

No. 678,950.

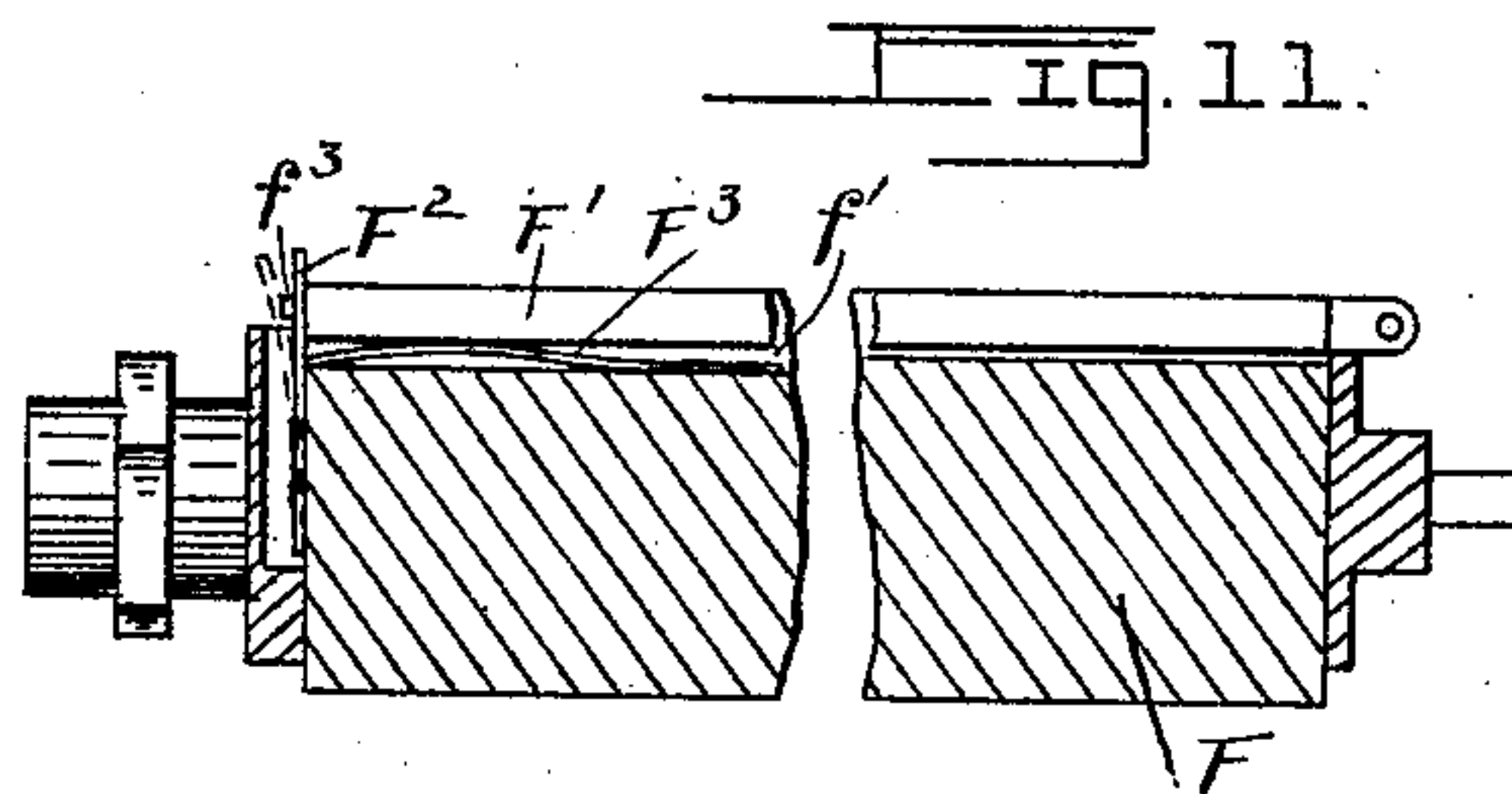
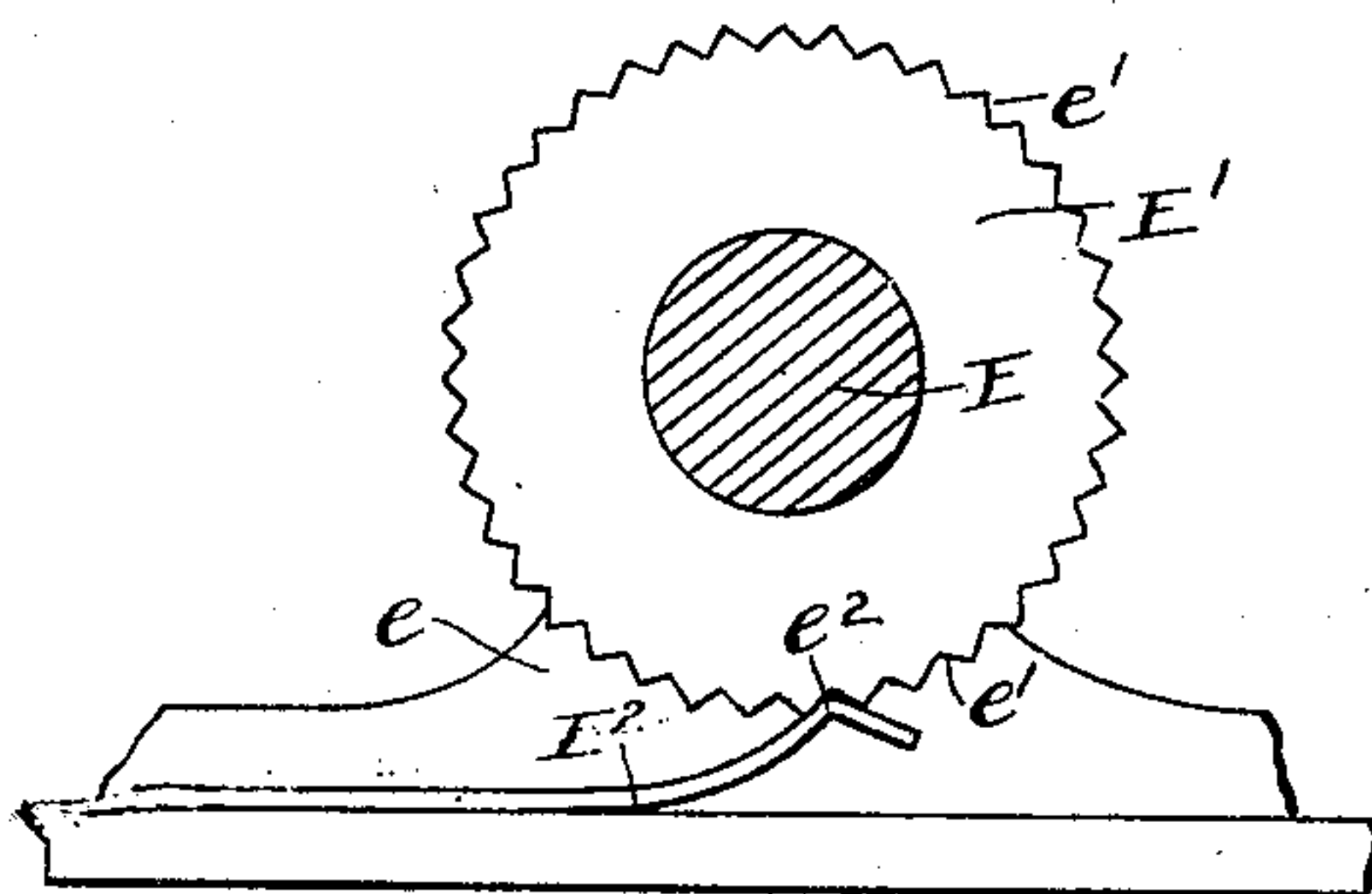
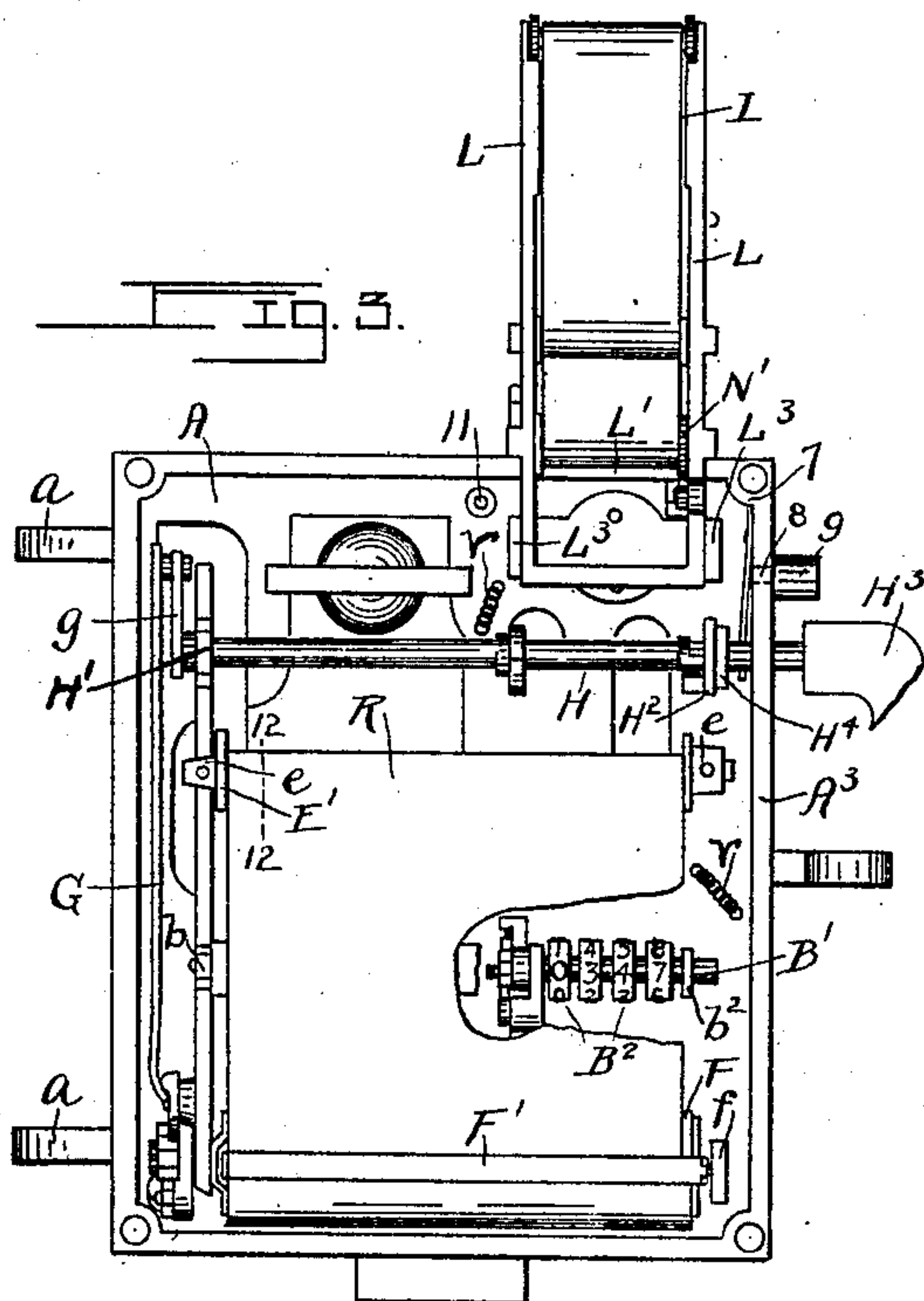
