

No. 681,014.

Patented Aug. 20, 1901.

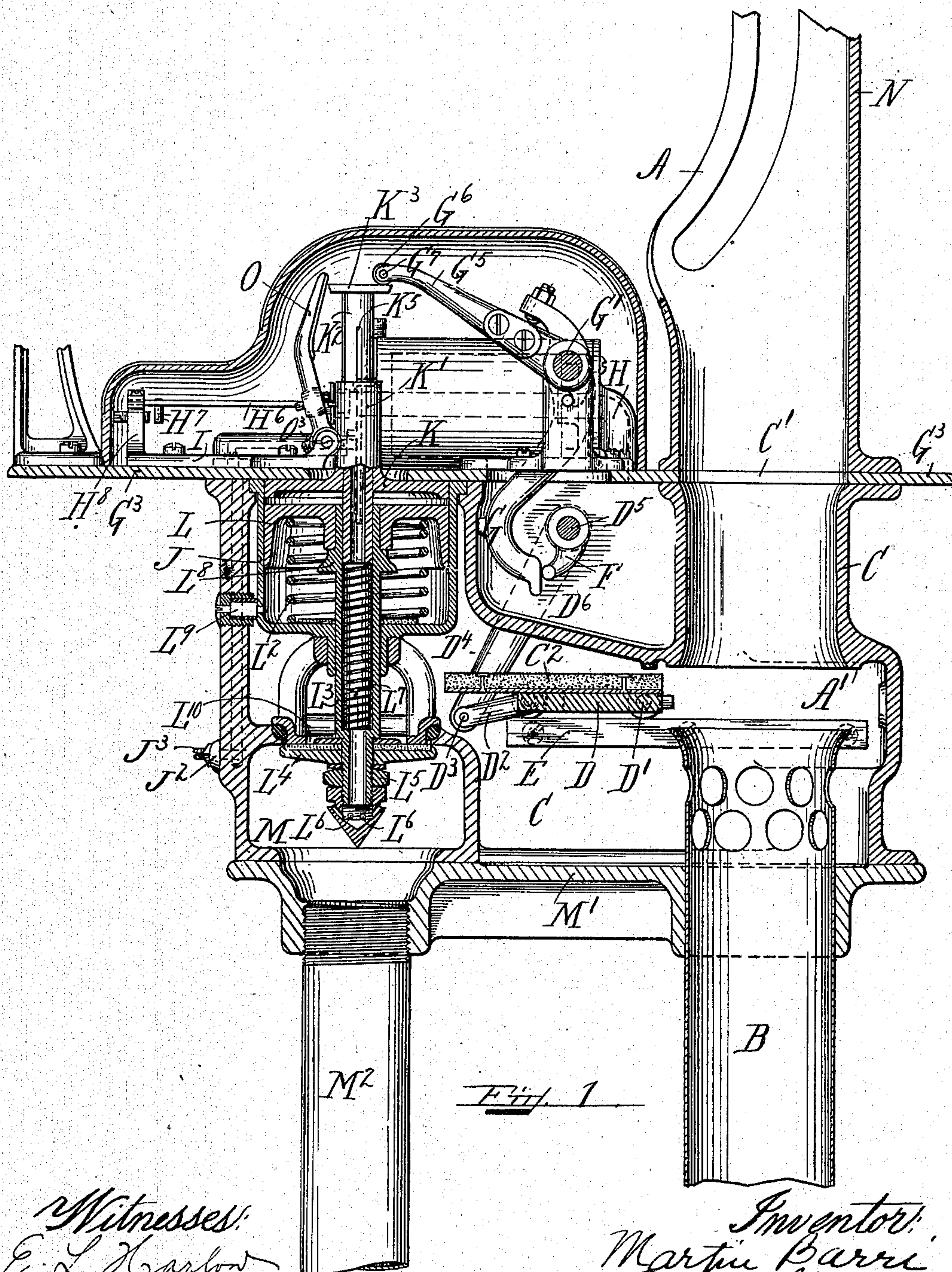
M. BARRI.

PNEUMATIC DESPATCH APPARATUS.

(Application filed May 8, 1901.)

(No Model.)

