

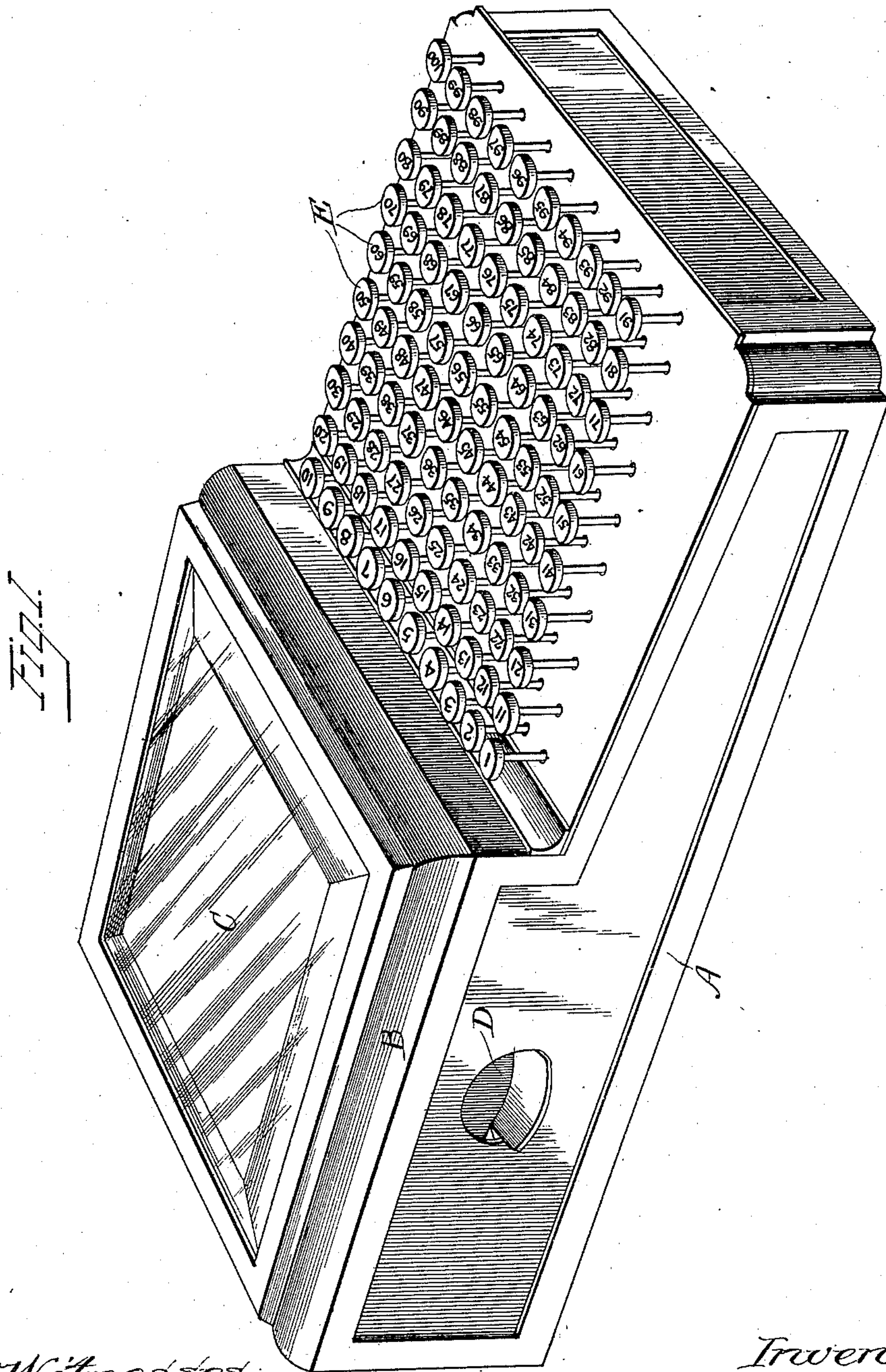
No. 679,837.

Patented Aug. 6, 1901.

H. L. FISHER.  
COIN DELIVERY APPARATUS  
(Application filed July 28, 1899.)

4 Sheets—Sheet 1.

(No Model.)



Witnesses:  
John H. Burkholder  
Leonora Wiseman

Inventor  
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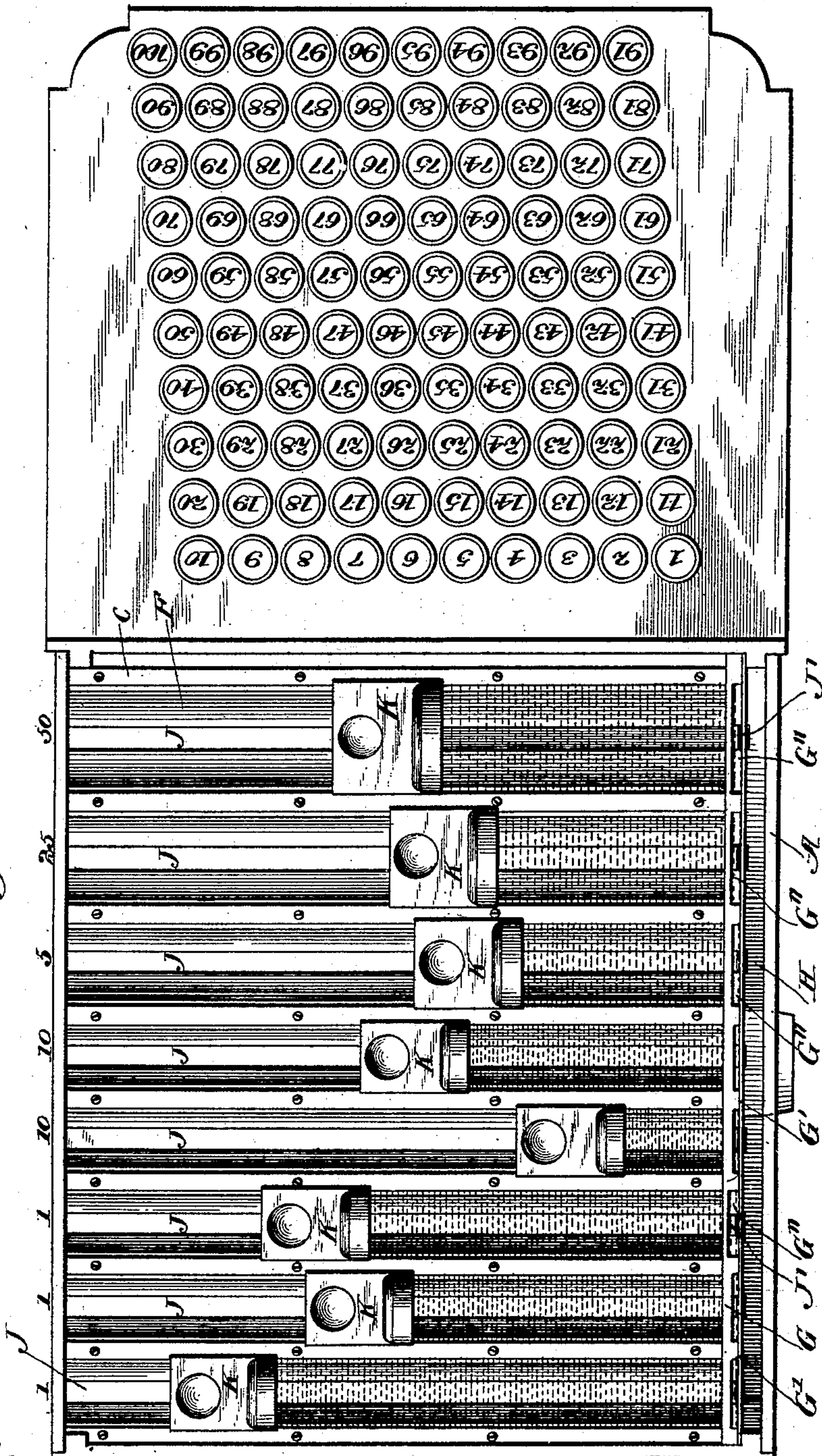
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(No Model.)

4 Sheets—Sheet 2.

Fig. 2.



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No. 679,837.