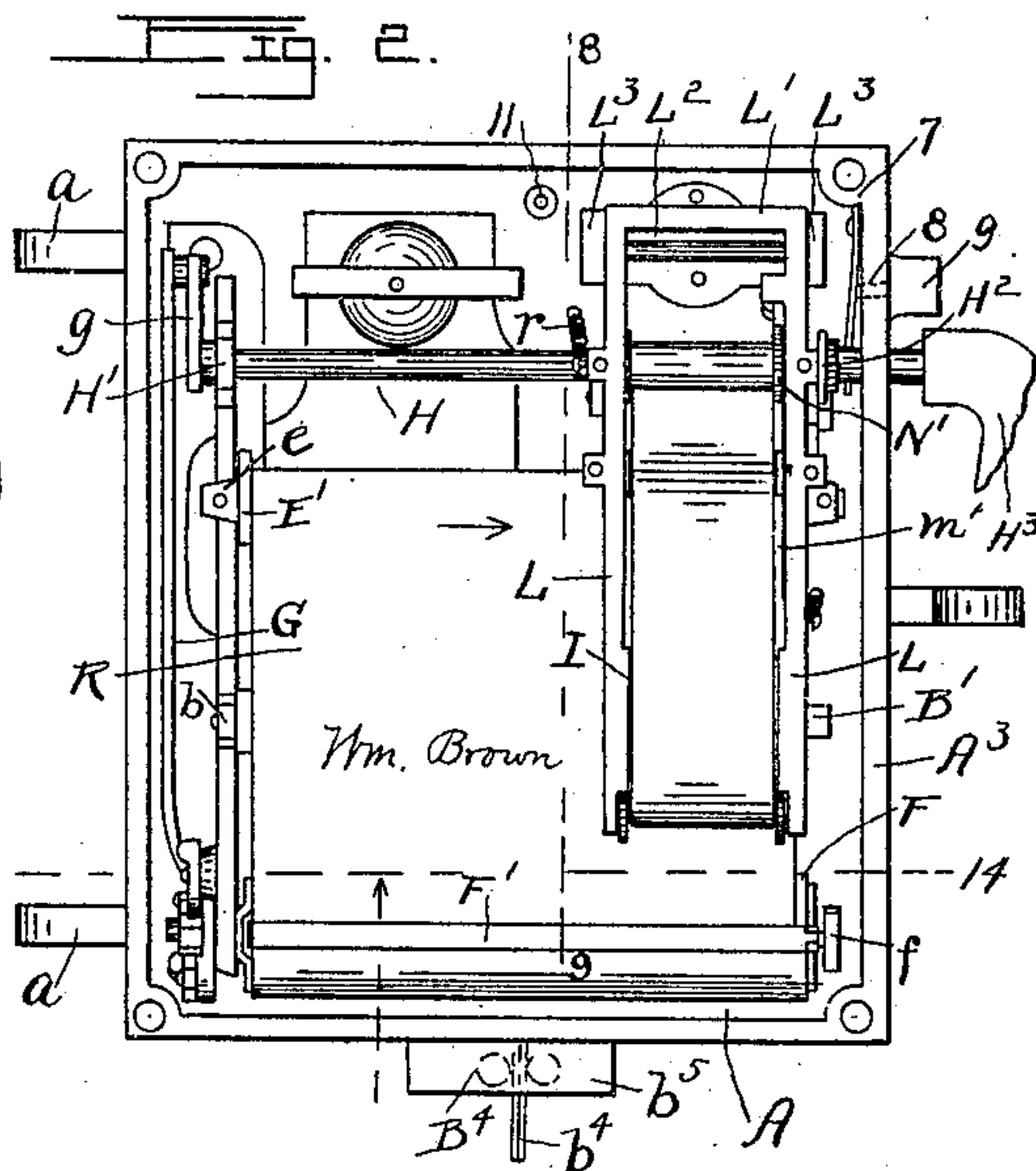
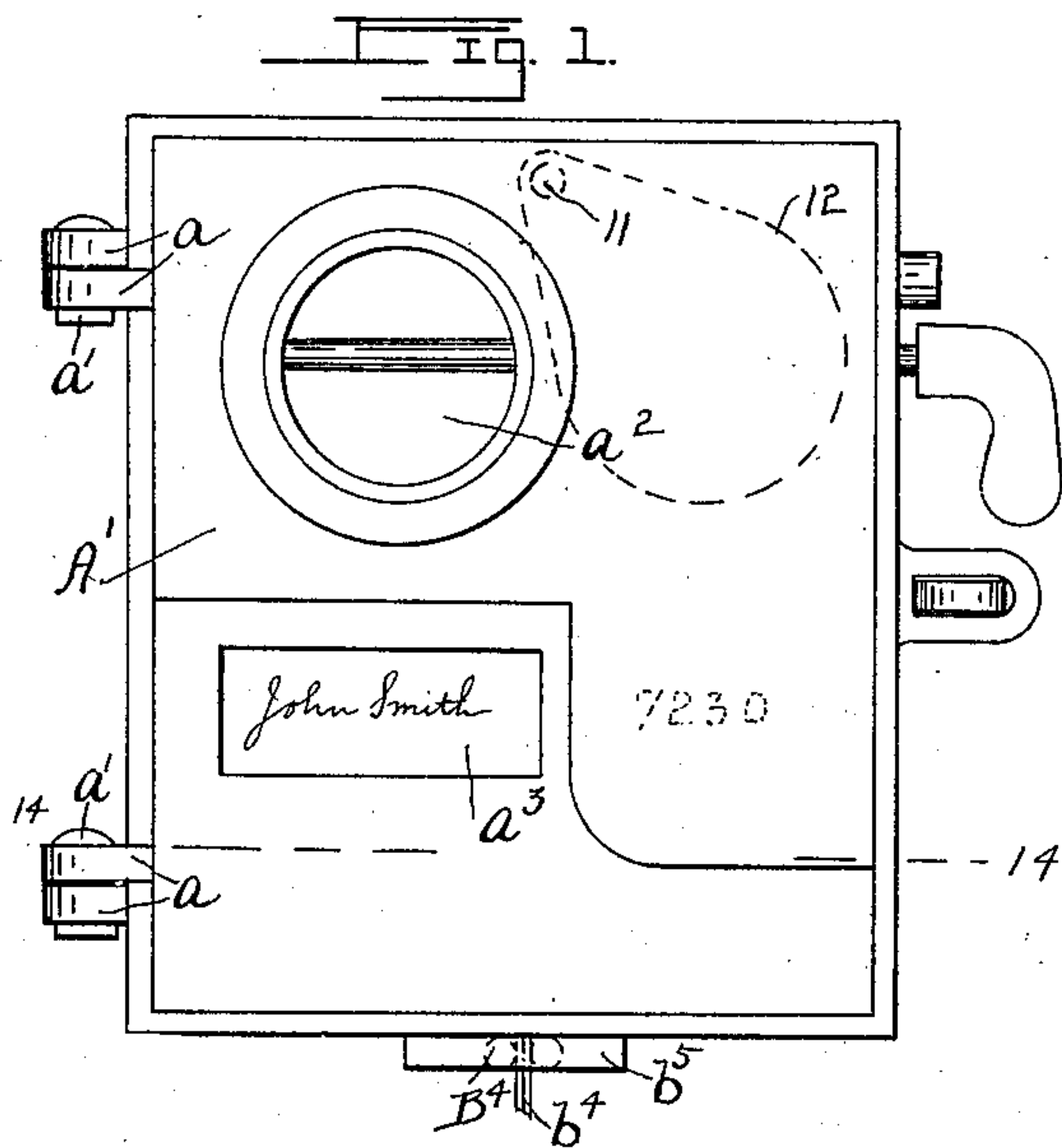
Patented July 23, 1901.

