

No. 772,483.

PATENTED OCT. 18, 1904.

J. W. WATKINS.
AUTOMATIC CLOSING DEVICE.

APPLICATION FILED FEB. 15, 1904.

NO MODEL.

4 SHEETS—SHEET 1.

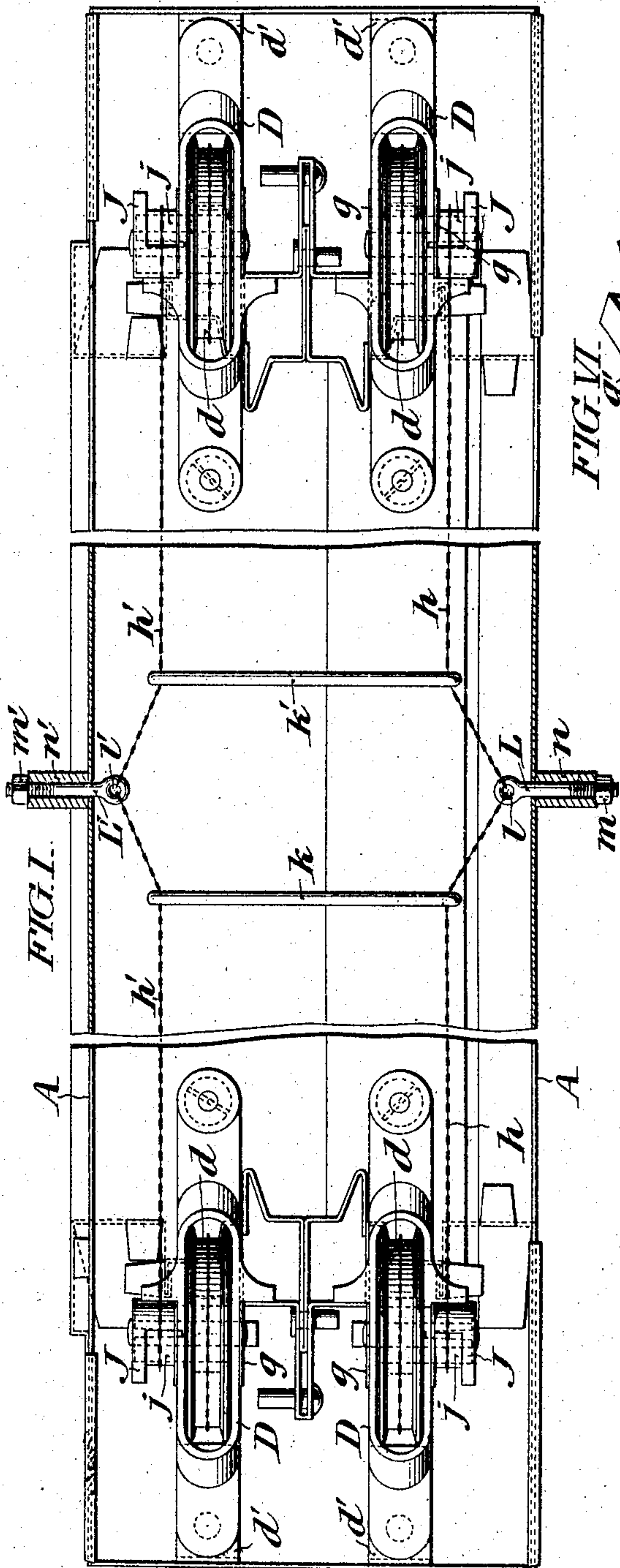
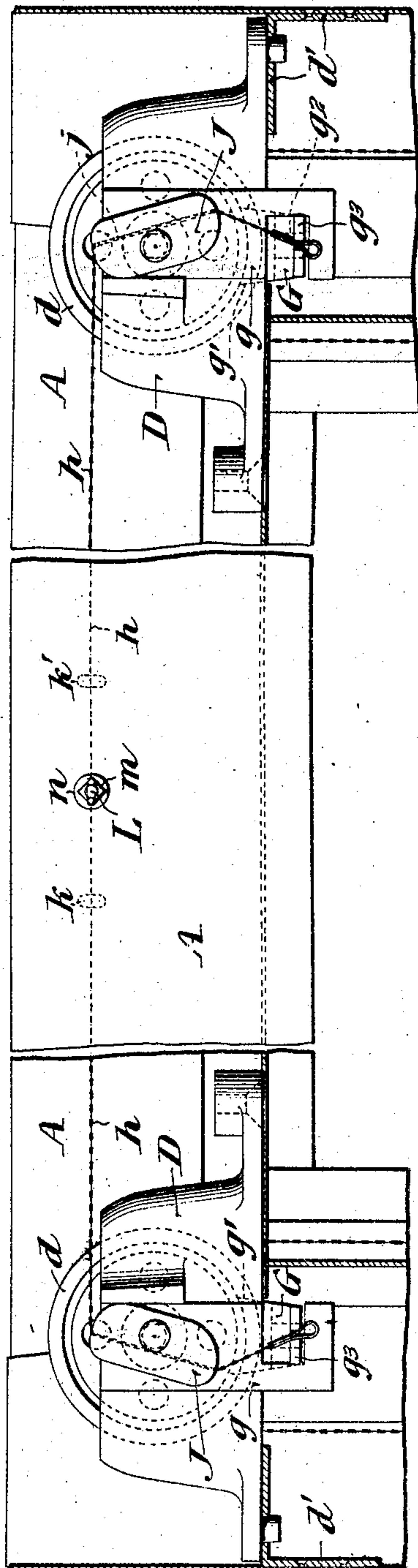