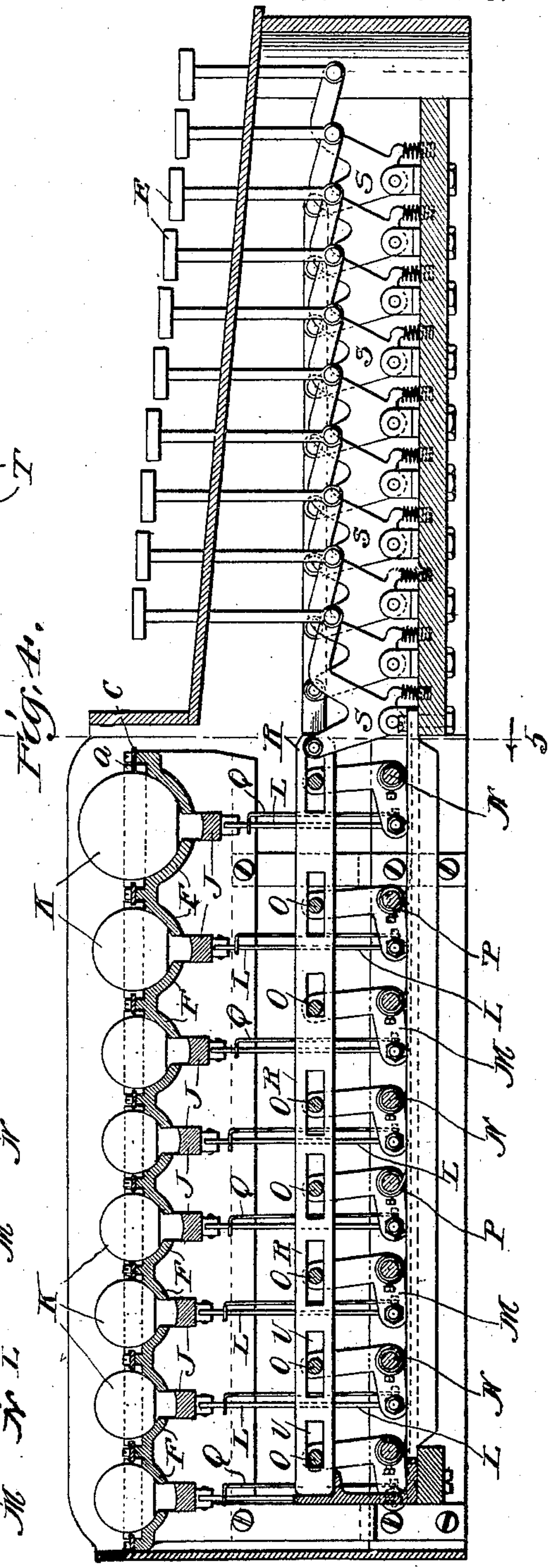
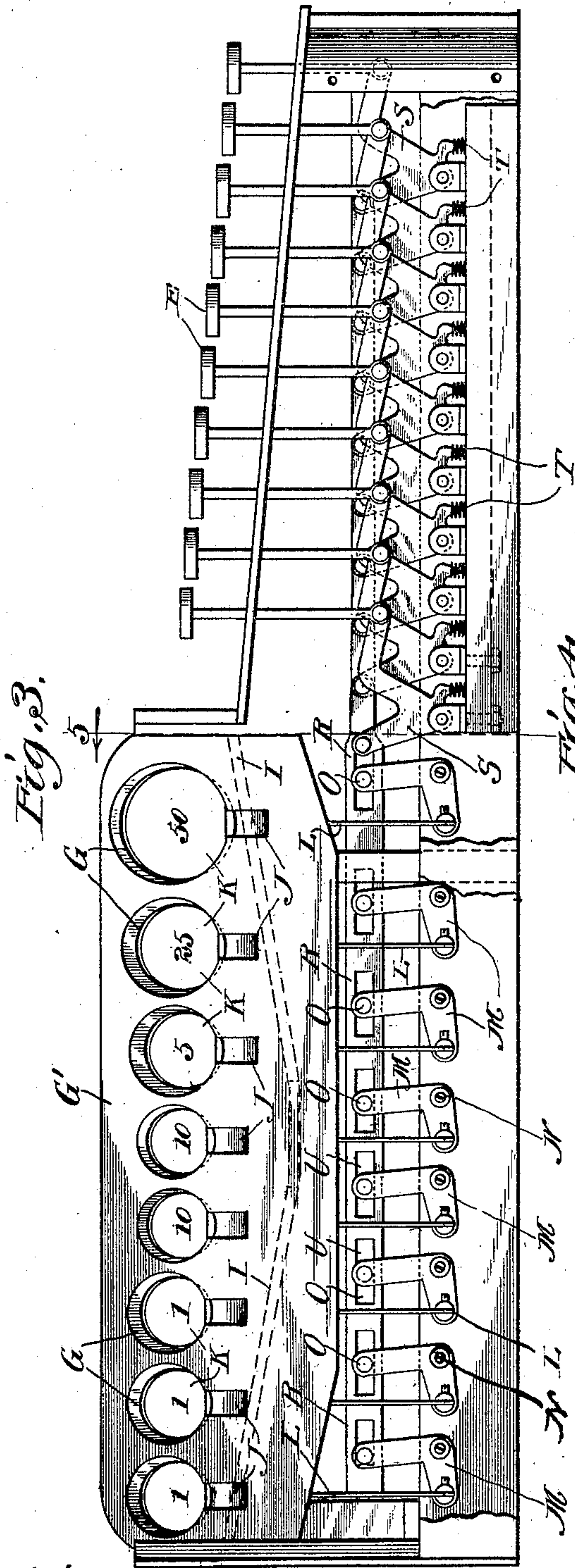
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4 Sheets—Sheet 3.



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COIN DELIVERY APPARATUS.

(Application filed July 28, 1899.)

(No Model.)