W. J. FORDNEY.
FARE REGISTER AND RECORDER.

(Application filed Mar. 6, 1899.)

(No Model.)

4 Sheets—Sheet 1.



Witnesses:
C. G. Bassler.
W. M. Hall.

Inventor.
Wm. J. Fordney.
By Attorney
Wm. R. Gerhardt.

No. 678,950.

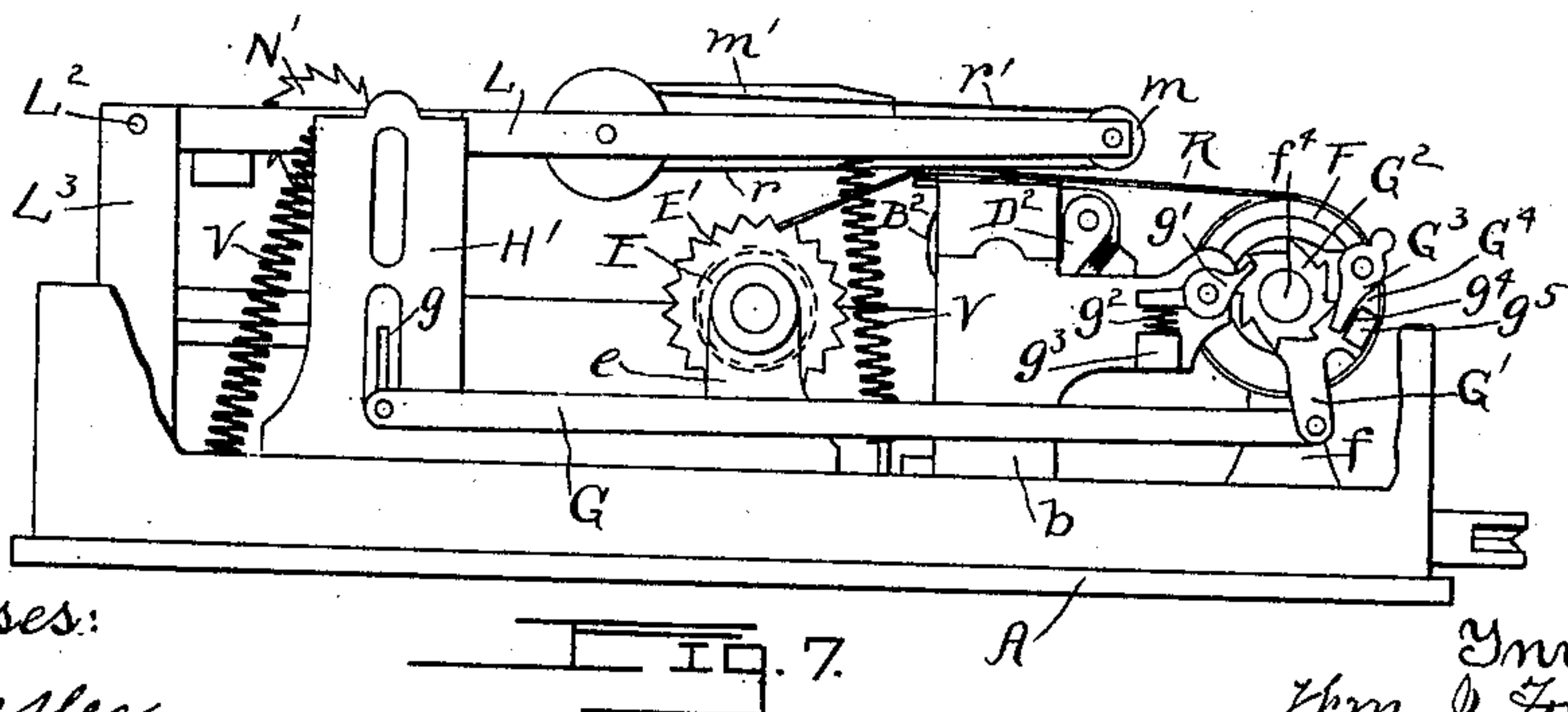
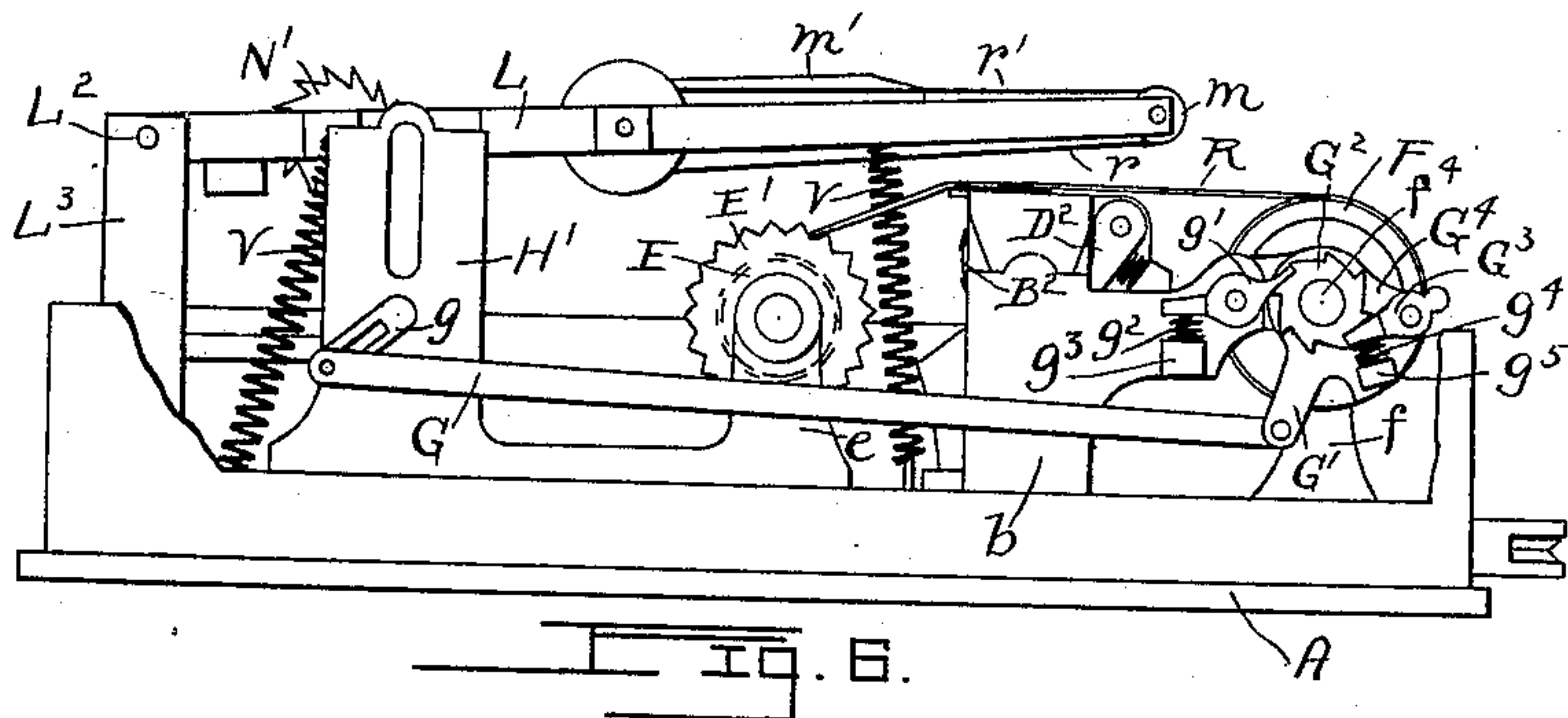
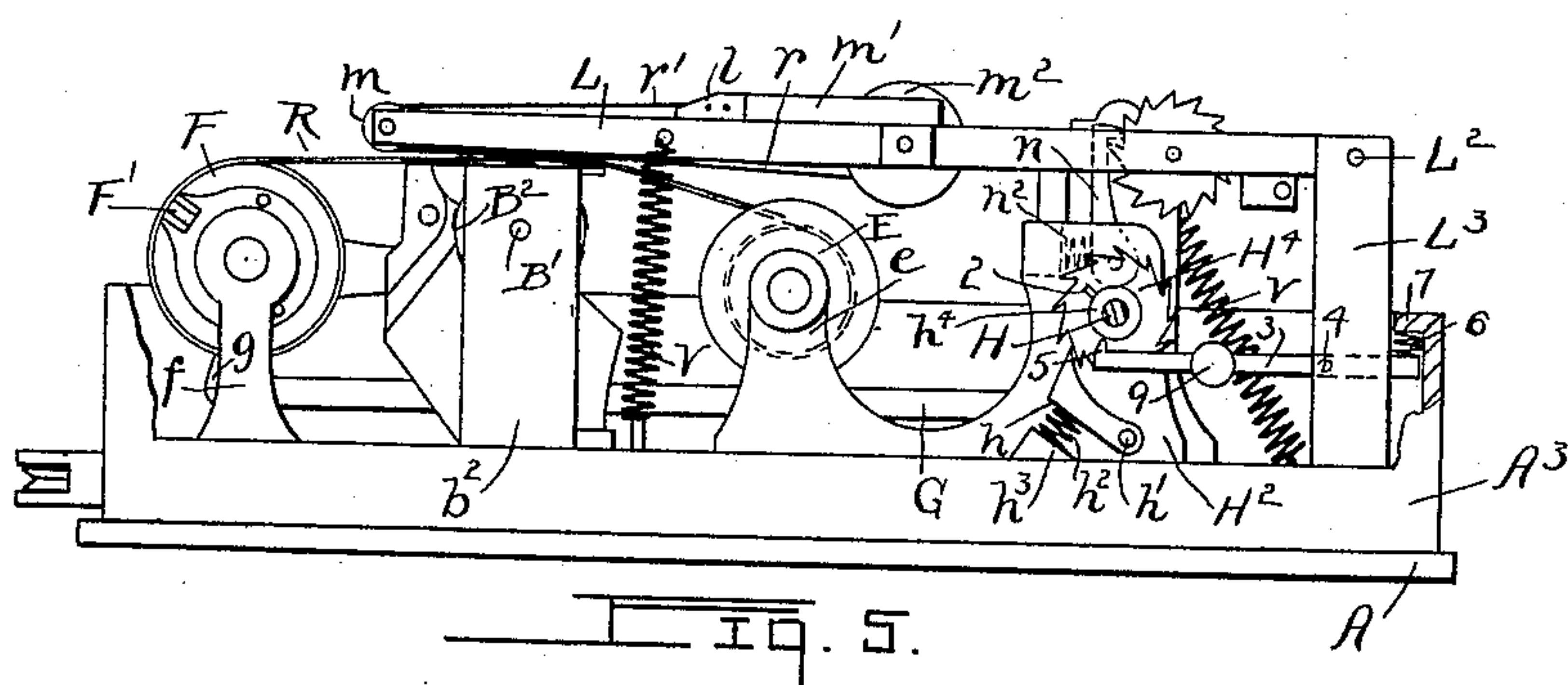
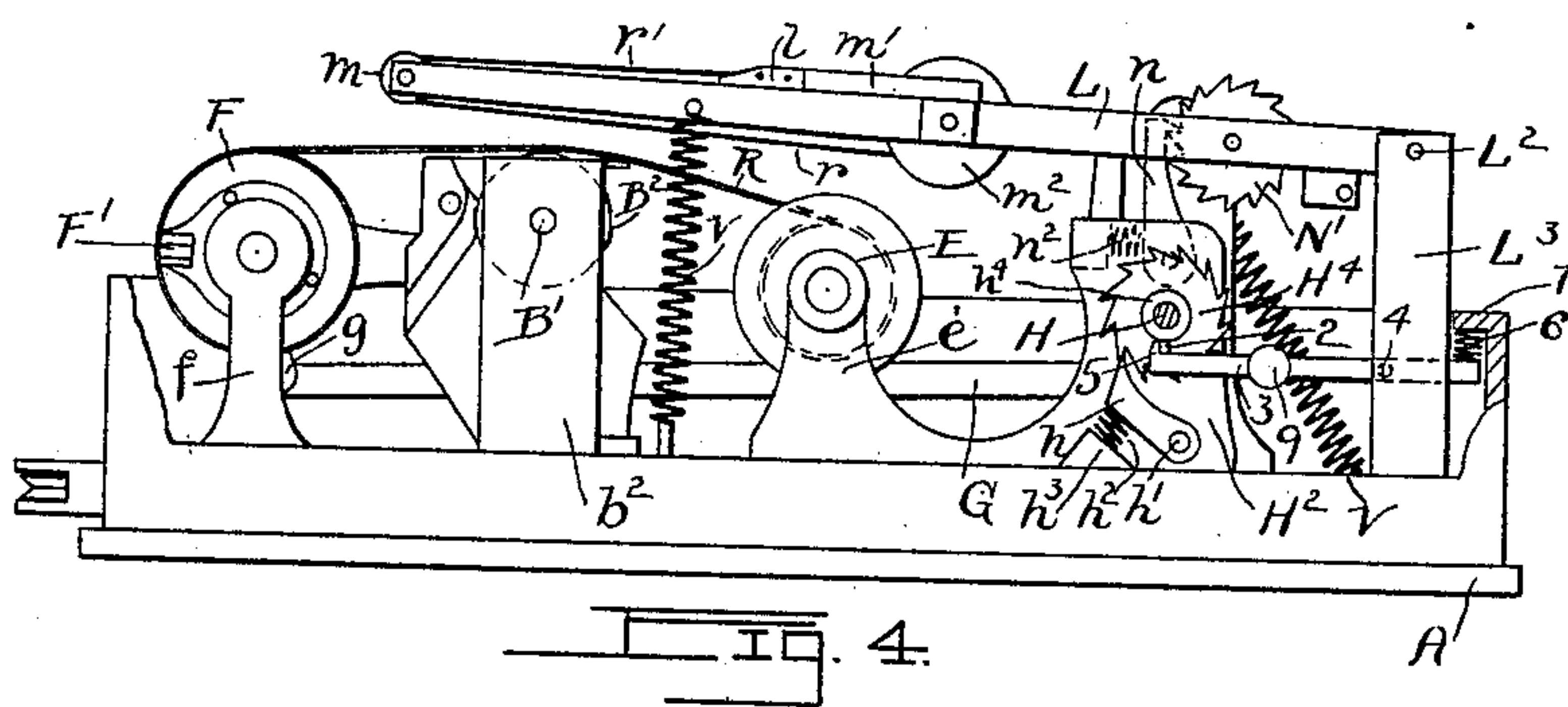
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4 Sheets—Sheet 2.



