

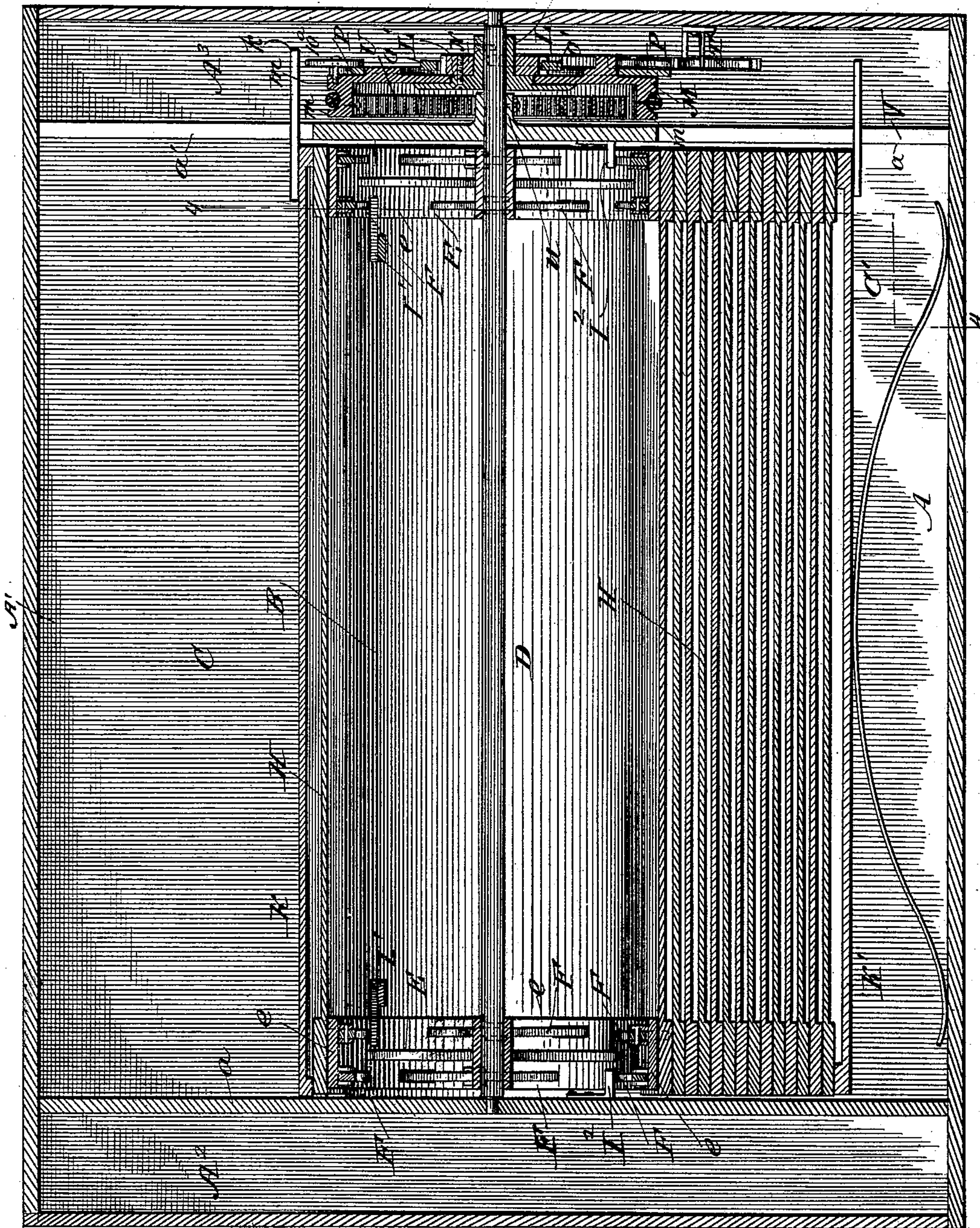
(No Model.)

3 Sheets—Sheet 1.

W. S. MALLARD.
STATION INDICATOR.

No. 471,874.

Patented Mar. 29, 1892.



WITNESSES:

Fred G. Dieterich
W. D. Blondel.

Fig. 1.

