation and secured at the under side of the bottom base plate 2, of the box case. The front ends of the levers 64, all terminate in a horizontal line at a point in front of the box case and have their ends bent upwardly and provided with finger pieces or keys 64', said keys being preferably arranged in a horizontal line or plane in front of the lower front portion of the case and below the horizontal plane of the letter support 10, and located outwardly beyond the vertical plane of said support. As said key levers 64, all branch out from the line of the keys to various points in the circle occupied by the lift rods 63, and as said levers vary in length, and yet all should impart approximately the same length of stroke to the lift rods, it is necessary to arrange the fulcrum points 65, of said levers at various points along the plate 66, to locate the fulcrum point of each lever at the proper point in its length, whereby the rear ends of all the levers will move vertically the same distance, approximately.

The horizontally disposed levers 49, connected, respectively, to operate the main letter conveyer stops, are shown arranged below said series of key levers 64. Each lever 49, is usually arranged in the form of a loop, or U-shaped, and the separated front ends of the parallel side bars of each lever, are rigidly connected by an elongated finger bar 50. The four levers 49, are of different lengths so that the four finger or cross bars 50, are arranged in different vertical planes and are parallel with each other. The front ends of the levers 49, are turned up to receive said finger bars, and said upturned ends are of different lengths so that the finger bars are in different horizontal planes. The bank or steps of finger bars are arranged in front of and parallel with the row of keys 64', so that a bank or steps of finger keys and bars is or are formed. The finger bar levers 49, are all loosely fulcrumed to independently rock on a horizontal cross bar 51, usually arranged just in advance of the central shaft 53, and hung in or secured to hangers 52, rigid with said plates or support 66.

The letter moving operating members and connections of the apparatus are normally inactive and disconnected from the continuously moving driver.

68, is the continuously rotating driver comprising a horizontal balance wheel or pulley concentric with the central shaft 53, and arranged at the lower end thereof on a hub or boss carried by the bottom frame 54. This driver has the ratchet wheel 69, secured thereto concentrically and rigid therewith and located at the upper side thereof.

The operating member for the letter moving devices is normally inactive and is operatively coupled with and disconnected from said continuously rotating ratchet wheel by a suitable make and break or clutch mechanism.



anism. The wheel 68, is driven by a motor or other power through the medium of any suitable power transmitting mechanism. In the specific example shown, the operating member for the letter moving devices consists of an eccentric 70, loosely mounted on the central shaft 53, above the continuously rotating ratchet wheel. This eccentric has a radial arm 71, rigid therewith beside and extending outwardly beyond the ratchet wheel. The clutch between the cam and continuously rotating driver comprises a swinging dog 72, pivotally joined at a point between its ends to said arm 71, so that its free hooked or shouldered end can swing into and out of locking engagement with the teeth of the ratchet wheel 69.

72', is a coiled spring constantly tending to draw the toothed free end of the dog into locking engagement with the ratchet wheel and thereby cause the arm 71, and eccentric cam to rotate with the ratchet wheel. The opposite end of the dog is formed rigid with the radial heel or stop projection 72''. A stop or trip lever 73, is provided with its rear free end held normally in the path of said heel 72'', of the dog, and normally abutting against said heel and holding said dog with its free end swung away from the ratchet wheel and against the tension of its spring 72'. Said stop or trip lever is horizontally arranged beneath the rigid frame 23, and at 73', is fulcrumed on a stud depending from said frame 23. This fulcrum point is about midway the length of the lever and the lever extends forwardly therefrom over the guide 23', rigid with the front end of said frame 23. 73'', is a retractive spring applied to said lever 73, to hold its rear end in the path of the dog. Mechanism is provided at the front end of said lever 73, to swing it laterally against the tension of its spring 73'', and move its rear end laterally from engagement with the heel of the dog and thereby permit the dog to swing into locking engagement with the ratchet wheel and cause rotation of the parts as before described. In the example shown, this releasing or controlling mechanism for the trip consists of a vertical bar 74, carried by and depending from a horizontal cross bar 74', arranged beneath lateral shoulders or projections 64'', from the upturned ends of key levers 64. The cross bar 74', is carried by the front ends of a vertically swinging horizontally disposed bail or frame 74'', at its rear end mounted to swing on the cross bar 51. The cross bar 74', is located under the shoulders 64'', of all the key levers, and the depression of any key lever will swing said bail down and force down the vertical bar 74. The lower end portion of bar 74, has the lateral and upward incline, cam, wedge face or edge 74<sup>+</sup>, normally arranged, or at its inner end terminating just, at the edge of the front end of the trip lever 73, so that

downward movement of said bar 74, will cause said wedge to ride against the edge of said trip and swing said lever to release said dog. The lower end of said bar 74, is vertically slotted to straddle a rigid guide 75, at its forward end having a stop to permit sufficient forward swing of the bar 74, (after said trip lever has been swung) to release bar 74, from the lever and permit the movement of the lever back to its normal position with its rear end in the path of the dog. A spring 75', is provided to return the bar 74, back to its normal position. The bar 74, is mounted to permit this back and forth movement and a spring is provided to return the bar and its bail to the normal elevated position when the key lever which pressed them down has returned.

The bar 74, is pressed forwardly to permit the return of the trip lever 73, by the elbow lever 76, swinging horizontally on said guide 23', and having one arm pressing against the rear face of bar 74, and its other arm resting against the rear cam edge of lateral arm 26, of the initial feeder shaft (herein before described) so that when said initial feeder starts on its feeding stroke, said cam edge will swing the elbow lever to force the bar 74, forwardly from the trip lever which has been swung to one side by the wedge of bar 74, and thereby permit the return swing of said trip lever. The return stroke of the feeder permits the return of the elbow lever and bar 74, under the action of spring 75', when the bar 74, is elevated to its normal position.

The projecting outer end of the radial arm 71, is formed with a double incline or cam shaped edge 77. This cam shaped edge 77, has the intermediate raised portion or point.

78, is a swinging arm pivoted to the stud 78', depending from the rigid frame 23. The forward end of this arm 78, is provided with a roller, normally bearing against the rear incline of the cam edge 77, and said arm 78, is yieldingly held against said cam edge by the spring 79.

79', is a stop, which limits the inward swing of the arm 78. This arm 78, acts on the radial arm 71, as a spring brake to press the arm 71, when inactive, toward the trip lever 73, and thus hold the end of the trip lever against the heel of the dog and thereby maintain the parts in their normal locked positions, preventing such retrograde movement of the arm 71, as might permit accidental release of the dog. When the trip lever 73, is swung to release the dog and permit its locking engagement with the ratchet wheel, the radial arm 71, swings forwardly, as before described, and the swinging arm 78, swings in against the stop 79', holding said arm in position to again engage the cam edge of the radial arm 71, when said arm completes its stroke and is stopped by the disengagement



of the dog from the ratchet wheel. The double incline 77, also serves the purpose of actuating the initial feeder. To this end, I show a horizontally swinging two-armed or elbow lever 80, at its elbow or angle fulcrumed to a stud depending from the frame 23. The rear end of this angle lever is provided with a roller yieldingly held against the cam edge 77, of the arm 71, by a retract-  
 10 ive spring 81. The opposite arm of said lever 80, is connected pivotally by the link 80', with the radial arm 82, rigid with the feed shaft 21, of the initial feeder.

The approximate normal position of the lever 80, with respect to the cam edge 77, is shown in Fig. 5. When said arm 71, starts to swing forwardly on its stroke the rear free end of the lever 80, rides up on the forward side or edge of the cam 77, and thereby  
 20 swings the lever 80, in a direction to rock the initial feeder shaft 21, and carry the upper feeding end thereof rearwardly to deliver the latter into the feed rolls. When the roller of the lever 80, arrives at the highest point of the cam edge 77, the said feeder has delivered its letter to the feed rolls, thereupon the roller of said lever 80, moves down the opposite incline, and the initial feeder shaft is rocked to carry its feeding end back  
 30 to its normal position on the top-most letter of the pile. The arm 71, then continues on its rotation leaving the rear end of the lever 80, which is limited in its inward swing by the rigid stop 81, so that when the arm 71, completes its single revolution, the roller of the lever 80, will be in a position shown in Fig. 5, when said arm 71, has completed its stroke and stopped.