Witnesses:
C. G. Bassler
H. M. Hall.

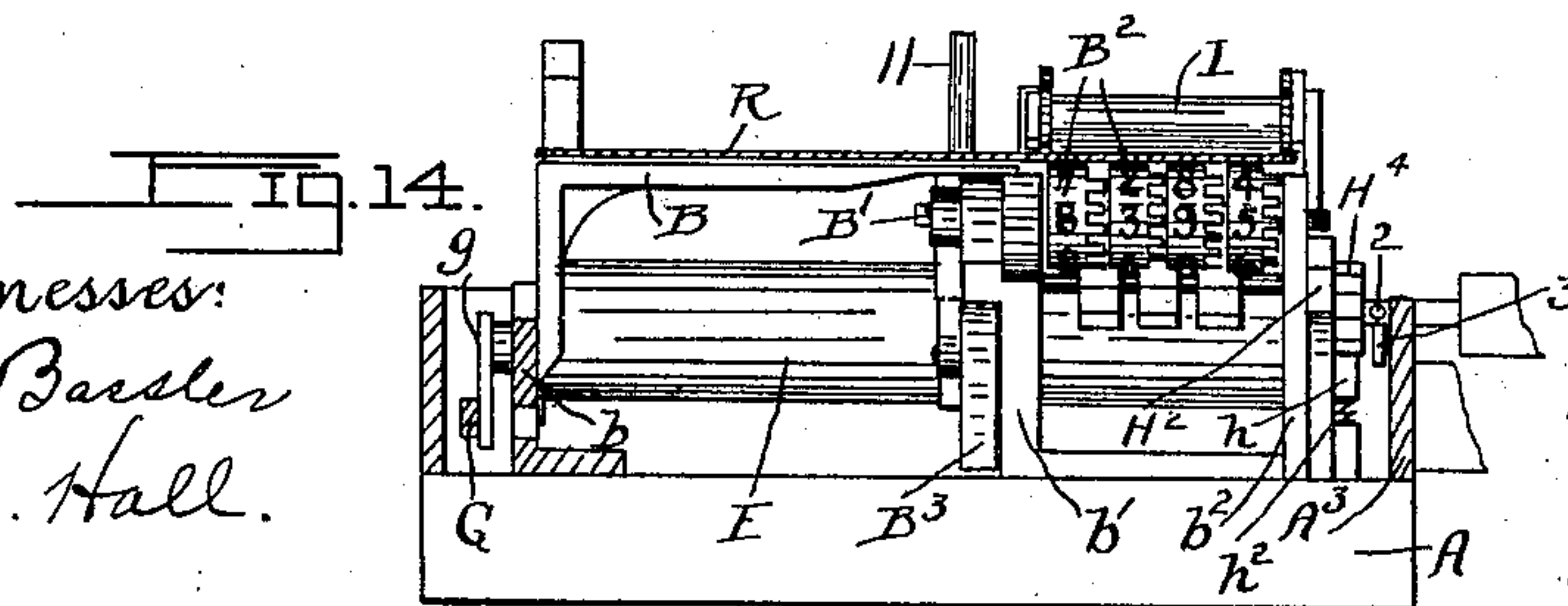
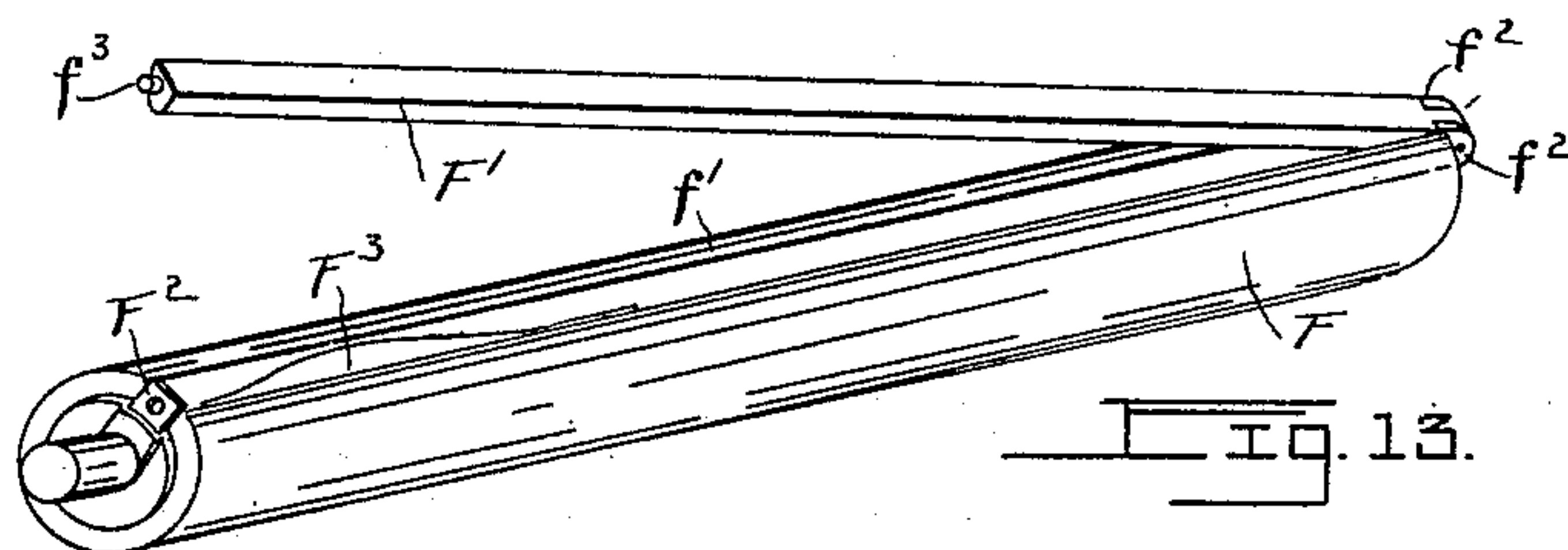
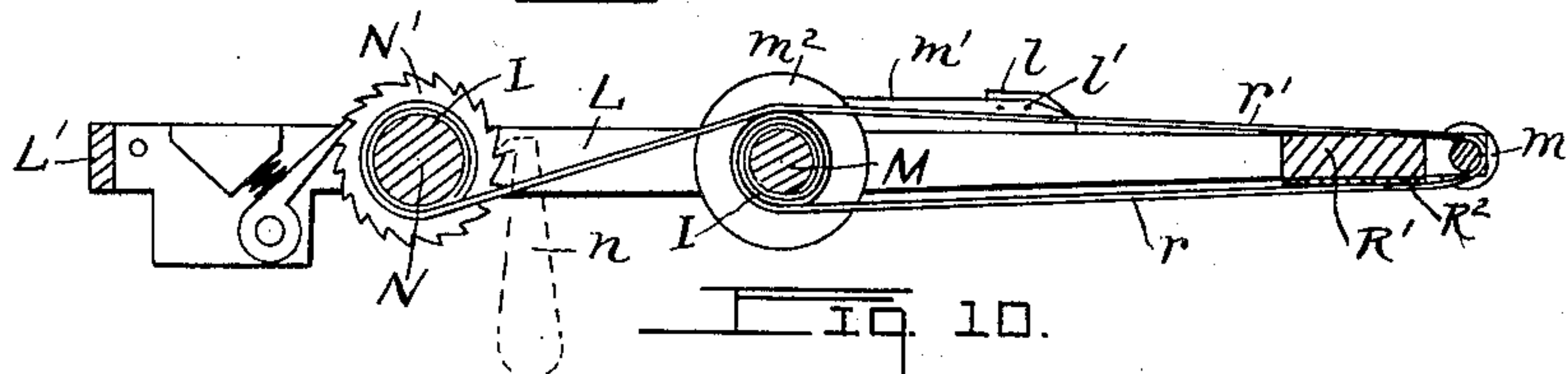
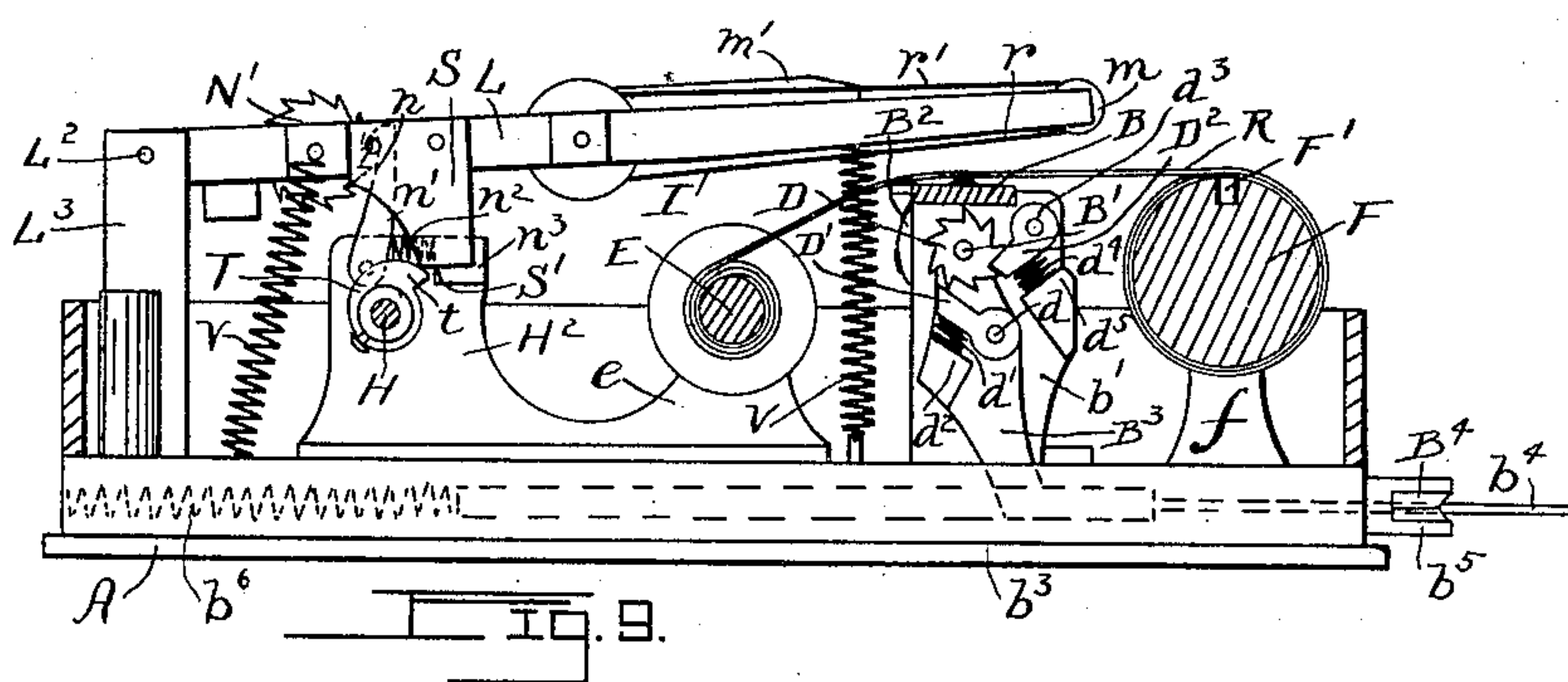
