

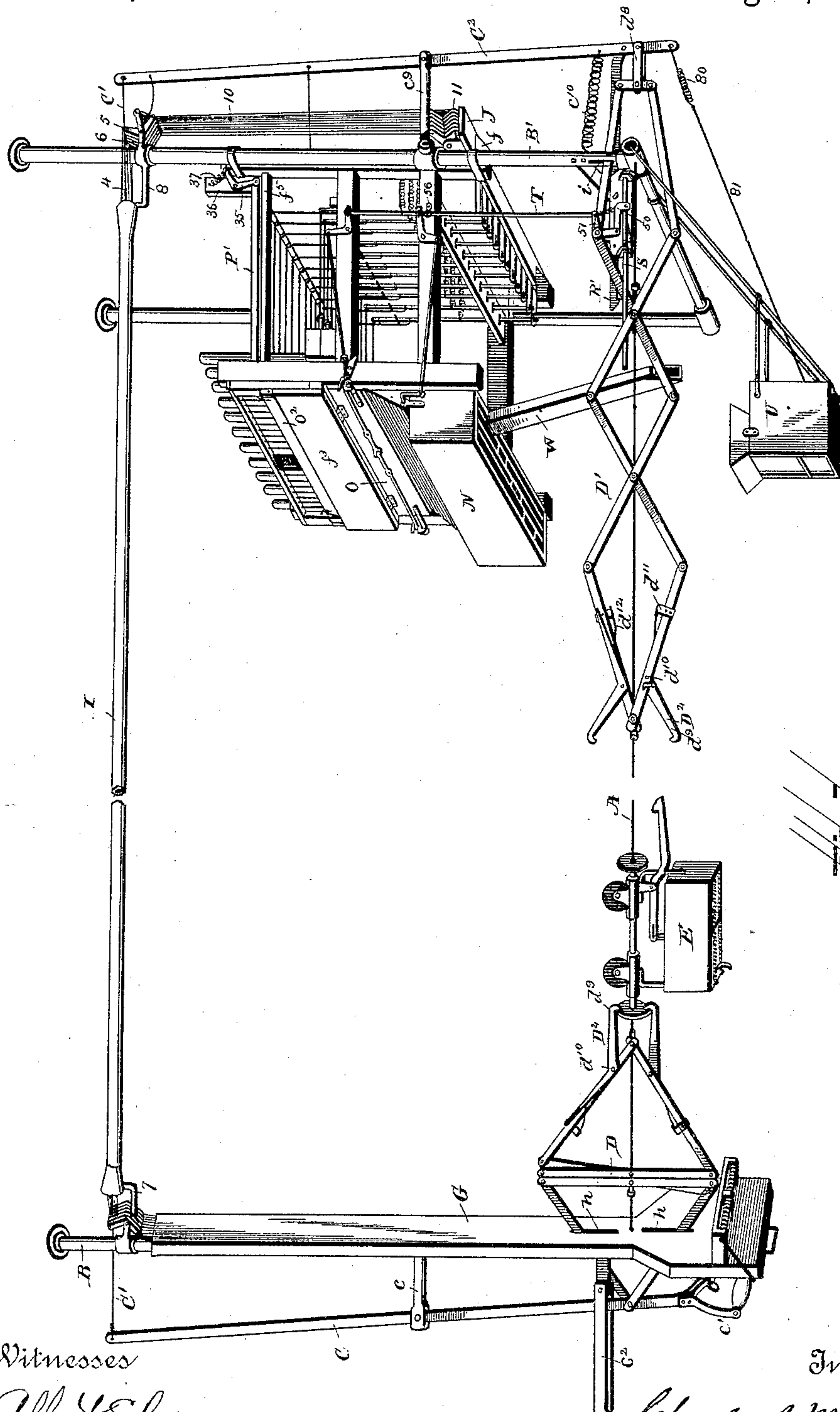
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10 Sheets—Sheet 1.

C. A. McKIEARNAN.
STORE SERVICE APPARATUS.

No. 433,741.

Patented Aug. 5, 1890.



Witnesses

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T. W. Keweenaw.

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(No Model.)

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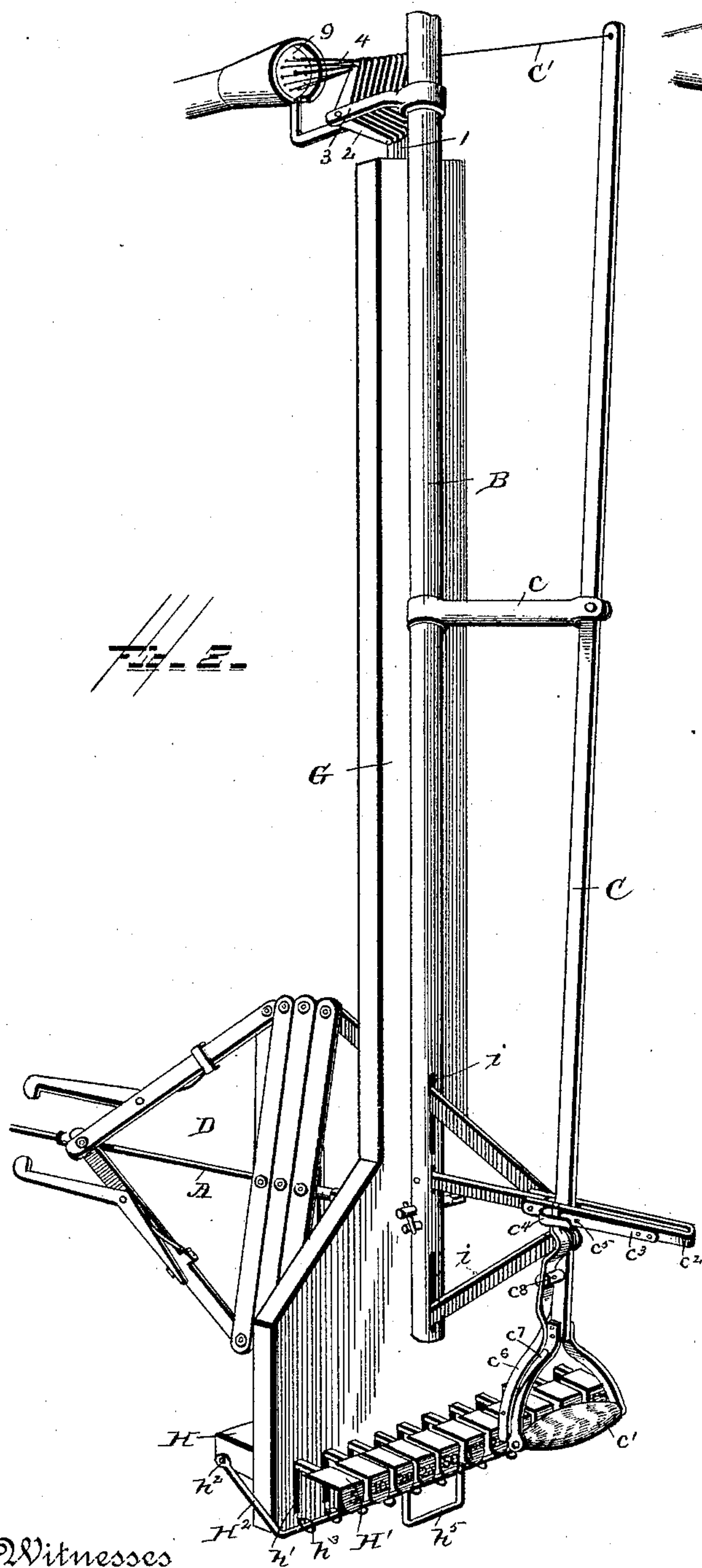


Fig. 2.

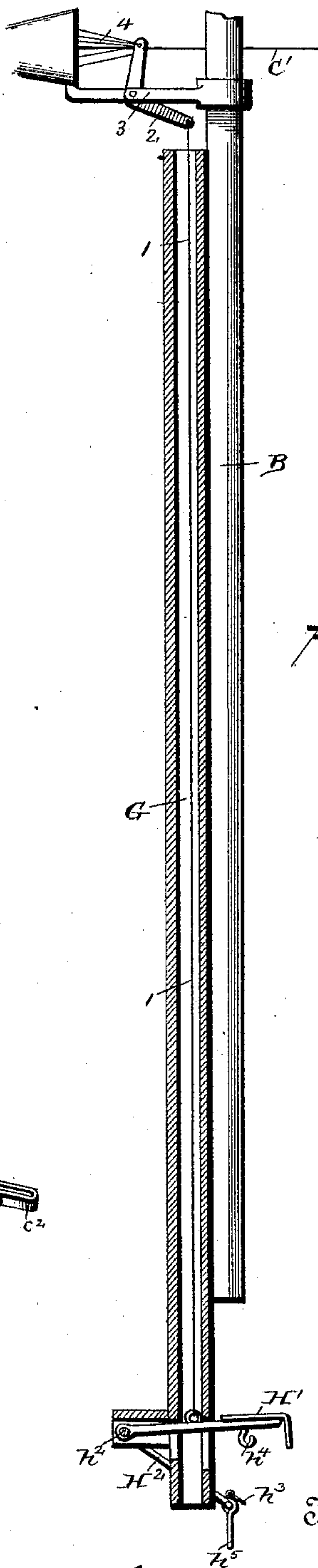


Fig. 3.