4 Sheets—Sheet 4.

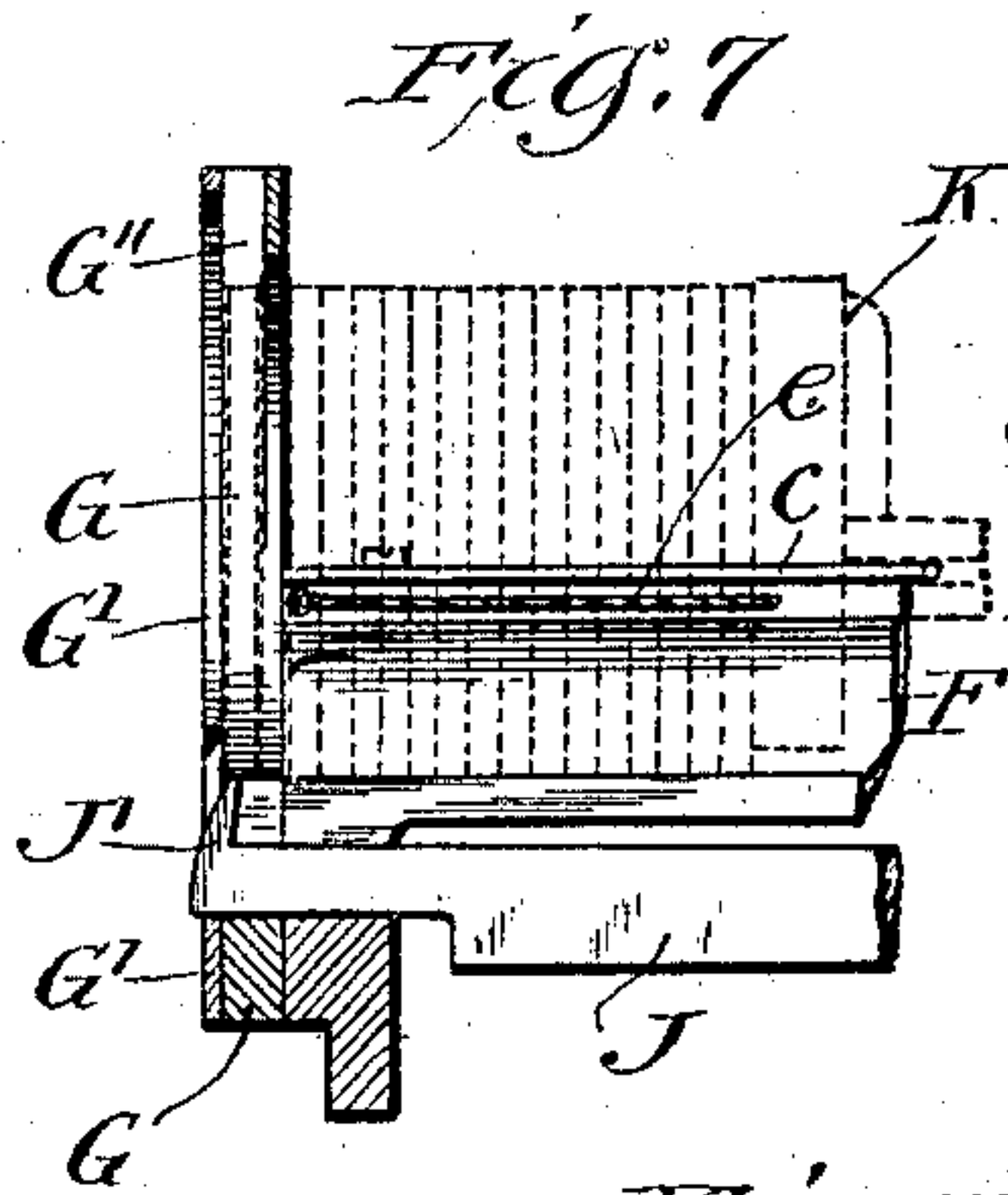
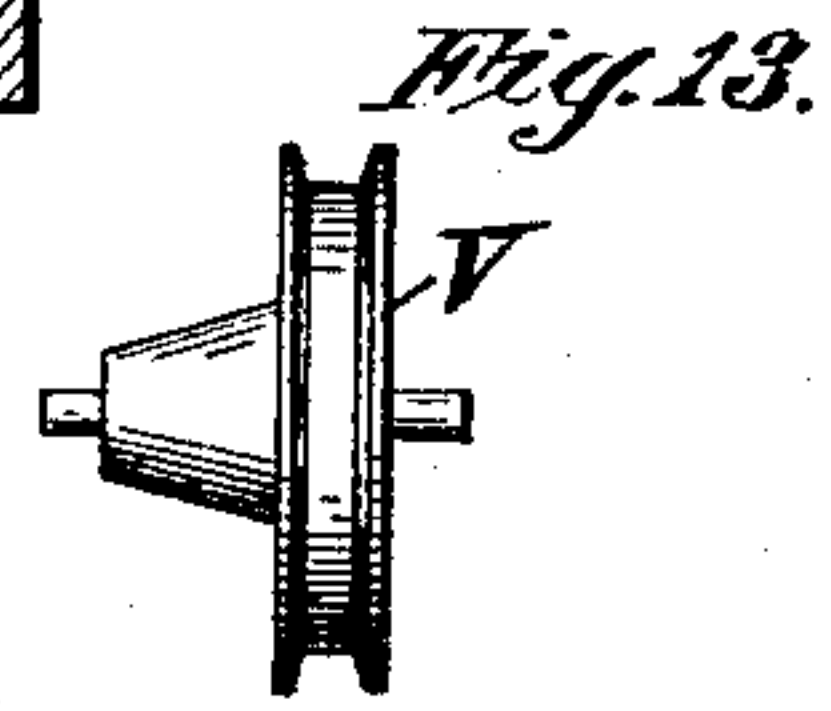
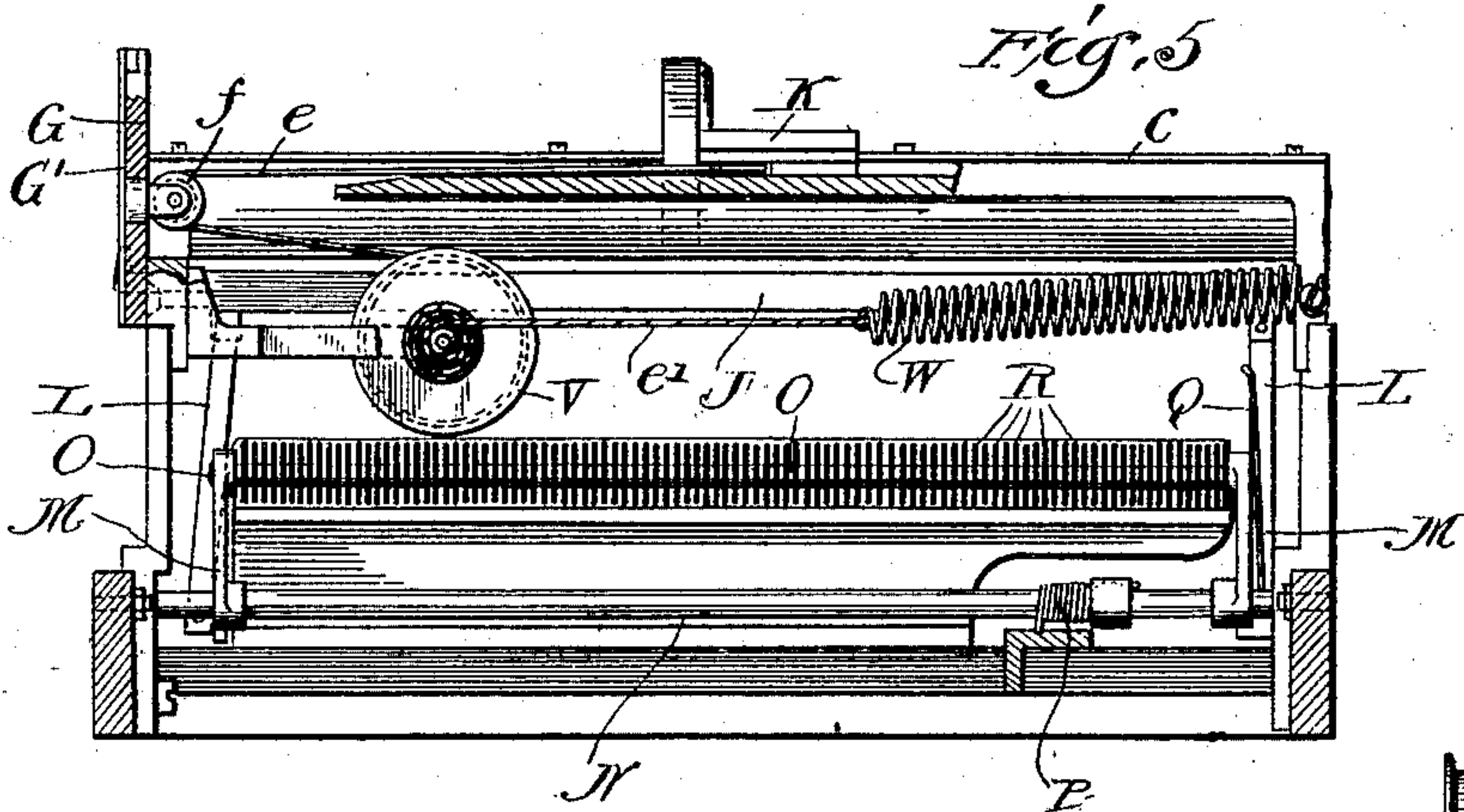