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BY *Merrill L.*

ATTORNEYS

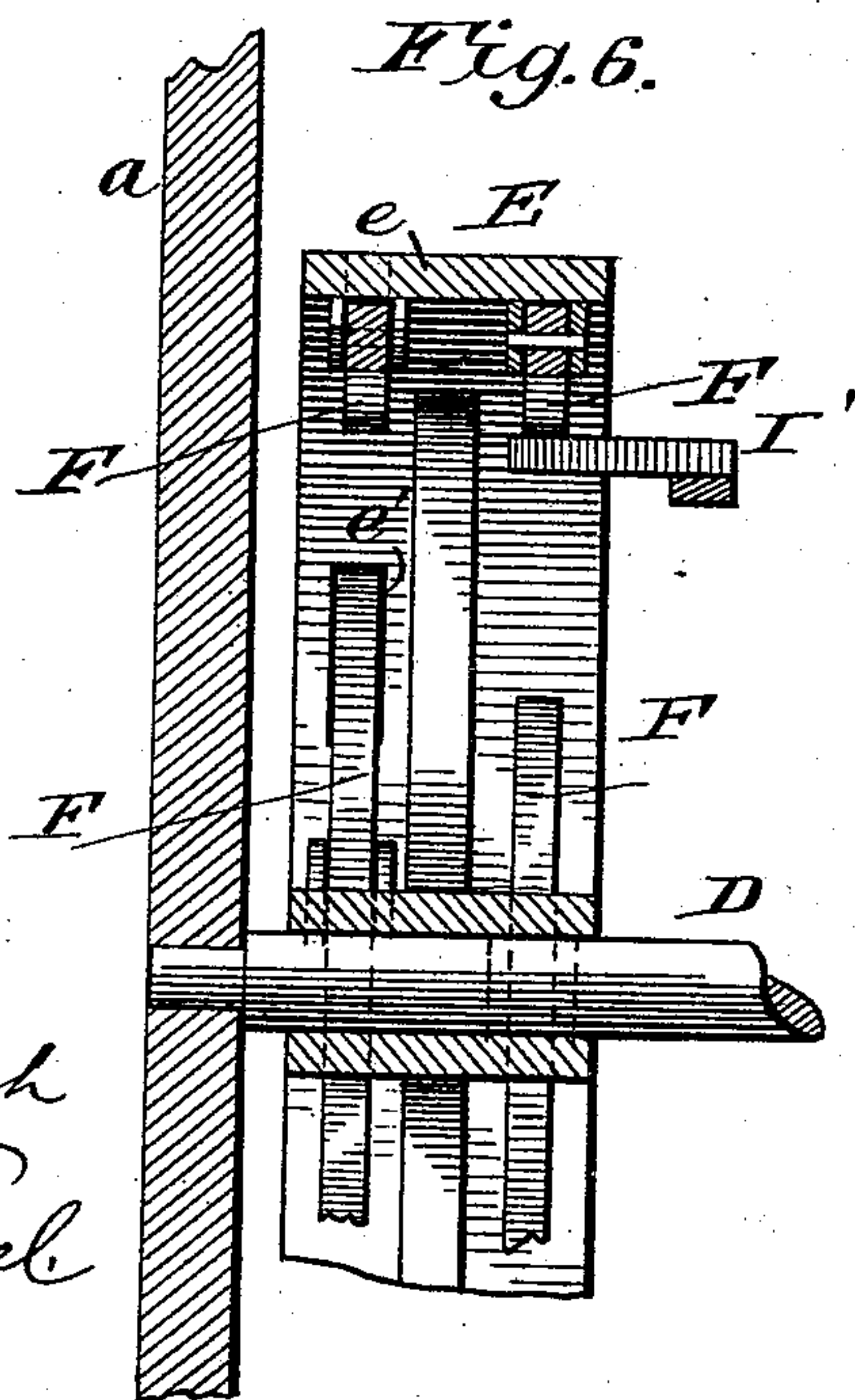