83, is a pinion rigid on the central shaft 53, and located immediately above the eccentric 70, which is loose on said shaft.

84, is an oscillating toothed sector pivoted or fulcrumed at 84', to the rigid frame 23. This toothed sector 84, has the rigid laterally  
 45 extending arm 84<sup>2</sup>, to the outer end of which the pitman 85, forming part of or projecting from the eccentric strap of the eccentric 70, is pivotally joined. The approximately normal positions of the toothed sector and the  
 50 cam are shown in Fig. 5.

When the dog is thrown into locking engagement with the ratchet wheel and the arm 71, rotates the eccentric, said pitman 85, rocks the crank arm 84<sup>2</sup>, and thereby rocks  
 55 the toothed sector 84, and rotates the pinion 83, and the shaft 53, hence swinging all of the branch passage feeders around the case of boxes to receive the letters from the main letter conveyer. As the eccentric cam completes the first half of its stroke the branch letter conveyers reach the limit of their forward movement projecting into the vertical main letter way, and when said cam starts on the second half of its stroke the direction  
 65 of swing of the sector 84, is reversed and con-

sequently the pinion 83, and the shaft 53, are rotated or rocked in the opposite direction, and the branch letter conveyers start on their return letter feeding stroke. In this connection, it should be observed that the  
 70 cam and radial arm 71, make but one complete revolution when the dog has been released and that at the completion of said revolution the trip lever 73, automatically disengages the dog from the ratchet wheel. 75

The lower feed roll can be rapidly rotated in the proper direction by a cord or belt 86<sup>2</sup>, passing over the pulley 24', of the feed roll shaft and under a pulley mounted on a shaft carried by a bracket 86, depending from the  
 80 rigid frame 23, said shaft of this bracket carries a friction roll 86', running on the top face of the continually rotating drive pulley carrying the ratchet wheel and constituting the driver of the apparatus. 85

The main letter conveyer or lift is actuated by mechanism located on the upper end of the shaft 53, above the top spider frame 4.

87, is a horizontally disposed flat faced disk rigid on the shaft 53, to rotate therewith, 90 and arranged just above the spider frame 4.

88, is a disk loose on the shaft 53, and having its flat under face bearing and resting on the upper face of the disk 87. This disk 88, has an upwardly extending sleeve or hub 95 rigid therewith and loosely embracing the shaft 53.

89, is the horizontally rotating sheave or pulley around which the endless flexible connection 40, for raising and lowering the lift 100 or main letter conveyer is wrapped and to which it may be attached. This pulley 89 loosely encircles the hub or sleeve of the disk 88, and rests loosely on the upper face of said disk or on a sheet of friction material 105 interposed between the flat faces of the disk 88, and the pulley 89. A coiled spring 89', is provided to yieldingly hold the pulley down on the friction disk and a suitable set screw can be provided to vary the tension of said 110 spring. The flexible connection 40, passes from the periphery of the pulley 89, in opposite directions above the spider frame 4, and extends downwardly over idler pulleys 40'', the portion of the flexible connection 40, 115 passing downwardly over the rear idler 40'', also passes around an idler 40'', at the bottom of the box case and extends horizontally across the bottom of the box case and upwardly past another idler to the main con- 120 veyer. The flexible connection passes upwardly from the main letter conveyer around an idler 40'', and then horizontally to the driving pulley 89. It will thus be observed that when the driving pulley 89, rotates in 125 one direction, the main letter conveyer will be elevated through the medium of said connection 40, and when said pulley 89, rotates in the opposite direction the main letter conveyer will be lowered. The pulley 89, is so 130



coupled with its driving power as to stop when the main letter conveyer engages one of the branch passage stops. This is attained by driving the pulley 89, by friction. To this end the pulley 89, is driven by friction from the disk 88, and when the main conveyer engages one of said branch passage stops the disk 88, will continue to revolve independently of the pulley 89. Mechanism is also provided to start the rotation of the pulley 89, and consequently the movement of the main letter conveyer, after the shaft 53, has started on and moved a short distance in its rotation. To this end, the driving disk 88, is driven by the disk 87, through the medium of a pin 87', rigid therewith and extending into a segmental slot 88', in the disk 88. When the parts are in their normal positions the pin 87', is at the rear end of said slot 88'. Hence, when the machine is set in motion the shaft 53, revolves and the disk 87, with it, independently of the disk 88, and the disk 88, does not begin to revolve until the pin 87' has passed through the length of the slot 88', and engaged the front end thereof whereupon the disk 88, begins to rotate and the pulley 89, is driven thereby to elevate the main letter conveyer.

It should be noted that the branch passage conveyers begin to move as soon as the operating mechanism of the machine is set to work, but the main letter conveyer does not start on its upward movement until it has received a letter from the feed rolls and until the particular branch stop has been set. When the particular branch passage conveyer has removed the letter from the main letter conveyer and the shaft 53, starts on its reverse rotation, the pulley 89, does not begin its reverse rotation until the pin 87', has moved back the length of the segmental slot 88', and engaged the rear end of said slot, thereby allowing the branch conveyers to move out of the main letter passage before the main letter conveyer starts on its downward movement. The friction clutch, as before described, between the main letter conveyer driving pulley 89, and the driving means for said pulley, allows said main letter conveyer to have a variable stroke or limit of movement so as to stop at any one of the branch passages.

When any set of box gates has been adjusted to cause the deposit of the letter into a particular box and when any branch passage stop has been adjusted to stop the main letter conveyer at said passage, it is desirable to lock these parts in their set positions until the letter moving devices have deposited the letter in the particular box. To this end I provide a lock for the lift bars 63, and 48. This lock in the specific construction illustrated, consists of an oscillating ring 90, arranged horizontally on the top spider frame 4, with edge slots 91, opposite each bar 63,

and opposite the four closely arranged bars 48. Each bar 63, and each bar 48, is provided with an inwardly projecting lug 63', and 48', respectively. The arrangement is such that when said ring 90, is in its normal position and the parts of the machine are at rest, any one of the bars 63, and 48, can be elevated as the lugs 63', and 48', will move upwardly through said slots 91. When any one or two of said bars have been elevated with their lateral lugs above the plane of the locking ring 90, said ring is partially rotated to throw the slots 91, out of the vertical planes occupied by the lugs of said bars so that the lugs of said bars will be above the unbroken portion of the locking ring and thus upheld against downward movement. The locking ring remains in this locking position until the operating mechanisms have completed their respective strokes and are about to return to their normal inactive positions; the locking ring is then moved to again bring the slots 91, below the locking lugs 63', and 48', and thus permit the bars 63, and 48, and the parts connected therewith to return to their normal positions. The locking ring is moved and properly timed in its movements by a horizontally disposed swinging lever 92, arranged above the spider frame and fulcrumed thereto at an intermediate point 92', with its outer forked end engaging a projection 92'', from the locking ring 90, and its inner end provided with a roller 92<sup>3</sup>, engaging and traveling on the edge of the disk 87, rigid with the central shaft 53. This disk 87, is provided with an edge depression or recess 93, so arranged that when the shaft 53, is in its normal inactive position the roller 92<sup>3</sup>, of the lever 92, will be located in said depression.

The locking ring 90, is limited in its movement by the pins or screws 96, passing through slots 95, in said ring into the arms of the top spider frame 4.