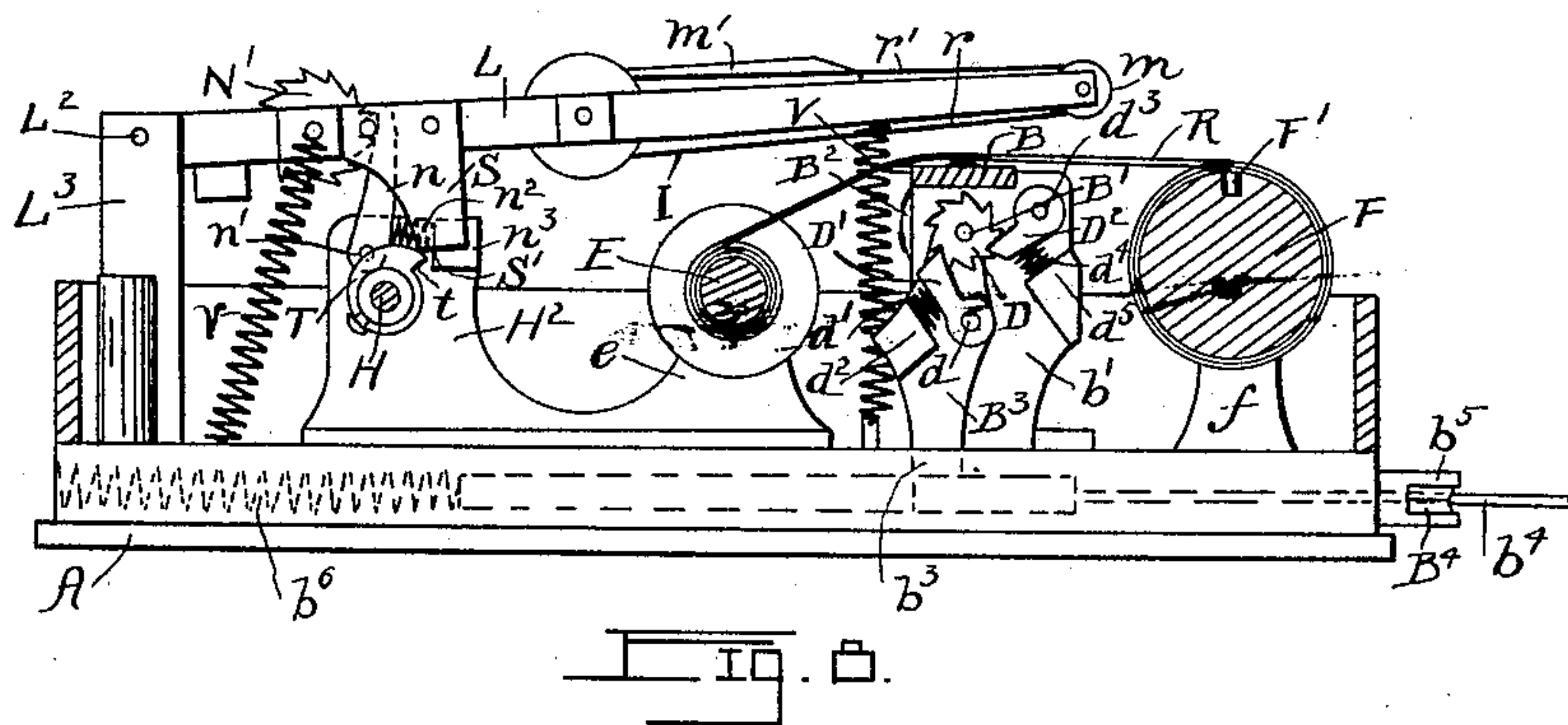
Inventor
Hm. J. Fordney,
By Attorney
Hm. R. Gerhard.

W. J. FORDNEY.
FARE REGISTER AND RECORDER.

(Application filed Mar. 6, 1899.)