5 Sheets—Sheet 1.



Witnesses:
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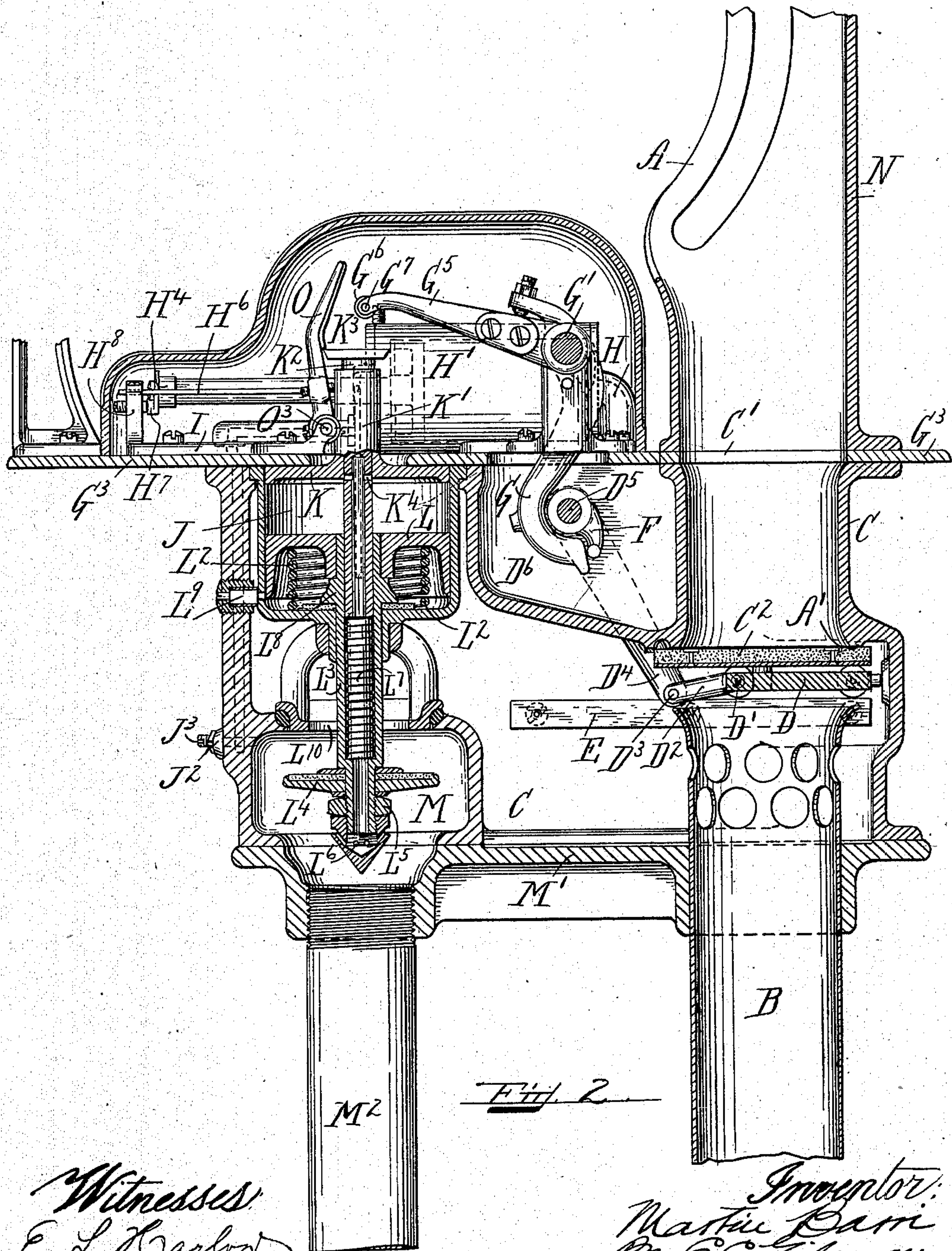
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(Application filed May 9, 1901.)

(No Model.)