94, is a coiled retractive spring secured to the spider frame 4, and to the locking ring 90, and constantly tending to hold said locking ring yieldingly in its normal unlocking position. It will thus be noted that the spring 94, also yieldingly holds the roller of the lever 92, to the edge of the disk 87, so that when said depression 93, of the disk arrives opposite the roller of the lever 92, said roller of the lever will drop into the depression and permit the locking ring 90, under the impulse of its spring 94, to move and locate the slots 91, below the locking lugs of the bars 63, and 48, so that any bars elevated can return to their normal lowered positions. After the key has been depressed and the machine thereby set in operation, the disk 87, moves a distance without rocking the lever 92, but when the lever 92, reaches the end of the recess 93, it is rocked to rotate the plate or ring to lock the bars 63, and 48, in the elevated position.



tion. The ring 90, is held in this locked position by the roller on the circular space or edge of the disk 87, until said disk is about completing its single rotation, the end of the lever 5 then drops into the recess 93, and the ring 90, is then moved as hereinbefore described.

The bank of keys and finger bars is arranged at the lower front of the case of boxes and below and outwardly from the plane of 10 the latter supporting table, so that the operator in front of the machine can look down on the topmost letter of the pile and read the address thereon and without turning his head can easily pick out the particular key 15 and finger bar that corresponds to the box to which said letter belongs.

From the foregoing description it will be readily understood that the finger bars only operate, set or control the main letter conveyer stops, and that the keys set, control or 20 operate the box gates, switches, or strippers, and also control the make and break mechanism to set the letter moving devices in operation.

25 When the letter to be operated on belongs in one of the boxes of the top row, it is only necessary to depress a key corresponding to such box because in such event it is not necessary to set any stop for this main letter conveyer, consequently the keys indicate 30 and correspond to the boxes of the top row.

When any one of the keys is depressed the gate or stripper belonging to the box indicated by the key is elevated, the operating 35 mechanism is operatively connected with the continuously rotating driver, the initial feeder operated to remove a letter from the common source and pass it into the feed rolls which deliver the same into the conveyer. After the main letter conveyer has 40 received this letter and after the branch passage conveyers have started on their forward movements, said main letter conveyer is elevated to the branch passage of the top row and the letter is then taken therefrom by 45 the branch letter conveyer and deposited in the particular box indicated by the key depressed. I show nineteen keys 64', corresponding to nineteen boxes of the top row, 50 but as no box gate or stripper is assigned for the last box B, (the 20th box of the said top row) and as it is only necessary to set the operating devices in motion to cause letters to be delivered into said last box B, of the 55 top row, I provide a key 74<sup>3</sup>, for and indicating said box B, of the topmost row. I attach said key 74<sup>3</sup>, to the cross bar 74', which controls or operates the make and break mechanism to throw the letter moving devices into gear or operative connection with 60 the continuously rotating driver.

I provide as many finger bars 50, as there are horizontal rows of boxes below the top row, and in the present instance, I provide 65 four finger bars, no finger bar being required

for the topmost row of boxes as it is not necessary to set a stop in order to hold said main letter conveyer opposite the topmost branch passage. The finger bars 50, are parallel with each other and with the row of 70 keys as before described, and said finger bars are also of approximately the same length as the row of keys, and are usually divided into spaces on vertical lines extending between the keys so that each finger bar will have a 75 space for a name or title opposite each key. Each finger bar has twenty spaces thereon corresponding to and indicating the twenty boxes, respectively, of the row indicated by the entire finger bar. If the topmost letter 80 of the common pile belongs in one of the boxes in a row below the topmost row of the case, the operator must depress that finger bar which will set the main letter conveyer stop to halt the main letter conveyer opposite the particular branch passage, and the 85 operator must also at about the same time or simultaneously, depress the particular key opposite the particular portion of the finger bar which indicates the particular box. 90 This depression of the key sets the letter stripper or gate of the particular box and also operatively connects the operating devices for the letter moving mechanisms with the continuously rotating driver as will 95 be readily understood from previous descriptions.

One hand can be employed in the operation, for instance, the thumb of the right hand can be used to depress the finger bar, 100 the thumb being placed usually on the particular space of said bar corresponding to the box to which it is desired to deliver the letter, and then one of the fingers of the same hand can be used to press down the opposite key, 105 that is the key opposite the space, or in the same vertical plane with the space of a finger bar indicating the particular box to which the letter belongs.

In Fig. 5, the eccentric cam is so arranged 110 with respect to the swinging toothed sector, that the central shaft changes its direction of rotation twice during each stroke, so that when the branch conveyers move on their return strokes they move beyond the far 115 side partitions of the end boxes B, enabling the letter strippers to pull a letter therefrom, and then move forward again a slight distance before coming to a stop. The branch conveyers thus finally stop over the 120 B boxes and out of the main letter passage and avoid any possibility of the lower branch conveyer stopping in the path of the initial feeder or a letter carried thereby. However, I do not limit my invention to such arrangement 125 as the letter moving parts can be otherwise arranged, located and operated by other constructions than such as specifically shown herein. I might also state that the suction cups of the initial feeder are de- 130



signed to drop down and rest on the topmost letter of the pile and said feeder will properly operate in removing the topmost letter, although such letters may not always be presented in the same horizontal plane. The topmost letter may possibly be so elevated as to hold the feeder shaft up against dropping down its full stroke and thereby holding the roller of the lateral arm from moving down to the lowest portion of the drop 25', in the track 25. Material advantages in the proper separation of the letters as they are successively moved laterally from the common pile, are attained by the vertical movement of the feeder when it starts on its lateral and horizontal feeding stroke.

If so desired the two feed rolls can be arranged to constitute a printing mechanism to imprint certain marks on each letter as it passes through said rolls. If desired, the feeding rolls can be tapered as shown to turn each letter passing therethrough and deliver the same into the main letter conveyer at the proper or desired angle, that is with the length of the letter approximately in the line of a radius of the cylindrical box case, hence each letter moves from the common pile to the main letter conveyer in a path forming a compound or reverse curve. However, I do not desire to limit my invention in all cases to the employment of the feed rolls as the letters may be directly delivered into the main letter conveyer, or an initial feeder may deliver directly into a main letter conveyer.

I use the term "letter", herein for the sake of convenience, not in any limited sense, but mean thereby any form of mail or other matter which my invention can be adapted to handle.

I have specifically described the construction shown as to all details, merely for the sake of enabling the public to clearly understand one example of a device within the spirit and scope of my invention, but I do not thereby limit myself to the construction illustrated, as parts and sub-combinations can be removed therefrom or others added thereto, changes and modifications can be made without departing from the spirit and scope of my invention, and I claim all such changes, and modifications and rearrangements as fall within the spirit and scope of my invention.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent of the United States is;

1. A mail distributing apparatus comprising a curved or circularly arranged row of receptacles, and letter conveying and distributing mechanism provided with controlling means and comprising a swinging arm provided with a letter clamp moving in a curved path over said receptacles, and means to push the letters from said clamp into the receptacles, substantially as described.

2. In a mail distributing apparatus, the combination of letter moving devices, controlling means therefor, and series of circularly arranged rows of boxes, substantially as described.

3. A mail distributing apparatus having circularly arranged separated rows of boxes forming an approximately cylindrical case, and letter moving devices, substantially as described.

4. A mail distributing apparatus, comprising a circularly arranged row of letter receiving compartments, letter moving mechanism having a curved path of movement over said compartments, and controlling mechanisms, substantially as described.

5. In a mail distributing apparatus, the combination of several tiers or rows of circularly arranged letter compartments, and letter moving and controlling mechanisms moving letters from a common source and distributing the same separately to predetermined compartments, substantially as described.

6. In a mail distributing apparatus, the combination of a series of letter compartments radiating approximately from a common center or axial line, letter moving devices having a path of movement beside openings into all of the compartments of said series, and letter controlling means determining the particular compartment into which each letter is deposited, substantially as described.

7. A mail distributing apparatus, comprising tiers or rows of letter compartments, the several tiers being arranged side by side with intervening branch letter passages into which the compartments open, said compartments all radiating from a common axial line, and letter moving and distributing mechanisms, substantially as described.