FIG. II.



WITNESSES:

Clifton C. Hallowell
John C. Berger

INVENTOR:

JOHN W. WATKINS,
by his attorneys
Raige Paul & Tracy

No. 772,483.

PATENTED OCT. 18, 1904.

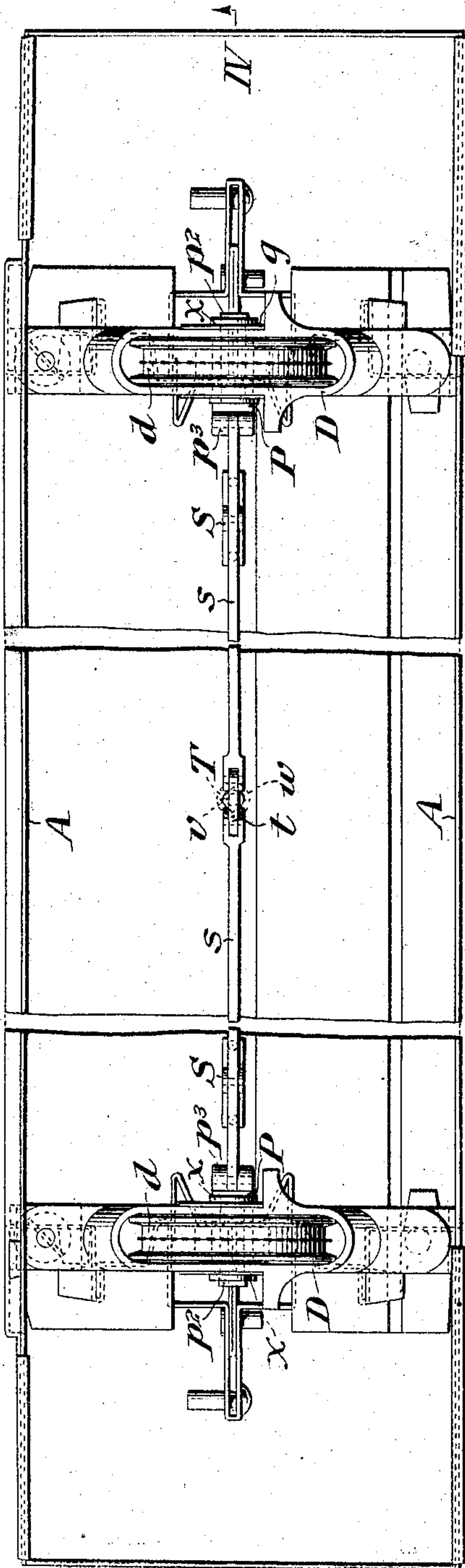
J. W. WATKINS.
AUTOMATIC CLOSING DEVICE.