5 Sheets—Sheet 2.



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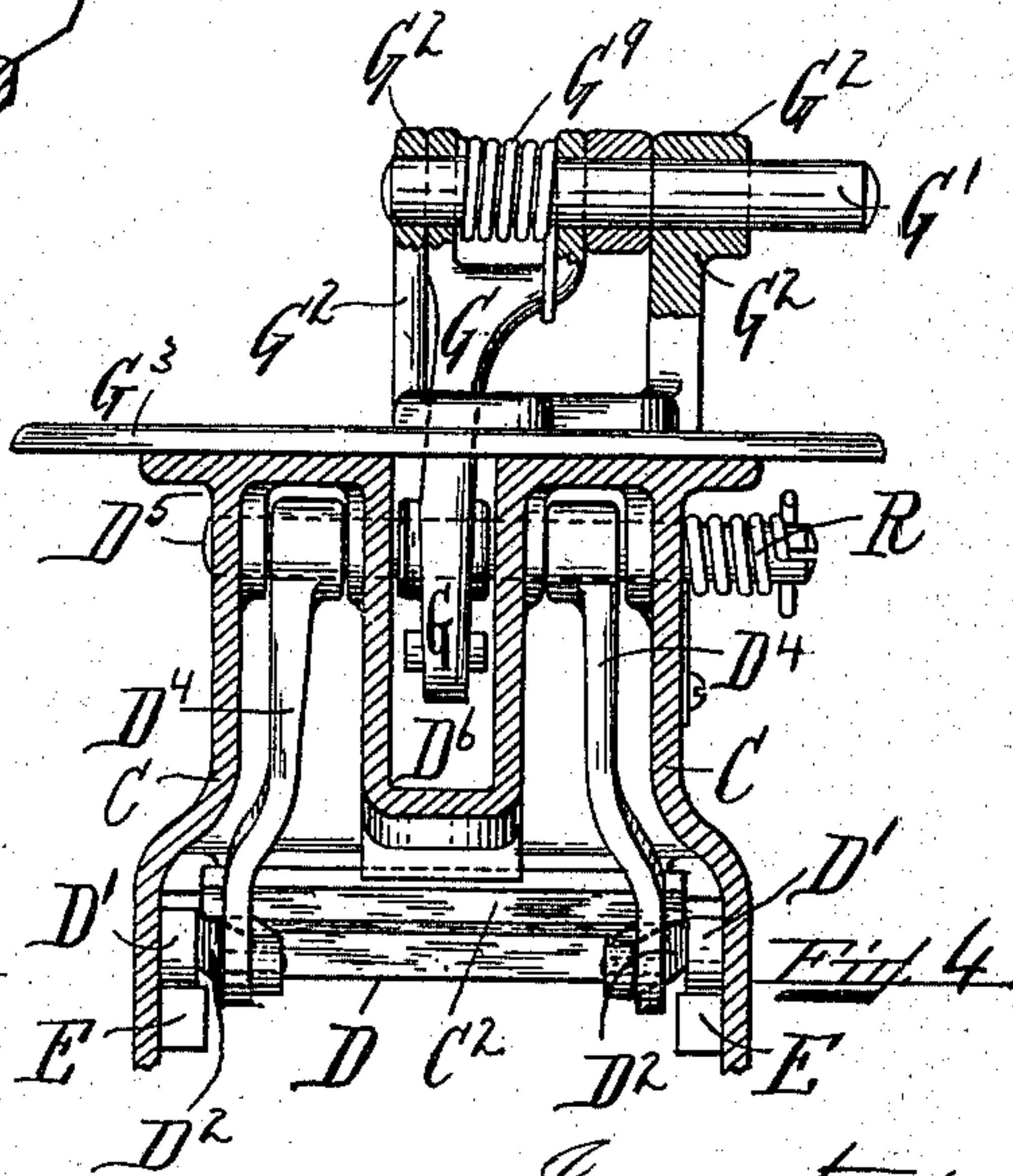