Fig. 6

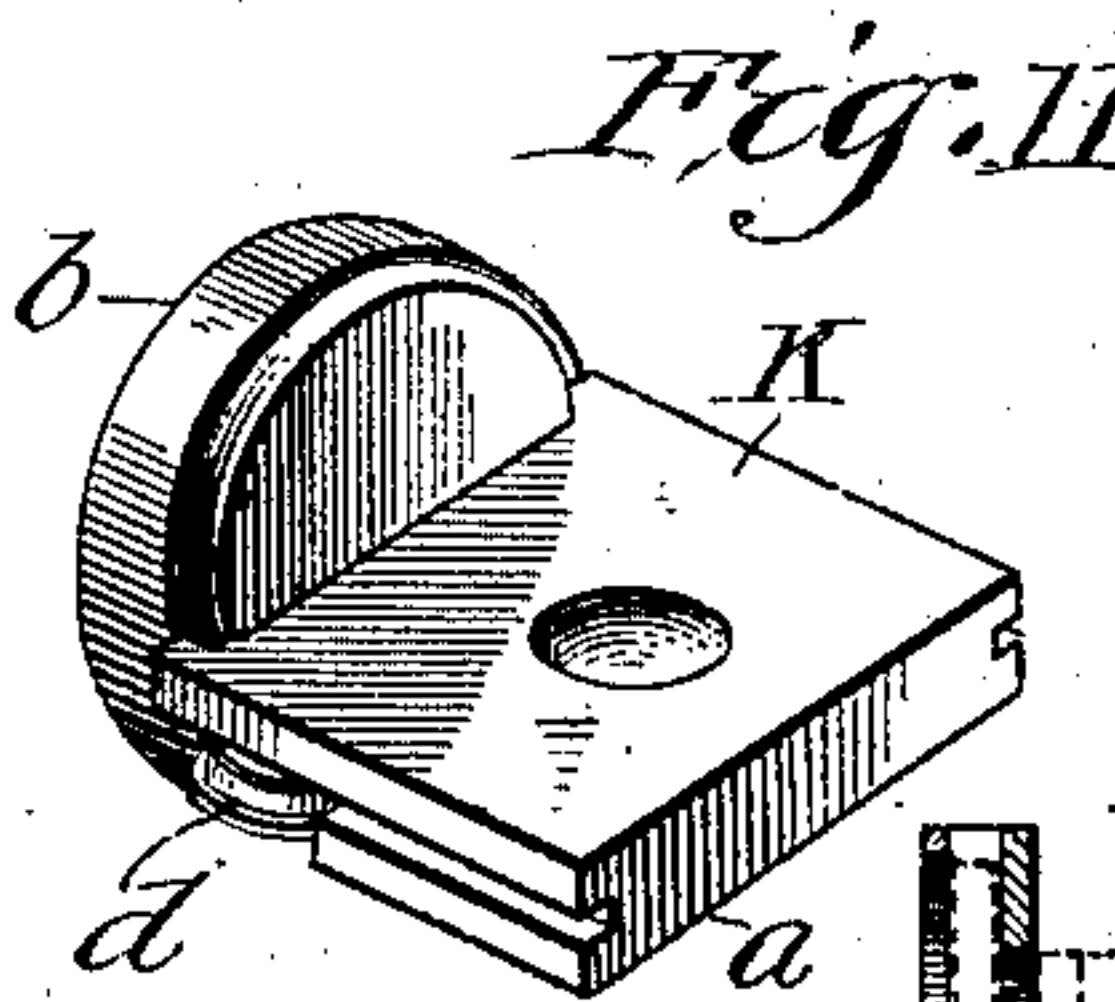
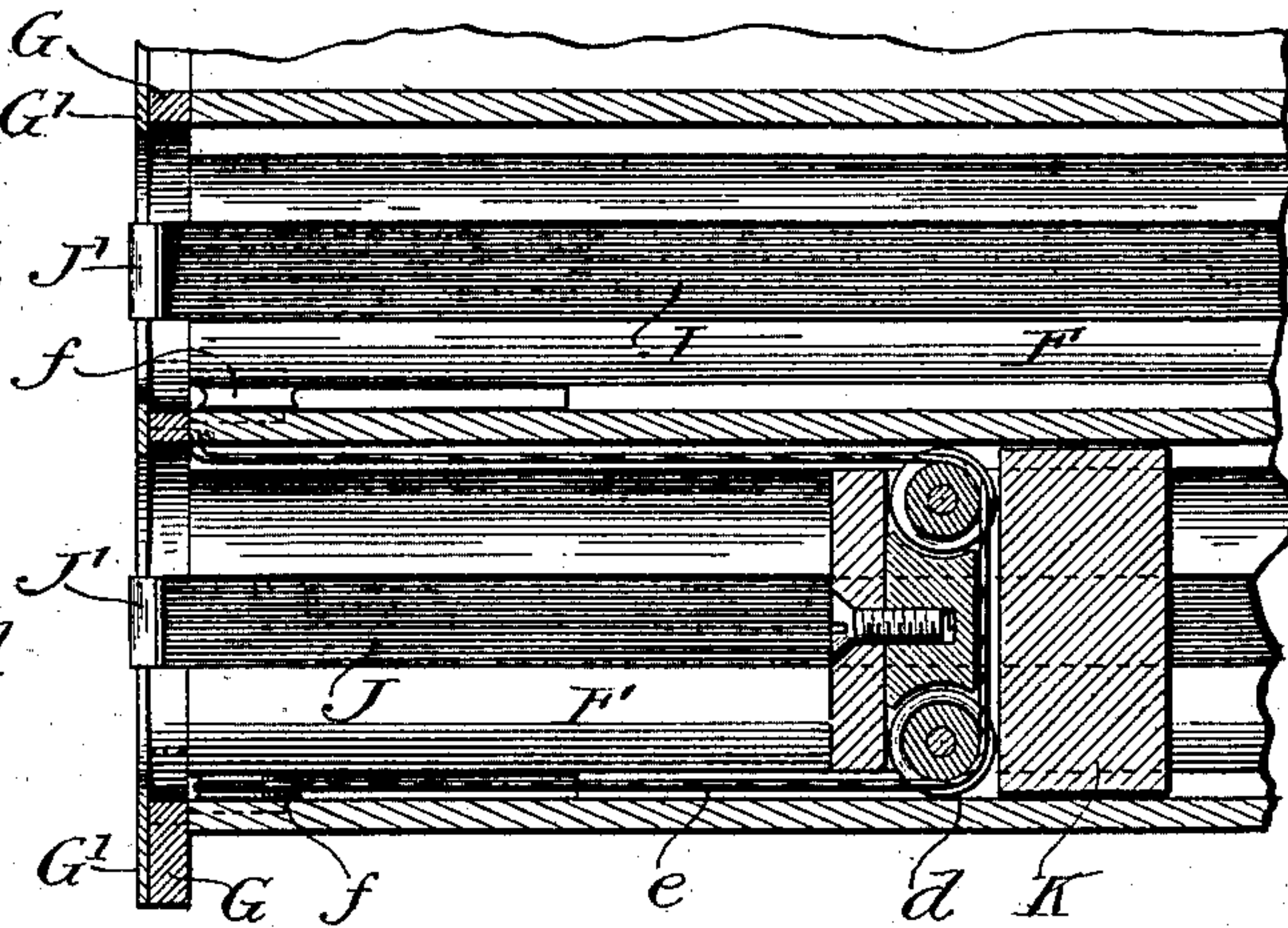
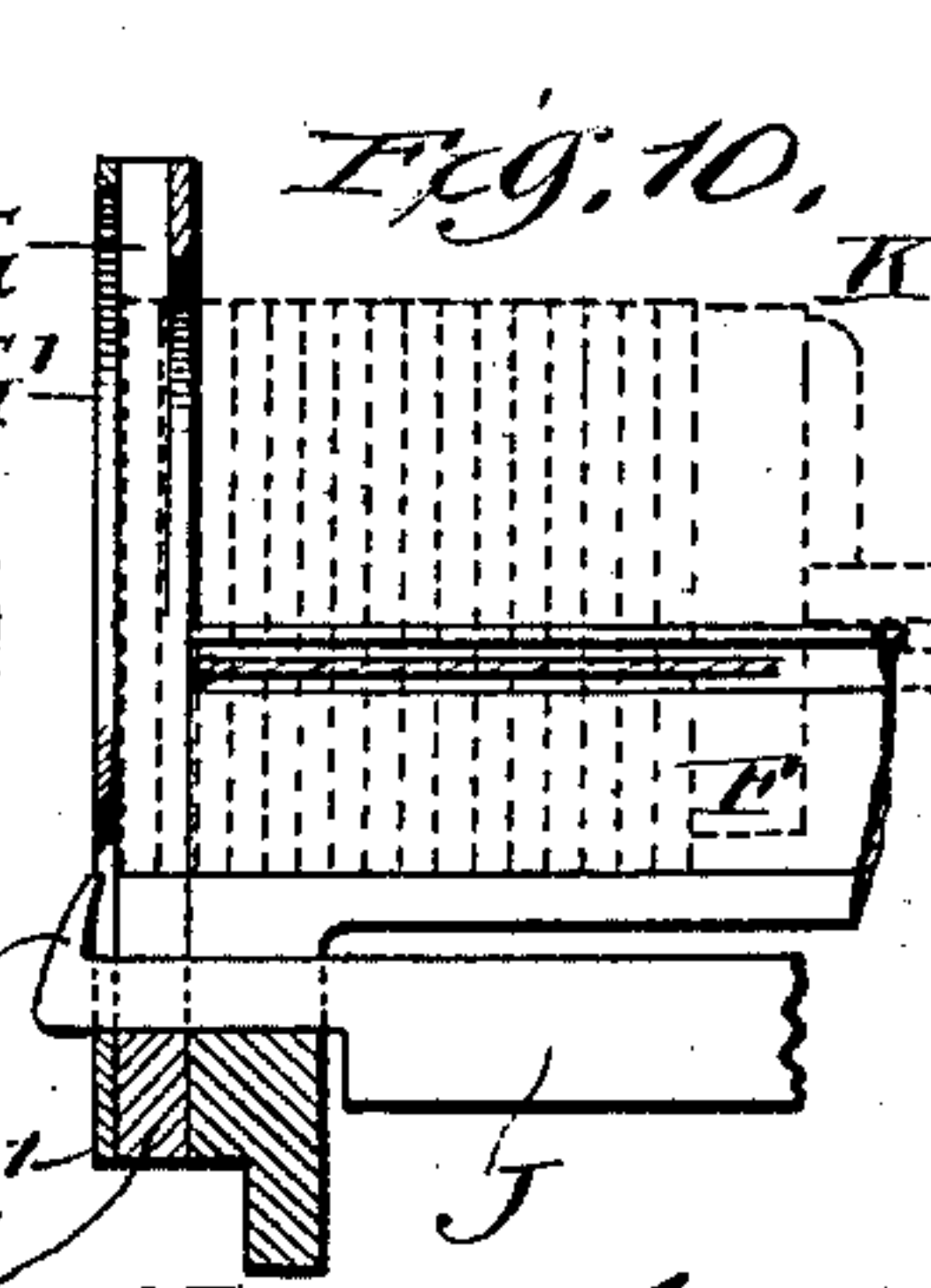