APPLICATION FILED FEB. 15, 1904.

NO MODEL.

4 SHEETS—SHEET 2.

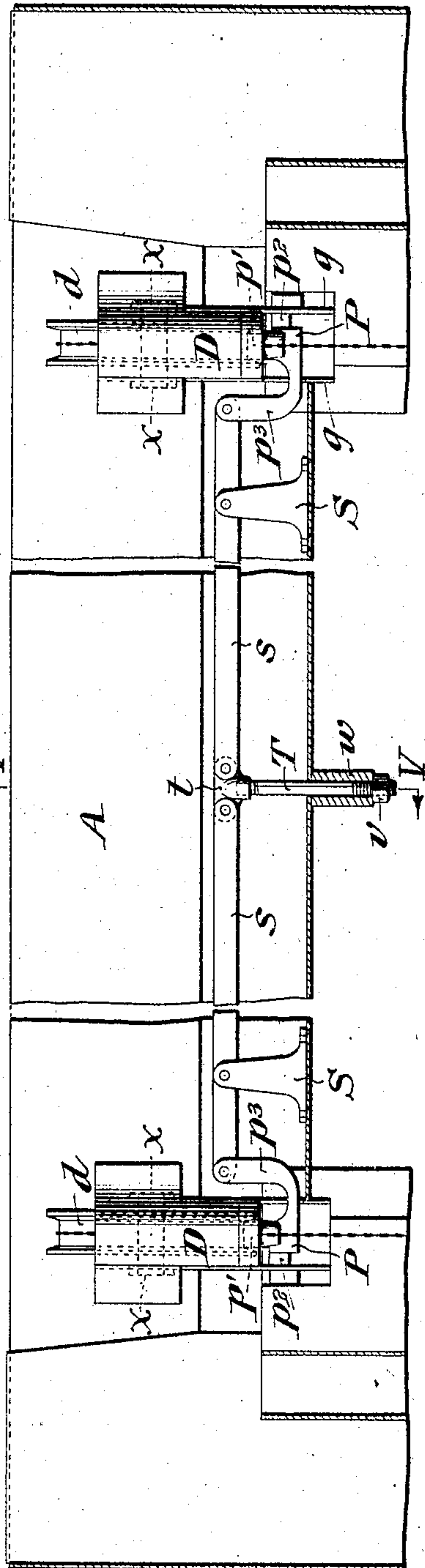
FIG. III.



WITNESSES:

Clifton C. Hallowell
John C. Berger.

FIG. IV.



INVENTOR:

JOHN W. WATKINS,
by his attorneys
Rice, Paul & Tracy

No. 772,483.

PATENTED OCT. 18, 1904.