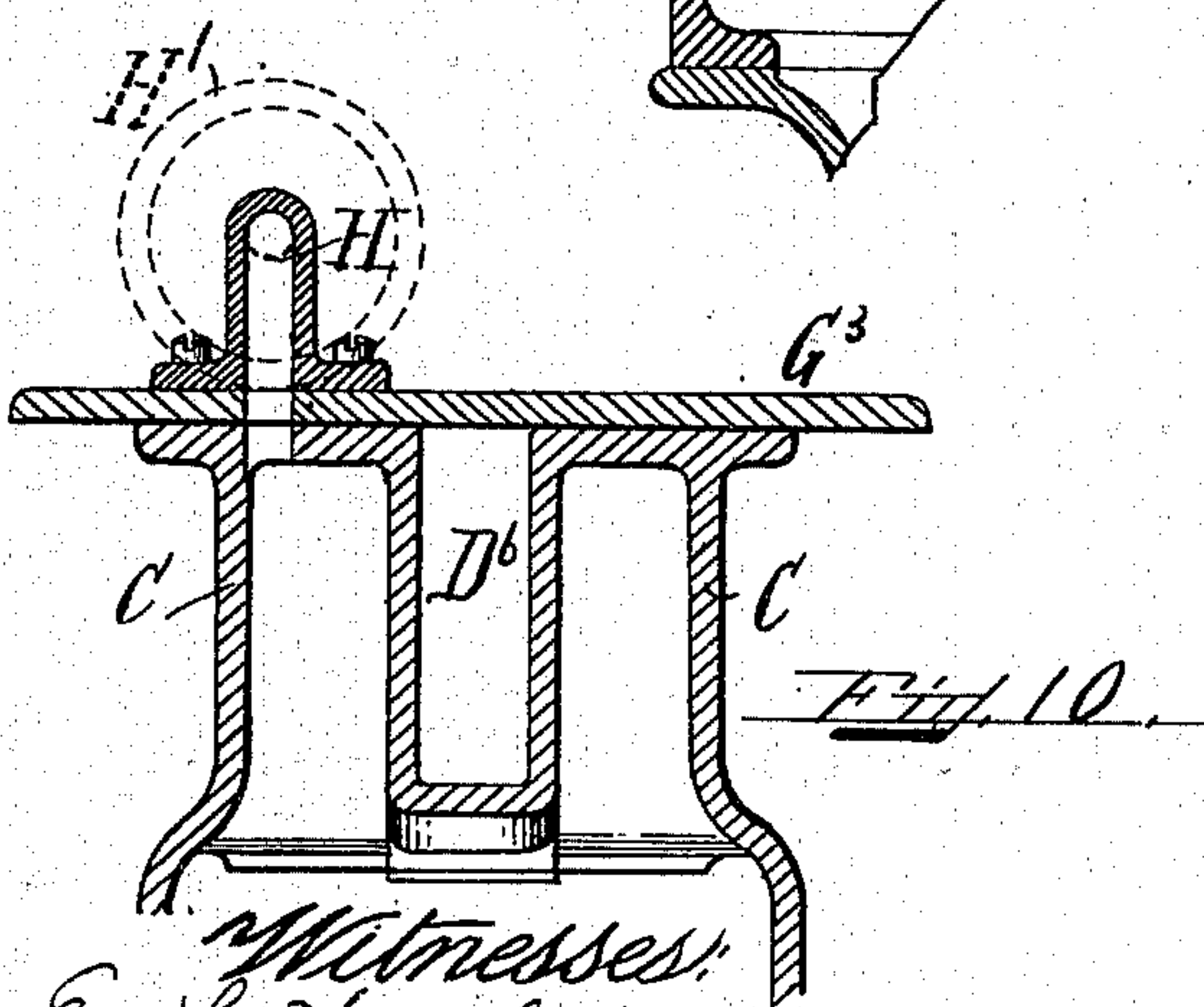
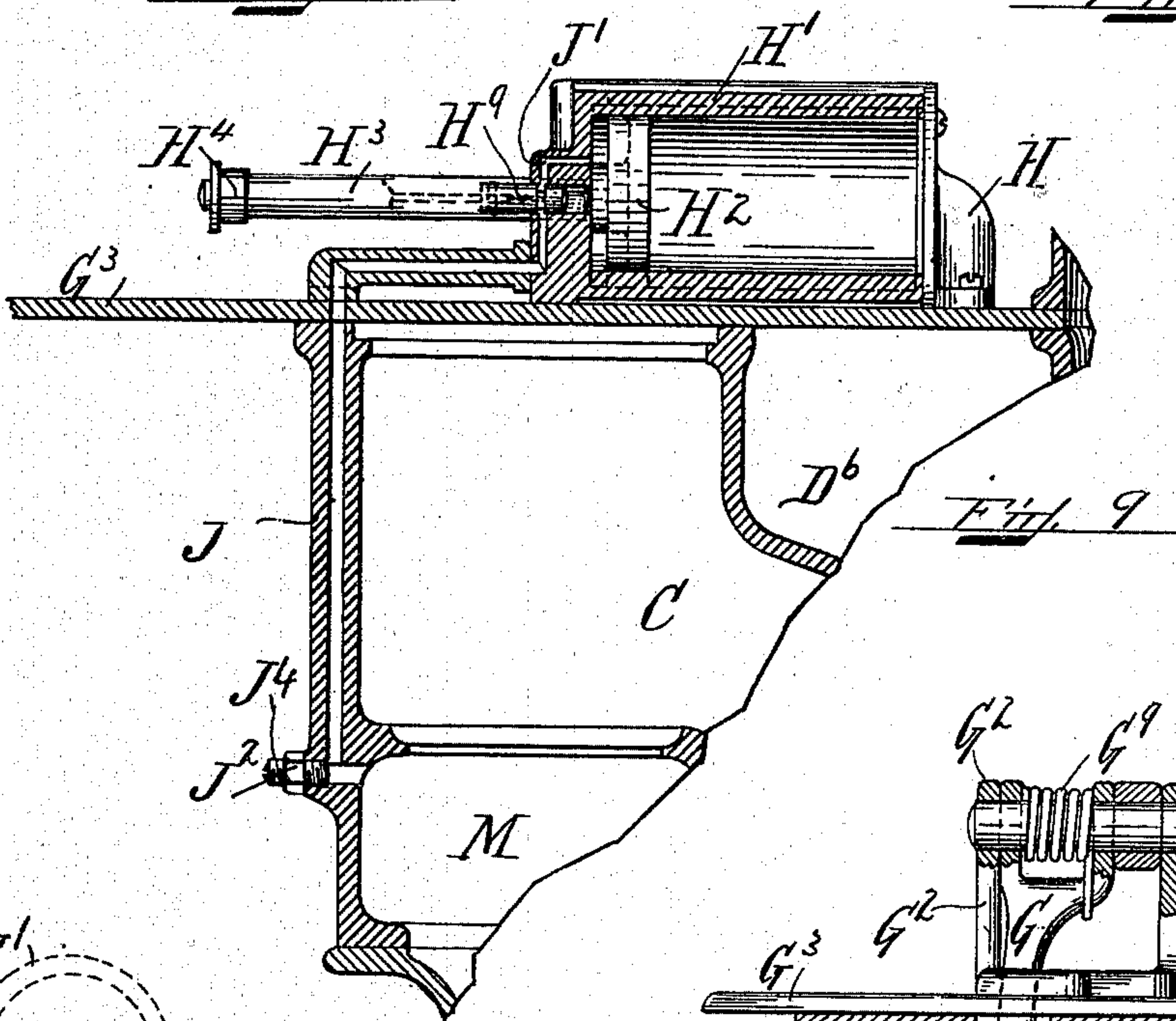
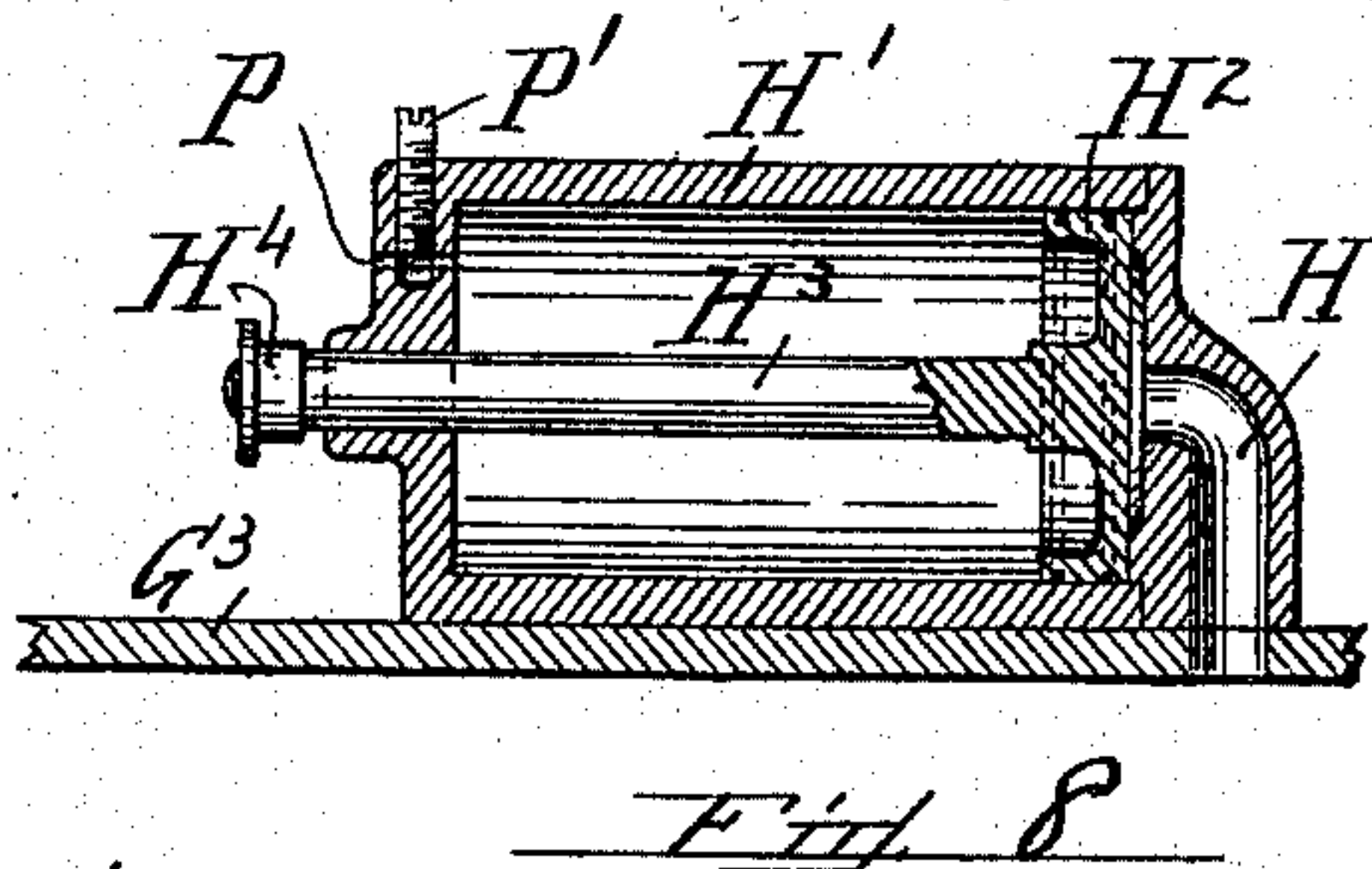