Witnesses

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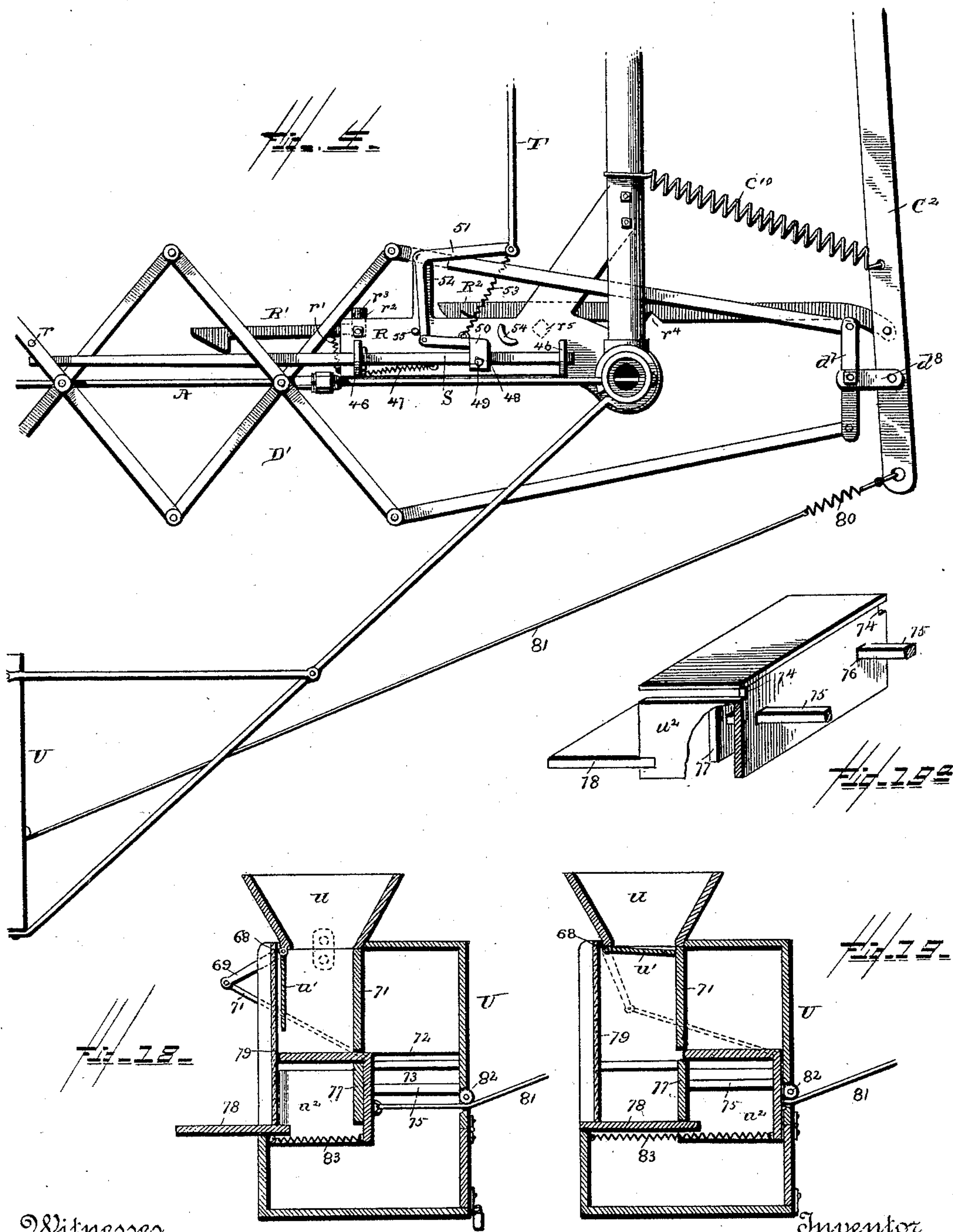
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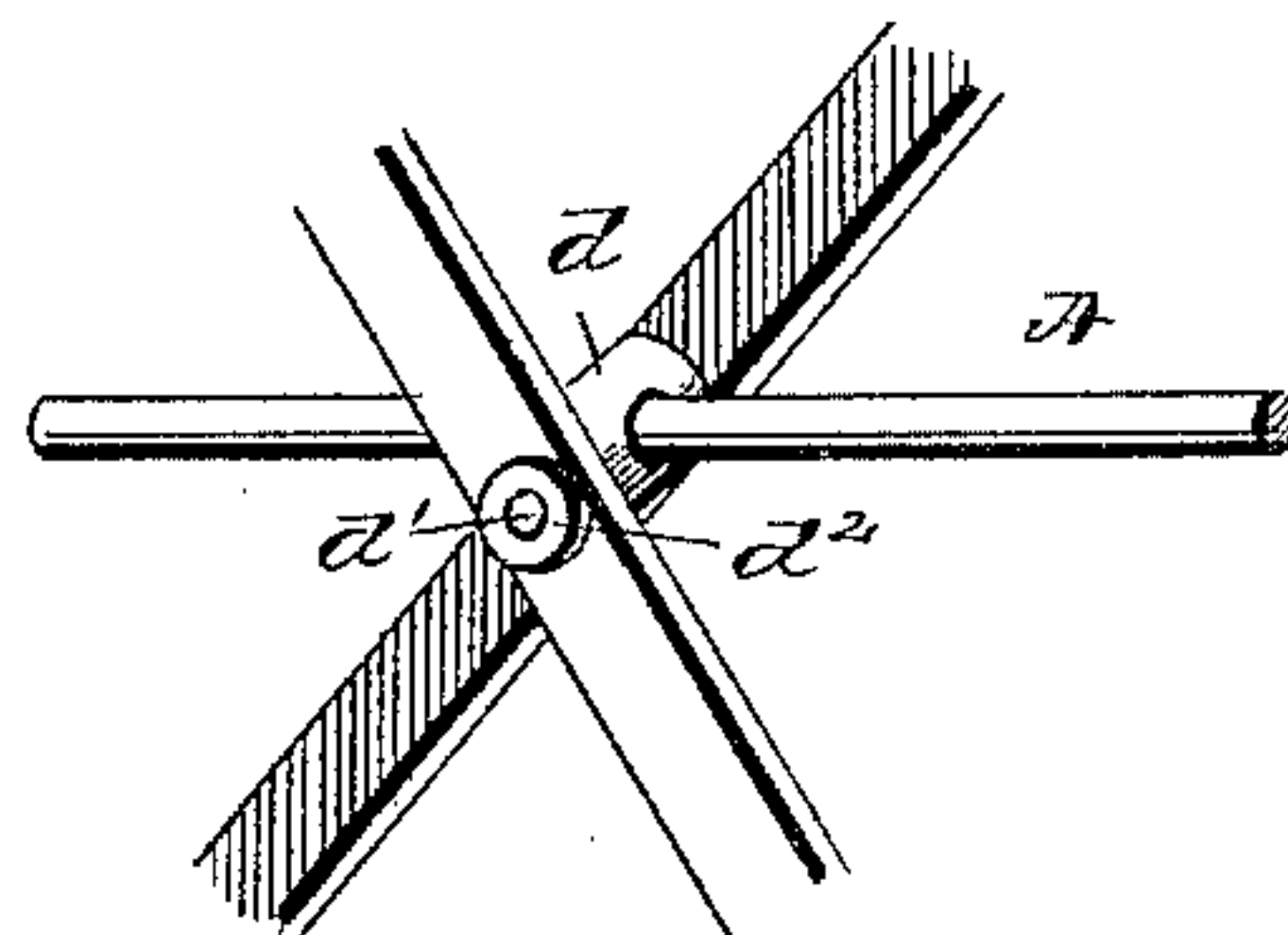
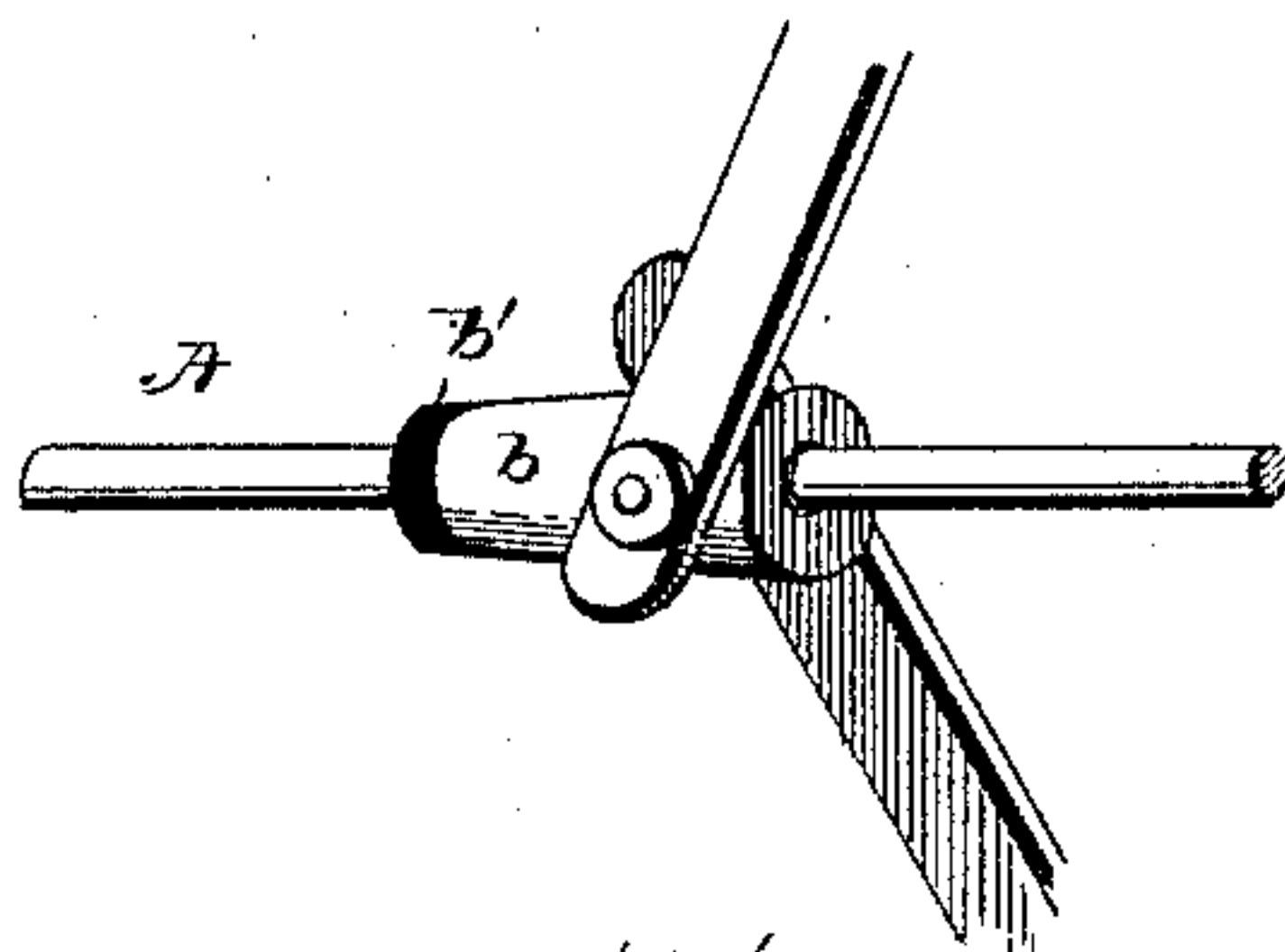
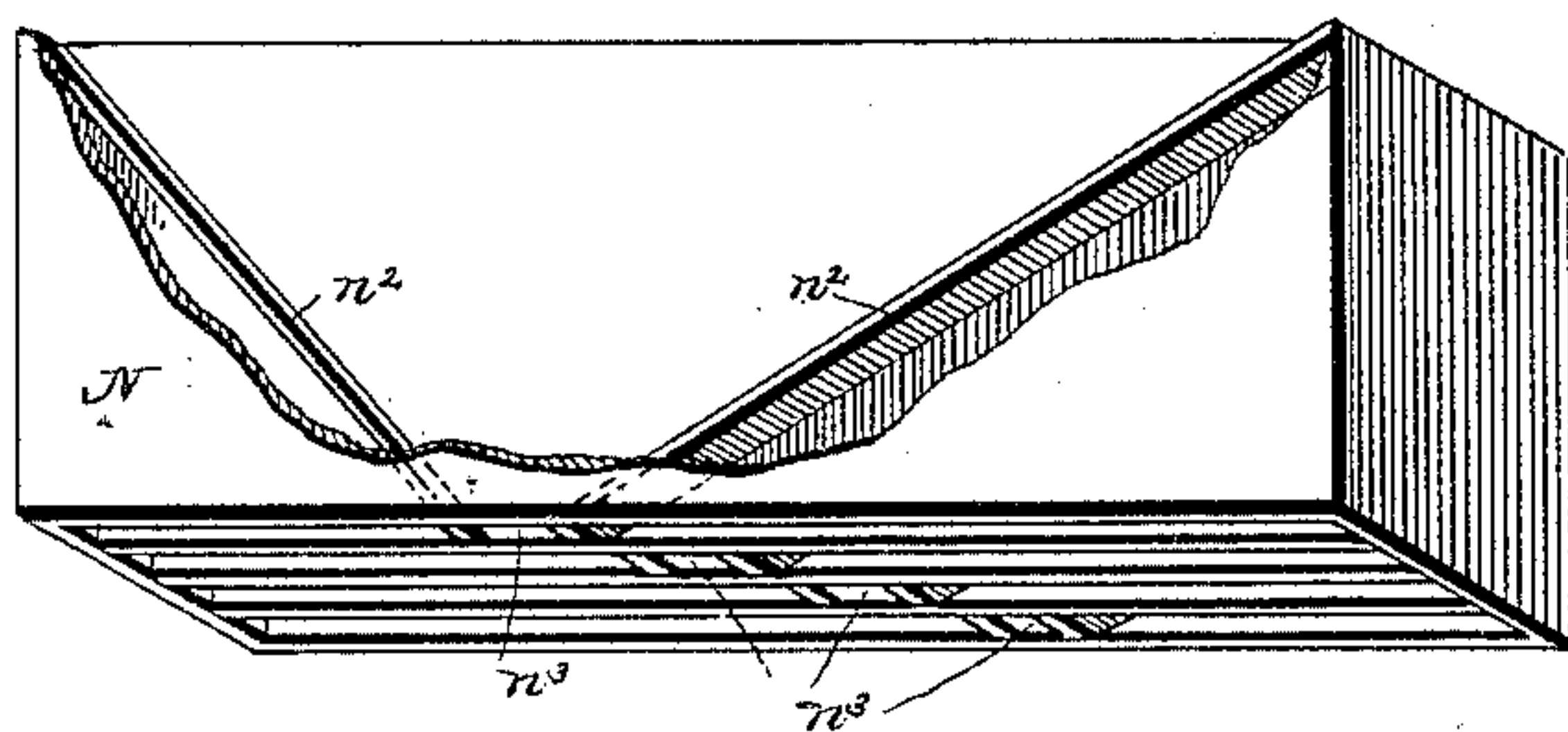
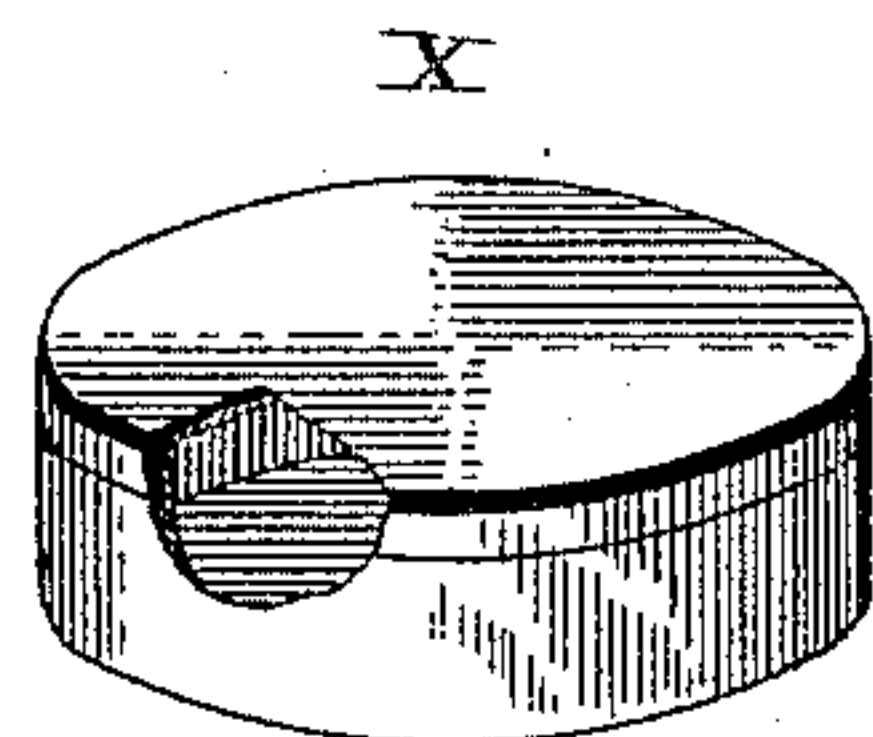
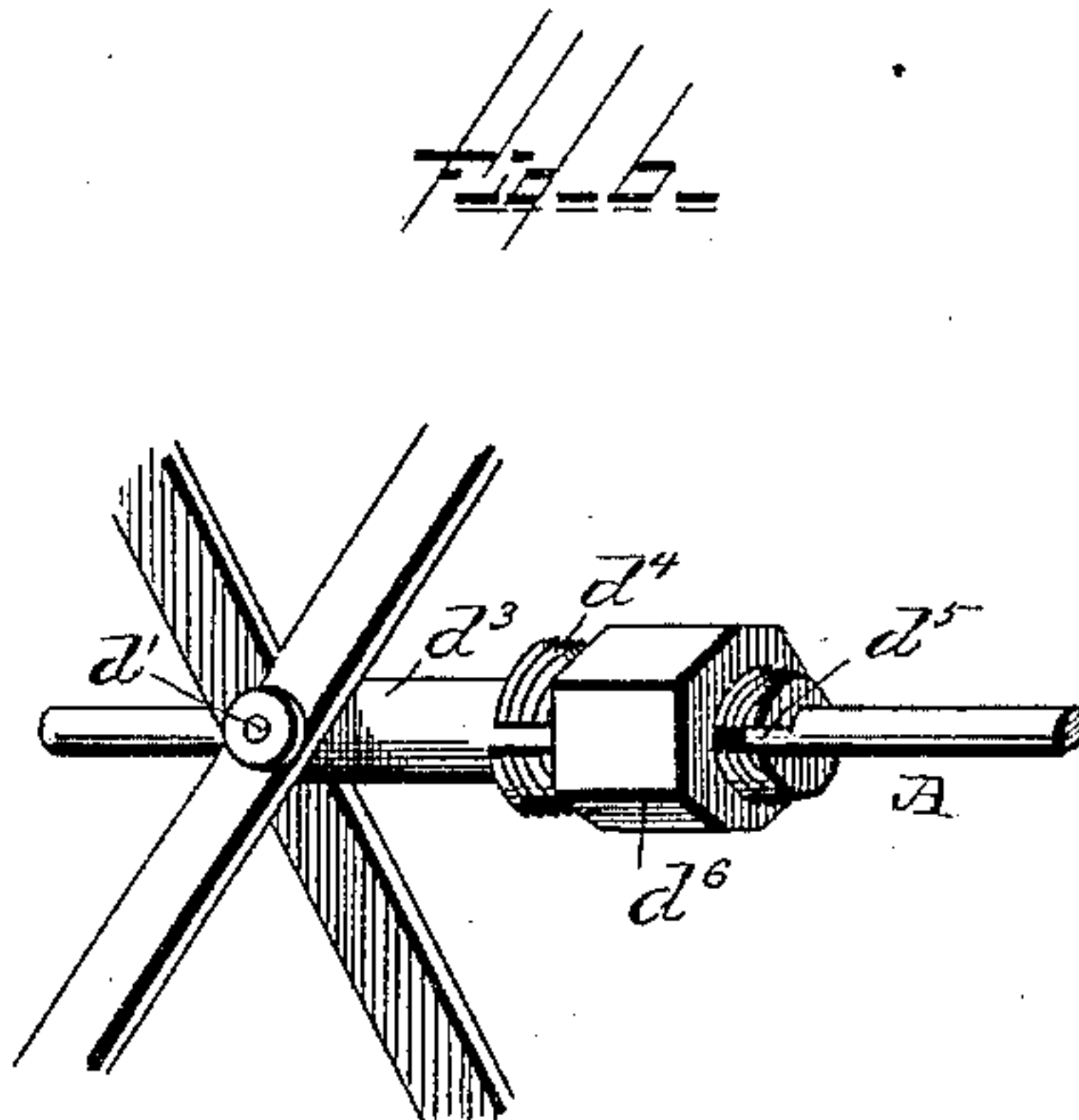