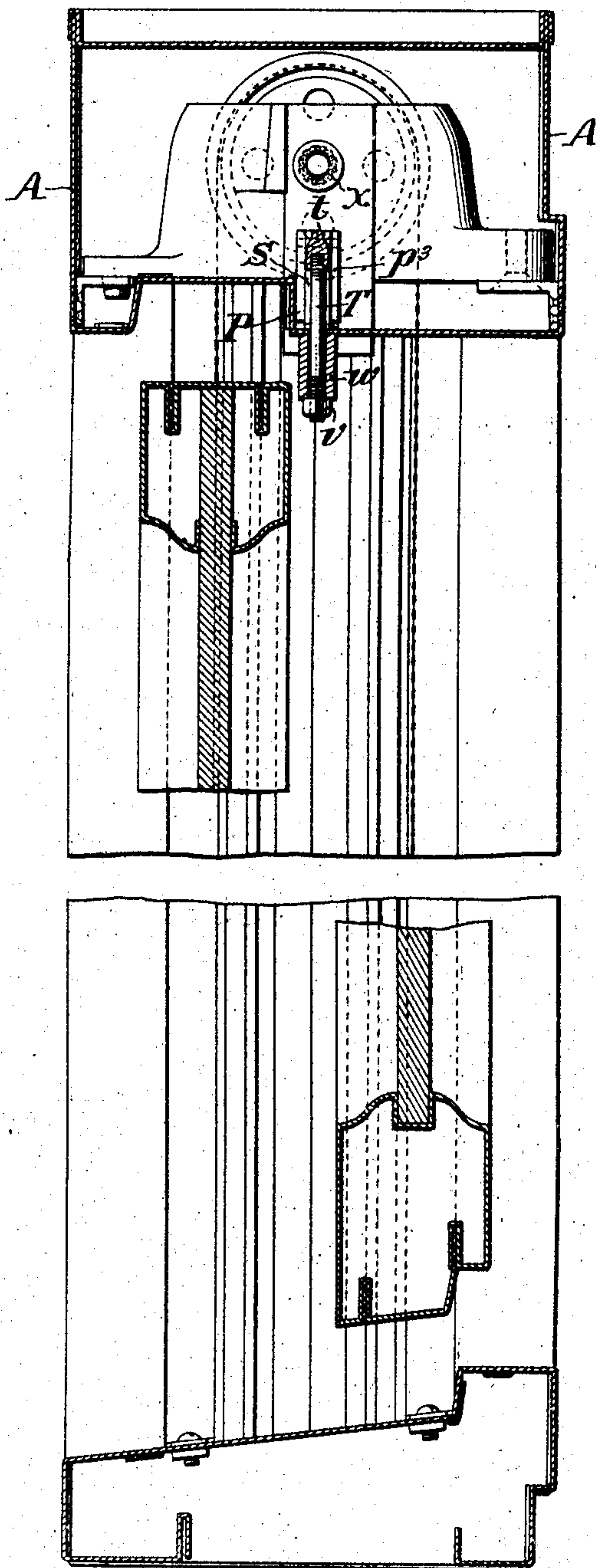
J. W. WATKINS.
AUTOMATIC CLOSING DEVICE.

APPLICATION FILED FEB. 15, 1904.

NO MODEL.

4 SHEETS—SHEET 3.

FIG. V.



WITNESSES:

Clifton C. Hallowell
John C. Berger

INVENTOR:

JOHN W. WATKINS,
by his attorneys
Reig, Paul & Mery

No. 772,483.

PATENTED OCT. 18, 1904.