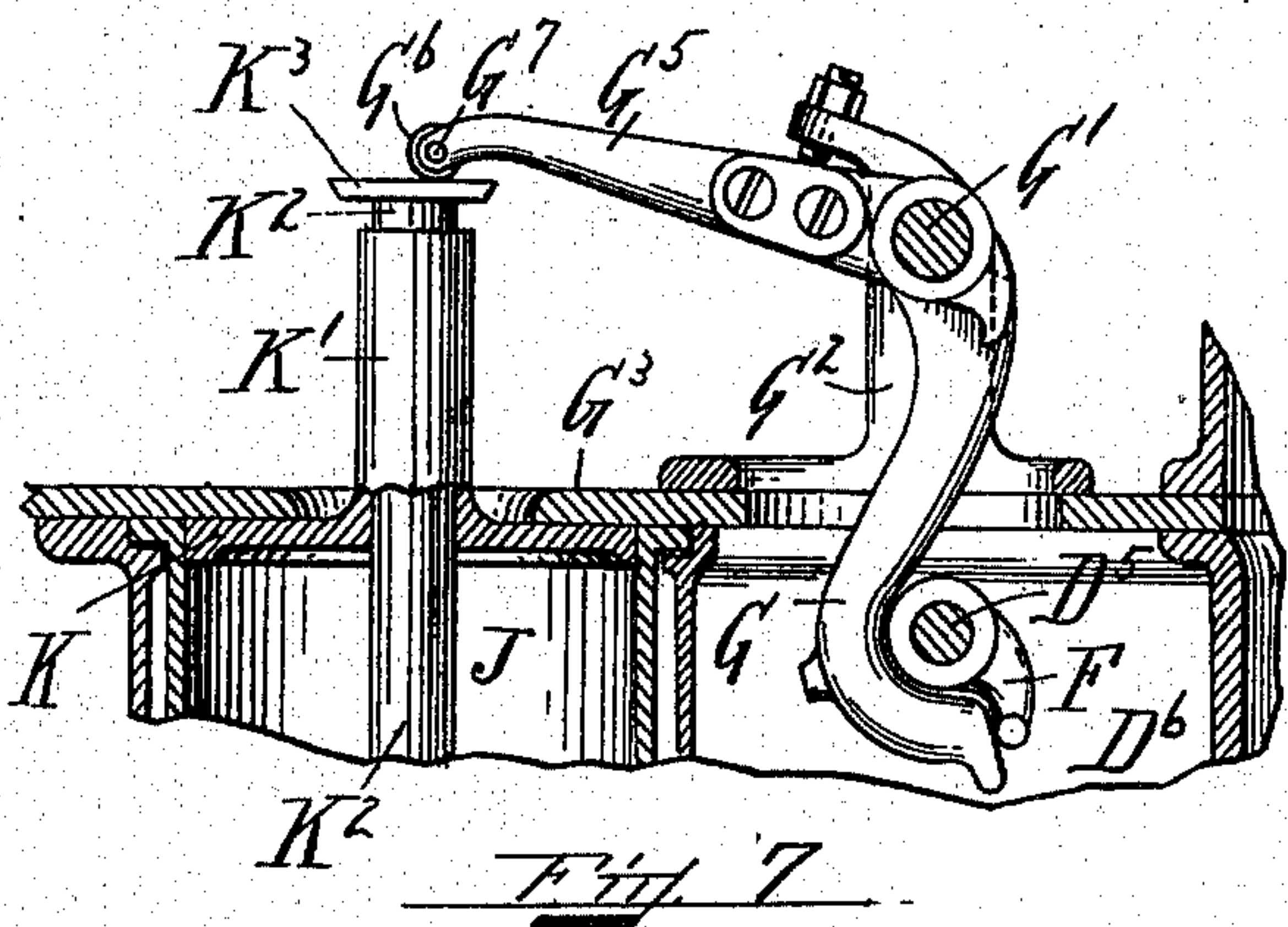
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(Application filed May 9, 1901.)