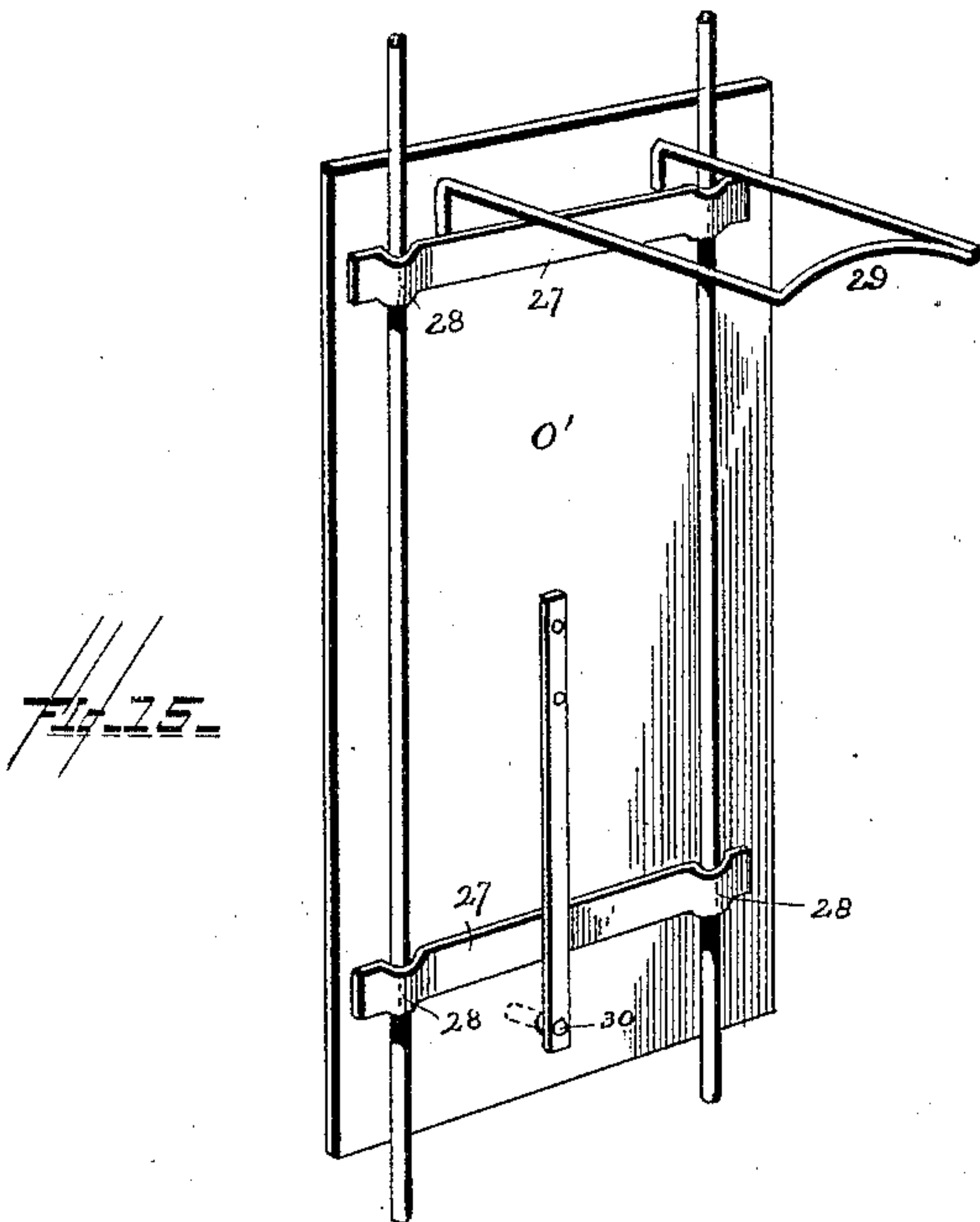
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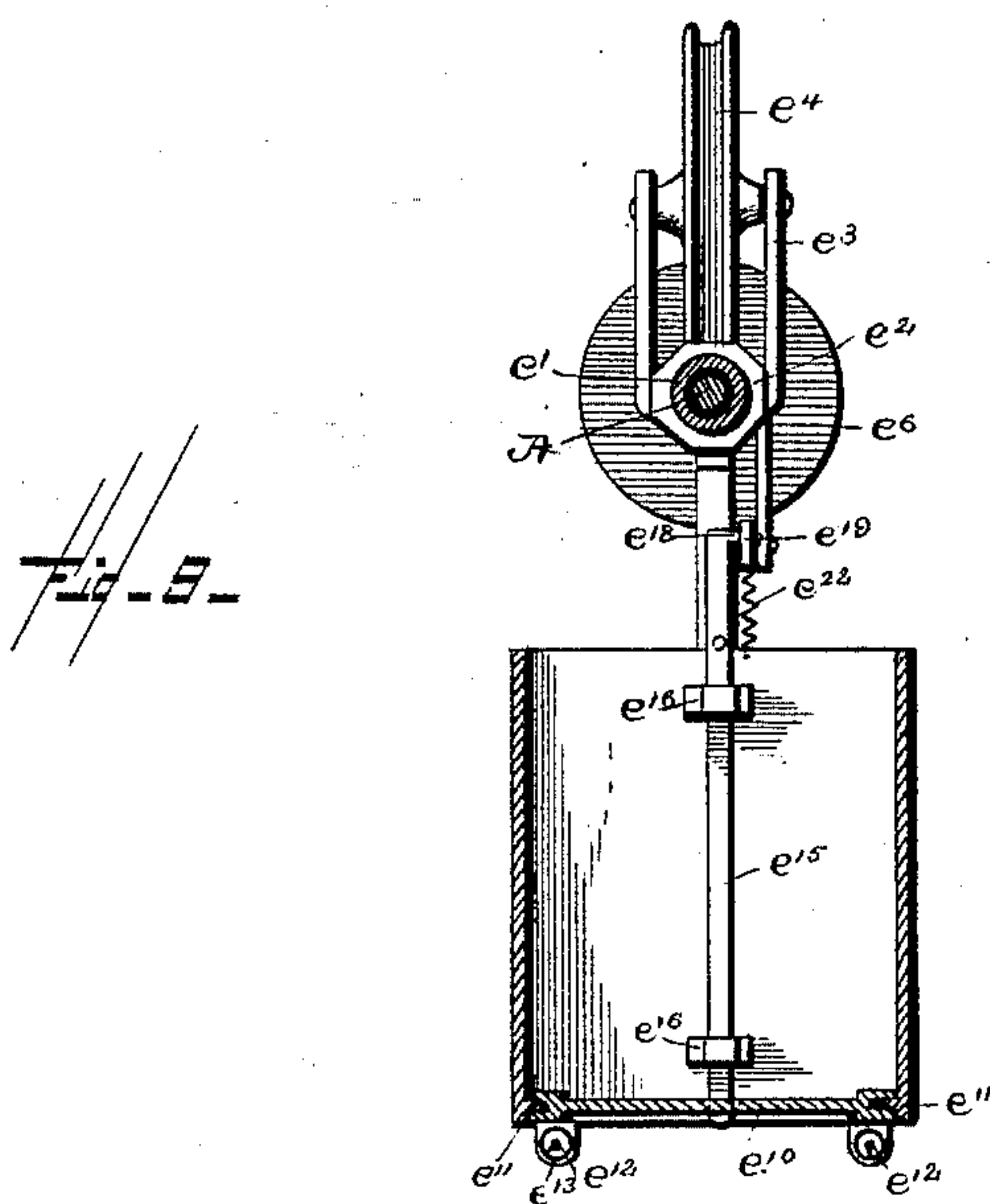
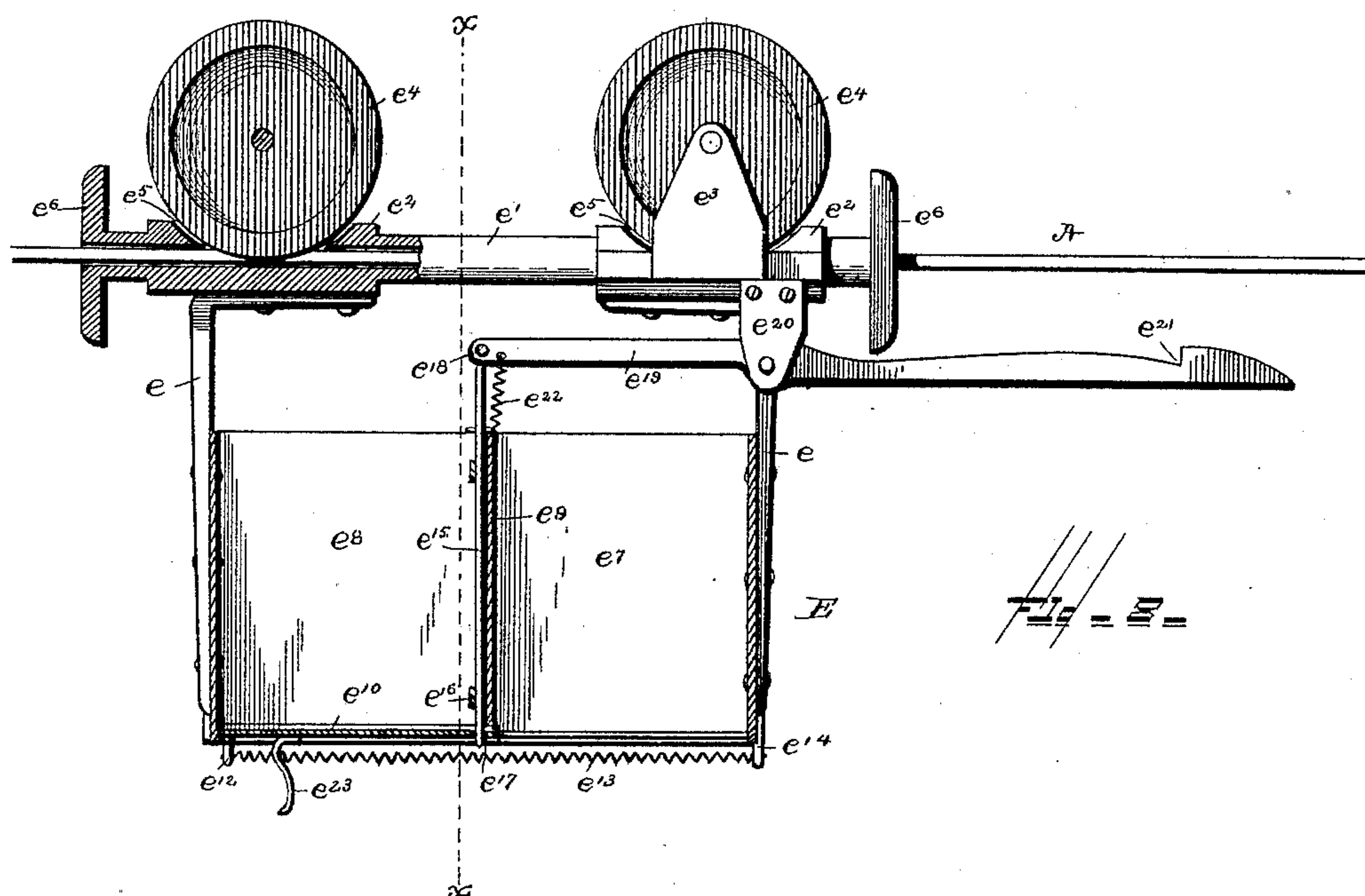
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C. A. McKIEARNAN.
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Patented Aug. 5, 1890.