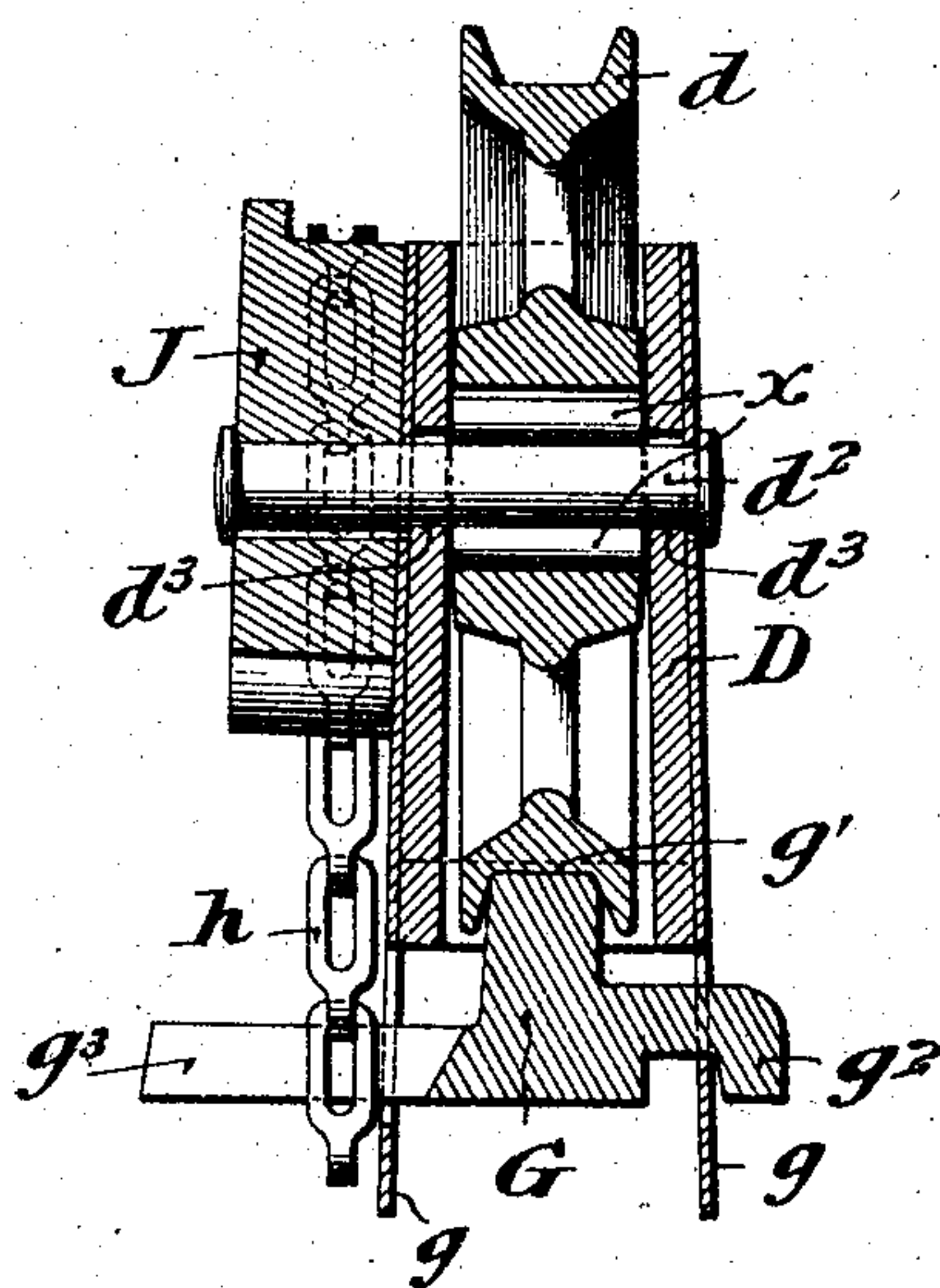
J. W. WATKINS.
AUTOMATIC CLOSING DEVICE.

APPLICATION FILED FEB. 15, 1904.

NO MODEL.

4 SHEETS—SHEET 4.

FIG. VII.



WITNESSES:

Clifton C. Hallowell
John C. Begner.

INVENTOR:

JOHN W. WATKINS,
by his attorneys
Ruige Paul & Tracy

UNITED STATES PATENT OFFICE.

JOHN W. WATKINS, OF PHILADELPHIA, PENNSYLVANIA.

AUTOMATIC CLOSING DEVICE.

SPECIFICATION forming part of Letters Patent No. 772,483, dated October 18, 1904.

Application filed February 15, 1904. Serial No. 193,529. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. WATKINS, of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Automatic Closing Devices, whereof the following is a specification, reference being had to the accompanying drawings.

My invention relates to an automatic closing device for window-sashes, doors, panels, and the like, which being over or under weighted are yet so hung as to stand in any open position in which they are set, so long as the temperature (in the region of the window) remains normal, but which as soon as the temperature rises to an abnormal degree automatically close themselves.

To this end my invention relates to devices whereby a suitable degree of friction is opposed to the rotation of the pulleys, around which pass the cords on which the door or sash is hung, the friction being sufficient to cause it to stand in any open position in which it may be set under ordinary circumstances, together with thermostatic means whereby any abnormal heat removes or lessens this friction and allows the door or sash to close itself.