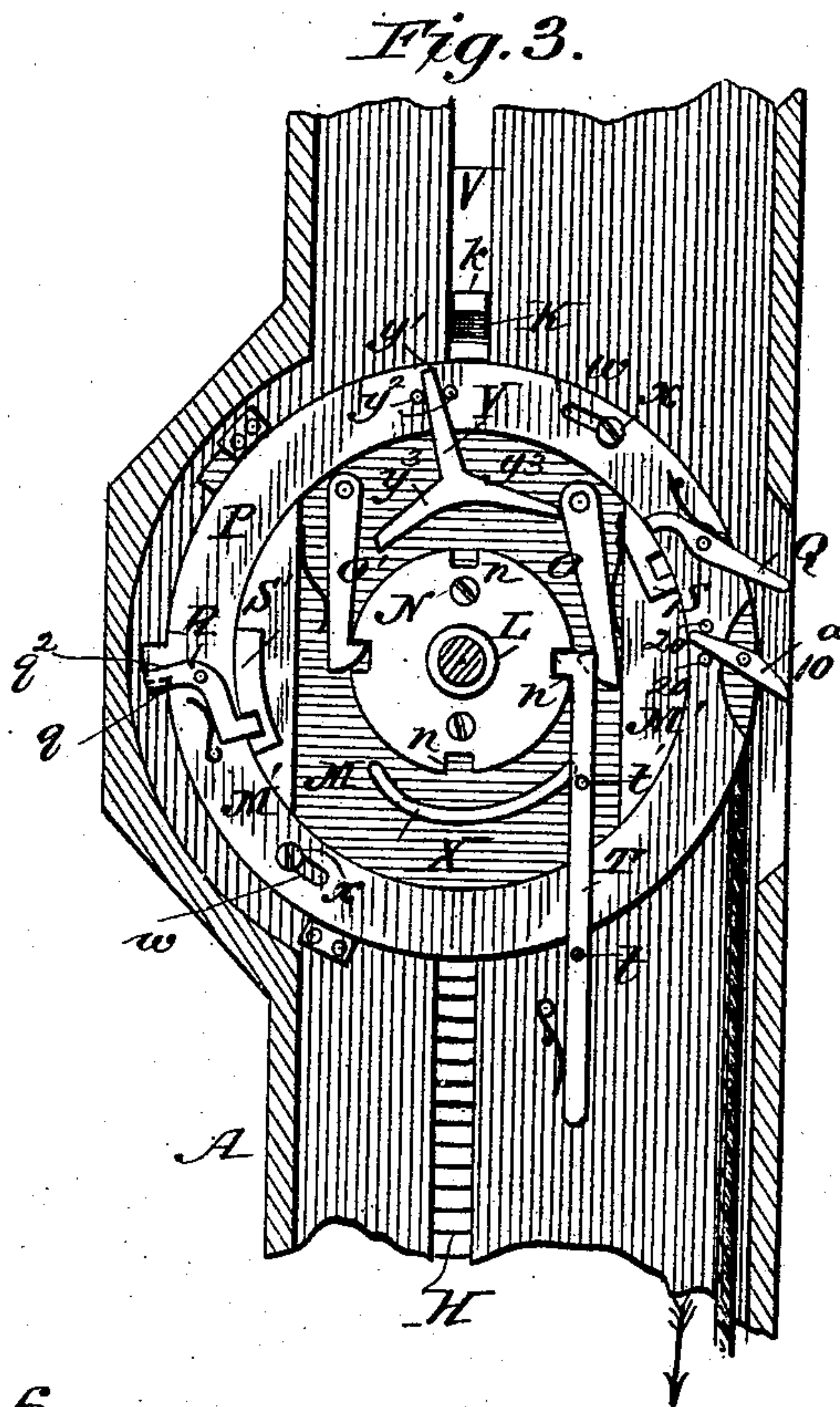
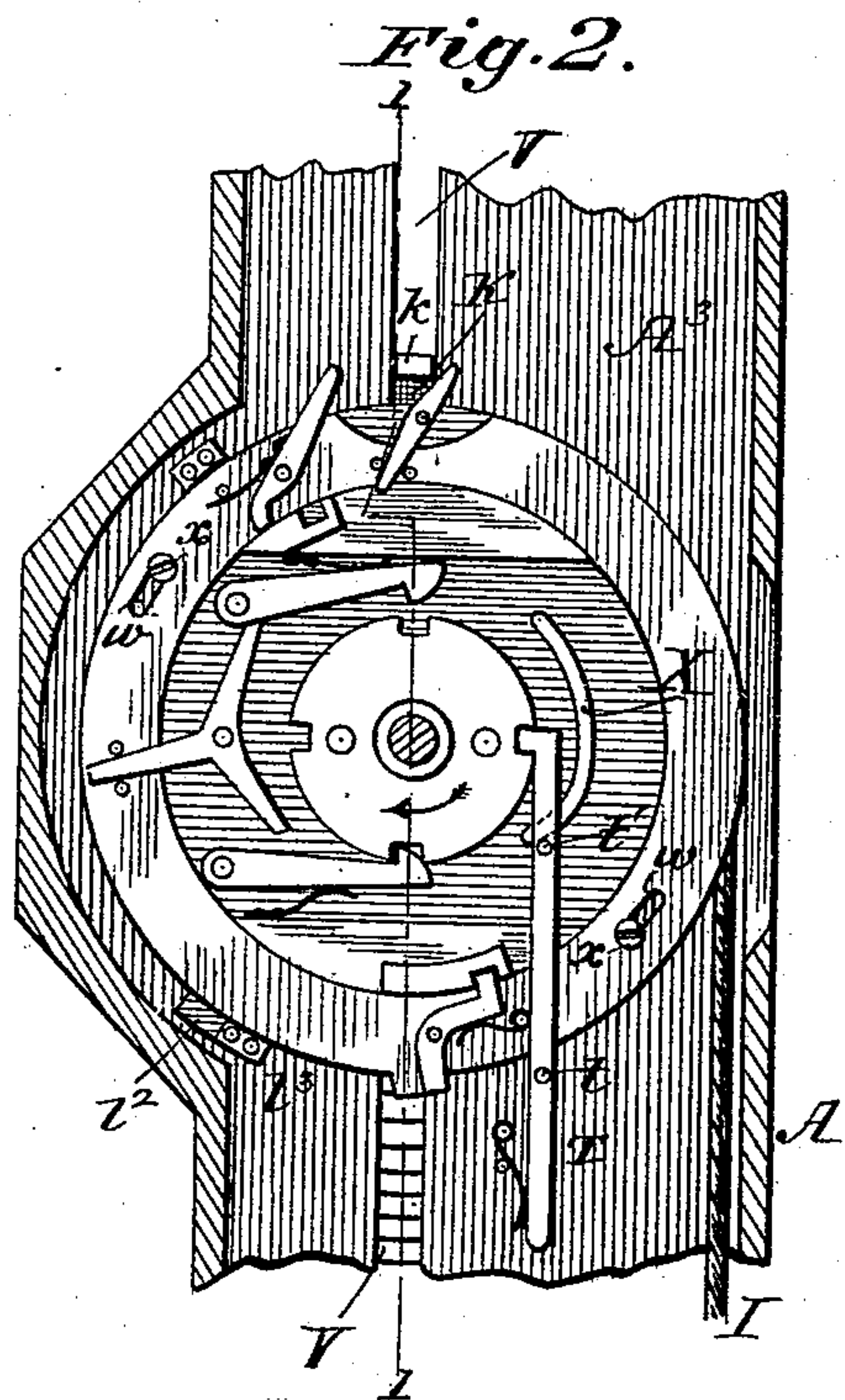
(No Model.)