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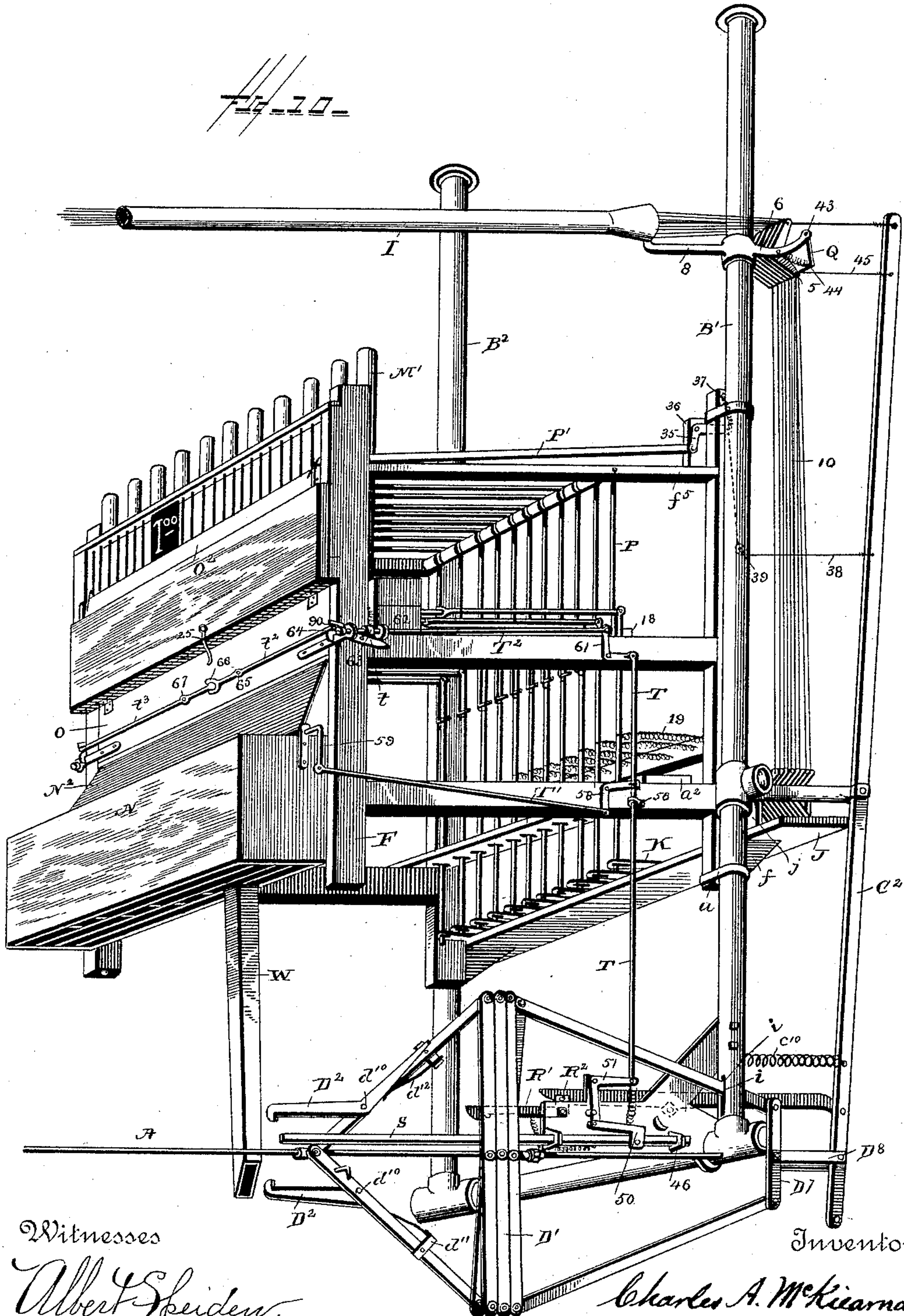
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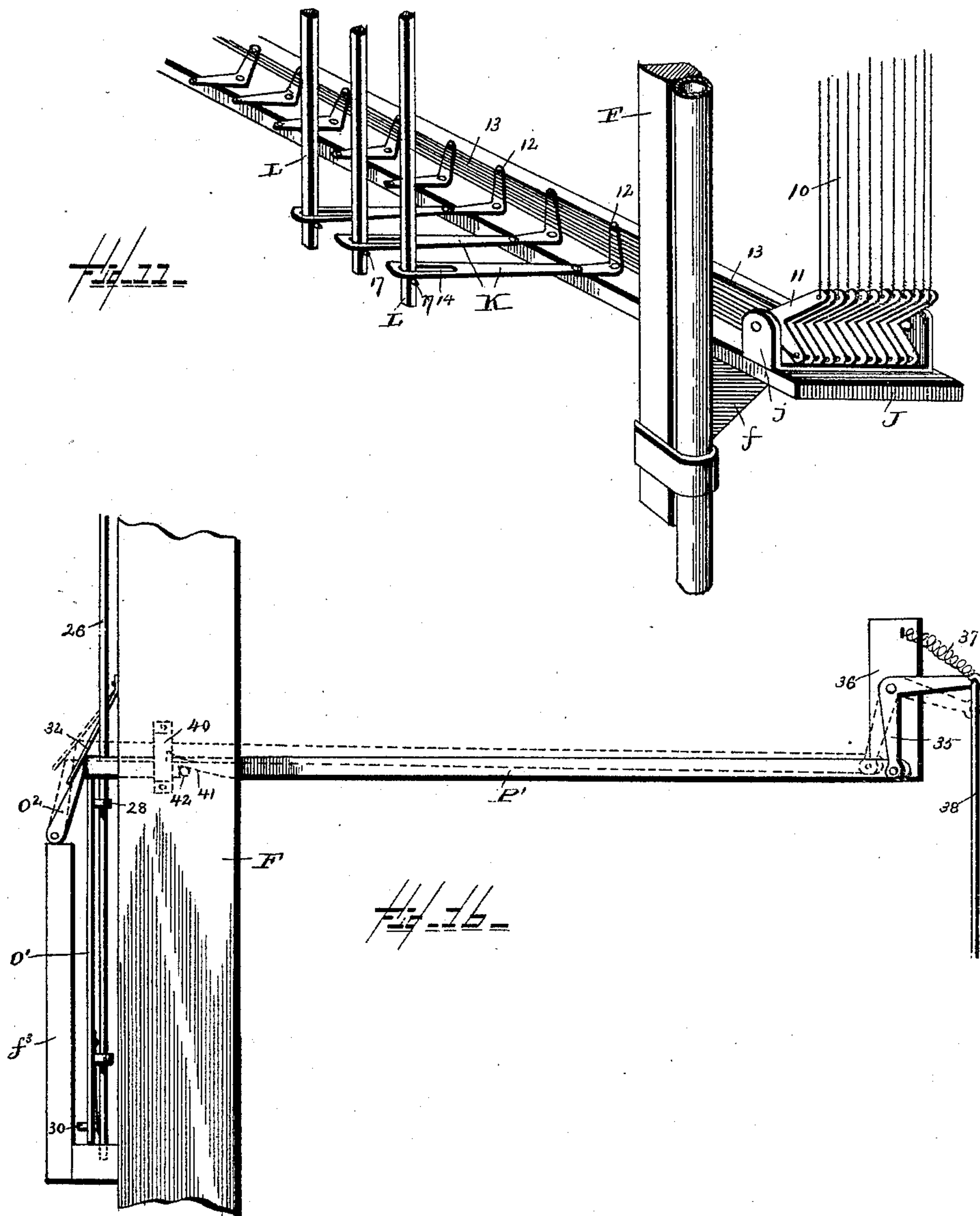
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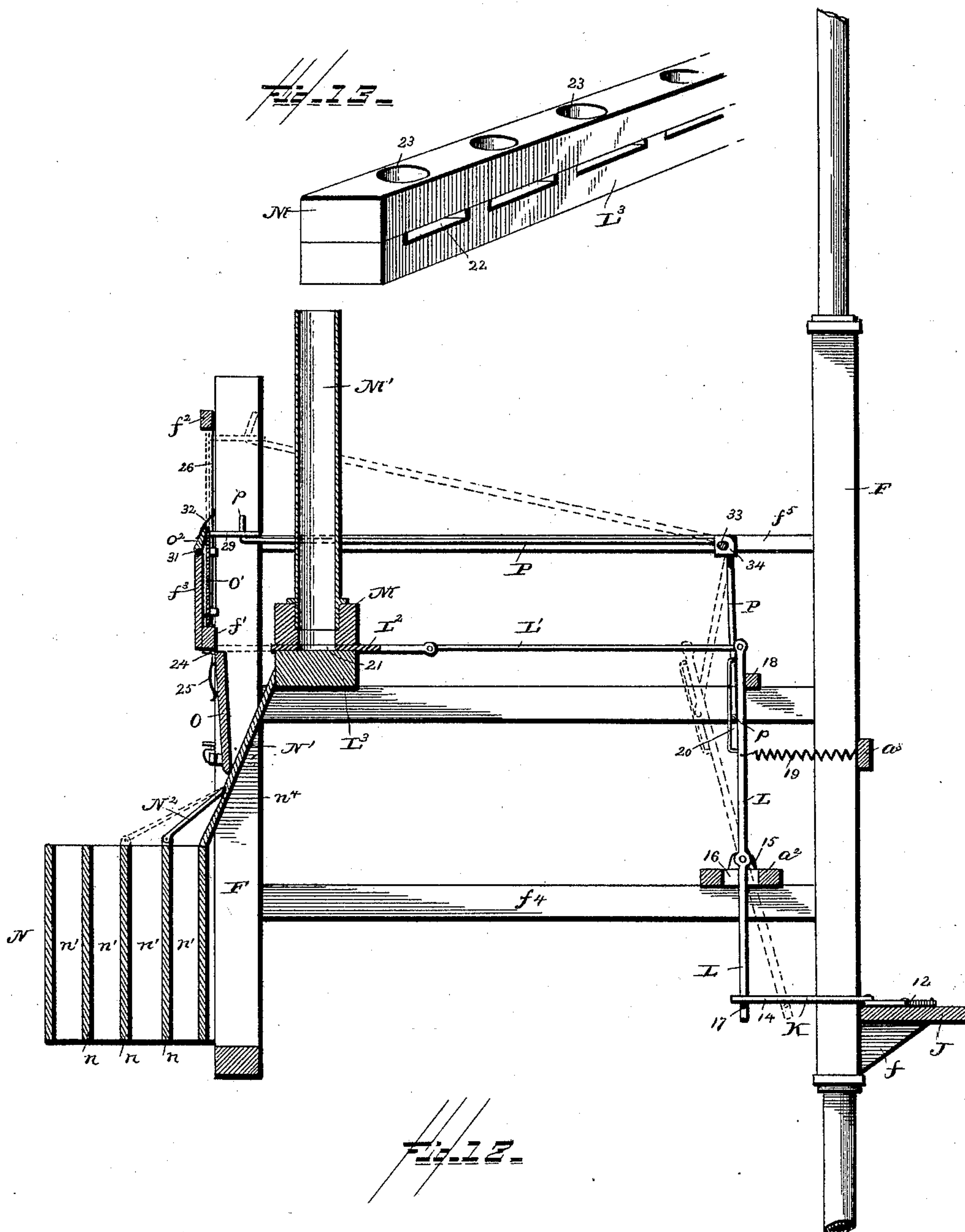
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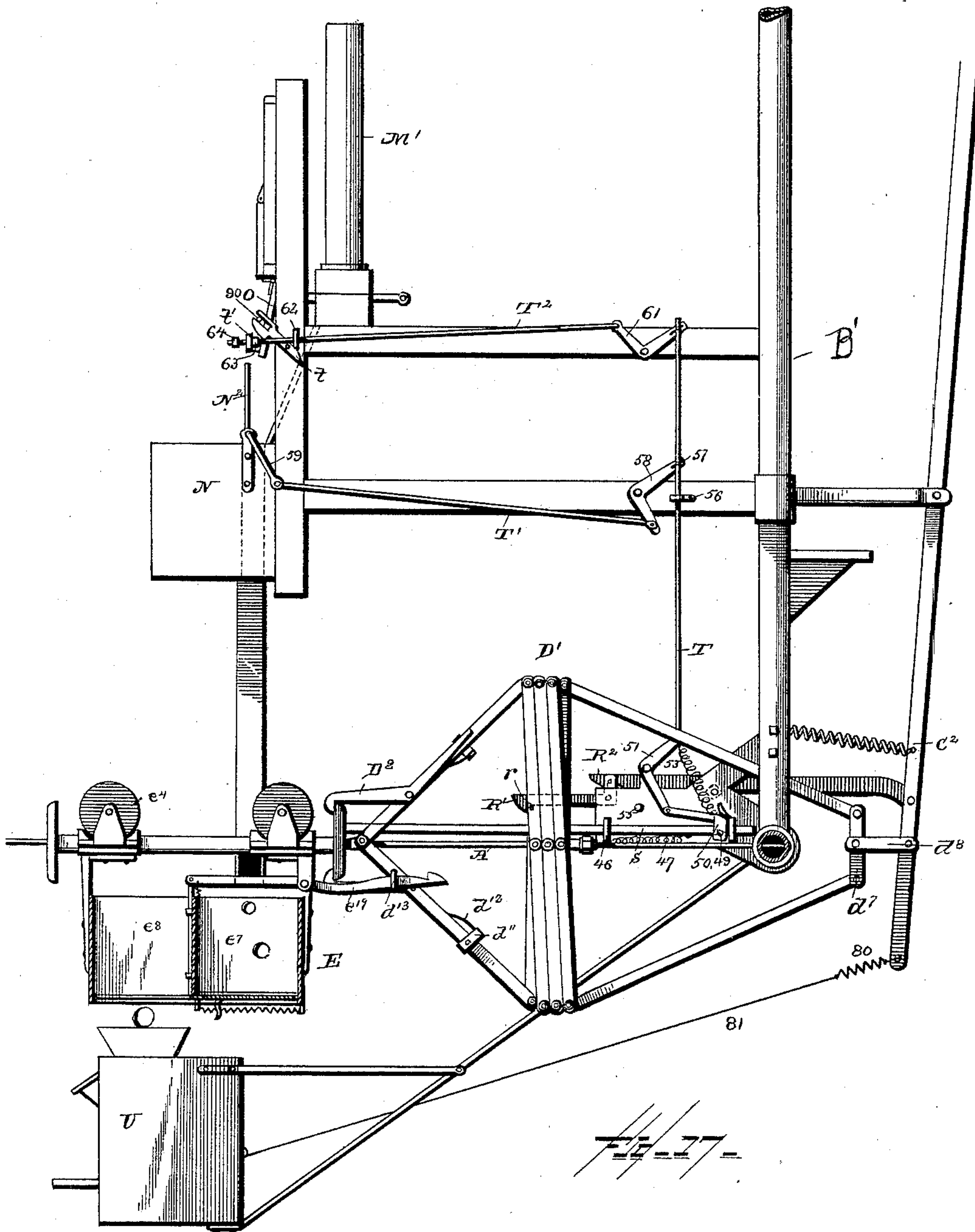
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C. A. McKIEARNAN.
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No. 433,741.