8. The vertical approximately cylindrical case of letter boxes or compartments comprising separated rows or tiers of radially disposed letter boxes having open outer ends and sides, in combination with letter moving and distributing mechanisms, substantially as described.

9. The approximately cylindrical case of letter compartments having open outer and closed inner ends and open tops, said compartments arranged in tiers with letter passages between the tiers and over said open tops, in combination with letter conveyers moving in curved or segmental paths over said tiers of compartments, and means determining the particular compartment in which each letter is deposited, substantially as described.

10. Several series of parallel segmental or curved rows of letter compartments with intervening passages, combined with letter moving devices movable through said passages and beside the compartments, and



means determining **the particular** box into which each letter is deposited, substantially as described.

11. An approximately cylindrical case of letter compartments having letter ingress openings and open letter egress outer ends, said compartments arranged in separate tiers, supports for said tiers, each tier having a base plate, combined with letter moving and distributing devices, substantially as described.

12. A supporting frame comprising series of uprights secured together at their upper and lower ends, and separate horizontally disposed segmental or curved tiers or rows of letter compartments secured to said uprights and supported and spaced thereby, combined with letter moving and controlling mechanisms, substantially as described.

13. A supporting frame comprising series of parallel rods rigidly connected at their ends, and tiers or rows of separated parallel letter compartments, each row carried by a supporting plate, said plates being secured to said rods and spaced thereby, said rows being curved or segmental and arranged within the series of rods, in combination with conveyers and controlling devices substantially as described.

14. A supporting frame comprising a base, series of uprights rigid therewith and rigidly connected together at their upper portions, and segmental or circularly arranged rows of letter compartments, said rows being horizontally disposed and arranged one above the other and between and secured to the said uprights, combined with conveyers movable between said rows substantially as described.

15. A segmental or curved row of letter compartments comprising a curved floor or base plate, a curved upright inner ring or wall, and radial partitions on the floor extending outwardly from the inner wall combined with a conveyer arranged to deposit mail matter in any one of said compartments substantially as described.

16. An upright supporting frame work, and a vertical series of spaced segmental or curved rows or tiers of letter compartments carried by said frame work each row of compartments comprising radiating partitions and a curved base plate or floor and rear curved wall combined with series of letter conveyers arranged to deposit mail matter in said compartments, substantially as described.

17. In a mail distributing apparatus, the combination with series of letter compartments, letter moving and controlling mechanisms, and a vertically movable support for the common pile of letters provided with mechanism constantly tending to move the same upwardly and with a pawl and ratchet

mechanism holding said support normally against upward movement, substantially as described.

18. In combination, in a mail distributing apparatus, letter moving and controlling mechanisms arranged to take the letters from a common source and deliver the same to various predetermined points of destination, a vertically movable support for the common pile of letters, mechanisms constantly pressing said support upwardly, and a pawl and ratchet mechanism normally holding said support against upward movement and provided with an operating lever whereby the pawl and ratchet mechanism can be operated to permit upward movement of the support step by step, substantially as described.

19. In a mail distributing apparatus, the combination of mechanisms for moving letters from a common source and distributing the same to various predetermined points of destination, a vertically movable support for the common pile of letters provided with mechanism constantly pressing the same upwardly, a rigid member depending from said support provided with ratchet teeth, a double toothed pawl having one tooth normally in engagement with said ratchet teeth and holding said support against upward movement, and a lever mechanism controlling said pawl and whereby the same can be rocked to permit the upward movement of the support tooth by tooth, substantially as described.

20. In combination, in a mail distributing apparatus, letter moving mechanisms arranged to take the letters successively from a common source and distribute the same to various predetermined points of destination, letter controlling means determining the delivery points of each letter, a vertically movable support for the pile of common letters provided with means constantly pressing the same upwardly, and mechanism normally holding said support against upward movement and provided with operating means permitting a step by step upward movement thereof, substantially as described.

21. In combination, in a mail distributing apparatus, a case of letter boxes or compartments comprising parallel horizontal rows of compartments approximately circular or segmental, said case arranged with branch passages between and opening into the compartments of the rows, and a vertical main letter passage intersecting all of said branch passages and arranged between the end boxes of each row, a support for the common pile of letters arranged at the lower portion of said main letter passage, letter moving and distributing mechanisms arranged to take the letters successively from the common source and deliver the same to the various boxes or



compartments comprising a horizontally swinging initial feeder, substantially as described.

22. In a mail distributing apparatus, the combination, of a vertical guide or alining wall, a vertically movable horizontally disposed support for the common pile of letters, the letters adapted to be horizontally arranged on the support and alined against said wall, means to hold the letters in place on the support and press the same against said wall, means constantly tending to press said support and the pile of letters upwardly, manually operated controlling mechanism normally holding said support against upward movement and arranged to permit upward movement thereof step by step as the letters are removed successively from the top of the pile on the support, an initial feeder arranged to take the letters successively from the top of the pile, substantially as described.

23. A mail distributing apparatus, having the horizontally disposed support for the common pile of letters, said support provided with a rigid depending leg, mechanism connected with said leg and constantly exerting upward pressure on the support to move the same upwardly with the common pile of letters as the letters are moved from the pile, a vertically swinging double toothed pawl, said leg formed with ratchet teeth engaged by said pawl, one tooth of said pawl normally holding said leg and support against upward movement, a foot lever yieldingly held in one direction by a spring and connected with said pawl to rock the same, substantially as described.

24. In combination, in a mail distributing apparatus, a case or series of letter boxes or compartments, letter moving mechanisms arranged to receive the letters from a common source and distribute the same to various predetermined compartments, letter controlling mechanisms, a support for the common pile of letters, an element of said letter moving mechanism located in rear of and to one side of the support for the common pile of letters, a swinging horizontally movable initial letter feeder arranged to take the letters successively from said common pile and move the same in a curved path to said element of the letter moving mechanisms, whereby the position of each letter is changed while being transferred from the common pile into the letter moving mechanisms, substantially as described.

25. In combination, in a mail distributing apparatus, a support for a pile of letters, a horizontally swinging initial feeder, mechanisms for swinging said feeder horizontally, and a fixed curved track for raising and lowering said feeder, as it swings horizontally, said feeder provided with means engaging said track, substantially as described.

26. In combination, in a mail distributing apparatus, a support for a pile of horizontally disposed letters, a vertical shaft extending up to one side of the letters and provided with a horizontal tubular upper end adapted to be connected with an air exhausting device and having depending suction mouths or cups adapted to rest on the topmost letter of the pile so that the air exhaust will draw the same to the cups, a rigid curved track having a depressed portion, said shaft having a rigid arm movable over said track and determining the vertical position of the shaft, means for rocking the shaft to cause the upper end thereof to successively remove the letters from the pile, and letter moving mechanisms into which the upper end of said shaft delivers the letters, substantially as described.

27. In combination, in a mail distributing apparatus, letter moving mechanisms, a support for a pile of horizontally disposed letters, an initial feeder comprising a horizontally swinging and vertically movable arm provided with means to carry the letters successively from said pile to said letter moving mechanisms, means to swing said arm to and fro between the pile and letter moving mechanism, and a curved track determining the vertical position of said arm with respect to said pile of letters and cooperating with said arm to move the same vertically, the end portion of said track being depressed to raise and lower said swinging arm at its limit of movement over the pile of letters, substantially as described.

28. In combination, in a mail distributing apparatus, a supporting frame work, a case or series of letter compartments, letter moving mechanisms for distributing the letters thereto, a support for the common pile of letters, an upright vertically movable rocking shaft extending up beside the pile of letters and having a laterally extended end over the same, said shaft and end being tubular and adapted to be connected with an air exhausting device, said end provided with depending suction mouths or cups, a rigid curved track having a depressed portion, a rigid arm from said shaft moving over and having its vertical position determined by said track, a rigid crank arm from the shaft and operating mechanism connected with said crank arm, substantially as described.