W. S. MALLARD.
STATION INDICATOR.

3 Sheets—Sheet 2.

No. 471,874.

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3 Sheets—Sheet 3.

W. S. MALLARD.
STATION INDICATOR.

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Fig. 4.

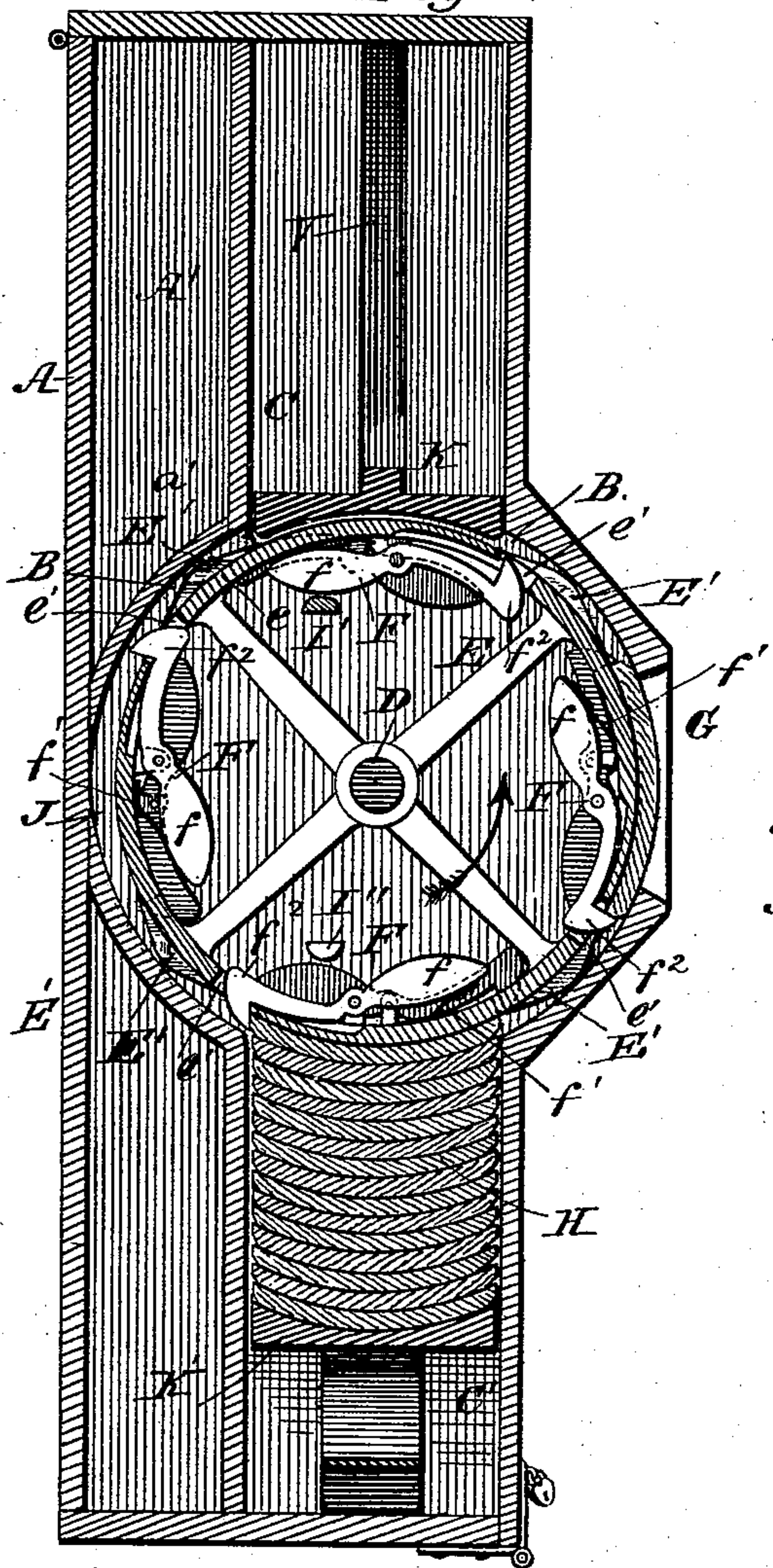


Fig. 5.