Patented Aug. 5, 1890.



Witnesses

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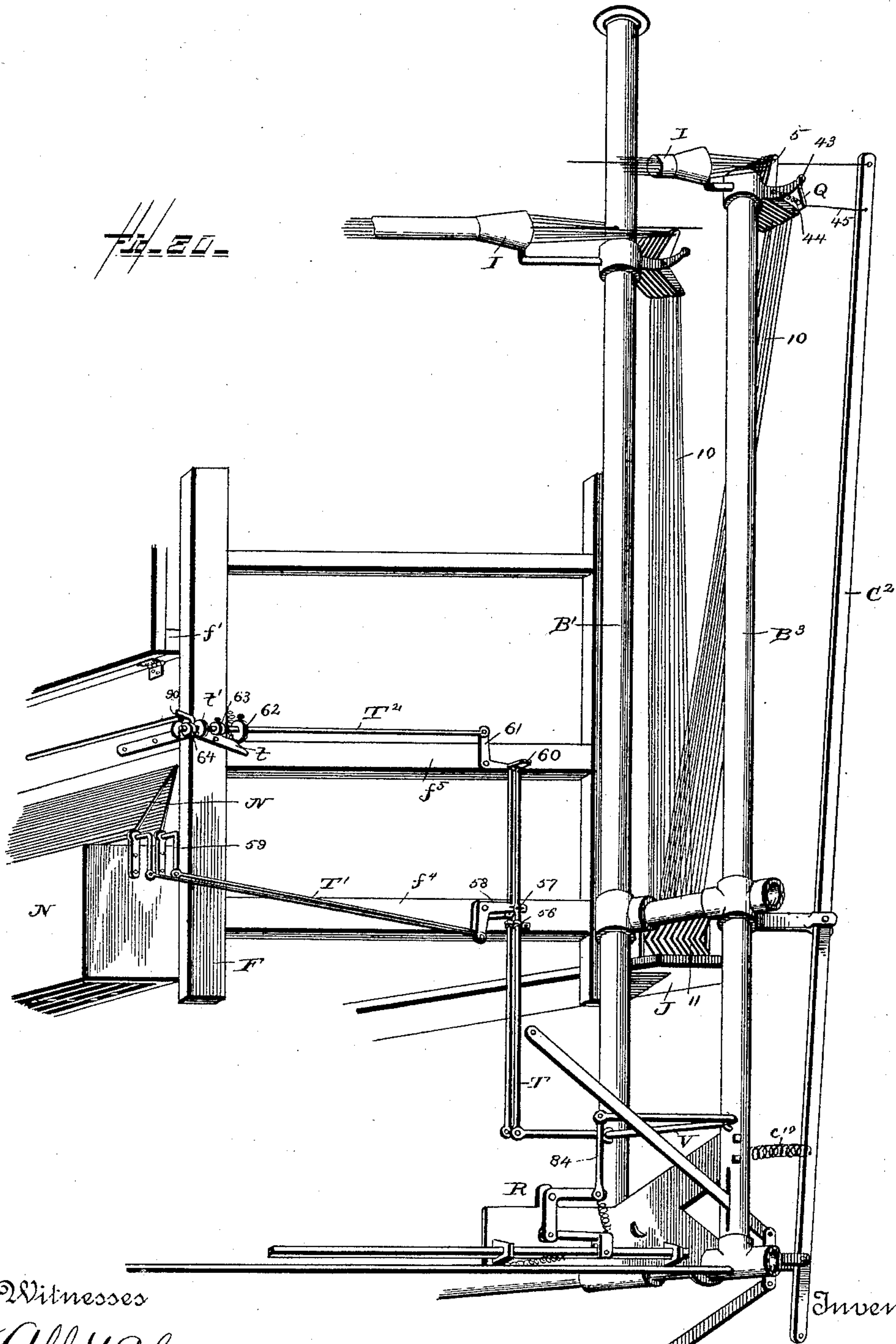
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UNITED STATES PATENT OFFICE.

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TO WILLIAM H. SALMON, OF SAME PLACE.

STORE-SERVICE APPARATUS.

SPECIFICATION forming part of Letters Patent No. 433,741, dated August 5, 1890.

Application filed August 7, 1889. Serial No. 320,015. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. McKIEARNAN, a citizen of the United States of America, residing at Clinton, in the county of Henry
5 and State of Missouri, have invented certain new and useful Improvements in Store-Service Apparatuses, of which the following is a specification, reference being had therein to the accompanying drawings.

10 My invention relates to improvements in the class of apparatus known as "store-service;" and it has for its object the provision of means whereby a salesman at a sub-station is enabled not only to send the cash-carrier
15 to a main station, but is also from his place at the counter enabled to deposit the contents of the carrier at the main station, make change of money at the main station, deposit the change
20 in the carrier, and return the carrier to his station, thus avoiding the necessity for a cashier.

The invention consists, broadly, in the combination, with a cash or package carrier, of a change-making apparatus.

25 The invention consists, more specifically, in the combination, with a store-service track or way and a propulsion apparatus and a carrier for the track or way, of a change-making apparatus capable under the control of a salesman at any one of a number of sub-stations
30 of selecting the desired amount of change and automatically delivering the change into the carrier.

35 The invention consists, further, in certain details of construction and combinations of parts, which will first be described in connection with the accompanying drawings, and then pointed out in the claims.

40 Figure 1 of the drawings is a perspective view of my improved store-service, showing the positions of the different parts when the carrier is at the sub-station. Fig. 2 is a perspective view of that portion of the store-service which is located at the sub-station. Fig. 3 is a vertical section taken through the
45 boxing and key-board. Fig. 4 is a side elevation illustrating the arrangement of the lazy-tongs at the main station, and also showing the mechanism with which the carrier acts to operate certain portions of the change-maker.

50 Fig. 5 is a detail perspective view of the buffer

on the front end of each section of the lazy-tongs. Fig. 6 is a detail perspective view showing the clamp at the rear of each section of the lazy-tongs for securing the lazy-tongs to the track-wire. Fig. 7 is a detail perspective
55 view showing the manner of pivoting the lazy-tongs and passing the track-wire through the pivot-bolt. Fig. 8 is an elevation of the carrier with one side removed and a portion of the runner in section. Fig. 9 is a transverse
60 section of the carrier, taken on the line $x x$, Fig. 8. Fig. 10 is an enlarged perspective view of the change-maker and so much of its operating mechanism as is located at the main station. Fig. 11 is a detail perspective view
65 showing the shelf on the rear side of the change-maker and the bell-cranks and wires thereon. Fig. 12 is a vertical section of the change-maker, showing the mechanism for operating the coin-slides and the indicator-tablets.
70 Fig. 13 is a detail perspective view of the supports for the coin-slides and money-tubes. Fig. 14 is a perspective view of the change-guide partly broken away in front. Fig. 15 is a perspective view showing the rear side of
75 one of the indicator-tablets. Fig. 16 is a detail side elevation showing the mechanism for dropping the indicator-tablets. Fig. 17 is a side elevation showing the carrier in the act of depositing money in the cash-receptacle
80 and operating the change-maker to receive change. Fig. 18 is a vertical section of the cash-receptacle, showing the parts in the positions they occupy as the carrier deposits the money. Fig. 19 is another vertical section of
85 the same, showing the position of the parts when the carrier has returned to the sub-station. Fig. 19^a is a perspective view of the sliding box of the cash-receptacle partly broken out. Fig. 20 is a perspective view of
90 so much of the store-service as is necessary to show how any desired number of cash-carrier apparatuses may be connected with the change-maker. Fig. 21 is a perspective view, partly broken out, of one of the paper-money
95 boxes.