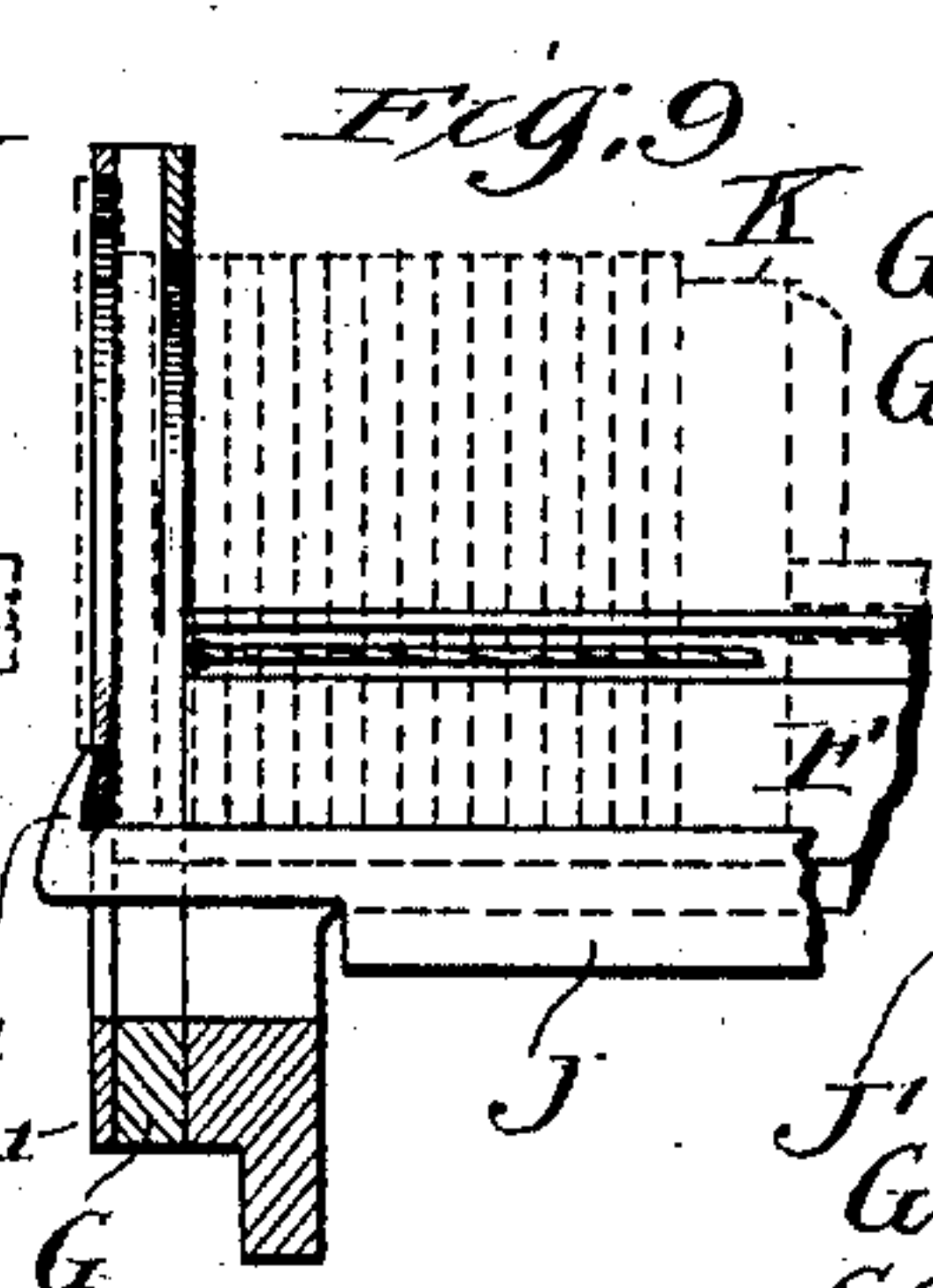
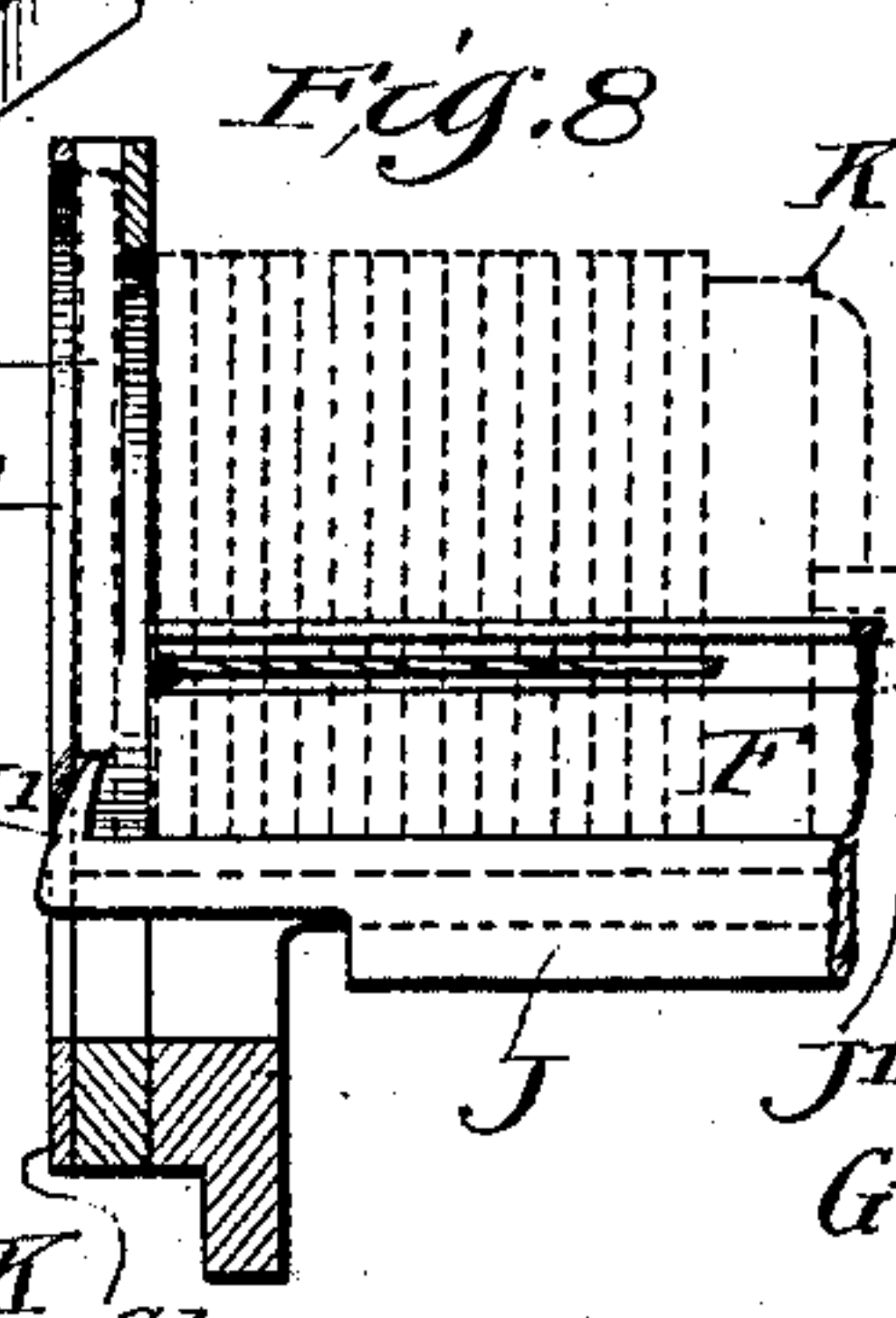
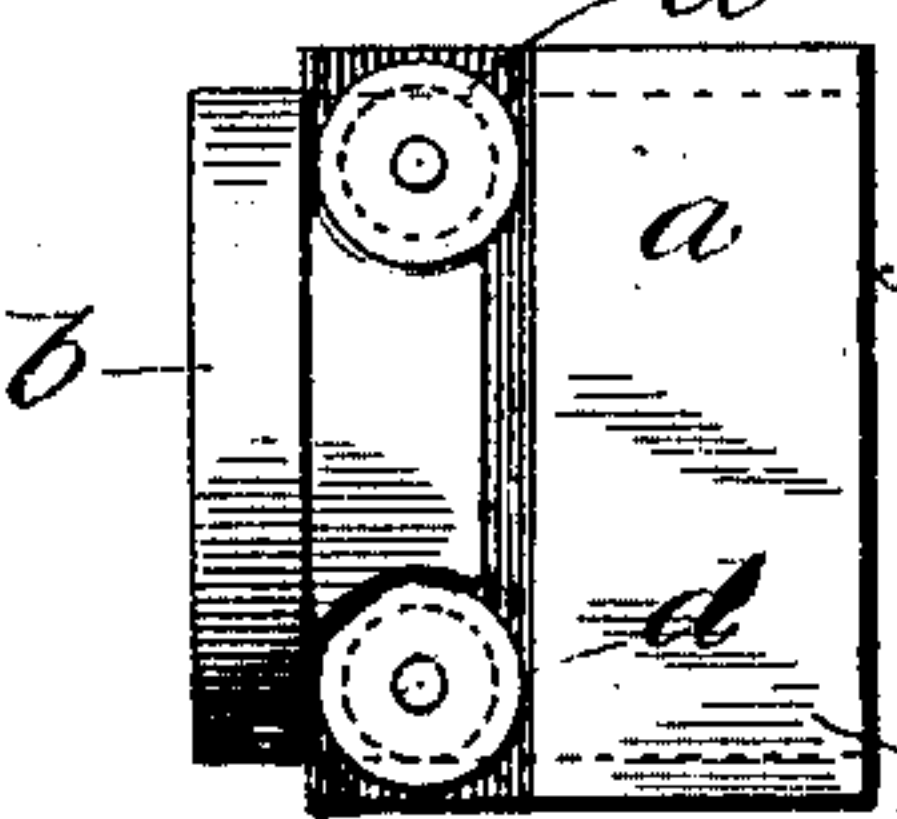