29. In combination, in a mail distributing apparatus, a case of letter boxes or compartments, letter moving mechanisms for distributing the letters thereto, a support for a common pile of letters, a swinging arm moving in a curved path from the pile of letters to the letter moving mechanism, said arm being tubular and adapted for connection with an air exhausting device and provided with depending suction cups or



mouths, a curved track having a depressed portion, a lateral arm having a roller moving on said track, said arm determining the vertical position of said tubular swinging initial feeder, an operating mechanism comprising a normally inoperative cam, a continuously rotating driver, make and break mechanism between the cam and driver, and an angle lever connected to operate said initial feeder and held to and operated by said cam, substantially as described.

30. A mail distributing apparatus, having letter moving mechanisms constructed and arranged to remove the letters successively from a common source and deliver the same to various predetermined points of destination, said letter moving mechanisms comprising a pair of rotary co-acting tapered feed rolls, and a horizontally swinging initial feeder removing the letters from the common source and moving the same in a curved path to said tapered rolls which receive the letter and change the direction of movement thereof and deliver the same into the letter moving mechanisms, substantially as described.

31. In combination, in a mail distributing apparatus, an approximately cylindrical upright case of boxes or letter compartments, said compartments being arranged in horizontal rows and formed with the main vertical letter passage between the end boxes of each row and longitudinally of the cylindrical case, a main letter conveyer reciprocating in said main passage, means to deliver the letters separately thereto, and branch way letter conveyers, having curved paths of movement substantially as described.

32. In combination, in a mail distributing apparatus, mechanisms for moving and distributing the letters from a common source to various predetermined points of destination comprising a sliding sleeve carrying a spring held letter clamp, a vertical guide rod embraced by said sleeve mechanism to deliver the letters into said clamp, and letter conveyers to pull the letters from said clamp, substantially as described.

33. In combination, in a mail distributing apparatus, a case of boxes or compartments formed with a main letter way, parallel guide rods extending longitudinally of said way, a main letter conveyer comprising sleeves slidable on said rods and carrying a main letter clamp composed of opposing spring held jaws, mechanism for reciprocating said main letter conveyer, and branch passage conveyers having spring clamps arranged to pull the letters from said clamp of the main letter conveyer, substantially as described.

34. A mail distributing apparatus comprising a vertical series of horizontally disposed segmentally arranged rows of letter compartments, said segmentally arranged

rows of compartments being spaced from each other to form intervening horizontal letter passages, the end boxes of each row being separated from each other to form the vertical main letter way intersecting all the said passages, a main letter conveyer movable in said way, swinging conveyers movable in said passages and arranged to receive letters from the main letter conveyer, substantially as described.

35. A mail distributing apparatus, comprising letter moving mechanisms constructed and arranged to receive the letters from a common source and deliver the same to various predetermined points of destination, comprising a reciprocating main letter conveyer consisting of parallel guide tubes or sleeves inclosing and movable on guide rods, and rigidly connected with each other and provided with a lateral rigid arm carrying a pair of elongated rigid jaws to one side of said tubes, a pair of connected movable opposing jaws carried by a spring and yieldingly pressed toward the before mentioned jaws, operating mechanisms, and controlling means determining the delivery point of each letter, substantially as described.

36. In combination, in a mail distributing apparatus, a case of compartments or boxes comprising horizontal rows arranged one above the other, a main letter way intersecting all of the rows, vertical guide rods throughout the length of said way, a main letter conveyer comprising a slide movable on said rods and carrying a spring letter clamp, a vertical rod extending throughout said way adjacent to said guide rods and provided with series of spring held stops arranged to stop the main letter conveyer at various points throughout the length of the main letter way, and a series of manually operated devices corresponding to and respectively connected with said stops, so that each manually operated device controls and sets its own stops, substantially as described.

37. A mail distributing apparatus having a main letter conveyer or lift provided with and carrying swinging pusher fingers, substantially as described.

38. A mail distributing apparatus comprising a reciprocating letter conveyer composed of a carrier and a letter clamp, and a swinging pusher carried by the carrier and arranged to push each letter into the clamp to hold the same against retrograde movement, said pusher operated by the operating mechanism of the conveyer, substantially as described.

39. A supporting frame work, series of approximately ring-shaped horizontal rows of letter compartments arranged one above the other, said rows being spaced to form the intervening branch letter passages, the compartments of each row opening into the branch passage thereof, in combination with



letter conveyers movable in curved paths in said passages along the compartments thereof, letter controlling means to cause the deposit of a letter carried by a conveyer into any compartment of the row served by said conveyer, mechanism to deliver each letter to any one of said conveyers, and operating devices, substantially as described.

40. A mail distributing apparatus comprising series of letter compartments, having unobstructed open tops, a letter gripping conveyer movable along said open tops, and means to strip the letters from said conveyer and cause them to drop flat face down through said open tops of said compartments, substantially as described.

41. A mail distributing apparatus comprising a letter conveyer-consisting essentially of a reciprocating slide, means for reciprocating said slide, a letter clamp carried by the slide, a frame carried by the slide, a swinging pusher carried by the frame, and operative connections between the pusher and said operating means of the slides, substantially as described.

42. A mail distributing apparatus having letter moving mechanisms comprising a reciprocating main letter conveyer, a letter pusher carried by said conveyer, and operating mechanism for reciprocating said conveyer, said mechanism having a limited independent movement, said pusher being operatively connected with said operating mechanism, and operated thereby independently of the conveyer, substantially as described.

43. In combination, in a mail distributing apparatus, a reciprocating letter conveyer, a lock to normally hold the letter conveyer at its limit of movement in one direction, said lock comprising a spring catch, letter controlling devices, and actuating mechanisms, substantially as described.

44. In combination, in a mail distributing apparatus, a letter conveyer comprising a sleeve and a letter clamp carried by said sleeve, a flexible connection for reciprocating said conveyer, actuating devices for said connection, a swinging letter pusher carried by said main letter conveyer and pivotally joined to said connection, and having an end movable between stops carried by said conveyer, so that the flexible connection and pusher end have an independent movement between said stops of the conveyer, substantially as described.

45. In a mail distributing apparatus, in combination, a guide rod, a stop near one end thereof, a sleeve sliding on said rod and provided with a spring catch to engage said stop, a letter clamp carried by said sleeve, and mechanism for reciprocating said sleeve longitudinally of the rod, substantially as described.

46. In a mail distributing apparatus, the combination of a carrier, mechanism for re-

ciprocating the same, and a letter clamp carried by the carrier and comprising elongated stationary jaws, and parallel movable opposing jaws, the opposing jaws secured together at about the centers of their lengths by a cross bar and a plate spring secured to the carrier and at its free end secured to said cross bar and yieldingly holding the movable jaws to the stationary jaws, substantially as described.

47. In combination, in a mail distributing apparatus, a reciprocating slide, means for reciprocating the slide, a letter clamp carried by the slide, means for passing letters into the letter clamp, a swinging pusher to force the letters into the letter clamp, said pusher carried by the slide and normally located out of the path of the letter entering the clamp, when the slide is at its limit of movement in one direction, a swinging arm for operating said pusher, said slide provided with stops between which said arm is free to swing independently of the slide, and an operating connection for reciprocating the slide and pivotally joined to said swinging arm, substantially set forth.

48. In a mail distributing apparatus, the combination of a frame, rows of letter compartments carried thereby and arranged to form a main letter way, a guide rod arranged in the main letter way, a slide reciprocating on the guide rod and carrying a letter clamp, a flexible connection provided with operating means, a rod to which said connection is secured, said rod being loosely confined to said slide to reciprocate the same as the connection is moved in opposite directions, substantially as described.

49. In combination, in a mail distributing apparatus, a reciprocating slide, a letter clamp carried thereby, a swinging letter pusher carried thereby, an operating connection for reciprocating the slide, said connection operatively connected to actuate the pusher to move the same out of the path of a letter entering the clamp when the slide reaches its normal position, and operatively connected with said pusher to swing the same to force a letter into the clamp before the slide starts on its feeding stroke, substantially as described.