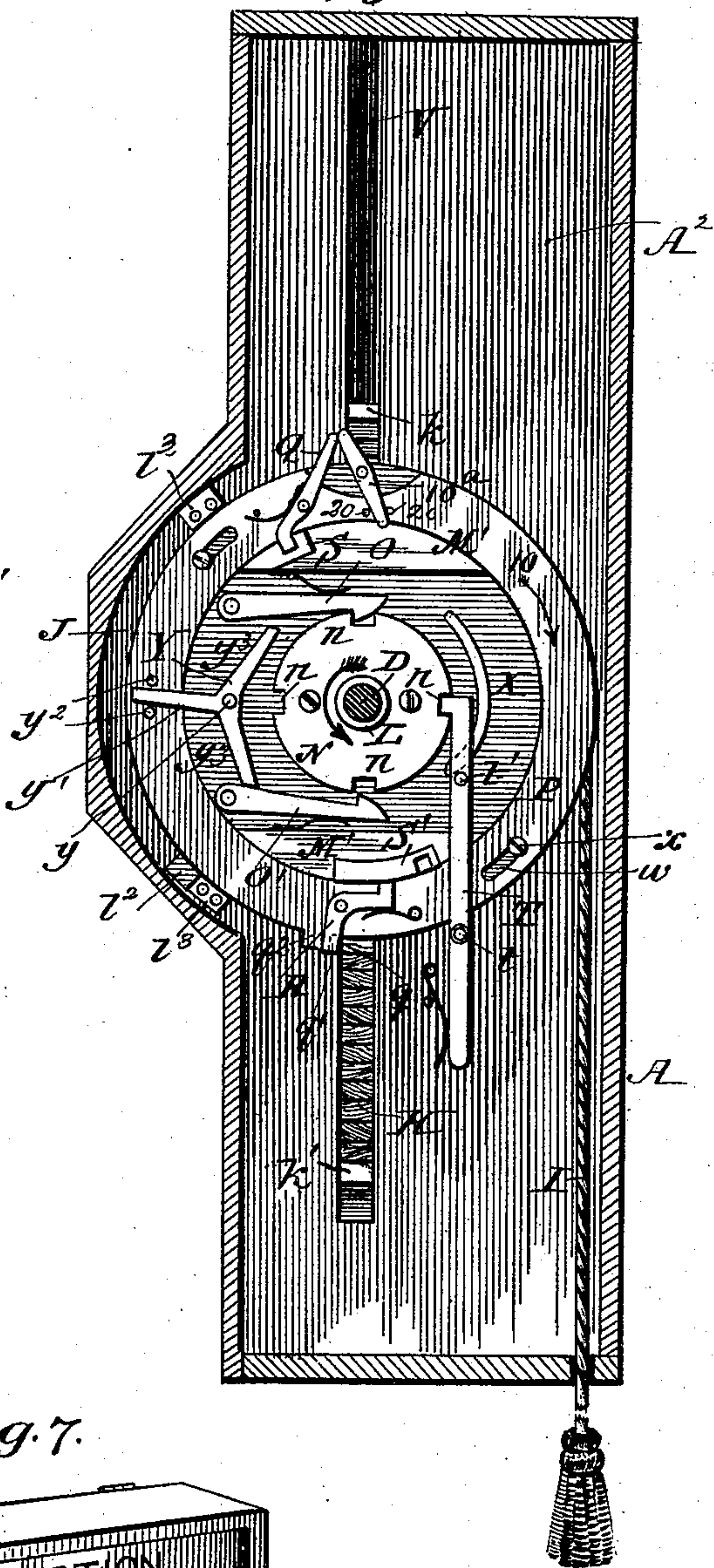
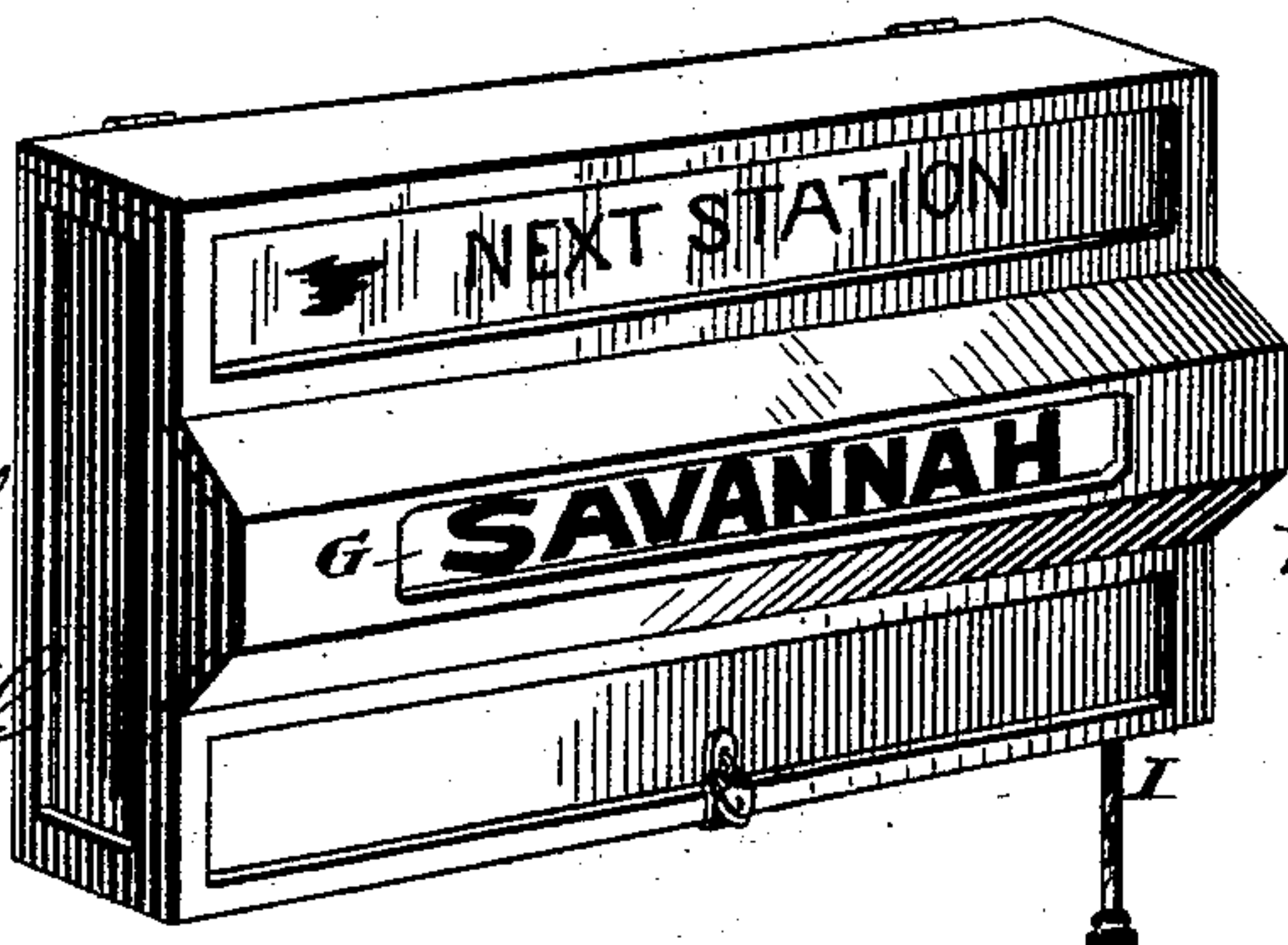


Fig. 7.



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UNITED STATES PATENT OFFICE.

WILLIAM S. MALLARD, OF DARIEN, GEORGIA.

STATION-INDICATOR.

SPECIFICATION forming part of Letters Patent No. 471,874, dated March 29, 1892.

Application filed May 4, 1891. Serial No. 391,578. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. MALLARD, residing at Darien, McIntosh county, in the State of Georgia, have invented certain new and useful Improvements in Station-Indicators, of which the following is a specification.

My invention relates to station-indicators for steam and horse railways, as well as other conveyances; and the purpose thereof is to provide a simple and novel construction and combination of parts whereby the separate sign cards or slides bearing the names of the different stations or points to be called may be successively shifted from one compartment to another of a dual casing and then returned to the compartment from which they were taken in a reverse order of succession.