Fig. 12



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# UNITED STATES PATENT OFFICE.

HARVEY L. FISHER, OF CHICAGO, ILLINOIS, ASSIGNOR OF THREE-FOURTHS  
TO DOUGLAS SMITH AND EDWARD RECTOR, OF SAME PLACE.

## COIN-DELIVERY APPARATUS.

SPECIFICATION forming part of Letters Patent No. 679,837, dated August 6, 1901

Application filed July 28, 1899. Serial No. 725,372. (No model.)

*To all whom it may concern:*

Be it known that I, HARVEY L. FISHER, a citizen of the United States of America, residing at Chicago, in the county of Cook, in the State of Illinois, have invented a certain new and useful Improvement in Coin-Delivery Apparatus, of which the following is a description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to that class of coin-delivery apparatus in which a series of coin chutes or holders for holding the supply of coins of different denominations are combined with suitable ejecting or delivery devices and a series of operating-keys representing different amounts, whereby upon operating any one of said keys one or more coins representing the value of such key will be delivered from the machine.

My invention has for its object the provision of a simple and efficient machine of this character; and its novelty consists in the new constructions, arrangements, combinations, and modes of operation of the several parts, all as hereinafter more fully explained, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a perspective view of my new machine; Fig. 2, a top plan view thereof with the lid removed; Fig. 3, an elevation of the left side of the machine with the lid and side plate of the casing removed and with part of the framework broken away to expose the parts behind it; Fig. 4, a vertical longitudinal section of the machine; Fig. 5, a transverse section approximately on the line 5-5 of Figs. 3 and 4; Fig. 6, a horizontal sectional detail of the coin-chutes and one of the coin-followers; Figs. 7, 8, 9, and 10, vertical sectional details of the parts at the delivery end of one of the coin-chutes; Fig. 11, a perspective view of one of the followers; Fig. 12, a bottom plan view thereof, and Fig. 13 is a detail view of the sheave.

The same letters of reference are used to designate corresponding parts in the several views.

The operating parts of the machine, with the exception of the projecting stems of the key-levers, are inclosed within a casing A,

whose rear half is provided with a lid B, covering the coin-chutes and having a glass window C, through which the supply of coins in the chutes may be observed. The casing A is provided in its left-hand side with a coin-delivery opening D, through which the coins from the coin-chutes are delivered upon the operations of the keys E, which latter are in the present instance numbered consecutively from "1" to "100" and represent multiples of one cent from one to one dollar. Upon depressing any one of said keys an amount of coin represented by the number upon the key will in the manner and by the means hereinafter described be delivered from the opening D in the casing.

The supply of coin is carried in a series of transverse horizontal troughs or coin-chutes F, which in the present instance are eight in number, of which the three rearmost ones are devoted to one-cent coins, the next two to dimes, the next to nickels, the next to quarters, and the last or foremost one to half-dollars, as indicated in Figs. 2 and 3. These coin-holders F are supported at their opposite ends in the framework of the machine, and extending across their left-hand or delivery ends are two plates G G', secured together side by side longitudinally of the machine, Figs. 2, 3, 5, 6, and 7, the inner plate G being considerably thicker than the outer plate G'. The inner plate G is provided opposite the ends of the respective coin-chutes with round holes somewhat larger than the respective coins which are to be delivered through them, while the outer plate G' is provided with a corresponding series of holes slightly larger than those in the plate G and located in a slightly higher plane, as shown in Figs. 3 and 7, so that the lower edges of the holes in the outer plate G' overlap and extend slightly above the lower edges of the holes in the inner plate G. The bottoms of the holes in the inner plate G are coincident with the bottoms of the coin-chutes F, so that the lower edge of the left-hand coin in each row of coins abuts against the outer plate G', the latter acting as a stop for the rows of coins, as hereinafter explained. The outer plate G' is separated from the side plate of the casing A by a space H, Fig. 2, whose bot-



tom wall is formed by a ledge I, projecting inwardly from the inner surface of the side plate of the casing and inclined from front to rear toward the delivery-opening D in said side plate, as indicated by the dotted lines in Fig. 3, so that the coins delivered from the chutes F through the openings in the plates G G' will roll down the inclined ledge I and pass out the opening D.

Extending longitudinally through the bottom of each coin-chute or trough is an open slot in which fits and plays a longitudinal bar J, constituting the coin lifting and delivering device. The bars J extend at their left-hand ends through rectangular notches cut in the plates G G' at the bottoms of the holes therein, Fig. 3, and each bar is provided at its end with an upturned finger J', whose concave upper edge is coincident with the recess G'' in the plate G and underlies the left-hand coin in the row, Figs. 6 and 7. The bars J are given a peculiar four-motion movement somewhat analogous to that of a four-motion sewing-machine feed mechanism by the means hereinafter described—that is to say, in delivering a coin from the left-hand end of any coin-chute, Figs. 7, 8, and 9, the bar J beneath such chute first rises through the slot in the bottom of the chute, thereby lifting the entire row of coins slightly above the bottom of the chute and also by means of the finger J' at its left-hand end lifting the left-hand coin in the row high enough in the recess G'' to bring it into register with the delivery-opening in the outer plate G', Fig. 8, then moves to the left (carrying the entire row of coins with it) and delivers the left-hand coin in the row through the opening in the plate G', Fig. 9, then drops downward again and deposits the row of coins upon the bottom of the coin-chute, (in a new position to the left of its former position, Fig. 10,) and then returns to the right to normal position, Fig. 7, with the upper end of its finger J' underlying the next succeeding coin in the row, ready to deliver it from the chute at the next operation of the bar J. In Fig. 9 the ejected coin is shown still resting upon the upper end of the finger J' of the bar J, so that it would not be entirely released and drop upon the ledge I and roll down upon the discharge-opening D in the casing until the bar J had dropped back to the position shown in Fig. 10 and perhaps returned to the right to normal position again; but the ends of the fingers J' are quite thin, so that the lifted coin readily escapes therefrom, and in operation the coin to be ejected will usually escape from the finger when the parts reach the position shown in Fig. 9 and be discharged at the delivery-opening in the casing before the bar J is released and returns to or toward normal position.

Located in each coin-chute behind the row of coins therein is a coin-follower K, Figs. 2, 5, 6, 7, 8, and 9, which is constantly pressed toward the left against the row of coins by a suitable spring, as hereinafter described.

The coin lifting and delivering bar J is so supported, as hereinafter explained, that it is free to be moved longitudinally toward the left, and the result is that whenever it is raised through the slot in the bottom of the coin-chute and lifts the row of coins therein the spring-pressed follower K, constantly tending to press the row of coins toward the left, will transmit the force of the spring to the bar J, (through the row of coins resting upon it and now free from the coin-chute,) with the result that the bar J and the entire row of coins supported upon it will be moved to the left by the action of such spring and the extreme left-hand coin in the row be delivered through the opening in the outer plate G', as heretofore stated. When the bar J is released and permitted to drop back until the row of coins again rests upon the bottom of the coin-chute and the upturned finger J' clears the lower edge of the left-hand coin, the bar will be relieved from the stress of the spring which has moved it to the left and will be returned to its normal right-hand position by a resetting-spring, hereinafter described, constantly pressing it in that direction, but overcome when the bar is lifted by the stronger spring which presses the bar to the left.

The manner in which the coin feeding and delivering bars J are supported and operated for the purpose and with the result above described may be understood by reference to Figs. 3, 4, 5, and 6, where it will be seen that each bar is pivotally supported at its opposite ends upon vertical links L, which are likewise pivotally supported at their lower ends in supports carried by the rearwardly-extending horizontal arms of a pair of bell-crank levers M, which are fast upon the opposite ends of a rock-shaft N and have the upper ends of their vertical arms connected by a rod O. A spring P, coiled around the rock-shaft N and connected at one end thereto and at its opposite end to a fixed point, exerts its power upon said shaft and bell-cranks in a direction to press the rod O rearward (to the left) and depress the rear ends of the horizontal arms of the bell-cranks and maintain the coin-lifting bar J in its lower position. A light spring Q, engaging the right-hand supporting-link L of the bar J, presses the latter toward the right, but is overcome by a strong spring connected to the coin-follower K, which forces the bar J and row of coins to the left when the bar J is lifted, as heretofore explained. The spring Q constitutes the resetting-spring heretofore referred to.

It will be understood from the construction just described that whenever the rod O is pulled forward the rear ends of the horizontal arms of the bell-cranks M, fast upon the shaft N, will be elevated and will raise the bar J through the slot in the bottom of the coin-chute and lift the row of coins therefrom, with the result heretofore explained. The means for pulling the rod O forward for this purpose consists of a series of horizontal



slides R, extending longitudinally through the machine and each connected at its forward end to the vertical arm of a bell-crank S, fulcrumed upon a support upon the bottom plate of the framework and having the end of its rearwardly-extending horizontal arm pivoted to the lower end of one of the vertical stems of the operating-keys E, Figs. 3 and 4. Suitable springs T, engaging the bell-cranks S, yieldingly hold the latter in normal position, with the operating-keys E elevated. The slides R are provided with longitudinal slots U, coincident with each of the rods O, which connect the upper ends of the vertical arms of the bell-cranks M, and through which slots said rods O pass, as shown in Figs. 3, 4, and 5. Whenever any operating-key is depressed, the slide R, connected to such key by means of the intermediate bell-crank S, will be drawn forward and one or more of the cross-rods O, connecting the bell-cranks M, will be engaged by the rear end wall of one or more of the slots U in said slide and be carried forward with the slide, thereby rocking the corresponding bell-cranks M and elevating the corresponding coin-lifting bars J. The slots U in the slides R are of such length and so arranged relatively to the several cross-rods O that whenever any slide R is drawn forward by the depression of its connected operating-key E such cross-rods O as correspond with the coin-chutes from which coins must be delivered to make up the amount represented by the operated key will be drawn forward by the slide, thereby lifting the bars J belonging to such coin-chutes and delivering a coin from each of them in the manner described, while all the remaining cross-rods O will be left unmoved by the operated slide, the latter playing idly back and forth so far as they are concerned. Thus in Fig. 3 the left-hand operating-key there shown is the one-cent key, and the slide R there shown is the one-cent slide, connected to such key by the left-hand one of the bell-cranks S in said figure. As will be noted, only the slot U at the extreme rear end of the slide R is arranged to engage and move its cross-rod O when the slide is drawn forward by the depression of the one-cent key, so that only the coin-lifting bar J of the rearmost coin-chute will be operated when the one-cent key is depressed, and consequently one cent will be delivered from the machine upon the operation of such key. In Fig. 4 the slide R there shown is connected by its bell-crank S to the six-cent key, and its slots U are so arranged relatively to the cross-rods O that when the slide is drawn forward by the depression of such key the rods O corresponding to the five-cent and one-cent coin-chutes will be carried forward with it, thereby operating the coin-lifting bars J of said chutes and delivering a five-cent coin and a one-cent coin to make up the amount of six cents represented by such key. When the one-dollar key is operated, its slide will

draw forward the rods O corresponding to all of the coin-chutes excepting the three rearmost ones, devoted to one-cent coins, and one dollar in change will be delivered from the machine. When the ninety-nine-cent key is operated, all of the rods O excepting the one corresponding to the five-cent coin-chute will be drawn forward, with the result that ninety-nine cents in change will be delivered from the machine, and so on, each operating-key being connected through its slide R and the rods O with the delivery devices of the coin-chutes necessary for the delivery of coins aggregating in value the amount represented by such key.