(No Model.)

5 Sheets—Sheet 4.



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Patented Aug. 20, 1901.

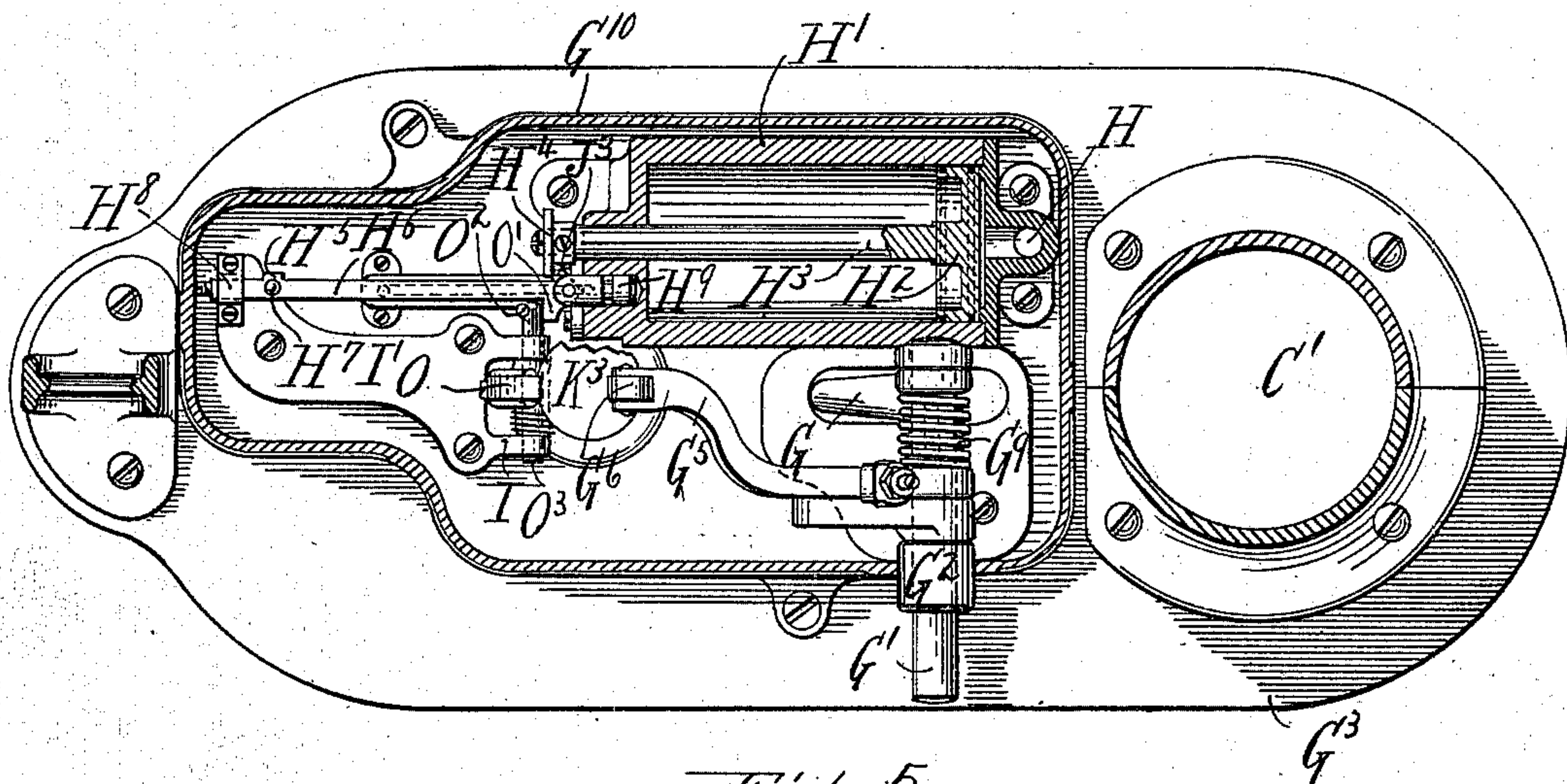
M. BARRI.

PNEUMATIC DESPATCH APPARATUS.

(Application filed May 9, 1901.)

(No Model.)

5 Sheets—Sheet 5.



UNITED STATES PATENT OFFICE.

MARTIN BARRI, OF LOWELL, MASSACHUSETTS, ASSIGNOR TO LAMSON CONSOLIDATED STORE SERVICE COMPANY, OF NEWARK, NEW JERSEY.

PNEUMATIC-DESPATCH APPARATUS.

SPECIFICATION forming part of Letters Patent No. 681,014, dated August 20, 1901.

Application filed May 9, 1901. Serial No. 59,435. (No model.)

To all whom it may concern:

Be it known that I, MARTIN BARRI, of Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Pneumatic-Despatch Apparatus, of which the following is a specification.

My invention relates to improvements in pneumatic-despatch apparatus, and especially to a pressure system wherein the carriers are driven from end to end of the same tube in either direction by air-pressure behind the carriers, and is an improvement on the apparatus shown, described, and claimed in my application filed August 25, 1900, Serial No. 28,008.

The object of my invention is to provide mechanism for cutting off the air-pressure upon the discharge of a carrier from the opposite end of the line from which sent, so that the pressure is used only when the carriers are in transit. This object is accomplished by mechanism so timed in operation that upon the carrier being discharged the air-pressure is cut off.

My invention consists of certain novel features hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, which illustrate a construction embodying my invention, Figure 1 is a longitudinal central sectional view of the terminals, showing the despatching mechanism and one end of the transmission-tube. Fig. 2 is a similar view, but showing the mechanism in position after a carrier has been inserted and the air-pressure admitted to drive the carrier to the opposite end of the transmission-tube. Fig. 3 is an end view, partly in section, with the casing partly removed. Fig. 4 is a view similar to Fig. 3 with certain parts removed. Fig. 5 is a top plan view, partly in section, of the air-controlling mechanism with the cover removed and with the parts in their normal positions. Fig. 6 is a top plan view, partly in section, of the air-controlling mechanism with the cover removed and showing the position of the parts when a carrier has reached the opposite end of the line and the air-pressure is about to be cut off. Fig. 7 is a side view, partly in section, showing certain operating mechanism for admitting air-pressure to drive

the carrier from end to end of the tube. Fig. 8 is a detail sectional view of the cylinder and piston used for controlling the time the air-pressure is admitted to the transmission-tube. Fig. 9 is a similar view to Fig. 8 and showing additional parts and the position of the piston in the cylinder after a carrier has been discharged from the opposite end of the line. Fig. 10 is a detail sectional view showing the air-passage between which the compressed air enters to move the parts from the position shown in Fig. 8 to that shown in Fig. 9 during the travel of the carrier.

Like letters of reference refer to like parts throughout the several views.