50. A mail distributing apparatus comprising a reciprocating letter conveyer, several stops to hold the conveyer at various distances from its normal position, actuating mechanism for the conveyer, and a clutch between the conveyer and said actuating mechanism, whereby the conveyer can be stopped at various points, substantially at set forth.

51. In combination, in a mail distributing apparatus, a reciprocating letter conveyer, a drive shaft, a driving pulley independent of said shaft, a flexible connection between said pulley and said conveyer, and a friction clutch between the pulley and drive shaft,



whereby the conveyer can be stopped at various points independently of said drive shaft, substantially as described.

52. In combination, series of rows of letter compartments, series of branch letter passages corresponding to said rows, each passage opening into the boxes of its row, series of radial swinging arms in said passages, respectively, and provided with letter clamps moving over the compartments, means to strip the letters from the clamps and permit them to drop into the boxes, and actuating and controlling devices, substantially as described.

53. In combination, several rows of letter compartments or boxes, a frame work, a reciprocating letter conveyer, operating mechanisms therefor, a series of independent movable stops arranged along the path of said conveyer and each adapted to be projected into the path of the conveyer to stop the same, said stops normally held out of the path of the conveyer to permit the same to move its longest stroke, a series of levers fulcrumed in the frame work corresponding to the stops, respectively, direct pull connections between the stops and levers, respectively, a series of adjacent separate manually operated swinging finger levers, corresponding to said stops, respectively, and direct pull connections from said finger levers, respectively, to said levers, whereby any one of said devices can be operated to set the stops controlled thereby into the path of the said conveyer, substantially as described.

54. In combination, a letter conveyer provided with and carrying a letter pusher, and means to move the letters into said conveyer, substantially as described.

55. A mail distributing apparatus, comprising a main letter conveyer provided with a movable letter pusher and stop, and a branch conveyer arranged to intercept the main conveyer and remove the letter therefrom, substantially as described.

56. A mail distributing apparatus comprising a conveying letter clamp provided with and carrying a movable pusher for forcing each letter into the clamp and holding the letter against retrograde movement while being removed from the clamp, and means for removing the letters from the clamp, substantially as described.

57. A mail distributing apparatus comprising a row of letter compartments or boxes open at the top in combination with a swinging arm provided with a spring letter clamp movable over the open tops of the row of boxes, said arm swinging from a center, and the row of boxes arranged concentrically with said center, substantially as described.

58. A mail distributing apparatus comprising a series of rows of letter compartments an oscillating shaft and radial arms carried by said shaft, and provided with letter

clamps movable over the boxes of the rows, substantially as described.

59. A mail distributing apparatus comprising a series of rows of letter compartments or boxes arranged with intervening letter passages, and an oscillating shaft provided with radial arms extending into said passages and carrying letter movers, substantially as described.

60. A case of letter boxes or compartments comprising series of rows of circularly arranged letter boxes or compartments having open tops and branch letter passages between the rows, and a shaft provided with radial arms extending into said passages and having letter movers or carriers, and mechanisms for oscillating said shaft to move the arms and their letter carriers back and forth over the boxes or letter compartments, substantially as described.

61. A mail distributing apparatus comprising an upright case of boxes or compartments, said compartments arranged in horizontal rows on curved lines with branch letter passages between the rows, each branch letter passage opening into the compartments which it serves, a vertical shaft concentrically arranged within the case and provided with radially disposed letter conveyers moving within the branch passages, and means to strip the letters from said conveyers and cause them to drop into the boxes or compartments, substantially as described.

62. A mail distributing apparatus, comprising mechanisms constructed and arranged to remove the letters from a common source and deliver the same to various predetermined points of destination, said mechanisms comprising radial arms provided with letter conveyers, said several radial arms being connected together and moving as one, substantially as described.

63. In combination, a frame, an upright case of letter boxes or compartments carried thereby and comprising horizontal rows of compartments arranged on curved lines, said case having a vertical open center, a vertical central shaft arranged in said open center, driving mechanism therefor applied at the lower end of the shaft, series of letter moving devices radiating from the shaft and moving beside the compartments, and letter controlling devices determining the particular compartment into which each letter is delivered, substantially as described.

64. A mail distributing apparatus comprising a series of letter compartments having open tops, series of reciprocating letter strippers, mechanism normally holding said strippers out of the path of letters moving above the boxes and arranged to project upwardly into said path to engage the edge of a letter and strip it from a letter clamp, and a letter clamp provided with operating means, said clamp movable along the open tops of



the boxes or compartments, substantially as described.

65. A mail distributing apparatus comprising a swinging carrier provided with a letter conveyer or clamp, said carrier swinging from a fixed center, and a row of letter compartments arranged in a curved line concentric with said center, and provided with letter stripping means, substantially as described.

66. A mail distributing apparatus comprising a series of letter compartments having open tops, reciprocating letter strippers arranged at the open tops of the compartments, respectively, means for reciprocating said strippers, and means for moving the letters over the open top of the compartments so that any stripper can be reciprocated into the path of the letter and cause the deposit of the same in the particular compartment represented by such stripper, substantially as described.

67. A mail distributing apparatus comprising a case or series of letter compartments arranged in rows, a main letter conveyer comprising a letter clamp, series of movable branch letter conveyers, each having a spring clamp arranged to intercept the main letter conveyer clamp and pull a letter therefrom, and means for stripping letters from the branch letter conveyers and causing deposit thereof in the compartments, substantially as described.

68. In a mail distributing apparatus, a movable spring letter clamp, means for moving the same, in combination with another movable spring letter clamp moving in a plane intersecting the plane of movement of said first mentioned clamp, first mentioned clamp having a spring of greater power than that of the first mentioned clamp and arranged to pull the letter therefrom, and letter controlling means determining the delivery points of said letter clamps, substantially as described.

69. A mail distributing apparatus comprising a rocking shaft having a radial arm rigid therewith and a spring letter clamp carried by the radial arm and comprising jaws yieldingly held together, substantially as described.

70. A mail distributing apparatus having a letter clamp comprising a carrier, a pair of stationary jaws projecting therefrom laterally, a pair of movable jaws opposing the stationary jaws, and a spring pressing the movable jaws to the stationary jaws, the movable jaws secured together by a cross bar, substantially as described.

71. A mail distributing apparatus having letter moving and controlling means constructed and arranged to remove the letters from a common source and deliver the same to various predetermined points of destination, comprising a rocking shaft having se-

ries of radial arms projecting therefrom, said arms carrying letter clamps at their free ends, means to deliver the letters to said clamps, and means to strip the letters from said clamps, substantially as described.

72. A mail distributing apparatus comprising series of letter boxes or compartments, a rocking shaft, means for rocking said shaft, a series of radial arms projecting from said shaft and carrying letter clamps or holders, substantially as described.

73. A mail distributing apparatus comprising a series of letter compartments, a rocking shaft, operating means for said shaft, series of radial arms projecting from said shaft and provided with letter holders, a letter conveyer having a path of movement intercepting the letter holders of said arms, and arranged to deliver a letter to any one of said arms, and mechanism for operating said letter conveyer and timing the movement thereof with respect to the movements of said letter holders, substantially as described.

74. A mail distributing apparatus comprising a rocking shaft, rows of letter compartments arranged around and concentric with said shaft, radial arms moving with said shaft over said rows of compartments, respectively, and provided with letter holders moving over the same, means for delivering letters to said holders, and means for removing the letters from said holders and depositing the same in any one of the boxes of a row over which a particular mover travels, substantially as described.

75. A mail distributing apparatus comprising several parallel rows of letter compartments having open letter receiving sides, said rows being separated to form branch letter passages along the open sides, reciprocating fingered letter strippers arranged at each compartment and normally retracted from the branch letter passage of the compartment, means connecting corresponding letter strippers of the rows to reciprocate the same into and out of the branch passages, and manually operated actuating means connected with and controlling the series of strippers, substantially as described.