(No Model.)

4 Sheets—Sheet 3.



Witnesses:
C. G. Bassler
W. M. Hall.

Inventor
Wm. J. Fordney.
By Attorney
Wm. R. Gerhart.

No. 678,950.

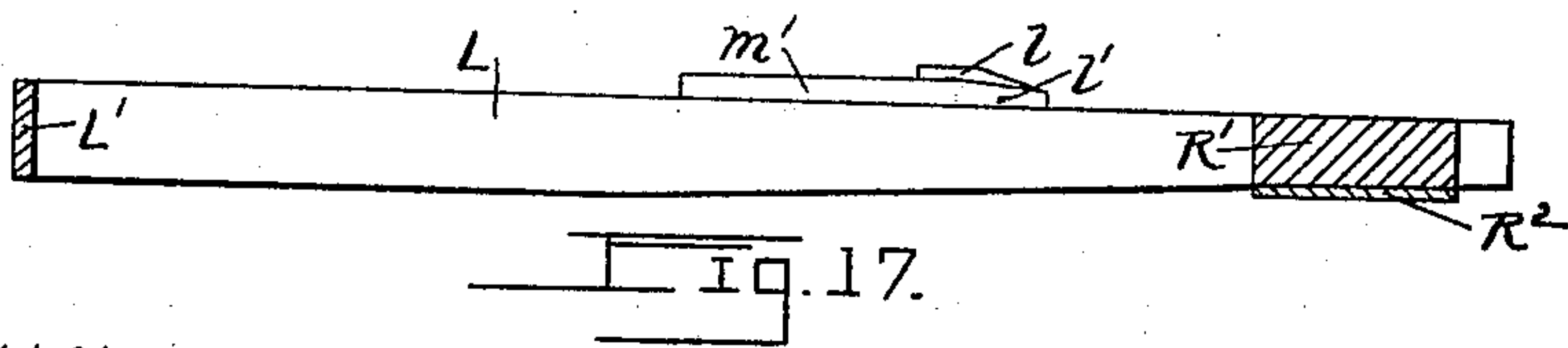
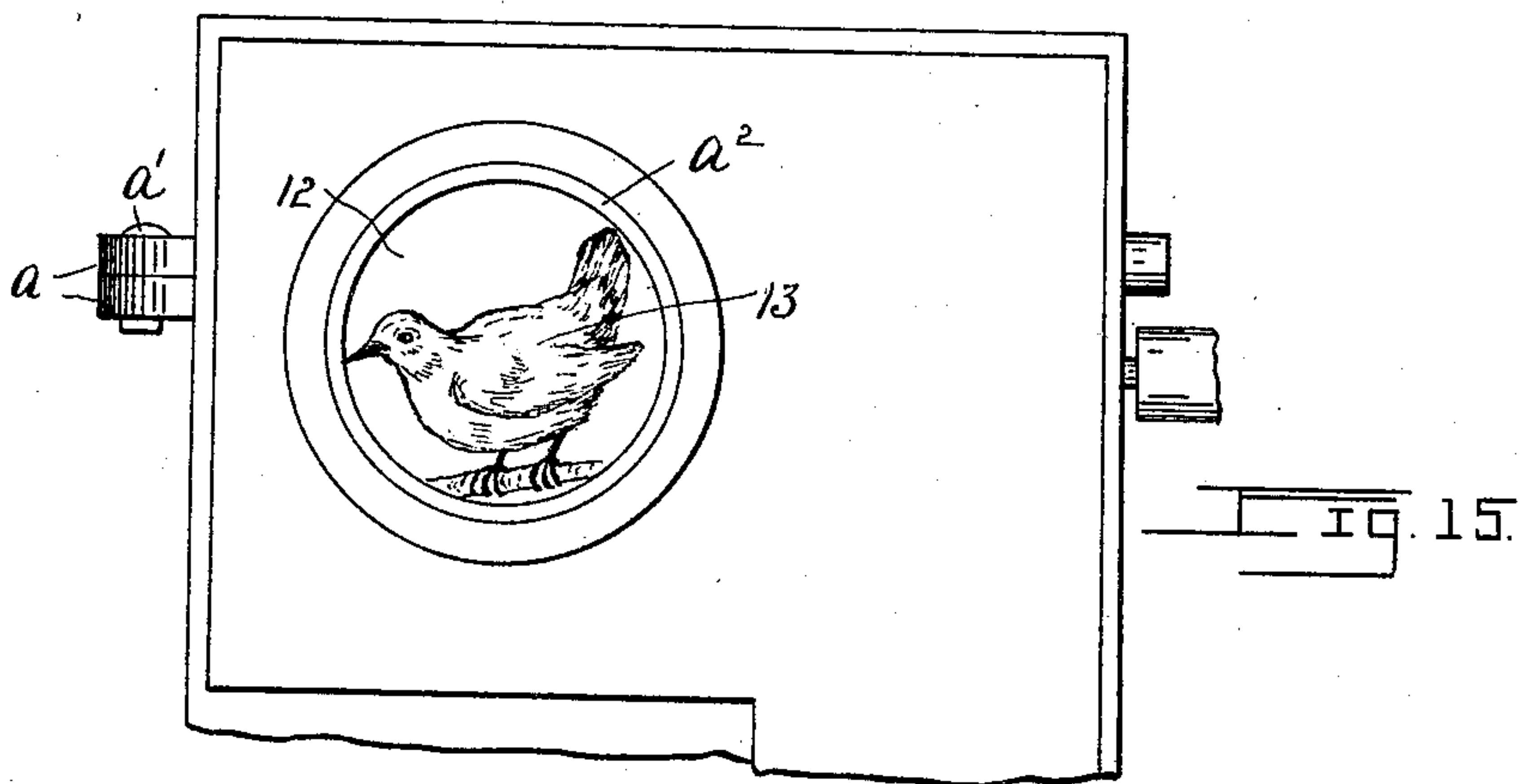
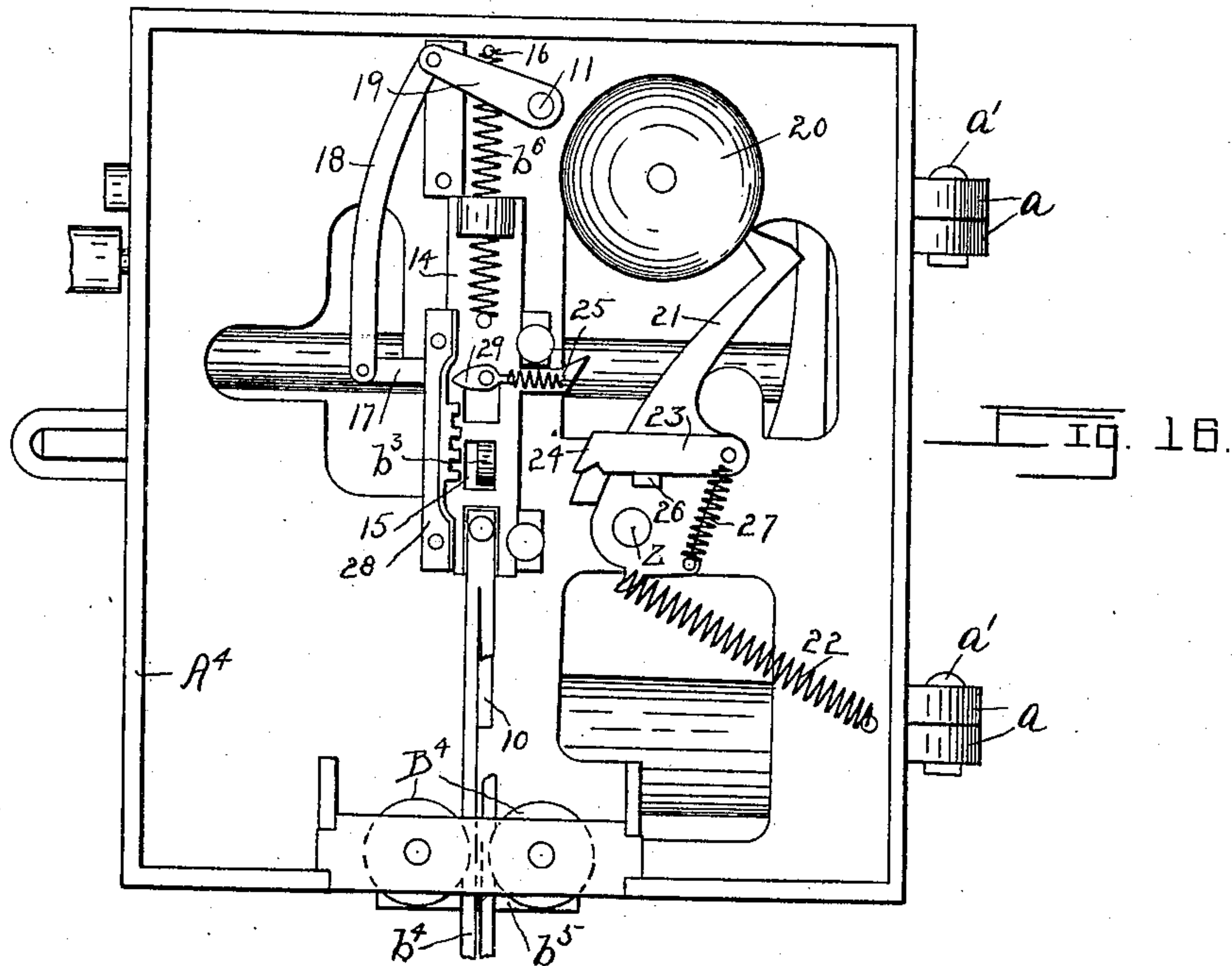
Patented July 23, 1901.

W. J. FORDNEY.
FARE REGISTER AND RECORDER.

(Application filed Mar. 6, 1899.)