Referring to the accompanying drawings, A represents a track-wire, one end of which is secured in a rigid hanger B at a sub-station and its other end in a similar hanger B' 100

at the main station, the hangers being secured to the ceiling of the room.

C, Fig. 2, represents a lever pivoted in a bracket c , secured to hanger B and provided at its lower end with a handle c' . The lower portion of the lever works in an elongated metal loop c^2 , secured to hanger B. On the outside of this loop there is secured a flat spring c^3 , having a hook c^4 at its free end, and in the spring and extending through and across the loop is a pin c^5 , which locks the lever C forward, thereby holding the section of lazy-tongs which is pivoted to it in a contracted position. A thumb-lever c^6 , provided on its under side with a spring c^7 , (which rests on the handle,) is pivoted at c^8 , and its upper end engages with hook c^4 , whereby when the lower end of said lever is pressed down the pin c^5 will be withdrawn from loop c^2 , releasing lever C.

To the upper end of lever C there is attached one end of a wire C' , the other end of which is attached to the upper end of a lever C^2 , which is pivoted in a bracket c^9 , secured to hanger B'. To this lever C^2 , near its lower end, is connected one end of a spiral spring c^{10} , its other end being secured to hanger B'.

D D' represent two sections of lazy-tongs, one at each end of the track-wire A. These are constructed in the same manner as the usual form of lazy-tongs, except that where the levers cross in the middle I employ, instead of the usual straight fulcrum, a short bolt d , having a trunnion d' on each end, and place a washer d^2 on each trunnion outside of the levers to give a greater bearing for the trunnion, and then rivet the latter down into the washer, so that the levers fulcrum on the trunnions, and are thereby prevented from buckling. The bolts d are perforated horizontally, and the track-wire is passed through these perforations, as clearly seen in Fig. 7.

In order to clamp the rear ends of each section of lazy-tongs to the track-wire, as is necessary, I form the trunnions d' on one end of a rod d^3 about three inches in length, having an enlargement d^4 at its other end, which enlargement tapers rearwardly, is screw-threaded, and is kerfed, as at d^5 , and on this screw-threaded portion I pass a nut d^6 . The track-wire passes through this rod, and as the nut is screwed on the kerfed portions grasp the wire, all as seen in Fig. 6.

In order to prevent the carrier from striking the front levers of the lazy-tongs, I provide a buffer b , which consists of a forwardly-projecting perforated metal rod, on the rear end of which the trunnions are formed, as above explained, and on the front end I secure a rubber tip b' , as seen in Fig. 5. The outer end levers of section D of the lazy-tongs pass through slots i in hanger B and are pivoted to lever C, as seen in Fig. 2, and the outer end levers of section D' are each pivoted to a short link d^7 , which is pivotally connected to a short arm d^8 , rigidly secured to lever C^2 , as seen in Fig. 4, one of the levers

of the lazy-tongs passing through a slot i' in hanger B', as seen clearly in Fig. 10.

As seen in Fig. 4, section D' of lazy-tongs is held in contracted position and released from that position as follows: As lever C^2 closes in the lazy-tongs, a latch R' , pivoted to a bracket R, secured to hanger B', engages with a pin r on the lazy-tongs, the inclined front end of the latch riding up on the pin against the stress of a spiral spring r' , secured to the latch and the bracket in a well-known manner. The latch R' has a vertical arm r^2 at its rear end, which arm carries at its upper end a laterally-projecting pin r^3 , with which a latch R^2 , pivoted at its rear end to lever C^2 , engages to rock latch R' upward, so as to disengage it from pin r and release the lazy-tongs. At the time latch R^2 is in engagement with latch R' a notch r^4 in the under side of the former is over a laterally-projecting pin r^5 , secured in the bracket. From this construction it results that as the lazy-tongs are being contracted latch R' engages with them, and latch R^2 engages with latch R' , as seen in Fig. 10, and when lever C^2 is moved, so as to expand the lazy-tongs, latch R^2 will rock and release latch R' , and at the same time it will be raised so as to release its own hold as its notch is drawn back from over pin r^5 , when the parts will be in the positions shown in Fig. 4.

Each section of lazy-tongs D and D' is provided at its inner or forward end with a pair of jaws D^2 for holding the carrier while at the sub-station or main station. Each pair of jaws consists of two bell-crank levers d^9 , pivoted to the inner sides of the lazy-tongs at d^{10} , the rear arm of each jaw resting loosely in a holder d^{11} , formed of a strip of thin metal bent inward at a right angle at each end and riveted to the lazy-tongs, as seen in Figs. 1, 10, and 17. A thin flat spring d^{12} is riveted at its rear end to one of the inward projections of the holder, its free end resting under the rear arm of the jaw in order to permit the jaws to yield and open when the knob on the carrier comes into contact with them, the jaws being normally closed, while the lazy-tongs are contracted. The carrier E is a rectangular box having a standard e at each end, to which is riveted a tubular runner e' , having enlargements e^2 near each end, on which to secure lugs e^3 , in which the wheels e^4 are mounted, the upper sides of the enlargements e^2 being cut out, as at e^5 , to permit the wheels to rest on the track-wire, as seen in Figs. 8 and 9. On each end of this runner there is a disk-like knob e^6 , rounded on its outer side, as shown.

The box is divided into two compartments e^7 and e^8 by a partition e^9 , and has a half-bottom e^{10} to close only one compartment at a time. Along each side of the box at the bottom is secured a cleat e^{11} , and on these cleats the bottom e^{10} , whose side edges are enlarged and grooved to loosely fit over said cleats, is free to slide from one compartment to an-

other. On the under side of the bottom, at one end and on each side, there is an ear e^{12} , in which is secured one end of a coil-spring e^{13} , the other end being secured in an ear e^{14} on the opposite side of the box. As thus constructed it will be readily understood that the bottom will be held normally under the compartment nearest the points of fastening of the springs to the box, and in order to hold it under the other compartment against the stress of the springs, I employ a catch e^{15} , which is a thin strip of metal sliding vertically in keepers e^{16} , secured centrally on one side of the partition, the lower end of the catch entering a slot e^{17} in the end of the bottom. To the upper end of the catch is secured a laterally-extending pin e^{18} , which passes through a hole in one end of a lever e^{19} , said lever being fulcrumed in an ear e^{20} , depending from the runner, the outer end of said lever having a downward slope, in rear of which there is a notch e^{21} , for a purpose which will hereinafter appear. The inner end of the lever is held down and the catch in engagement with a slot in the bottom by a coil-spring e^{22} , secured to the end of the lever and the top of the partition, as shown in Figs. 8 and 9. On tipping the lever the catch will be disengaged from the bottom, and the latter will be drawn over to the other compartment. A short stem e^{23} , secured to the bottom, serves as a finger-hold for drawing and setting the bottom under the other compartment.

While a cash-carrier apparatus is an essential element of my improved store-service, and while I have shown and described one system of apparatus well adapted for use as a part of the store-service, it is to be understood that I do not limit myself to the employment of any particular system of cash-carrier apparatus, as there are other systems aside from the one herein described, which, by slight mechanical changes, can be readily combined with the change-maker, and therefore any such combination would be clearly within the scope of my invention.

I will now proceed to describe the change-maker and other mechanisms connected therewith, which, together with a cash-carrier apparatus, compose my complete store-service.

F represents the skeleton frame-work of the change-maker, which when used in connection with the cash-carrier apparatus herein described may, for convenience, be clamped, as at a , to hanger B' on one side and to a corresponding hanger B^2 on the opposite side. It may, however, be otherwise supported at the desired elevation.

At each sub-station (see Figs. 1, 2, and 3) there is a boxing G , secured to the hanger B and extending from a short distance below the wire A to near the ceiling of the room, slots h being cut in the boxing in register with the slots in the hanger, through which pass the end levers of the lazy-tongs, as shown. In the lower end of this boxing, which is made wide for the purpose, is located a key-board

H , in which there is a series of keys H' , these keys bearing figures on their faces, indicating given amounts of money, ranging from five cents to ten dollars, in a manner well understood. These keys pass through slots h' in the boxing, and are pivoted at their rear ends in the key-board, as at h^2 .

As the keys H' must be operated to throw up their corresponding indicator-tablets and push out the change after the carrier has left the sub-station, it is desirable when several pieces of money are wanted at one time to be able to depress the desired number of keys simultaneously. For this purpose I pivot a bail H^2 on the rod, on which the keys are pivoted, and attach links h^3 to it at proper intervals to engage with hooks h^4 , secured in the under side of the keys, the bail being provided with a suitable hand-hold h^5 . By thus connecting the bail to the desired keys the latter may all be operated at once by pulling down on the bail.

To each of the keys H' is connected one end of a wire 1, whose other end is connected to one arm of a bell-crank 2, pivoted in a bracket l , secured to the hanger B near the ceiling, there being one bell-crank for each wire, the boxing serving as a housing for these wires. To the other arm of each of the bell-cranks 2 is attached one end of a wire 4, which leads to the main station, where it is attached to another bell-crank 5, pivoted in a bracket 6, secured to hanger B' . These wires are housed in a metal tube I , supported at its ends by brackets 7 and 8, secured to the hangers B and B' , respectively. The ends of this tube are flared outward to receive the wires as they radiate from the bell-cranks, and in each flared portion there is a perforated disk 9 through each perforation, in which passes one of the wires 4. The wire C' , connecting levers C and C^2 , also passes through the disks. By means of these perforated disks the wires are prevented from sagging and buckling. Wires 10 lead from bell-cranks 5 to another series of bell-cranks 11, pivoted vertically in standards j at one end of a shelf J , secured to brackets f , attached to the rear side of frame-work F , as clearly shown in Fig. 11. On this shelf there is another series of bell-cranks 12, pivoted horizontally a short distance apart, and a wire 13 connects the rear arm of each of these bell-cranks with the lower arm of each of the bell-cranks 11.

To the front arm of each of the horizontal bell-cranks 12 is pivoted one end of a forwardly-extending arm K , whose forward end is slotted, as at 14.

L represents a series of levers, each fulcrumed near its center in lugs 15 on top of a cross-piece a^2 , which runs transversely of the frame-work F , and is slotted at regular intervals, as at 16, to permit the passage thereof of said levers, the lower end of each of which also passes through the slot 15 in each arm K , and is held in engagement with the arm by means of a pin 17 passed through

the lever. Each lever L is held normally against a stop 18, which is a light strip of wood extending across the frame F, by a spiral spring 19, attached to the lever above its fulcrum and to a cross-piece a^3 on the rear side of the frame. A wire loop 20 is attached to the upper end of each of these levers, for a purpose which will presently appear.

To the upper end of each lever L is pivoted one end of a rod L' , the other end of which is pivoted to the rear end of a metal coin-slide L^2 , perforated at 21. The slides are of varying thicknesses, ranging from the thickness of four silver dollars down to that of a ten-cent piece, and the perforation 21 in each slide is of a size to receive the piece or pieces of money it is designed to take from its respective money-tube. Each of these slides works in a recess 22 cut in the upper face of a slide-support L^3 , which is simply a plank secured in and extending across the frame near its front side, the depth of the recess being just equal to the thickness of the slide.

M represents a money-tube support, which is secured squarely on top of the slide-support. It consists of a wooden plank perforated at intervals, as at 23, for the reception of a series of metal or glass tubes M' , the perforations 23 registering with the perforations in slides L^2 . Each tube is designed to contain pieces of money of a denomination corresponding to that marked on the key that operates the slide beneath it.

N represents what I term the "change-guide," whose function is to direct the pieces of money into the proper chute for delivery thence to the carrier belonging to any particular sub-station. It consists of an oblong box divided vertically by partitions n into as many compartments n' as there are sub-stations in communication with the main station, four such compartments being shown in the present instance. In each compartment there is an inclined partition n^2 extending from each end at the top to the bottom, these partitions converging in such manner as to leave an opening n^3 of the size of the upper end of the chute W, as clearly shown in Fig. 14. The said chute may be of wood or metal, and of any construction adapted to deliver the money into the carrier.