76. A mail distributing apparatus comprising two pairs of parallel spring held letter clamping jaws, said pairs of jaws being parallel and separated from each other, in combination with a letter carrier comprising two pairs of spring held projecting jaws, a carrier from which jaws project, said jaws arranged to pass between the jaws of the first mentioned clamp and remove the letter therefrom, and operating mechanisms, substantially as described.

77. In a mail distributing apparatus, a letter conveyer comprising two pairs of parallel spring held elongated letter holding jaws, and actuating mechanism therefor, in combination with a carrier provided with a pro-



jecting letter clamp arranged to pass between the jaws of the before mentioned clamp and remove the letter therefrom, said letter conveyer moving in a path intersecting the plane of the path of the letter clamp, and operating mechanism, substantially as described.

78. A mail distributing apparatus comprising a row of letter compartments having open tops and provided with means to project there above to engage the edge of a letter and cause the letter to drop into a compartment, a carrier provided with operating mechanism, and a letter clamp or holder carried by the carrier and movable over the open top of said compartments, substantially as described.

79. In combination, a row of letter compartments arranged on a curved line, a shaft, a radial arm carried by and swinging with the shaft and moving over said compartments, a spring letter clamp projecting laterally from said arm and comprising a jaw rigidly secured, and an opposing spring held jaw loosely confined to said arm and parallel with the before mentioned jaw, substantially as described.

80. In combination, an upright case of letter compartments comprising horizontal curved rows of boxes with intervening branch passages, each row of boxes being approximately circular with a space between the end boxes thereof, the end boxes of all the rows being arranged one above the other thereby forming the vertical main letter way intercepting the branch passages between the rows of boxes, a vertical shaft extending longitudinally within the case and provided with the radial arms movable in said branch passages and provided with letter holders movable over the compartments, said holders being normally located over the end boxes of their rows, mechanism to rock said shaft and move the holders over all of the compartments of the rows and into the main letter way, and then move the shaft in the opposite direction to carry said holders back over all of the compartments of the rows, and mechanism in the main letter way to deliver the letters to said holders, substantially as described.

81. In combination, a row of letter compartments having open tops, vertical movable supports arranged along the side walls of the compartments and provided with upward projections, mechanism for vertically moving said supports, and a letter holder arranged to travel over the open tops of the compartments, whereby any support can be elevated to throw its projections into the path of a letter carried by said holder so that the projections will engage the edge of a letter and strip the same from the holder and cause the letter to fall into the compart-

ment represented by the projections elevated, substantially as described.

82. In combination, several horizontal rows of letter boxes, the boxes of the horizontal rows being arranged one above the other in vertical rows, said rows being arranged with intervening branch letter passages, and the boxes having open tops, vertically movable supports arranged in the boxes and having upwardly projecting stripper fingers, the supports of each vertical row being connected together, series of manually operated controlling devices corresponding to and indicating the series of vertical connected strippers, and series of letter holders movable over the rows of boxes respectively, whereby any vertical row of strippers can be elevated to project in to the path of a letter carried by any one of said holders, for the purpose substantially as described.

83. In combination, in a mail distributing apparatus, several horizontal rows of letter compartments, said rows being arranged one above the other with intervening letter passages, vertical lift rods extending up beside the boxes of the various rows and provided with supports extending into the boxes, vertical stripper fingers extending up from said supports, series of vertically movable levers provided with keys, said levers corresponding to and pivotally joined with the lower ends of said rods respectively, so that when any key is depressed the strippers indicated thereby will be elevated into the branch passages, and letter holders movable in said branch passages, whereby the strippers which are elevated in any branch passage will remove the letter therein held by a holder and cause the letter to drop into the box indicated by the key depressed, substantially as described.

84. In combination, series of letter compartments, series of letter controllers, series of manually operated devices connected with and actuating said controllers, respectively, letter moving devices comprising a reciprocating letter conveyer, series of stops to limit the movement of said conveyer, another series of manually operated devices connected with said stops, respectively, to set any one of the same, and actuating devices, substantially as described.

85. In a mail distributing apparatus, in combination a series of letter compartments, a series of letter gates or controllers corresponding thereto, a series of manually operated levers for operating said gates, letter moving mechanisms comprising a vertically movable main letter conveyer, a series of stops for limiting the travel of said conveyer, and a separate series of finger levers for operating said stops independently of said gates, substantially as described.

86. In a mail distributing apparatus, the



combination of a series of letter compartments, each having a letter receiving opening, a letter conveyer movable along said openings, and reciprocating stops arranged adjacent to said compartment openings, respectively, and provided with operating mechanisms, substantially as described.

87. In combination, a series of letter compartments, having top openings, guide ways in said compartments, supports movable vertically in said guide ways and provided with upwardly projecting stops, means for reciprocating said supports and stops, and a letter mover or conveyer movable along the open tops of said compartments, substantially as described.

88. In combination, in a mail distributing apparatus, a vertically arranged case of boxes or letter compartments, the compartments thereof arranged in horizontal rows with intervening branch letter passages, movable letter gates or strippers for the compartments, respectively, branch letter conveyers movable in said passages, a main letter conveyer having a path of movement intersecting the paths of movement of said branch letter conveyers, a series of stops arranged to stop said main letter conveyer opposite any one of said branch letter conveyers, series of horizontally disposed vertically rocking levers arranged beneath the box case and having their front outer ends turned up and provided with finger pieces, said finger pieces forming a bank at the front of the case, certain of said levers being connected to operate the compartment gates, and the other finger pieces being connected to operate the main letter conveyer stops, and operating mechanism having a controlling trip actuated by certain of said levers, substantially as described.

89. In combination, in a mail distributing apparatus, a row of letter compartments having unobstructed letter inlet openings, a projected letter stop from the far side of the opening into the rear end box, normally withdrawn movable letter stops arranged at the far sides of the openings into the remaining compartments, operating devices for said stops, respectively, whereby the letter stop of any compartment can be projected into the path of a letter carried along the openings into said compartments, a letter carrier or holder movable along the openings into said compartments, and operating and controlling mechanisms, substantially as described.

90. The combination, in a mail distributing apparatus, a case of letter boxes or compartments comprising letter compartments arranged in rows with intervening letter passages, a vertical shaft carrying arms provided with letter holders movable in said passages, a main letter conveyer having a path of movement intersecting the paths of move-

ment of said letter holders, driving mechanism for said shaft arranged at the lower end thereof, a disk rigid on said shaft at a point above the case, a disk loose on said shaft and formed with a segmental slot, a stop rigid with first mentioned disk and projecting into said slot, a pulley loose on said shaft and yieldingly held to said last mentioned disk to be rotated by friction therewith, and a flexible connection on the pulley connected to actuate the main letter conveyer, substantially as described.

91. In a mail distributing apparatus, in combination, a case of letter boxes or compartments, the compartments thereof being arranged in rows with intervening letter passages, movable letter stops or gates arranged at the compartments, branch letter conveyers, movable in said passages, a main letter conveyer to deliver letters to said branch passage conveyers, series of devices to control the movement of said main letter conveyer, operating connections for said devices, operating connections for said box or compartment gates, and a lock controlling said several operating connections to lock the parts moved thereby, substantially as described, said lock being operated automatically by a movable part of the mechanism, substantially as described.

92. In combination, in a mail distributing apparatus, a case of letter compartments comprising compartments arranged in rows, movable letter gates or stops for the compartments, reciprocating rods for operating said gates, branch letter conveyers, a main letter conveyer to deliver the letters to the branch letter conveyer, stops to limit the movement of the main letter conveyer, vertical movable rods connected with said stops, a rotary locking ring cooperating with said rods, to permit movement thereof and to hold certain rods locked in their operative positions, and a rotary part of the mechanism controlling the position of said locking ring, substantially as described.