I have illustrated my invention as applicable to window-sashes of two varieties. In the first variety the sashes are balanced by the usual weights, and by having the upper sash overweighted and the lower sash underweighted my invention insures the closing of the sashes when the temperature rises sufficiently. In the second variety of my invention the sashes are self-balanced—that is to say, the sash-cords run from one sash to the other—and in this case by having the lower sash somewhat heavier than the upper sash the release of the cord-pulley from friction likewise allows the sashes to immediately close themselves.

In the accompanying drawings, Figure I is a plan view with parts in section of the head of a window-frame embodying the first variety of my invention. Fig. II is a front elevation with parts in section of the same. Fig. III is a plan view of the head of a window-frame embodying the second variety of my invention. Fig. IV is a vertical section

of the same. Fig. V is a fragmentary central section through the entire window illustrated in Figs. III and IV, taken along the line V V in Fig. IV. Fig. VI is a detail perspective view of the saddle-block G of Figs. I and II. Fig. VII is a vertical central section through one of the pulley-blocks shown on an enlarged scale.

I have throughout illustrated my invention as applied to a preferred form of sheet-metal window, which in many of its details is similar to the fireproof window for which on November 9, 1903, I filed an application for Letters Patent of the United States, Serial No. 180,330, which application is still pending. I will not in this specification describe in detail the parts which are fully described in that application.

Referring to Fig. I, it will be understood that there is there shown the head (certain portions being broken away) of a metal-sheet window-frame, of which A is a sheet-metal piece which forms the front back and bottom or facing of the head of the frame. Supported partially upon the bottom of the head and partially upon a bracket or shoulder piece d' , affixed to the interior side of the jambs, are pulley-blocks D, each containing a pulley d in position to carry one of the sash-cords of the window, which cords are attached to weights so chosen that the upper sash is slightly overweighted and the lower sash slightly underweighted. Each pulley d is provided with an axle or pin d^2 , resting in journals d^3 , formed in the sides of the pulley-block D. The pulley is so mounted as to have a considerable amount of vertical play. This may be secured either by making the pin d^2 loose within the pulley or by making the journals d^3 larger than the pin or by employing both expedients. As shown in Fig. VII, both the loose pulley and the loose journal are employed, the pulley d loosely surrounding the pin d^2 notwithstanding the interposition of the rollers x (constituting a roller-bearing) and the journals d^3 likewise loosely receiving the pin d^2 . The sides of each of the pulley-blocks are projected downwardly below the journals of the pulley-block to form side plates $g g$. Between each pair

of these side plates is mounted a saddle-block G. (Shown in detail in Fig. VI.) This comprises a curved saddle g' , which fits the groove of the pulley, a hooked fulcrum-arm g'' , which rests within an aperture in the corresponding side plate g , and a forked lever-arm g''' , which engages with a chain h . At the side of each of the pulley-blocks over the point of engagement of the chain h with the saddle-block is a rocking lever J, preferably pivoted upon the pin d'' , as best shown in Fig. VII, having along one side a flattened groove j , capable of accommodating the chain h , which from its point of attachment of the saddle-block passes up and around the rocking arm resting in the groove j and then runs across the head of the window-frame and is at its other end similarly attached to the saddle-block beneath the opposite sash-pulley after passing over a corresponding rocking arm. This arrangement is precisely duplicated upon the other side of the window, the saddle-blocks beneath the cord-pulleys being similarly united by a chain h' . Near the center of the head of the window the two chains h and h' are connected by a pair of metal links k k' , through which the chains pass, the two links being adjusted at a little distance apart. At a point intermediate between the links k k' the chain h is led through an eyelet l upon the end of a screw L, provided with a nut m . n is a collar or sleeve, of fusible material, mounted upon the outside of the window-frame, preferably centrally and near its top. Through this fusible collar the screw L passes and is caused to exert tension upon the chain h by screwing the nut m down upon the fusible collar n . A like arrangement is provided upon the other side of the window, where a screw L' with an eyelet l' passes through the fusible collar n' and exerts tension upon the chain h' by screwing the nut m' down upon the fusible collar n' . It will be observed that in the system of connections thus described the tightening of either of the nuts m m' communicates an evenly-distributed tension to both ends of both chains h h' . For proper operation the chains are placed under a sufficient tension by the adjustment of the nuts m m' to cause the ends of each of the chains to exert enough upward pull upon the saddle-blocks under the four pulleys to lift the pulleys (necessarily lifting with them the weights and the sashes) until the axles of the pulleys are raised off their journals, the pulleys resting solely upon the saddles. The rocking arms J J facilitate this adjustment, transforming the horizontal pull of the chains into the vertical pull required to raise the saddle-blocks with the load which they carry. When thus adjusted, the cord-pulleys can rotate only subject to the very appreciable degree of friction occasioned by their movement on the saddles within which they rest. This degree of friction is too great to be overcome by the