N' represents an inclined apron extending from the top edge of the rear wall of the change-guide to the slide-support L^3 , to the front face of which it is secured, the upper and lower edges of the apron being properly beveled, so as to fit snugly on said wall and against the slide-support. It is reduced in thickness for some distance upward from its lower edge, as seen at n^4 , Fig. 12, for a purpose which will presently appear.

N^2 , Fig. 12, represents a thin leaf, of any suitable material, hinged to the top edge of one of the vertical partitions n in the change-guide N. The upper edge of the leaf rests normally against the recessed portion n^4

of apron N' , in order that it may offer no obstruction to the money as the latter slides down the apron. The function of this leaf is when thrown back into vertical position to prevent the money falling down the apron from going beyond the first compartment of the change-guide, and when lying in its normal position while the money-changer is being operated from a second sub-station to serve as a prolongation of the apron and direct the money into the second compartment, the second leaf, which is shown in dotted lines in Fig. 12 and in full lines in Fig. 20, meanwhile serving to prevent the money from going beyond the second compartment for which it is intended, and so on, it being understood that there is to be a leaf for each compartment, each operating independently of the others, as hereinafter described and as illustrated in Fig. 20. The leaves overlap each other at their upper edges, and as the apron may be made of any thickness it may be recessed sufficiently to permit the upper edges of all the leaves to lie in said recess.

O represents what I term the "detainer," which holds on the apron N' the money selected as change by the salesman until the cash-carrier reaches the main station. It consists of a thin board hinged at its upper edge at 24 to the under edge of a cross-piece f' on the front side of the frame F, the lower edge of the detainer resting against the apron at a point above where the leaves come into contact with it, as seen in Fig. 12, and a light spring 25 holds the detainer normally in contact with the apron.

26 represents wires secured at their lower ends in the upper edge of the cross-piece f' of the frame, and at their upper ends in another similar cross-piece f^2 , each pair of wires serving as guides for an indicator-tablet O' , of metal or other suitable material, bearing on its face a figure or figures indicative of a money value equal to that expressed on one of the keys. As clearly seen in Fig. 15, the tablet is provided on its rear side with two transverse metal strips 27, having loops 28 at their ends, which pass over the wires and hold the tablet. At the upper end of the tablet on the rear side is secured a laterally-extending wire bail 29, and also on the rear side there is a light strip of spring metal, secured at its upper end to the tablet and carrying a forwardly-extending pin 30 at its lower end, which pin passes through a perforation in the tablet.

To the upper edge of a face-plate f^3 , secured to the cross-piece f' of the frame, is hinged, as at 31, a narrow strip O^2 , of wood or metal, which serves as a support for the tablets when in their raised position, the spring-pins on the tablets resting on the upper edge of the support, which is caused to normally press against the tablets by a spring 32, attached to one of the posts of the frame and bearing against the front side of the support, this latter spring being considerably stronger than

those carrying the pins on the indicator-tablets.

P represents a series of right-angularly-bent rock-arms, pivoted on a rod 33, extending transversely of the frame and secured in a beam f^4 at each side, the rock-arms being kept the required distance apart on the rod by spools 34. The lower end of the rear or vertical portion of each of these rock-arms is bent laterally at a right angle to form a finger p , which enters loop 20 on lever L, thereby loosely connecting the rock-arm and lever, and the front end of the forward or horizontal portion of the rock-arm is bent upward to form a hook p' for engagement with the bail 29 on one of the indicator-tablets O'.

From the description so far given it will be clear that when the salesman at the counter depresses any given key H on the key-board H' each one of the bell-cranks connected with it (2, 5, 11, and 12) will be rocked on its pivot in such manner as to cause the upper end of the lever L to be thrown forward, thus pushing the slide L^2 forward until its perforation 21 has passed entirely beyond the slide support, when the coin that was in the slide will fall onto the apron N' and lodge against the detainer O. The same movement of lever L will also rock the rock-arm P in a manner to elevate its respective indicator-tablet O' until the spring-pin 30 on the tablet has passed above the tablet-support O², when the pin will be projected forward and rest on the upper edge of said support, it being understood that the pin 30 normally extends through the tablet, as seen in Fig. 15; but in the ascent of the latter it is forced back until flush with the front face of the tablet by contact with the inclined tablet-support, the spring holding the latter being sufficiently strong to overcome the pressure by the pin 30. The full and dotted lines in Fig. 12 clearly indicate the above-described operations. The indicator-support is thrown forward to permit the indicator-tablets to drop by means of an arm P', whose front end rests normally against it, as clearly seen in Fig. 16. The rear end of this arm is pivoted to one arm of a bell-crank 35, pivoted on a block 36 on top of one of the beams f^5 . A spiral spring 37, secured to the other arm of the bell-crank and to one of the rear posts of the frame, tends to hold the arm P' in its normal position, the bell-crank being rocked to throw said arm P' forward, and thus push the indicator-support forward by means of lever C², that arm of the bell-crank to which the spring is attached being connected with said lever by means of a wire or cord 38, which passes over a pulley 39, mounted on the post of the frame, as seen in Fig. 10. The front end of arm P' passes through and is supported by a keeper 40 on the inner side of one of the front posts of the frame, the keeper allowing vertical play of the arm. In the under side of the arm there is a notch 41, having a

square shoulder at the front and an incline at the rear. When arm P' is in its normal position, this notched part rests on a pin 42, secured in the post, so that when the upper end of lever C² is thrown rearward the bell-crank will be rocked to throw arm P' forward, pressing the indicator-support forward and allowing the tablet or tablets to drop. The arm P' is raised as the notched portion passes over the pin until, when the notch has passed beyond the pin, the indicator-support is free to resume its normal position, as seen in Fig. 16, when the spiral spring 37 will rock the bell-crank in the opposite direction and withdraw arm P' as soon as the cord 38 is slackened by the forward movement of the upper end of lever C².

In order to prevent manipulation of the money-changer by an unauthorized person, I apply a lock Q to the bell-cranks 5, so arranged as to prevent any of the slides L^2 from being operated while the cash-carrier E is at its sub-station. This lock consists of a rectangular metal plate hinged at its upper edge on a rod 43, mounted in the outer upwardly-turned arms of the brackets 6, in which the bell-cranks 5 are pivoted. A spiral spring 44, attached to the inner side of the lock and also to the rod on which the bell-cranks are pivoted, serves to hold the lock normally over the lower arms of the bell-cranks, and a wire 45, attached to the lock and to lever C², serves to withdraw the lock from engagement with the bell-cranks whenever the upper end of said lever is thrown outward, as seen in Figs. 1, 10, and 20. It will thus be seen that the money-changer remains inoperative until the carrier has been sent forward.

I will now describe the mechanism operated by the carrier E. The bracket R, secured to hanger B', as before stated, is provided on its outer side with two perforated ears 46, through which passes a slide-bar S, which is held in forward position by a spiral spring 47, attached to the front ear and to the bar. In the under side of the bar there is a notch 48, (best seen in Fig. 10,) which is engaged by a pin 49, carried in the vertical bifurcated branch of a right-angular arm 50, which straddles the bar. To the horizontal branch of said arm 50 is pivoted the lower arm of a bell-crank 51, pivoted to a vertical extension 52 of bracket R. Arm 50 is held so that its pin 49 will engage with the notch in the slide-bar by means of a spiral spring 53, secured to it and to the upper arm of the bell-crank. A crescent-shaped lug 54 is secured on the side of bracket R in the path of arm 50 as it is carried backward by the slide-bar, and a stud 55 in the bracket limits the movement of the bell-crank, so that on its return movement arm 50 will be caused to stop in the right place to engage the notch in the slide-bar. A vertical rod T reciprocates freely through a keeper 56, secured to the outer side of beam f^4 of frame F, the lower end of said rod being pivoted to bell-crank 51. A small

pin 57 extends laterally from the rod above the keeper and enters the slotted end of one arm of a bell-crank 58, pivoted to the side of said beam. To the other arm of bell-crank 58 is pivoted one end of a rod T', the other end of which is pivoted to a crank-arm 59, which is a right-angular extension of the rod on which the leaf N² is hinged to the change-guide N. The upper end of rod T strikes against the under side of an outwardly-extending flange 60 on one arm of a bell-crank 61, pivoted on the side of beam f⁵ of the frame. To the other arm of this bell-crank is pivoted one end of a rod T², on the outer end of which are secured three set-nuts 62 63 64. The inner nut 62, when the rod is moved forward, rides up on the rear end of a latch t and depresses it, thus raising the front end, which engages with a metal strip or catch t' on the end of the detainer O, to hold the detainer against the apron. The second nut 63 abuts against the inner side of catch t' to push the detainer outward, and the third nut 64 is for the purpose of pulling the detainer back to its place against the apron.

When cash-carrier apparatuses are connected with the money-changer on both sides, as will be explained farther on, there must be some provision for releasing the catches at each end of the detainer O simultaneously, and for this purpose I pivot two rods t² t³ to the front side of the detainer, which rods are arranged in the form of a compound lever. The rod t², which is pivoted at 65, is enlarged and bifurcated at its inner end, as at 66, and the inner end of rod t³ plays in this bifurcation, said rod being pivoted at 67. The outer end of each rod extends outward a short distance beyond the frame and engages in a slot 90, cut in each latch t, it being understood that in this case there is to be a catch at each side of the frame.

U represents the cash-receptacle, which is designed to receive the money deposited by the carrier, it being suitably supported under the track-wire. As seen in Figs. 18 and 19, it is a rectangular box, having a hopper u in its top, which is secured therein in any suitable manner. To one side of the hopper on its under edge is hinged a flap u', adapted when in its raised position to cover the opening into the box. The rod 68, on which the flap is hinged, extends a short distance outside the box at one end, and to it is rigidly secured at an obtuse angle one end of a short arm 69, the other end of said arm being pivoted to a rod 70. On a line with the lower edge of the hopper, opposite the side on which the flap is hinged, there is a partition-plate 71, extending downward nearly half the depth of the box, and from the lower edge of this partition-plate back to the rear wall of the box the sides are slotted, as at 72.

Inside the main box there is a sliding box u², (clearly shown in Fig. 19^a), open at the front, side, and bottom, which moves back and forth on ways 73, secured to the sides of the

main box just below the slots 72, the rear end wall of the sliding box being grooved, as at 74, to fit on the ways, the sides of the box extending only up to the lower edges of these grooves. Secured to the front ends of two arms 75, passed through openings 76 in the rear wall of the sliding box, the other ends of said arms being secured to the rear wall of the main box, is another partition-plate 77, which stands in line with partition-plate 71. The sliding box u² is provided with a forwardly-extended apron 78, secured in the front edges of its end walls near the bottom.

The front wall of the main box down to a line even with the lower edge of partition-plate 77 is composed of a glass plate 79.

The sliding box is drawn rearward by means of the lever C², to the lower end of which is attached one end of a short spiral spring 80, to whose other end is attached a cord 81, which passes under a small pulley 82 in the rear wall of the main box and is secured to the rear wall of the sliding box. A spiral spring 83, attached to the lower edge of the rear wall of the sliding box and to the front wall of the main box, serves to move said box in the opposite direction. The flap u' is raised and lowered by means of the rod 70, whose lower end is bent at a right angle, enters the slot 72 in its side of the main box, and is connected to the upper edge of the rear wall of the sliding box, the other end of the rod 70 being connected as before described.

I have as yet described my improved store-service as embracing but a single cash-carrier apparatus. I will now explain how a number of these apparatuses may be connected with the money-changer, each one of them independent of the other, there being an apparatus for each sub-station. Fig. 20 illustrates this feature so plainly that but little description is necessary, as the construction involves but a duplication of parts, with one or two minor exceptions, the first of which is that instead of having a hanger B' for each cash-carrier apparatus I secure a column B³ to the hanger, preferably by means of pipe-joints, as shown, and attach to it the working parts attached to the hanger in the first instance. In the second place, instead of attaching rod T directly to the bell-crank 51, I pivot it to the inner forwardly-extending end of a rock-arm V, journaled on the front sides of the hanger and column, and pivot the outer forwardly-extending end of the rock-arm to the upper end of a short link 84, whose lower end is pivoted to the bell-crank 51, as shown in Fig. 20, in which figure the bracket R and the parts which it carries (shown in the other figures as attached to the hanger) have been omitted for the purpose of clear illustration of this attachment of a second cash-carrier apparatus. As seen in Fig. 20, the wires 10 of all the cash-carrier apparatuses are connected to the bell-cranks 11 on shelf J. When a key at any of the sub-

stations is depressed, causing its wire 10 to operate the particular bell-crank 11 with which it is connected, all the other wires 10 connected with that bell-crank will slack, as is evident. A third cash-carrier apparatus may be connected with the change-maker alongside the second, and so on, and also cash-carrier apparatuses may be attached to the change-maker on the opposite side in the same manner.