When it is desired to despatch a carrier, it is inserted into the terminal at the inlet A, Fig. 1, and passes down through the opening C' of the valve-box C into the despatch-tube B. The valve C² is then closed by rolling it to the position shown in full lines, Fig. 2. The valve C² is provided with a series of pins C³, which extend downwardly into suitable openings in the carriage D, and said valve is guided in said carriage by said pin as it rises and falls due to the admission or non-admission of air-pressure. The carriage D is provided with rollers D', which roll on the guideways E. As shown in Figs. 1, 2, and 3, the links D², pivoted to the rollers D', are pivotally connected at D³ to the oppositely-arranged rocking arms D⁴, which extend upwardly and are secured fast on the shaft D⁵, passing through the valve-box C.

This valve-box C is provided with a closed pocket D⁶, through which the shaft D⁵ passes, and on said shaft and projecting into the closed pocket D⁶ is a lever F, and bearing against the lower end of this lever is another forked lever G, the upper end of which is mounted loosely on the shaft G', journaled in upright supports G², secured to the plate G³, and said lever passes down through a suitable opening in said plate. The shaft G', extending outwardly on one side, is provided with a handle G⁴ for a purpose hereinafter described. On this shaft G' is securely fastened a lever G⁵, provided at its outer end with a roll G⁶, mounted on the pivot G⁷. The lever G is held in contact with the lever G⁵ by the spring G⁹ around the shaft G' and having one end secured to said shaft and the

other end bearing against the lever G and holding the upper end of the lever G in contact with the lever G⁵ at all times, as shown in Figs. 3, 4, and 7. In order to close the valve C², the handle G⁴ is moved forward toward the left, moving with it the shaft G', to which the lever G⁵ is secured, and through the medium of the spring G⁹ the lever G and lever F and the valve C² are moved into the position shown in full lines, Fig. 2, thereby closing the opening into the tube B. Located within the pocket J and secured to the plate G³ is a plate K, provided with a hub K', within which is mounted the plunger K², provided at its upper end with a flange K³, against which the roll G⁶ on the lever G⁵ bears. Within the pocket J is mounted the piston-plunger L, held in its raised position, Fig. 1, by the spring L², and this plunger L is provided with a hollow stem L³, to which the valve L⁴ is secured by suitable nuts L⁵, and the lower one of which is provided with suitable openings L⁶, communicating with the pocket M of the valve-box C. The spring L⁷ tends to keep the plunger K² in its upper position. (Shown in Fig. 1.) The flange L⁸ on the stem L⁶ limits the downward movement of the plunger K² in the pocket J. The plunger K² is provided with a series of radial openings K⁴ and with a groove K⁵ on the outer periphery of said plunger.

M' is a plate covering the bottom of the valve-box C, to which the air-pressure-supply pipe M² is connected, communicating with the pocket M. To this plate is also secured the despatch-tube B for the transmission of the carriers. The air-supply pipe M² extends between the terminals and at a convenient point is connected to a suitable compressed-air tank, as shown in the application hereinbefore referred to. Extending upwardly from the plate G³ and secured thereto is a curved chute N, which curves as shown in said application, and from which the carriers are discharged into a suitable receptacle.

Communicating with the valve-box C is the air-passage H, which at its opposite end is in communication with the piston-chamber H', and within said piston-chamber is located the piston H², having a suitable piston-rod H³, which at its outer end without the cylinder is provided with a flanged collar H⁴, which is adapted as the piston moves toward the left from the position shown in Fig. 5 to that shown in Fig. 6 to engage with the lateral lug H⁵ on the valve-stem H⁶ and to move said stem and lug to the position shown in Fig. 6, the movement of said stem H⁶ being limited by the vertical pin H⁷ contacting with the vertical support H⁸, secured to the plate G³. This movement of the valve-stem takes place after the carrier has been discharged, and in this movement the valve-stem moves the valve H⁹ from the position shown in Fig. 5 to that shown in Figs. 6 and 9, so that compressed air from the pocket M passes upwardly through the air-passage J, controlled

by the screw J² and nut J⁴, into the air-passage J' and into the piston-chamber H' and moves said piston back to its normal position, (shown in Fig. 5,) and as the piston-rod reaches its inner limit of movement the flanged collar H⁴ strikes the limited extension J³ and moves the valve back to its normal position, (shown in Fig. 5,) thus cutting off the air-pressure through the passage J', so that the apparatus in the terminal is in its normal position, as shown in Fig. 1. Pivoted in the opposite lugs I of the plate I' is a spring-catch O, adapted to engage the flange K³ of the plunger K², and when the valve-stem H⁶ is moved to the position shown in Fig. 6 the limited extension O' on the valve-stem H⁶ strikes the upright pin O², which is a part of the shaft O³, on which is fixed fast said spring-catch O, and the engagement of said limited extension O' moves said pin O² toward the left and releases the spring-catch from the flange K³, thereby allowing the plunger K² to rise, and the spring L⁷ being under compression throws the plunger K² upwardly. When the plunger K² has been depressed by moving the lever G⁴, as previously described, the openings K⁴ move downwardly, Fig. 2, and open into the space above the piston-plunger L, and the air-pressure passing up from the pipe M² through the openings L⁶ and through the hollow stem L³ passes out through said openings K⁴ into the space above the piston-plunger L, and by reason of said piston-plunger being of greater area than the valve L⁴ the plunger L moves downwardly and forces the air in the pocket J out through the opening L⁹ and opens the valve L⁴ to the position shown in Fig. 2, and the pressure passes through the opening L¹⁰ into the valve-box C and from there into the tube B, through which the carrier is driven, and at the same time acts on the bottom of the valve C² and raises it and holds it against its seat A', as shown in Fig. 2. At the same time the air passes upwardly around the closed pocket D⁶ and into the passage H and passes into the piston-chamber H' and forces the piston H² toward the left and operates the connecting mechanism, as hereinbefore described, to allow the closing of the valve L⁴, as above described, after the carrier has reached the opposite end of the line, and when the spring-catch O is released in the manner above described the plunger K² rises from the position shown in Fig. 2 to that shown in Fig. 1, which brings the opening K⁴ up into the hub K' to close communication between the pipe M² and the space above the plunger L, and the air-pressure in said space above the piston-plunger passes through the groove K⁵ up and out above the hub K', and the spring L⁸, acting on the plunger L, raises said piston-plunger to the position shown in Fig. 1, and the pressure acting on the valve L⁴ closes said valve, and the pressure being relieved from below the valve C² said valve drops onto its carriage D, and the spring R on the shaft