One of the objects of my invention is to render the mechanism by which this transposition is effected automatic in action, and to provide simple means whereby the passage of the final card in either direction shall automatically reverse the transposing devices and bring them into proper position to return the cards to the compartment from which they were originally taken.

My invention also has for its object to provide means of a simple character for securing the sign-slides, successively, into their respective holding-compartments and to always bring one of such plates to the sight-opening in the casing without undue friction, whereby the proper order of stations is preserved and the indicator adapted to read in both directions of movements of the car.

My invention has, finally, for its object to provide an indicator for the purpose described which can be produced at a much less cost, which is more effective in its use, and easier to manipulate than indicators of this character now in general use.

To these ends my invention consists in the peculiar combination and novel arrangement of the several parts, all of which will hereinafter be fully described in the annexed specification, and particularly pointed out in the claims, reference being had to the accompanying drawings, in which—

Figure 1 is a longitudinal section of my improved indicator, taken on the line 1 1, Fig. 2, all but one of the indicator-slides having been

moved from the upper to the lower compartment. Fig. 2 is an end view of the shifting and moving devices, showing all of the slides as having left the upper compartment and the upper follower down to its lowermost limit. Fig. 3 illustrates the position of the shifting and operating devices when the operating-cord has been pulled down to its limit. Fig. 4 is a vertical transverse section of the indicator, taken on the line 4 4, Fig. 1, looking in the direction indicated by the arrow, the parts being in position to shift from the lower to the upper compartment. Fig. 5 is an end elevation of the shifting devices, showing the same in position for shifting the sign-slides from the upper to the lower compartment, all but one of the upper slides having been moved from the upper to the lower compartment. Fig. 6 is a detail sectional view of a portion of one of the shifting-wheels, and Fig. 7 is a perspective view of the complete indicator.

In the practical construction of my improved station-indicator I provide a casing formed of a vertical rectangular body, centrally of which at one side is the sight or indicator opening, which extends almost entirely across the said side of the casing through which the different slides or plates may be seen.

The general construction of my indicator consists of a longitudinal operating-shaft arranged to be revolved in reverse directions by the operating-cord, which cord always operates in one direction, and above and below such shaft I arrange compartments adapted to receive and hold the several indicator-slides, which in their movement from the upper to the lower, or vice versa, are first fed from such compartments to the sight-opening and then to the respective compartment. Upon such shaft are loosely mounted wheels or disks, which carry certain automatically-operated shifting devices, which serve to engage the outermost plates in the compartment in which they may be stored and carry the same at the first operation to the sight-opening and at the next operation to the opposite compartment, the said shifting devices being so arranged that as the last plate in either of the compartments is about to be

moved to the sight-opening such devices will be automatically shifted, so that at the next operation of the indicator the slides will move in a reverse direction.

5 Referring now more particularly to Figs. 1, 2, and 3 of the drawings, A indicates the casing or frame, preferably of the shape shown, which is divided into a main chamber A' and end chambers A² A³ by means of the vertical
10 partitions *a a'*, the central chamber A' being divided into a central longitudinal chamber B and longitudinal compartments C C', arranged, respectively, above and below the said central chamber B, as shown.

15 D indicates a shaft journaled in the partitions *a a'* centrally of the chamber B, upon which are mounted the indicator-plate-carrying wheels E, fixed to turn with said shaft, said wheels being formed with broad rims *e*,
20 in which are secured the automatically-operated gravity-pawls F, which are arranged to engage the indicator-slides presently referred to and bring them to the sight-opening G in the casing in the manner hereinafter ex-
25 plained. Each of the wheels E is provided with eight of such pawls arranged in two sets, one set of which is arranged to engage the indicator-slides in one direction of movement of such wheels and the other to engage such
30 slides on the reverse movement thereof. By referring to Fig. 4 it will be seen that each of such pawls is pivoted upon the inner face of the rims of the wheels E, one end thereof being weighted, as at *f*, and provided with springs
35 *f'*, which bear against the said rims and serve to normally force the hooked ends *f*² out through slots *e'* in the rims *e* beyond the face of such rims, said hooked ends being beveled, as shown.

40 As before stated, the different sets of pawls are arranged to operate the slides in reverse directions. To this end the said sets are arranged reversely—i. e., the hooked ends of one set being projected in a reverse direction to
45 the opposite set. Thus should the parts be in the position shown in Fig. 4 to operate in the direction indicated by the arrow the outer set will be in position to carry the slides from the lower to the upper compartment. The in-
50 ner set of pawls during this operation will engage the slides H with their beveled ends and ride over such slides, and when the parts are set to carry the slides H from the upper to the lower compartment the outer set of
55 slides will engage with their beveled ends against the slides in the upper compartment and pass over them in the same manner.

In the practical construction of the machine it is operated by a downward pull upon
60 the cord I, which serves to throw the intermediate mechanism between it and the shaft, presently referred to, and give the said shaft and wheels E one-fourth of a revolution in the direction for which the shifting devices
65 have been automatically set. Thus when the pawls operate to move the slides in the direc-

tion shown in Fig. 4 it is essential that to admit of such movement the pawl which moved the slide from the sight-opening to the upper compartment be moved from engagement
70 with the said slide, so that it can pass thereunder when the next succeeding pawl brings the next slide from the sight-opening to the upper compartment. To this end I arrange the
75 lugs I' I², one of which I' projects under the upper end of the rim *e* in the path of the weighted curved end of the outer set of pawls F, while the other I² projects over the lower rim of the wheel in the path of the weighted
80 ends of the inner set of pawls. From Figs. 1 and 4 of the drawings the operation of such construction will be readily understood. The pawl which brings the plate to the respective compartments will, after it has done so, be
85 tilted on its pivot, so that its hooked end will be drawn inside of the rim of the wheel E. It will also be observed that a space J is formed between the rims of the wheels E and the walls of the chamber B, in which the plates
90 are moved, and that the outer one of the slides projects out of its respective compartment, so as to be in the path of the particular pawl which is to move it, and to provide means for forcing such projecting slides H into the com-
95 partments during the operation of moving the last indicator-slide from the sight-opening to the compartments I form the peripheral edge of the wheel E with beveled projections E', which engage the slides or the followers K
100 K' and push them into their respective compartments, so that the next slide can be moved under or over the same.