For the purpose of avoiding the necessity of having four coin-chutes devoted to one-cent coins and yet enabling four one-cent coins to be delivered whenever four cents are required in making up the amount represented by the operated key I arrange the delivery devices for the third coin-chute from the rear to deliver two one-cent coins whenever such devices are operated, to which end the finger J' upon the left-hand end of the coin-lifting bar J of this chute is made thick enough to engage and lift the two left-hand coins in the row, and thereby deliver two coins from said chute whenever the bar J is operated, the recess G'' in the plate G opposite the delivery-opening of this coin-chute being formed to accommodate two coins, as indicated in Fig. 2. This provision for delivering two one-cent coins from one of the chutes instead of providing four chutes for one-cent coins enables the machine to be made proportionately shorter. Four chutes may be employed whenever desired.

It remains now to describe the particular construction of the coin-followers K illustrated in the present instance and the manner of connecting their operating-springs to them.

Each coin-follower K consists of a flat plate *a*, having secured to its left-hand edge an approximately round disk *b*, which bears against the left-hand end of the row of coins. The opposite edges of the plate *a* rest on guide-ways formed upon the opposite upper edges of the coin-chutes F and are provided with narrow longitudinal slits or grooves, which engage thin metal strips *c*, secured to the upper edges of the walls separating the several chutes. The engagement of these strips *c* with the grooves in the edges of the plates *a* serves to hold the followers in place and guide them in their movements longitudinally of the chutes. The under side of the plate *a* of the follower K is cut away adjacent the disk *b* to form a recess to receive two peripherally-grooved sheaves *d*, Figs. 6, 11, and 12, over the rear or right-hand sides of which transversely of the follower passes a cord *e*, whose inner end is secured to a fixed point at the left-hand rear corner of the coin-chute, Figs. 6 and 7, whence the cord passes to the right along the upper edge of the rear wall of the



chute, thence forwardly transversely through or across the follower, (over the rear sides of the sheaves *d*,) thence to the left and downward around a peripherally-grooved sheave *f*, and thence to the right around a larger sheave *V*, to which it is secured. The spindle of the sheave *V* has secured to it the left-hand end of a second cord *e'*, whose right-hand end is secured to the left-hand end of a strong coiled spring *W*, this being the spring heretofore referred to as the actuating-spring for moving the coin-delivering bar *J* and row of coins to the left when the bar has lifted the row of coins above the bottom of the coin-chute. When the coin-follower *K* is moved toward the right in the coin-chute, Figs. 5 and 6, the loop of the cord *e*, which engages said follower, will be carried to the right with the follower, thereby unwinding said cord from the sheave *V* and turning the latter in a direction to wind up the end of the cord *e'* upon the spindle of the sheave and stretch the spring *W*. Under such conditions the tension of the spring will tend to unwind the cord *e'* from the spindle of the sheave *V* and turn the latter in a direction to wind up the cord *e* upon the sheave, and thereby press the follower *K* toward the left against the row of coins in the chute. For the purpose of causing the spring *W* to act with approximately uniform power upon the coin-follower throughout the length of movement of the latter from one end of its coin-chute to the other the spindle of the sheave *V*, upon which the cord *e'* is wound, is made tapering outward from the sheave and the end of the cord *e'* is secured to it adjacent the sheave, so that when the coin-follower is moved to the right-hand end of the coin-chute and the cord *e'* thereby wound upon the spindle of the sheave (winding outwardly from the sheave upon the spindle) and the spring *W* placed under greatest tension the spring will exert its force through the cord *e'* upon the smaller diameter of the spindle, and as the cord *e'* is gradually unwound from the spindle as the follower moves toward the left and the spring contracts and its tension decreases the spring will exert its power upon the larger diameter of the spindle. It will of course be understood that there is one of the springs *W* and cooperating devices for each of the coin-chutes and its follower. When the coins in any chute become exhausted, the disk *b* of the follower *K* will take the place of the left-hand coin immediately over the finger *J'* of the lifting-bar *J*, and inasmuch as this disk cannot be lifted (owing to the engagement of the follower with its guides upon the walls of the chute) it follows that it will lock the bar *J* of such chute from upward movement, and consequently no key cooperating with such bar and chute can be depressed.

My above-described coin-delivery apparatus is simple in construction and efficient in operation, and the rows of coins are moved longitudinally of their chutes as the coins are

successively delivered from them without any friction whatever between the coins and the chutes. In this respect my machine embodies, I believe, a radically new mode of operation in coin-delivery apparatus, and my invention is therefore not restricted in its broader scope to details of construction or arrangement of parts. It will be understood that, as is common in coin-delivery apparatus, the operating-keys may be employed either to deliver from the machine an amount of change represented by the numbers upon the keys or to deliver from the machine an amount of change equaling the difference between such numbers and some unit of value, usually one dollar. Thus if in the present instance the keys were numbered in reverse order from one cent to ninety-nine cents, beginning with the ninety-nine cent key and ending with the one-cent key, the operation of any key in the series would deliver from the machine the difference between one dollar and the number borne by the operated key. In using the machine under such arrangement the numbers upon the operated keys will be employed to represent the amount of the sale or transaction instead of the amount of change to be given, so that by simply depressing the key representing the amount of the sale or transaction the proper change (up to one dollar) will be delivered from the machine without the necessity for any mental calculation upon the part of the operator.

Having thus described my invention, I claim—

1. In a coin-delivery apparatus, the combination of a coin-chute and means for lifting the row of coins from the chute and advancing them toward the delivery end thereof, substantially as described.

2. In a coin-delivery apparatus, the combination of a coin-chute and means for lifting the row of coins therefrom and advancing them toward the delivery end thereof and releasing the end coin, and redepositing the remainder of the coins in the chute, substantially as described.

3. In a coin-delivery apparatus, the combination of a coin-chute provided at its delivery end with a stop engaging the end coin in the row, and means for lifting the row of coins from the chute and the end coin out of engagement with said stop, and advancing the row of coins toward the delivery end of the chute to eject said end coin, substantially as described.

4. In a coin-delivery apparatus, the combination of a coin-chute provided at its delivery end with a stop engaging the end coin in the row, and means for lifting the row of coins from the chute and the end coin out of engagement with said stop, advancing the row of coins toward the delivery end of the chute to eject said end coin, and redepositing the remaining coins in the chute, substantially as described.



5. In a coin-delivery apparatus, the combination of a coin-chute, a stop-plate at the delivery end thereof engaging the end coin in the row, a second plate intermediate the stop-plate and the end of the coin-chute and provided with a coin-delivery aperture and a vertically-extending recess, and means for lifting the row of coins from the chute and the end coin vertically in said recess and out of engagement with the stop-plate, advancing the row of coins toward the delivery end of the chute to eject the end coin, and redepositing the remainder of the coins in the chute, substantially as described.

6. In a coin-delivery apparatus, the combination of a coin-chute and a coin lifting and delivering bar operating to lift the row of coins in the chute and advance them toward the delivery end thereof, substantially as described.

7. In a coin-delivery apparatus, the combination of a coin-chute and a coin lifting and delivering bar operating to lift the row of coins in the chute and advance them toward the delivery end thereof to eject the end coin in the row, and to then redeposit the remaining coins in the chute, substantially as described.

8. In a coin-delivery apparatus, the combination of a coin-chute and a coin lifting and delivering bar located in the bottom of the chute and extending longitudinally thereof, said bar operating to lift the row of coins from the chute, advance them toward the delivery end of the chute and eject the end coin in the row, and redeposit the remaining coins upon the bottom of the chute, substantially as described.

9. In a coin-delivery apparatus, the combination of a coin-chute provided in its bottom with a longitudinal slot, and a coin lifting and delivering bar extending longitudinally of said slot and operating to lift the row of coins from the chute, advance them toward the delivery end thereof and eject the end coin in the row, and redeposit the remaining coins in the chute, substantially as described.