overweight or underweight to which the sashes are respectively subjected, and therefore when a sash is raised or lowered by hand it will stay in place where it is set; but if by reason of an abnormal rise in the temperature in the region of the window-frame either on the outside or the inside one or other of the fusible collars n n' is melted the tension upon the chains is immediately relaxed and the pulleys are permitted to settle down upon their proper bearings. In this position they rotate so freely that the overweight or underweight of the sashes is immediately effective to close them.

It will be observed that by my arrangement the fusible collars, upon the efficiency of which the operation of the device depends, are placed in a most advantageous position—namely, very near the top of the window-frame and near its center, which is the place most likely to be first affected by heat. It will also be observed that at no time is any friction exerted upon the window-cords, the saddles creating friction only between themselves and the pulleys.

Referring now to the second variety of my invention, as shown in Figs. III, IV, and V, it will be noted that the cord-pulleys instead of being four in number are but two and that they are mounted transversely to the head of the window. In this way a single pulley-cord suffices for each end of the window, one cord running from the lower sash over the pulley to a point of attachment upon the upper sash. Beneath each of these pulleys is the pivoted saddle-block P, with a saddle p' , a fulcrum-arm p'' , and an upwardly-projected free arm p''' . To the latter is pivoted a lever-arm s , which in turn is pivoted upon a bracket S, set upon the bottom of the head of the window. The central ends of the two levers s s are pivotally connected to a cross-arm t , which carries a screw T with a nut v , the screw passing down through a fusible sleeve or collar w , projecting downwardly below the bottom of the head of the window at or near its center. This collar thus affords the point of resistance for the nut v when screwed down so as to depress the central ends of levers s s . By properly adjusting this single nut sufficient tension is placed upon the levers s s to raise both of the saddle-blocks until both of the pulleys are lifted off their journals, causing them to rest only upon the saddles, with the resulting increase of friction resisting their rotation to a sufficient degree to prevent the difference in weight between the sashes from effecting the closing of the window. As soon, however, as the fusible collar w melts under an abnormal rise in the temperature the tension upon the saddle-blocks is released and the pulleys fall to their natural bearings, whereupon their rotation is so easy as to allow the difference in weight between the sashes to immediately close the window. Although I have shown but a sin-

gle fusible collar *w* arranged to control both of the saddles, it will be understood that when desired a separate screw may be used to control each of the levers, (which in this case will be disunited.) This latter arrangement is preferable where the window is of considerable breadth.

The roller-bearings *x x* greatly facilitate the rotation of the pulleys so long as the weight of the sash-cord is received upon the pin *d*². It will be observed, however, that the rollers do not completely fill the space at the center of the pulleys within which they rest. Hence it results that when the saddle-block is pressed up beneath the pulley the latter is lifted to the position shown in Fig. VII, where the whole weight of the sash-cord is supported by the saddle-block, rotation only being possible subject to the friction between the periphery of the pulley and the saddle-block and the pin *d*² being quite free from pressure and resting loosely within the pulley and its journal.