The several indicator-slides H are each formed of segmental plates, which are curved to fit the rim of the wheels E and extend en-
105 tirely across the chamber B, as shown in Fig. 1, the body portion proper of such slides being reduced in thickness, so as to avoid undue friction between the slides, and upon the outer face of such plates are printed, painted, or otherwise formed the names of the several sta-
110 tions or streets. The slides as they are seated in the lower compartment are normally forced upward by means of the spring-actuated follower K', while the plates in the upper com-
115 partment are normally forced downward by their own weight and that of the follower K.

In order to render the mechanism wholly automatic, as before stated, I provide the means (clearly shown in Figs. 1, 2, and 3) for
120 shifting the shaft-turning devices, consisting of a hub L, fixedly held on the shaft D and formed with a flange L', upon which is loosely mounted the disk M, formed with a rear-
125 wardly-projecting annular flange *m*, the periphery of which is grooved and forms a seat for the operating-cord I, which at one end is made fast to said flange.

Fitted upon the face of the hub L and made fast thereto is a disk N, formed with four ra-
130 dial notches *n*, as shown, with which are arranged to engage the pulling-pawls O', pivoted

upon the outer face of the disk M, such pawls being spring-actuated and normally forced toward the said toothed disk.

P indicates a discus which fits upon the outer face of the disk M and held for a slight free movement thereon and to turn therewith, being held locked thereto by means of spring-actuated locking-pawls Q R, which are arranged to engage locking-lugs S S', which are projected outward from segmental projections M' on the disks M. By reference to Figs. 2 and 5 it will be seen that the said devices are so arranged relatively that when the shaft is to be turned in the direction indicated by the arrow in Fig. 2 the lower pawl O' will be held in engagement with the notched disk N, while the upper pawl will be freed therefrom, and the lower locking-pawl R will be held locked to the lug S'; but when the shaft is to be moved into the position indicated by the arrow, Fig. 5, the upper pawl O will be in engagement with the notched disk N and its locking-pawl Q in engagement with the lug S.

When the slides are to be moved from the lower to the upper compartment, the operator pulls down upon the cord I and turns the disk M one-quarter of a revolution, said movement being limited by means of the lug l^2 engaging the stops l^3 l^3 , and the lower pawl O', being held in engagement with the notched disk N, turns it and carries it to the position shown in Fig. 3, which figure shows the position of the several parts when the cord I has been pulled down to its limit. The notched disk N, being secured to the hub L, which is made fast to the shaft D, serves to turn such shaft one-fourth of a revolution at each operation of the machine, and thereby moves the wheels E and the indicator-shifting slides, as before stated, such shaft at each quarter-turn being held to its adjusted positions by means of the automatically-operated stop-lever T, pivoted at t to the main frame and formed on its inner face with a lug t' , with which engages a cam X on the face of the disk M, such cam being arranged to engage the lug t at the beginning of each operation of the cord I to move the lever T out of engagement with the notched disk N and to admit of its automatically engaging again the next succeeding notch in such disk N when the disk M resumes its normal position, which is accomplished by means of the spring U, secured at one end to a collar u on the main frame and at its other end to the annular flange of the disk M, as shown in Fig. 1. It will be seen by reference to Fig. 2 that the lower end of the pawl R projects beyond the edge of the ring P, its rear surface q being slightly in advance of the rear edge q' of a lug q^2 on the said ring P.

One end of the upper and lower panel compartments is slotted, as at V, through which project arms k k' on the followers K K', such

arms serving when the last plate in each compartment is fed out to automatically trip and set the shifting devices for the purpose before stated. As the plates in the lower compartment are removed therefrom the follower K' rises up, and as the disk M, with its carrier-pawl, is turned to move the last card away from the sight-opening the follower K' will come up and take its place in the lower compartment, the arm k' thereof projecting out through the slot V in the path of the pawl R, which, when the parts return to their normal position, will strike the said arm k' , be tripped and pulled from engagement with the lug S, the lug q' of the ring then engaging such arm k' , and arrests further movement of the ring P, the disk M, however, turning back to its limit, thereby causing the ring P to become shifted on said disk from the position shown in Fig. 2 to that shown in Fig. 5, the movement of the ring on the disk M being limited by the slot w and pin x , the movement of such ring also serving as a means of throwing the lower pawl O' out of engagement with the disk N and the upper pawl into engagement with such disk, such operation being accomplished by means of a rocking lever Y, pivoted at y to the disk M and formed with a long arm y' , which extends over the ring P between lugs y^2 y^2 , and with oppositely-projecting arms y^3 y^3 , which are arranged to alternately engage the upper and lower pawls O O' in a manner clearly understood from the drawings. When the slides are all located in the upper compartment and the parts are in the position shown in Fig. 5, the operator in pulling upon the cord to turn the disk M in the direction indicated by arrow 10 causes the upper pawl to lift out of the upper notch in the disk N and carries it over to the rear notch, into which such pawl will slip, the locking-lever T having been lifted out of engagement with such last-named notch in the manner before stated. Now when the operator releases his hold upon the cord I the spring, bringing the disk M back, pulls the disk N and shaft D in a reverse direction, and thereby moves one of the slides from the upper compartment to the sight-opening. When the last slide in the upper compartment is to be moved therefrom, the pawl Q will pass under the arm k of the upper follower; but as the disk M is returned by the spring U the indicator-plate will be moved out of the compartment, thereby allowing such follower to fall and bring its arm k in the path of the pawl Q, which, engaging such arm k , will be thrown out of engagement with the lug S. At the same time a pivoted arm 10^a on the disk M, which projects over the ring P between a pair of lugs 20 20, will with its upper end engage said end k and cause the ring to be shifted forward, so as to trip the devices and again set them in the position shown in Fig. 2, when the machine will