93. In a mail distributing apparatus, in combination, a case of letter compartments, a suitable frame therefor, a rotary spring held locking ring at the top of said frame provided with edge slots, movable letter gates or stops for the compartments, vertically movable rods for controlling said gates, said rods projecting normally beyond the edge of the ring and having lateral projections extending beside said ring, the slots of the ring being so arranged that when the ring is in one position said rods can move vertically with the projections moving through said slots, and when said ring is in its opposite position said rod cannot move vertically by reason of the projections engaging the unslotted portion of the ring, and mechanism for moving said ring, substantially as described.



94. In a mail distributing apparatus, in combination, a case of letter compartments, letter moving mechanisms, operating mechanisms therefor comprising a rotary shaft  
 5 provided with a disk having a cam edge, a rotary locking ring having edge slots and means limiting its movement, a spring device yieldingly holding said ring to its limit of movement in one direction, a lever device  
 10 operated by said disk to move the ring against the action of the spring, mechanisms for determining the delivery points of the letters having reciprocating operating connections projecting beyond the edge of the  
 15 ring with lateral lugs at the face of the ring, the lugs being so arranged with respect to the edge slots of the ring that when the ring is in one position the lugs can move through the slots and when the ring is in the opposite  
 20 position the unslotted portions thereof will prevent movement of the lugs and the parts carrying the same, substantially as described.

95. In a mail distributing apparatus, in combination, letter moving devices, operating mechanism therefor, comprising a rocking shaft, a pinion rigid on said shaft, a frame, a toothed sector meshing with said pinion and fulcrumed to the frame and provided with a lateral arm, a rotary member  
 30 loose on said shaft and having an eccentric connection with said arm to swing said sector to rock said shaft in opposite directions during a complete rotation of said rotary means,  
 35 a continuously rotating driver loose on said shaft, a make and break mechanism between said driver and said rotary means provided with controlling mechanism, and manually operated devices acting on said controlling  
 40 mechanism, substantially as described.

96. In a mail distributing apparatus, in combination, a frame, a case of letter compartments, letter moving mechanisms comprising a rotary upright shaft, a continuously rotating driver loose on said shaft and  
 45 provided with a ratchet wheel rigid therewith, an eccentric loose on said shaft and operatively connected to rotate said rock shaft oppositely during a single rotation of the eccentric, said eccentric rigid with a lateral arm, a dog pivotally joined to said arm, and provided with a spring yieldingly holding the same toward the ratchet wheel, a trip lever arranged to hold the dog from the  
 50 ratchet wheel, a series of manually operated key levers, reciprocating bar having a cam edge to move said trip lever to release the dog; mechanism operated by the depression of any one of said key levers to reciprocate  
 55 said bar to operate the trip lever to release the dog, and spring returning mechanisms, substantially as described.

97. In a mail distributing apparatus, the combination of letter moving mechanisms  
 65 comprising a normally inactive rocking mem-

ber, a frame, devices controlling the delivery points of each letter, a series of independent manually operated levers connected to set said devices, a continuously rotating driver, a make and break mechanism between the  
 70 driver and said normally inactive member provided with controlling means comprising a trip lever, a reciprocating wedge operated by each of said manually operated levers to move the trip lever to throw the driver into  
 75 operative connection with said letter moving mechanisms, a device to release said wedge from the trip lever after the wedge has been moved to swing the trip lever, said letter moving mechanism comprising an initial  
 80 letter feeder controlling said last mentioned releasing device, substantially as described.

98. In a mail distributing apparatus, in combination, a continuously rotating driver, a frame, letter moving mechanisms, comprising  
 85 an initial feeder having a rocking operating shaft formed with a lateral arm, a swinging lever connected with said arm to rock said shaft, a normally inactive cam acting on said lever, a clutch mechanism between the cam and the continuously rotating  
 90 driver, a trip lever controlling the clutch mechanism, controlling means for the trip lever, a swinging angle lever to free the controlling means from the trip lever, said initial  
 95 feeder shaft provided with a cam edge acting on said angle lever to operate the same, substantially as described.

99. In a mail distributing apparatus, in combination, a frame, letter moving devices  
 100 and means controlling the final delivery point of each letter, a series of manually operated vertically swinging levers, a cross bar moved on the depression of any one of said levers and provided with a depending  
 105 member having a cam edge, a swinging spring held frame carrying said cross bar, driving mechanisms for the letter moving devices comprising a clutch operated by said depending member with the cam edge, sub-  
 110 stantially as described.

100. In a mail distributing apparatus, in combination, letter moving devices arranged to remove the letters from a common  
 115 source and deliver the same to various predetermined points of destination, normally inactive operating devices for said letter moving mechanisms, a continuously moving driver, a clutch mechanism between the driver and said operating devices, letter controlling means determining the delivery  
 120 point of each letter, a series of levers provided with keys arranged in a row, said levers connected to operate certain letter controlling devices, a controlling means for said  
 125 clutch mechanism operated by any one of said levers, other series of levers arranged parallel with said first mentioned levers and with each other and connected to control other letter controlling devices, said last  
 130



mentioned levers having finger bars arranged parallel with each other and with said row of keys, the keys and finger bars arranged to form a bank or steps of finger bars and keys, the finger bars of approximately the same length as the row of keys, substantially as described.

101. In combination, in a mail distributing apparatus, several parallel rows of letter compartments arranged with intervening branch letter passages, branch letter conveyers movable in said passages, a main letter conveyer arranged to deliver a letter to any one of said branch letter conveyers, controlling means determining the particular branch letter conveyer to which the main letter conveyer delivers each letter, controlling mechanisms determining the particular box of a row in which a branch letter conveyer deposits its letter, operating mechanisms for said letter conveyers, a row of key levers corresponding to and indicating, respectively, the letter compartments of the end row of compartments, said key levers connected to operate or set the controlling mechanisms determining the particular box of said row to which a letter is to be delivered, and also determining the particular boxes of the other rows to which letters are to be delivered, and other series of manually operated levers connected only to operate the various devices determining the particular branch letter conveyer to which the main letter conveyer is to deliver the letter, substantially as described.

102. In a mail distributing apparatus, in combination a series of boxes having unobstructed open tops or letter ingress openings and letter conveying means above the same arranged to drop letters into any box, the path traveled by a letter from said means and into a box being normally unobstructed, and letter controllers arranged out of said paths, substantially as described.

103. A mail distributing apparatus constructed and arranged to take the letters from a common source and deliver them separately at various predetermined delivery points comprising constantly operating driving means, a normally inactive initial feeder which includes a movable member having an air passage adapted to be placed in communication with an air exhausting device and provided with power driven operating connections normally out of operative communication with said driving means and arranged to make only one feeding stroke

when thrown into gear with said driving means, letter directing means manually operated controlling devices and a make and break connection between said driving means and said operating connections and actuated by any one of said controlling devices.

104. In a mail distributing apparatus, in combination, an initial feeder comprising a swinging hollow member adapted to be placed in communication with an air exhaustion device and having a suction mouth to engage and carry each letter, said feeder arranged to take the letters successively from a common source, letter moving mechanisms arranged to deliver the letters at various predetermined delivery points, controlling devices provided with manually controlled selecting means determining the delivery points of the letters, constantly moving driving means for said letter moving mechanisms, operating connections for said feeder, said feeder being normally inactive, and a manually operated mechanical device controlled by said selecting means and arranged to operatively connect said feeder-operating connections and said driving means and cause a feeding stroke of said feeder which thereupon returns to its normal inactive position, substantially as described.

105. In combination, in a mail distributing apparatus, letter moving and controlling mechanisms constructed and arranged to receive the individual pieces of mail matter from a common source and distribute and sort the same to various predetermined receptacles, series of manually actuated controlling means whereby the delivery point of each letter is determined, a power-driven normally inactive initial feeder for successively delivering the letters from the common source to said letter moving mechanism comprising a rocking hollow shaft or member having a suction mouth in open and constant communication therewith said shaft adapted to be placed in open and constant communication with an air exhausting device, and means to forcibly strip the letter from said suction mouth, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses.

WILLIAM BARRY.

Witnesses:

HUBERT E. PECK,  
GEO. E. FRECH.