(No Model.)

4 Sheets—Sheet 4.



Witnesses:
C. G. Baessler,
W. M. Hall.

Inventor.
Wm. J. Fordney.
By Attorney
Wm. R. Gerhardt.

UNITED STATES PATENT OFFICE.

WILLIAM J. FORDNEY, OF LANCASTER, PENNSYLVANIA.

FARE REGISTER AND RECORDER.

SPECIFICATION forming part of Letters Patent No. 678,950, dated July 23, 1901.

Application filed March 6, 1899. Serial No. 707,839. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. FORDNEY, a citizen of the United States, residing at Lancaster, county of Lancaster, State of Pennsylvania, have invented certain Improvements in Fare Registers and Recorders, of which the following is a specification.

This invention relates to improvements in that class of registers in which a record is made of fares collected by conductors of cars and of other vehicles, and it is an improvement on a device of a similar character for which Letters Patent No. 605,247 were issued to me by the United States on June 7, 1898. In the registers now generally in use for this purpose the fares are registered as they are "rung up" by the conductor; but the numbers so registered are openly displayed on the face of the register, so that a conductor deducting the number displayed when he takes the car from the number displayed when he leaves it knows exactly how many fares are registered against him and how much he must consequently pay in to the company. This affords opportunity for more or less fraud on the part of conductors so disposed, for when a car is crowded or when there is confusion among the passengers it is a very easy matter for the conductor in "ringing up" a number of fares to omit one or more of those he has collected, and he pays into the company just the number the register shows him he has rung up against himself.

The object of my invention is to interpose such obstacles to dishonest practices of this character that it will be practically impossible for a conductor to "pocket" any fares collected.

With this end in view the invention consists in the construction and combination of the various parts, as hereinafter fully described, and then pointed out in the claims.

In the accompanying drawings, which form a part of this specification, Figure 1 is a front elevation of the register and recorder, the cap being closed as when said register and recorder is in use; Fig. 2, a similar view, but with the cap removed, showing the operating mechanism; Fig. 3, a view similar to that shown in Fig. 2, but having the striker thrown up. Fig. 4 is a longitudinal elevation of the right side of the operating mechanism,

a part of the case being cut away to show the same, the striker occupying its normal position; Fig. 5, a similar view showing the striker in the position occupied thereby just as it has struck the record-strip against the registering-disks; Fig. 6, a longitudinal elevation of the left side of the operating mechanism, the striker occupying its normal position; and Fig. 7, a view similar to Fig. 6, but showing the striker in the position occupied thereby just as it has struck the record-strip against the registering-disks. Fig. 8 is a vertical section on broken line 8 9 of Fig. 2, showing the mechanism whereby the striker is actuated, the parts occupying their normal positions; and Fig. 9, a section on the same broken line, but showing the position of the parts when about to rotate the registering-disks. Fig. 10 is a longitudinal section of the striker; Fig. 11, a longitudinal section of the take-up drum; Fig. 12, a section of the discharge-drum on broken line 12 12 of Fig. 3; Fig. 13, a perspective view of the take-up drum, the clamp being shown in a partially-open position; and Fig. 14, a section on broken line 14 14 of Figs. 1 and 2, the detent of lever 3 being disengaged from stud 2. Fig. 15 is a front elevation of the upper portion of the register and recorder with the indicator exposed, and Fig. 16 a rear elevation of the register and recorder. Fig. 17 is a longitudinal section of a modified form of the striker.

Similar letters and numerals indicate like parts throughout the several views.

Referring to the details of the drawings, A indicates the body of the case, to which is attached the operating mechanism, and A' the cap or door, hinged to said body by ears a and hinge-bolts a' , and having therein a glass eye a^2 , wherethrough the indicator is exposed each time a fare is rung up by the conductor, and below said eye is a slot a^3 , permitting said conductor to write his name on the record-strip for the purpose hereinafter described.

b , b' , and b^2 indicate outwardly-projecting horizontal brackets located between the drums carrying the record-strip. Brackets b and b' support a vertically-disposed plate or tablet B, and in brackets b' and b^2 and back of tablet B is journaled a shaft B', whereon

are a series of registering-disks B^2 , connected, as is usual, with like disks in various indicators and registers; but these disks have the numerals thereon raised from the surface, as type, instead of being merely painted on the surface. Shaft B' projects through bracket b' , (see Figs. 8, 9, and 14,) and on said projection is loosely fulcrumed a lever B^3 , through which said shaft is actuated. Lever B^3 extends rearwardly through a slot 10 in the back plate of case A, and the end b^3 of lever B^3 projecting beyond said back plate is connected with the mechanism through which said lever and the indicator are actuated, as will be explained. On the inner end of shaft B' outside of lever B^3 is rigidly secured a ratchet-wheel D, through which said shaft is rotated by the engagement therewith of pallet D' , pivoted to lever B^3 at d , and actuated to engage ratchet-wheel D by coiled spring d' , having one end bearing against the back of the pallet and the other end against a stud d^2 , formed on said lever. Backward movement of ratchet-wheel D is prevented by the engagement therewith of a pawl D^2 , pivoted to bracket b' at d^3 and held in engagement with said ratchet-wheel by a coiled spring d^4 , having one end bearing against the back of said pawl and the other end against a stud d^5 on bracket b' .

Journalled in the back plate of the case and near the top thereof is a horizontal rock-shaft 11, carrying on its outer end an indicator 12, which, as will be explained, is normally held away from eye a^2 , as shown by dotted lines in Fig. 1; but each time the registering-disks are actuated to add one to the number indicated thereby said indicator is exposed through eye a^2 , whereby it may be seen that a fare is being registered. The indicator is designed to attract the attention of the occupants of the car, for which purpose some brilliant figure, as shown at 13, is painted on a ground of strongly-contrasting color, or an advertisement may be placed on the indicator—anything, in fact, that will call attention to its movement.

On the outer face of the back plate of the case (see Fig. 16) and protected by rim A^4 of said case is a vertically-acting draw-bar 14, an opening 15 in which is engaged by end b^3 of lever B^3 , and to the lower end of the draw-bar 14 is attached a hand-pull b^4 , which passes down between antifriction-rollers B^4 , journalled between jaws b^5 , depending from the lower edge of body A of the case. The draw-bar is normally supported in an elevated position, holding the indicator away from eye a^2 , and is retracted by a powerful spring b^6 , connected with the upper end of said bar and with a stud 16 adjacent to the top of the case. On one side of draw-bar 14 is an arm 17, connected by a rod 18 with a crank 19 on the inner end of shaft 11, whereby motion is communicated to the indicator each time the draw-bar is pulled downward and a fare is registered. That

attention may be more certainly called to the registering of a fare, a gong 20 is located as shown, and said gong is sounded through a lever 21, pivoted at z , spring 22, and arm 23, pivoted on lever 21 and having a beveled end 24, adapted to be engaged by a beveled end of an arm 25 on draw-bar 14. Arm 23 is prevented from yielding to the downward movement of the draw-bar by a stud 26 on lever 21; but it yields before the upward pressure of arm 25, as said draw-bar is retracted by spring b^6 being returned to its normal position by a spring 27. To compel draw-bar 14 to be pulled down far enough to fully register each fare, a rack-bar 28 is located by the side of the draw-bar, and on said draw-bar is a spring-actuated pawl 29, adapted to engage said rack and prevent upward movement of the draw-bar until said bar has been pulled down to its fullest extent; but the pawl does not interfere with the upward movement of the draw-bar, as said pawl then rides over the rack. With the downward movement of draw-bar 14, caused by tension on hand-pull b^4 , and the sounding of the gong and the appearance of the indicator at eye a^2 registering-disks B^2 are manipulated through lever B^3 , pallet D' , ratchet-wheel D, and shaft B' to add one to the number of fares previously registered.

Journalled in brackets e , located above brackets b , b' , and b^2 , is a discharge-drum E, whereon is rolled the record-strip R, which is carried down over tablet B and registering-disks B^2 and secured to take-up drum F, journalled in brackets f , drums E and F and the record-strip being of such width as to enable said strip to fully cover tablet B and the registering-disks B^2 . On one end of a spindle of drum E is a wheel E' , having on its periphery teeth e' , and below said wheel E' (see Fig. 12) is a spring E^2 , provided with a shoulder e^2 , adapted to engage the teeth of wheel E' to prevent the record-strip from being unwound therefrom unless drawn down by drum F, as will be described. Drum F, Figs. 11 and 13, has lengthwise therein a groove f' , and in said groove is a clamp-bar F' , having one end pivoted between ears f^2 . On the other end of said clamp-bar is a stud f^3 , adapted to engage an opening in a vibrating spring F^2 , secured on the end of drum F opposite that on which are ears f^2 . To secure the lower end of the record-strip, the movable end of clamp-bar F' is raised, as seen in Fig. 13, and said end of the record-strip is inserted beneath it, when the raised end of said bar is lowered and engaged with spring F^2 . When closed, said clamp-bar is prevented from vibrating by the tension of a flat spring F^3 , secured in the bottom of groove f' . Motion is communicated to drum F through a rod G, connecting a crank g on a shaft H, to be more fully described, with the lower arm G' of a lever loosely fulcrumed on a journal f^4 of drum F, Figs. 6 and 7. On journal f^4 is keyed a ratchet-wheel G^2 , en-

gaged by a pallet G^3 , pivoted to the upper arm G^4 of said lever, said pallet being retained in engagement with ratchet-wheel G^2 by a spring g^4 , which has one end bearing against the back of the pallet and the other end against a shoulder g^5 on said arm G^4 . Retraction of ratchet-wheel G^2 is prevented by a pawl g' , pivoted on the opposite side of said ratchet-wheel from pallet G^3 and actuated to engage the ratchet-wheel by coiled spring g^2 , bearing against the back of said pawl and against a shoulder g^3 on the adjacent bracket b .