I will now describe the operation of my store-service complete. The money-tubes are first filled with coins of a denomination corresponding to their respective keys. Those of the tubes, however, whose slides are capable of receiving four silver dollars (and all the slides whose respective keys are of greater value than two dollars are of just that capacity) are charged with small metal boxes X, like that shown in Fig. 21, whose lid is flush with the periphery of the body and fits snugly. In these boxes are placed paper money, each box containing money of the value of the tube in which it is placed. We will now suppose the salesman at his sub-station wishes thirty-five cents change out of a dollar and that certain of the indicator-tablets are up, indicating the amount of change taken at a previous operation. He first places the dollar (if of paper, inclosed in one of the boxes X) in the compartment e^8 of the carrier, and then releases lever C and draws it backward, when spring c^{10} will draw the lower end of lever C² forward, and thereby throw its upper end outward. In this outward movement of the upper end of the lever bell-crank 35, through cord 38, will be rocked, so as to push bar P' forward to push the indicator-support back and allow the tablets to fall. In moving forward the inclined notch 41 in the bar rides up on pin 42, thereby raising the front end of the bar above the support, when the spring bearing against the latter will return it to its place. The outward movement of lever C causes the section D of the lazy-tongs to expand, and as they do so their jaws automatically release their hold on the carrier, which latter is given sufficient momentum by the lazy-tongs to send it to the main station. So soon as the carrier has been started on its way the salesman depresses the keys marked 10 and 25, when, through the instrumentality of their respective wires 1 4 10 12 and the bell-cranks with which they are connected, arms K will be moved rearward, thus drawing the lower ends of levers L in the same direction. This movement of levers L causes the coin-slides L² under the respective tubes containing the ten and twenty-five cent pieces to be pushed forward by the rods L' until their perforations (the perforation in each slide containing a coin) have passed clear of the slide-support L³, when the coins will fall down onto apron N' and rest against detainer O. At the same time the rock-arms P, connected with these particular levers L, will be so operated as to carry upward the indicator-

tablets marked 10 and 25, and when they have been fully elevated their spring-pins 30 will fly forward and rest on top of the indicator-support, as before explained, holding the tablets elevated until another amount is to be indicated. As soon as pressure is off the keys, the springs 19 will draw levers L back to their normal position against stop 18, (which insures the perforation in each coin-slide resting directly under its money-tube,) thereby causing the keys to be raised and also lowering the rock-arms P away from their indicator-tablets in position for the bails on the tablets to fall over their upturned ends. Just before the knob e^6 on the carrier E comes into contact with the jaws of lazy-tongs D' at the main station the forward end of lever e^{19} on the carrier strikes a downwardly-bent pin d^{13} on the forward end of the lazy-tongs, thereby causing that end of said lever to be slightly depressed and raising catch e^{15} out of engagement with the carrier-bottom, when the latter will immediately fly under the compartment e^7 , dropping the contents of compartment e^8 into the cash-receptacle U. As soon as the notch e^{21} in the forward end of the carrier-lever has reached the pin d^{13} , the spiral spring e^{22} will draw down the inner end of that lever and force the catch e^{15} again in engagement with the bottom, holding it under compartment e^7 . As the rounded face of the knob on the carrier comes into contact with the jaws on the lazy-tongs, the latter are forced open until the knob has entered, when the springs under their rear ends will cause them to close and hold the carrier in position with its compartment e^7 directly under the chute W. In entering the jaws the knob strikes against the end of the slide-bar S, which projects slightly beyond the buffer b on the lazy-tongs and pushes it rearward, the buffer preventing shock on the lazy-tongs. As the bar S slides backward, the arm 50 (by reason of its pin 49 being in engagement with notch 48 in the under side of the bar) is also moved backward, thereby rocking bell-crank 51 and raising rod T. As said arm 50 moves under the lug 54, it is thereby depressed, disengaging pin 49 from the notch 48 in the slide-bar, when the spring 47 will reset said bar in its forward position, allowing rod T and parts operated thereby to assume their normal positions. The raising of the rod T operates, through bell-crank 58 and rod T', to throw the leaf N² up into a vertical position, and it also operates, through bell-crank 61 and rod T², to throw the detainer O outward away from the apron N', the movement of the leaf being timed slightly ahead of that of the detainer. As the detainer leaves the apron, the money will slide down into the change-guide N, and thence through chute W to the carrier. The salesman now pushes lever C forward, which throws the lower end of lever C² outward, thereby expanding section D' of the lazy-tongs and sending the carrier back to the sub-station. By the outward movement

of the lower end of lever C² the sliding box u² in the cash-receptacle U is drawn rearward and the money deposited by the carrier, which has meanwhile lain on top of said box, is
 5 scraped off by partition-plate 71 onto apron 78, which by this time is in position to receive it, where it lies exposed to view until the lever C² is again reversed, when it will be
 10 scraped off the apron by the glass front and fall into the bottom portion of the receptacle, which is locked.

The operation of the duplicated mechanism is the same as that already described.

Having thus described my invention, what I
 15 claim as new, and desire to secure by Letters Patent, is—

1. In a store-service, the combination, with a cash-carrier apparatus, of a change-maker.

2. In a store-service, the combination, with
 20 a cash-carrier apparatus, of a change-maker embodying mechanism for indicating the amount of change desired.

3. An apparatus comprising a cash-carrier, a change-maker, and mechanism for operat-
 25 ing said cash-carrier and change-maker.

4. In a store-service, the combination, with a cash-carrier apparatus whose carrier is propelled back and forth between a sub-station and the main station by mechanism under
 30 the control of a person at the sub-station, of a change-maker.

5. In a store-service, the combination, with a cash-carrier apparatus whose carrier is propelled back and forth between a sub-station
 35 and the main station by mechanism under the control of a person at the sub-station, of a change-maker embodying mechanism for indicating the amount of change desired, located at the main station.

40 6. In a store-service, a change-maker located at the main station, in combination with a series of keys located at a sub-station connected through wires and bell-cranks with said change-maker.

45 7. In a store-service, the combination, with a cash-carrier apparatus, of a change-maker located at the main station and mechanism under the control of a person at a sub station
 50 for selecting the desired amount of change and placing it in position to be automatically delivered to the carrier.

8. In a store-service, the combination, with a cash-carrier apparatus, of a change-maker located at the main station and mechanism
 55 under the control of a person at a sub-station for indicating the amount of change desired and selecting the change and placing it in position to be automatically delivered to the carrier.

60 9. In a store-service, the combination, with a cash-carrier apparatus, of a change-maker provided with a change-guide adapted to direct the selected change to the carrier for the time being in operation.

65 10. In a store-service including a change-maker and one or more cash-carrier apparatuses, the combination, in the change-maker,

of the coin-tubes, the coin-slides under them, the apron below the slides, and the detainer resting against the apron of a change-guide
 70 having as many compartments as there are cash-carrier apparatuses, and a leaf for each compartment, a chute attached to the under side of each compartment, and mechanism
 75 operated by the carrier to raise the detainer and one of the leaves, substantially as described.

11. In a store-service, a change-maker located at the main station and provided with a series of coin-slides, a series of indicator-
 80 tablets, a series of levers, springs for retracting the levers, rods connecting the upper ends of said levers with the coin-slides, and a series of rock-arms connected with the levers
 85 and engaging with the tablets to elevate them, in combination with a series of keys at a sub-station connected through wires and bell-cranks with the lower ends of said levers,
 90 substantially as described.

12. In a store-service, a change-maker located at the main station and provided with a series of coin-slides, a series of vertical
 95 levers, springs for retracting the levers, and rods connecting the upper ends of said levers with the coin-slides, and a series of keys at a sub-station connected through wires and bell-cranks with the lower ends of the levers, substantially as described, and for the purpose
 100 set forth.

13. In a store-service, a change-maker located at the main station, having a series of indicator-tablets, each provided with a spring-
 105 pin playing through it from its rear side, a support upon which said pins rest when the tablets are elevated, and mechanism operated from a sub-station to move the support from
 110 under said pins to permit the tablets to fall, substantially as described.

14. In a store-service, the combination, with two levers located, respectively, at the main
 115 station and a sub-station and connected in any suitable manner, the lever at the main station being provided with a retracting-spring, of a change-maker having a hinged spring-pressed indicator-tablet support, a
 120 rod bearing at one end against said support and pivoted at its other end to one arm of a bell-crank, a wire or cord connecting the other arm of the bell-crank with the lever at the main station, and a spring for retracting the
 125 bell-crank, for the purpose stated.

15. In a store-service, the combination, with a cash-carrier apparatus, of a change-maker located at the main station and provided with a series of coin-slides operated from a sub-
 130 station through the medium of keys, wires, and bell-cranks, of a device for automatically locking one series of the bell-cranks while the carrier is at the sub-station, substantially as described.

16. In a store-service including a cash-carrier apparatus and a change-maker, the combination, in the change-maker, of a series of money-tubes, a series of coin-slides beneath

said tubes, mechanism for operating the slides to withdraw coin from the tubes, an inclined apron below the slides on which the coins fall, and a detainer for holding the coins on the apron temporarily, with a change-guide having a leaf hinged to its top and resting at its upper edge normally on the apron, a chute connected to the change-guide, and mechanism operated by the carrier to raise the detainer and the leaf to release the money and direct it to the chute and thence to the carrier, substantially as described.

17. In a store-service, a change-maker located at the main station and provided with a series of tubes for containing coins, a series of coin-slides under said tubes, a series of vertical levers, springs for retracting them, and rods connecting the upper ends of said levers and the coin-slides, in combination with a series of keys at a sub-station connected through wires and bell-cranks with the lower ends of said levers, substantially as described, and for the purposes set forth.

18. A store-service comprising a change-maker, a cash-receptacle, and a carrier whose body is divided into two vertical compartments, its bottom, which closes but one compartment at a time, being arranged to automatically move from one compartment to the other as the carrier reaches the change-maker, whereby the contents of one compartment are deposited in the cash-receptacle and the other compartment is put into condition to receive money from the change-maker.

19. In a store-service, a carrier comprising two vertical compartments, a sliding bottom adapted to close only one compartment at a time, a lever-operated detent for holding the bottom under one of the compartments, and a spring for drawing the bottom to the other compartment when the lever withdraws the detent, substantially as described.

20. In a store-service including a change-maker and a cash-carrier apparatus, the combination, with the detainer O and leaf N², of the slide-bar S, having notch 48 and provided with a retracting-spring 47, arm 50, provided with the pin 49, adapted to engage with the notch in the bar, bell-crank 51, one arm of which is pivoted to arm 50, spring 53, connecting the latter with said bell-crank, rod T, pivoted at its lower end to said bell-crank, and mechanism operated by said rod to operate the detainer and leaf, the said slide-bar being operated by the carrier, substantially as described.

21. In a store-service, the combination, with two levers located, respectively, at the main station and a sub-station, pivoted to fixed

supports and connected in any suitable manner, the lever at the main station being provided with a retracting-spring, of a track-wire between the two stations and a lazy-tongs propeller on each end of the track-wire, each of said propellers pivoted to the lever at its station, substantially as described.

22. In a store-service, the combination, with two levers located, respectively, at the main station and a sub-station pivoted to fixed supports and connected in any suitable manner, the lever at the main station being provided with a retracting-spring, of a track-wire between the two stations and two sections of lazy-tongs, through whose central pivot-bolts the track-wire passes, one of said sections being pivoted to the lever at the main station and the other to the lever at the sub-station, substantially as described.

23. In a store-service, a lazy-tongs propeller having bell-crank jaws pivoted to its forward joint, the inward movement of the jaws being limited by stops on the lazy-tongs, in combination with a carrier having a knob to be engaged by the jaws, substantially as described.

24. In a store-service, a lazy-tongs propulsion apparatus having bell-crank jaws pivoted to its forward joint, springs bearing against the inner sides of the inner ends of the jaws, and stops on the lazy-tongs for limiting the inward movement of the jaws, in combination with a carrier having a knob to be engaged by the jaws, substantially as described.

25. In a store-service, the combination, with two levers located, respectively, at the main station and a sub-station, pivoted to fixed supports and connected in any suitable manner, the lever at the main station being provided with a retracting-spring, of a track-wire between the two stations, a lazy-tongs propeller on each end of the track-wire, each lazy-tongs pivoted to the lever located at its station, and a bracket secured to the support at the main station, a latch R', provided with arm r² and pin r³ and adapted to engage with pin r on the lazy-tongs, and a latch R², pivoted to lever C² and adapted to engage with lever R', the lever R² having a notch r⁴ in its under side to ride over a pin r⁵ on the bracket, substantially as described, and for the purposes stated.

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

CHARLES A. McKIEARNAN.

Witnesses:

ALBERT SPEIDEN,
G. W. BALLOCH.