10. In a coin-delivery apparatus, the combination of a coin-chute, a coin lifting and delivering bar extending longitudinally thereof, and means for giving said bar a four-motion movement to cause it to first rise and lift the row of coins from the chute, then advance them toward the delivery end of the chute and eject the end coin in the row, then redeposit the remaining coins in the chute, and then return to normal position, substantially as described.

11. In a coin-delivery apparatus, the combination of a coin-chute provided in its bottom with a longitudinal slot, a coin lifting and delivering bar extending longitudinally of said slot, and means for giving said bar a four-motion movement to cause it to first rise in said slot and lift the row of coins from the chute, then advance them toward the delivery end of the chute, then redeposit them in

the chute, and then return to normal position, substantially as described.

12. In a coin-delivery apparatus, the combination of a coin-chute, a spring-pressed follower therein pressing the row of coins toward the delivery end of the chute, and a vertically and longitudinally movable coin lifting and delivering bar operating to lift the row of coins from the chute and permit the spring-pressed follower to then advance them toward the delivery end of the chute, substantially as described.

13. In a coin-delivery apparatus, the combination of a coin-chute provided at its delivery end with a stop engaging the end coin in the row, a spring-pressed follower located in said chute and pressing the row of coins toward the delivery end thereof, and a vertically and longitudinally movable coin lifting and delivering bar operating to lift the row of coins from the chute and the end coin from engagement with said stop and permitting the spring-pressed follower to then advance the row of coins toward the delivery end of the chute and eject said end coin, substantially as described.

14. In a coin-delivery apparatus, the combination of a coin-chute, a spring-pressed follower therein pressing the row of coins toward the delivery end of the chute, a vertically and longitudinally movable coin lifting and delivering bar extending longitudinally of said chute, a resetting-spring yieldingly holding said bar from longitudinal movement, and means for lifting said bar, to cause it to lift the row of coins from the chute and permit the spring-pressed follower to move them and the bar toward the delivery end of the chute, and then permitting the bar to drop downward and redeposit the remainder of the coins upon the chute and be returned longitudinally to normal position by its resetting-spring, substantially as described.

15. In a coin-delivery apparatus, the combination of a plurality of coin-chutes and means for simultaneously lifting the rows of coins in several chutes and advancing them toward the delivery ends thereof, to eject the end coins in said rows, substantially as described.

16. In a coin-delivery apparatus, the combination of a plurality of coin-chutes and means for simultaneously lifting the rows of coins in several chutes and advancing them toward the delivery end thereof, to eject the end coins, and redepositing the remainder of the coins in their respective chutes, substantially as described.

17. In a coin-delivery apparatus, the combination of a plurality of coin-chutes, a stop-plate extending across their delivery ends and engaging the end coins in rows, and means for simultaneously lifting the rows of coins in several chutes and disengaging the end coins in said rows from said stop-plate, and advancing the rows of coins toward the



delivery ends of the chutes, to eject said end coins, and then redepositing the remainder of the coins in their respective chutes, substantially as described.

5 18. In a coin-delivery apparatus, the combination of a plurality of coin-chutes, coin lifting and delivering bars coöperating with the several chutes to lift the rows of coins therein and advance them toward the delivery  
10 ends of the chutes, and means for operating single bars and combinations of bars, substantially as and for the purpose described.

15 19. In a coin-delivery apparatus, the combination of a plurality of coin-chutes, coin lifting and delivering bars located in the bottoms of the several chutes and operating to lift the rows of coins from the chutes and advance them toward the delivery end of the  
20 chute, to eject the end coins in the rows, and then redepositing the remaining coins in their respective chutes, and means for simultaneously operating different bars in combination with each other, substantially as and  
25 for the purpose described.

20. In a coin-delivery apparatus, the combination of a plurality of coin-chutes, coin lifting and delivering bars coöperating with said chutes and each having a four-motion  
30 movement causing it to first rise and lift the rows of coins from the chute, then advance them toward the delivery end thereof, and eject the end coin in the row, then redeposit the remaining coins in the chute, and then  
35 return to normal position, and means for simultaneously operating different ones of said bars in combination with each other, substantially as and for the purpose described.

40 21. In a coin-delivery apparatus, the combination of a plurality of coin-chutes, spring-pressed followers located therein and pressing the rows of coins toward the delivery ends of the chutes, vertically and longitudinally  
45 movable coin lifting and delivering bars coöperating with the respective chutes to lift the rows of coins from the chutes and permit the spring-pressed followers to then advance them toward the delivery ends of the  
50 chutes, and means for simultaneously operating different ones of said bars in combination with each other, substantially as and for the purpose described.

22. In a coin-delivery apparatus, the combination of a plurality of coin-chutes, a stop-  
55 plate extending across their delivery ends and engaging the end coins in the rows, spring-pressed followers located in the chutes and pressing the rows of coins toward the delivery end thereof, vertically and longitudinally  
60 movable coin lifting and delivering bars coöperating with the respective chutes to lift the rows of coins from the chutes and the end coins from engagement with the stop-plate, to permit the spring-pressed followers to advance the rows of coins toward the delivery  
65 ends of the chutes and eject the end coins,

and means for simultaneously operating different ones of said coin-lifting bars in combination with each other, substantially as and for the purpose described. 75

23. In a coin-delivery apparatus, the combination of the coin-chute F provided with the longitudinal slot in its bottom, and the four-motion coin lifting and delivering bar J  
75 operating in said slot and coöperating with the coins in said chute in the manner and for the purpose described.

24. In a coin-delivery apparatus, the combination of the coin-chute F having the longitudinal slot in its bottom, the stop-plate G'  
80 at the delivery end of said chute, and the coin lifting and delivering bar J provided with the finger J' and coöperating with the coin-chute and stop-plate in the manner and for the purpose described. 85

25. In a coin-delivery apparatus, the combination of the coin-chute F having the longitudinal slot in its bottom, the stop-plate G'  
90 at the delivery end of said chute, the plate G located intermediate the stop-plate G' and coin-chute and having the coin-aperture and the vertical recess G'', and the coin lifting and delivering bar J having the finger J' and coöperating with the coin chute and plates  
95 G G' in the manner and for the purpose described.

26. In a coin-delivery apparatus, the combination of the coin-chute F having the longitudinal slot in its bottom, the spring-  
100 pressed coin-follower K located in said chute, the pair of bell-cranks M having their upper ends connected by the cross-rod O, the links L pivotally supported at their lower ends upon the horizontal arms of the bell-cranks  
105 M, the coin lifting and delivering bar J pivotally supported upon the upper ends of the links L and operating in the slot in the bottom of the coin-chute, and the resetting-spring Q for the bar J, substantially as described.

27. In a coin-delivery apparatus, the combination, with a series of coin-chutes and suitable coin ejecting or delivering devices coöperating therewith, of a series of bell-cranks  
110 M for actuating said devices, a series of slides R coöperating with the bell-cranks to actuate the same singly and in combination, the bell-cranks S connected to the slides R, and the operating-keys E connected to the bell-cranks  
115 S, substantially as described.

28. In a coin-delivery apparatus, the combination, with a plurality of coin-chutes and suitable coin ejecting or delivering devices coöperating therewith, of a series of pairs of  
120 bell-cranks M, one pair for each coin-chute for actuating the coin-ejecting devices thereof, and the vertical arms of the bell-cranks of each pair being connected by a cross-rod  
125 O, the series of slides R having the slots U through which the rods O pass and by which the several pairs of bell-cranks are actuated  
130 singly and in combination, the bell-cranks S connected to the slides R, and the operating-



keys E connected to the bell-cranks S, substantially as described.

29. In a coin-delivery apparatus, the combination, with the coin-chutes F, and the  
 5 spring-pressed followers K and coin lifting and delivering bars J cooperating therewith, of the series of pairs of bell-cranks M and connecting-rods O, the supporting-links L for the bars J pivotally supported at their lower  
 10 ends by the horizontal arms of the bell-cranks M, the series of slides R having the slots U through which the rods O pass and by which the bell-cranks are actuated singly and in combination, the bell-cranks S connected with  
 15 the slides R, and the operating-keys connected to the bell-cranks S, substantially as described.

30. In a coin-delivery apparatus, the combination, with the coin-chute F, of the fol-  
 20 lower K guided therein and provided with the sheaves *d*, the cord *e* having the loop portion passing across said follower, over said sheaves, and having its free end connected to the sheave V, the cord *e'* wound at one end around  
 25 the spindle of the sheave V, and the spring

W connected to the opposite end of said cord, substantially as described.

31. In a coin-delivery apparatus, the combination, with the coin-chute F, of the fol-  
 lower K guided therein and composed of the  
 30 horizontal plate *a* and vertical disk *b*, and provided with the sheaves *d*, the edges of the plate *a* of the follower being provided with grooves engaging strips *c* secured to the upper edges  
 35 of the coin-chute, the cord *e* secured at one end to one side or corner of the coin-chute and extending thence longitudinally of the chute, thence transversely across the chute  
 40 over the sheaves *d* of the follower, thence longitudinally of the chute in the opposite direction and downward over the sheave *f*, and thence to the sheave V, the cord *e'* wound at one end upon the spindle of the sheave V, and the spring W secured to the opposite end of said cord, substantially as described.

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Witnesses:

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