The numbers on registering-disks B^2 are printed on record-strip R from an inking-ribbon I , supported by and operated on a striker, comprising bars L and a cross-bar L' , Figs. 2, 8, and 9. The upper end of this striker swings on a hinge-rod L^2 , passing through the upper ends of bars L and engaging openings in brackets L^3 , located adjacent to the top of the case. Inking-ribbon I is first wound around a drum M , journaled in bars L and near the center thereof. Thence it is carried downward, as shown at r , and around an antifriction-roller m , journaled in the free ends of bars L , which extend in front of record-strip R and registering-disks B^2 and somewhat below said registering-disks, and thence said ribbon is carried back over fold r and drum M , as shown at r' , to a drum N , around which it is wound by the actuating mechanism to be described. The fold r passes beneath a plate R' , located between bars L and above antifriction-roller m and opposite the outermost row of figures on registering-disks B^2 , which plate R' has on its inner face a thin pad R^2 , of rubber or other elastic material. To a lip l on the outer bar L is riveted a flat spring m' , as shown at l' , Fig. 10, that extends upward and bears against the outer face of an annular plate m^2 on the outer end of drum M , whereby accidental unwinding of record-strip R from said drum M is prevented, and on the corresponding end of drum N is a ratchet-wheel N' , engaged on the lower edge of its periphery by a pallet n , pivoted, as shown at n' , Figs. 8 and 9, to the bracket H^2 . Said pallet n is forced into engagement with ratchet-wheel N' by a spring n^2 , having one end bearing against the pallet and the other against a shoulder n^3 , formed on the inner face of bracket H^2 .

The striker just described is the form preferred by me; but, if desired, the inking-ribbon and the parts necessary to the operation of the same may be omitted. The striker would then comprise the bars L , cross-bar L' , the plate R' , and the pad R^2 , wherewith an impression of the figures on registering-disks B^2 would be made on record-strip R ; but these impressions would not be colored, or any other form of striker might be adopted.

H indicates a shaft journaled in brackets H^1 H^2 , located somewhat below brackets L^3 , and one end of said shaft extends through the side wall A^3 of the case and has attached

to its extremity a handhold H^3 . Between said wall A^3 of the case and bracket H^2 , Figs. 4 and 5, a ratchet-wheel H^4 is fixed on shaft H , which ratchet-wheel is engaged by a pawl h , pivoted at h' to the adjacent bracket H^2 and held in engagement with said ratchet-wheel by a coiled spring h^2 , having one end bearing against the back of said pawl and the other end against a shoulder h^3 on said bracket. On a boss h^4 of a ratchet-wheel H^4 , between said wheel and the side A^3 of the case, is a stud 2, and behind said boss is located a lever 3, fulcrumed to side A^3 at 4 and having on its lower end an outwardly-extending detent 5, which lies in the path of travel of stud 2, which it is actuated to engage by a spring 6, having one end bearing against a lip 7 of the case and the other against the upper end of said lever. On the outer face of lever 3 and below fulcrum 4 is a stud 8, extending through a horizontal slot in wall A^3 and having on its outer end a knob 9.

S indicates an inwardly-extending arm adjustably attached to the outside of inner bar L of the striker, the inner end S' of which arm engages a cam T , keyed to shaft H . The swell of cam T terminates in a shoulder t , Figs. 8 and 9, and to each of the bars L is attached the end of a coiled spring V , the other ends whereof are secured to the back plate of case A and which serve to hold arm S against cam T and to jerk the outer end of the striker toward registering-disks B^2 .

In operation when the conductor takes a car he writes his name on that portion of record-strip R exposed through slot a^3 , as seen in Fig. 1, which slot is located in line with the outermost row of figures on registering-disks B^2 . After taking a fare he registers the same by a pull on hand-pull b^4 , whereby said fare is added to the number before indicated by registering-disks B^2 . The mechanism being in the position shown in Figs. 4, 6, and 9, when the conductor leaves the car he disengages detent 5 from stud 2 by pressing backward on knob 9, after which he grasps handhold H^3 and makes one complete revolution of shaft H , during which movement he releases knob 9, again throwing detent 5 in the path of travel of stud 2, whereby the movement of shaft H is automatically stopped upon the completion of one revolution. The result of this action of shaft H is to revolve cam T , so that the end of arm S passes over shoulder t , and plate R' , with fold r of inking-ribbon I on its inner face, by the action of springs V is sharply struck against the portion of record-strip R resting against the outermost row of figures on registering-disks B^2 , whereby those numbers are printed on said record-strip R . With the rotation of shaft H drum F is revolved through crank g on said shaft H , connecting-rod G , lever G^1 G^4 , pallet G^3 , and ratchet-wheel G^2 on journal f^4 of said drum F , by which action record-strip R is drawn downward, so as to move the name of said conductor and the figures

opposite the same below the plate or tablet B and registering-disks B². The relation of crank *g* to cam T and of the other parts of the mechanism connecting said crank with drum F are such each to the other that movement is not imparted to said drum until the action of cam T on arm S has pushed the lower end of the striker away from record-strip R. As the action of cam T on said arms S continues and the striker is swung outward to its full extent a small portion of the inking-ribbon is wound around drum N by the engagement of pallet *n* with a tooth of ratchet-wheel N', the hook on the end of said pallet passing to the following tooth on said ratchet-wheel each time the free end of the striker is drawn toward registering-disks B². By this last-described mechanism each time the record-strip is struck against the registering-disks a fresh portion of said ribbon is used. The succeeding conductor pursues the same course, so that opposite the name of each there is registered on the record-strip the number of the last fare rung up by each. The record of the fares collected being concealed, and as it is practically impossible for a conductor to keep an account of the number of fares he collects during the whole time he has charge of the car, it follows that for his own protection he must "turn in" all money collected by him.

The register is kept locked while the car is on the road, and it is only open after it is returned to the barn, and then by a trusted employee of the accounting department, who removes the portion of the record-strip that has been used, and then by deducting from the number recorded opposite each conductor's name the number preceding it on said strip it is seen precisely how many fares each conductor has rung up, and the money each turns in must be equal to or exceed that amount, for a conductor will turn in the full amount of fares he has rung up, as well as the amount of those he forgot to ring up, unless he has been able to keep an accurate account of the latter, which is practically impossible.

I do not limit myself to the details of construction herein shown and described, as it is obvious that many alterations may be made therein without departing from the principle and scope of my invention.

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

1. The combination, in a register, of registering-disks, a striker hinged at one side of the registering-disks and extending over said disks, an inking-ribbon carried over the registering-disks by the striker, a record-strip passing between said disks and the inking-ribbon, a shaft under said striker, a cam on said shaft and terminating in a shoulder, an arm on said striker and engaging the cam, and springs actuating the striker toward said shaft, for the purpose specified.

2. The combination, in a register, of regis-

tering-disks, a striker hinged at one side of the registering-disks and extending over said disks, a delivery-drum M and a take-up drum N journaled in said striker between the hinge thereof and the registering-disks, an inking-ribbon on drum M and extending around the free end of the striker and attached to drum N, a record-strip located between the registering-disks and the inking-ribbon, a shaft under said striker, a cam on the shaft and terminating in a shoulder, an arm on said striker and engaging the cam, springs actuating the striker toward said shaft, a ratchet-wheel on the drum N, and a pallet engaging said ratchet-wheel and adapted to actuate the drum N to take up the inking-ribbon, for the purpose specified.

3. The combination, in a register, of registering-disks, an inking-ribbon, a delivery-drum E on one side of said disks, a take-up drum F on the other side of said disks, a record-strip on drum E and passing between the registering-disks and the inking-ribbon and attached to drum F, a shaft H, connections between shaft H and the inking-ribbon, whereby said ribbon is actuated to strike the record-strip on the registering-disks, an arm on shaft H and adapted to revolve said shaft, and a rod G connecting a crank on shaft H and the arm on drum F, whereby the drum F is actuated to take up the record-strip after the same is struck by the inking-ribbon, for the purpose specified.

4. The combination, in a register, of registering-disks, an inking-ribbon, a delivery-drum E on one side of said disks, a take-up drum F on the other side of said disks, a record-strip on drum E and passing between the registering-disks and the inking-ribbon and attached to drum F, a shaft H, connections between shaft H and the inking-ribbon, whereby said ribbon is actuated to strike the record-strip on the registering-disks, crank *g* on shaft H, lever G' revolvably attached to a spindle of drum F, ratchet G² on the spindle of drum F, a pallet on lever G' and engaging said ratchet-wheel, and a connecting-rod between crank *g* and lever G', for the purpose specified.

5. The combination, in a register, of a closed case, registering-disks, a plate or tablet in line with said disks and located opposite a slot in the case, an inking-ribbon located over the registering-disks, a record-strip passing over said plate or tablet and between the inking-ribbon and the registering-disks, mechanism whereby the inking-ribbon is actuated to strike the record-strip on the registering-disks, mechanism for automatically moving the inking-ribbon on the device carrying the same after said ribbon strikes the record-strip, and mechanism for automatically moving the record-strip over the plate or tablet and the registering-disks after said strip has been struck by the inking-ribbon, for the purpose specified.

6. The combination, in a register, of a case

having a slot and an eye therein, registering-
disks in line with said slot, a plate or tablet
in the case and opposite the slot, a record-
strip extending over said plate or tablet and
5 over the registering-disks, a striker carrying
an inking-ribbon, mechanism whereby said
striker strikes the record-strip against the
registering-disks with the inking-ribbon,
mechanism for changing the relative posi-

tions of the registering-disks, an indicator, 10
and mechanism whereby said indicator is
caused to appear at said eye in the case each
time the relative positions of the registering-
disks are changed, for the purpose specified.

W. J. FORDNEY.

Witnesses:

C. G. BASSLER,

WM. R. GERHART.