again be in position for the operation of moving the slides from the lower to the upper compartment.

As a convenience I form the front of the casing into a hinged portion, which is held locked, as shown.

Having in a general way outlined the operation of my invention, a detailed statement of the operation is deemed unnecessary, such operation and advantages being readily understood from the above description and the drawings.

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

1. In a station-indicator, the combination of the casing formed with a central longitudinal chamber formed with a sight-opening, slide-carrying chambers C C', located, respectively, above and below said central chamber, indicator-slides held in said compartments, followers under such slides and normally pressed toward the central chamber, and shifting devices held within the said central chamber, arranged to move the slides successively from the lower to the upper compartment and then from the upper to the lower compartment, said followers formed with tripper-arms arranged, when the last slide is moved from the compartments, to engage the shifting devices and set them for reverse movement, substantially as and for the purpose described.

2. A station-indicator comprising a casing, a central longitudinal chamber formed with a sight-opening in one face thereof, longitudinal compartments arranged one above and the other below said central chamber and opening therein, indicator-slides held in said compartments and normally pressed toward the central chamber, a shaft journaled in the central chamber, arranged to be revolved in reverse directions, the wheels E, carrying shifting-pawls adapted to engage said slides, fixedly secured to said shaft, and an operating-cord extended to the outside of the casing, arranged to partially revolve said shaft when pulled upon, whereby to carry the slides from one compartment to the sight-opening and then to the opposite compartment, substantially as and for the purpose described.

3. The combination of the case A, formed with a circular central chamber B, having a sight-opening, the compartments C C', the indicator-slides and followers held therein, the shaft D, journaled in the central chamber, carrying the wheels E E, provided with a series of pawls F, arranged in sets, one set to operate reversely to the other, each set arranged to engage the slides in the compartments in one direction of movement and pass under them in a reverse direction, and means for partially revolving the shaft at each operation of the machine, whereby to carry one slide from one compartment to the sight-

opening and the preceding indicator-slide to the opposite compartment, substantially as and for the purpose described.

4. The combination, with the casing formed with the longitudinal compartments C C', the central circular chamber B between such compartments and communicating therewith, and the indicator-slides and followers held in such compartments and normally pressed toward the central chamber, of the operating-shaft D, the wheels E, formed with flanges e, secured to the shafts, the shifting-pawls F, arranged, as shown, upon said flanges, the hub L, secured upon said shaft, the disk M, loosely mounted on said hub L, formed with an annular flange, a spring connection between said disk M and the frame of the casing for returning such disk to its normal position, the notched disk N, secured to the hubs L, pawls on the disk M, arranged to engage said disk N, said disk M arranged for a quarter-revolution about said shaft D, and the operating-cord secured to said disk M, all arranged substantially as and for the purpose described.

5. The combination of the casing having a central chamber B, formed with a sight-opening, the slide-compartments C and C', located above and below it, as shown, the indicator-slides held therein, the followers for normally forcing such slides toward the central chambers, said followers formed with projecting arms k k' at one end, the shaft D, journaled in the central chamber, the wheels E, carrying the shifting-pawls F, arranged in sets, each set adapted to work on opposite movements of the shaft D, cam projections on the wheels arranged to depress the slides in the compartment to which it is intended to move them, tripping devices arranged to depress the pawls F as they carry the slide from the sight-opening to such compartment, whereby said pawls will pass under the said slides, and shifting devices mounted upon the outer end of the shaft B, adapted to operate to turn the shaft and be engaged by the arms k', and be thereby set to turn the shaft in the opposite direction, substantially as and for the purpose described.

6. The combination, with the casing formed with a central longitudinal chamber, the compartments C C', the slides held therein, the followers for forcing them toward the operating-shaft, and the shifting devices carried thereby, of the hub L, fixedly secured to the shaft, the loose disk M, mounted thereon and adapted for a partial revolution thereon, the notched disk N, secured to the hub L, the pawls O O' on the disk M, arranged to alternately engage the disk, the ring P, secured upon disk M and adapted for a limited rotation thereon, the pawls Q and R, the lock-stops S S', one of such stops and pawls normally in locked position, the shifting-lever Y, secured to the disk M and adapted to be

swung by the free movement of the ring P to
release the pawls O O', the automatically-
operated stop-pawl T, the shifting-lever 10^a,
pivoted to the disk M and connected with
5 the ring P to move said ring when operated,
the projecting arms *k k'* on the followers,
said arms arranged to alternately engage the
pawls Q and R to set the device for reverse
operation, the arm *k*, also adapted to engage
10 the lever 10^a as it engages pawl R, the oper-

ating-cord I, secured to the disk M and pro-
jected to the outside of the casing, and means
for bringing the disk M back to its normal
position, all arranged substantially as and
for the purpose described.

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Witnesses:

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