Although I have described my invention as applied to window-sashes, it is equally applicable to any sliding closure hung from a cord or chain running over a pulley—as, for instance, sliding doors, metal theater-curtains, or any sort of “closing-panel,” which word I employ here and in the claims in its generic sense as including any sliding piece by which any aperture is closed.

Having thus described my invention, I claim—

1. In an automatic closure the combination of a panel; a counterweight connected to the panel and tending to its closure; a pulley over which said connection runs; loose bearings for the pulley; a saddle beneath the pulley the opposing face of which has the curvature of the run of the pulley; means whereby the saddle may be raised to lift the pulley off its bearings, said means including a fusible piece by the melting of which the pulley is suffered to settle down in its bearings, substantially as described.

2. In an automatic closure the combination of a panel weighted so as to have a tendency to close; a pulley over which the connection of the panel to the weight runs; a pivoted saddle-block beneath the pulley; a fusible piece; an adjustable connection, of which the fusible piece forms one point of attachment, whereby tension may be placed upon the pivoted saddle-block to raise the pulley off its bearings, substantially as described.

3. In an automatic closure the combination of a panel weighted so as to have a tendency to close; a pulley over which runs the connection of the panel to the weight; a saddle-block beneath the pulley provided with a saddle fitting the groove of the pulley, a fulcrum-arm, and a free arm; with means for raising the latter arm until the pulley rests upon the sad-

dle instead of upon its bearings, said means including a fusible piece by the melting of which the pulley is suffered to fall to its bearings, substantially as described.

4. In a self-closing window the combination with a sash weighted so as to have a tendency to close; a pulley resting in loose bearings over which the sash-cord of the sash runs; a saddle-block beneath the pulley; means for raising the saddle-block until the pulley rests upon it instead of upon its bearings, said means including a fusible piece by the melting of which the pulley is suffered to fall to its bearings, substantially as described.

5. In an automatically-closing window, the combination of a sash weighted so as to have a tendency to close; a pulley on either side of the window over which runs the sash-cord for that side; a movable saddle beneath each pulley; connections uniting the saddles, tension upon which tends to raise them against the pulleys; and means for creating such tension inclusive of a fusible piece by the melting of which the tension is released, substantially as described.

6. In an automatically-closing window, the combination of an overweighted upper sash and an underweighted lower sash; pulleys over which the cords for these sashes are carried; a movable saddle beneath each of the pulleys; flexible connections whereby each saddle is united to its fellow on the opposite side of the window; one or more connecting-links communicating the tension of one flexible connection to the other; and one or more fusible pieces which form a point of resistance from which tension is communicated to the flexible connections so as to press the saddles against the pulleys with sufficient force to raise them from their bearings, thus preventing the overweighting and underweighting of the sashes from being effective to allow them to close of their own accord, substantially as described.

7. In a self-closing window, the combination of a sash weighted so as to have a tendency to close; a pulley in loose bearings over which the cord of this sash runs; a pivoted saddle-block mounted below the pulley; a chain by the tension of which the saddle-block is raised up under the pulley; and means for putting tension upon the chain, comprising a fusible piece as a point of resistance for said tension, said fusible piece being situated near the top of the head of the window, substantially as described.

8. In a self-closing window, the combination of a sash weighted so as to have a tendency to close; a pulley in loose bearings over which the cord of this sash runs; a pivoted saddle-block mounted below the pulley; a pivoted rocking arm; a chain affixed to the free end of the pivoted saddle-block, and passing over the rocking arm to a point of

attachment; and a fusible piece affording the point of resistance from which tension is placed upon said chain, sufficient to raise the saddle-block to hold the pulley against rotation by the window-sash alone, substantially as described.

In testimony whereof I have hereunto

signed my name, at Philadelphia, Pennsylvania, this 12th day of February, 1904.

JOHN W. WATKINS.

Witnesses:

JAMES H. BELL,
E. L. FULLERTON.