D⁵ moves said valve to its open position, (shown in Fig. 1,) when the apparatus is in condition to despatch another carrier. In one end of the cylinder H' is an opening P, the area of which may be increased or diminished by adjusting the screw P', thus controlling the time in which the air is allowed to escape from the cylinder H' as the piston H² moves from the right to the left by the air-pressure from the air-passage H.

When the compressed air from the tube M² passes up during the opening of the valve L⁴ into the pipe H, it drives the piston H² toward the left from the position shown in Fig. 8, and the rapidity of the movement of the piston depends upon the area of the small opening P at the left-hand end of the cylinder, so that in a long line the screw P' would be adjusted so as to make the opening P small in order to retard the egress of the air, while in a short line the screw P' would be adjusted to increase the area of the opening P to allow the air to pass out rapidly, so that by this arrangement the flow of air from the cylinder H' can be controlled to allow the carriers to travel any predetermined distance. After a carrier has passed out at the opposite end of the line the piston H² reaches the position shown in Fig. 6 and operates the mechanism hereinbefore described to close the valve L⁴ and shut off the air-pressure, thus providing for the use of the air-pressure only during the transmission of carriers.

The operation is as follows: A carrier is dropped into the inlet A at the right-hand end of Fig. 1 and passes down through the opening C' in the valve-box C into the despatch-tube B, and the handle G⁴ is then moved to the left and moves the valve C² across the mouth of the tube B, as previously described. This movement of closing the valve also pushes down the lever G⁵, fast on the shaft G', and the lever G⁵ pushes down the plunger K² against the tension of the spring L⁷. After the valve C² has moved to its closed position (shown in Fig. 2) the spring G⁹ yields and allows the plunger K² to be still farther depressed, and when the plunger K² reaches its lowest position the spring-catch O engages with the top of the flange K³ on the plunger K² and holds said plunger in its lowest position. When said plunger K² is in its lowest position, as shown in Fig. 2, (which is just previous to its rising, owing to the piston H² moving over and about to release said plunger,) the ports K⁴ allow the compressed air passing up through the hollow stem L³ to pass above the plunger L, and the air-pressure above said plunger forces said plunger down and opens the valve L⁴ and allows the air-pressure to pass from the pipe M² into the valve-box C and then into the despatch-tube B, driving the carrier which has just been inserted to the opposite end of the line and at the same time raising and holding the valve C² against its valve-seat A', as shown in Fig. 2, and upon the removal of the hand from the handle G⁴

the plunger K² is held down by the spring-catch O and remains in this position, allowing the air to drive the carrier through the despatch-tube until said catch O is removed from the flange K³ on the plunger K². The carrier traveling along the tube B from the right terminal, as shown in the drawings, toward the left passes out of the left terminal, which is identical with the right-hand terminal, into a suitable receptacle. At this time the piston H² has tripped off the spring-catch O, (shown in Fig. 2,) and this releasing of the plunger K² will move the ports K⁴ out of alignment with the space above the piston-plunger L in the upper part of the pocket J, due to the spring L⁷, and will also bring the upper end of the vertical groove K⁵ above the hub K', and the air in said space K⁶ will escape through said groove into the casing G¹⁰ and from thence to the atmosphere, and the parts will assume the position shown in Fig. 1, as heretofore described. With the parts in the position shown in Fig. 1 the air-pressure from the pocket M is cut off from the upper part of the pocket J, and a vent is formed by means of the groove K⁵ to allow the escape of air from above the plunger L through said groove, when the spring L² will force the plunger L upwardly, carrying with it the valve L⁴ against its seat, as shown in Fig. 1, closing the opening L¹⁰ from the pocket M and preventing a further flow of air into the despatch-tube B. When the air has thus ceased to flow, the pressure is removed from the valve C², which drops onto its carriage D, and the spring R will move said valve to its normal position, as shown in Fig. 1, and at this time the apparatus is in condition to despatch another carrier.

From the above it is clear that the compressed air is used only during the transit of the carrier from end to end of the tube, as the pressure is cut off immediately upon the arrival of the carrier at the terminal. As shown and described, a single tube is used for the transmission of the carriers in both directions, as the terminals and operating parts at both ends may be identical.

The operation as above described as taking place in the terminal at the right-hand end of Figs. 1 and 2 for the discharge of a carrier at the left-hand end of the line will likewise occur in the terminal at the left-hand end of the line upon the discharge of a carrier coming from the left hand and discharging at the right hand.

The specific construction of the valve C² for closing the despatch-tube B is no part of my present invention, as it forms the subject-matter of another application, filed July 10, 1901, Serial No. 67,753.

I do not limit myself to the arrangement and construction shown, as the same may be varied without departing from the spirit of my invention.

Having thus described the nature of my invention and set forth a construction embody-

ing the same, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In an apparatus of the character described, a despatch-tube, a source of compressed air, a valve for closing the despatch-tube after the insertion of the carrier, mechanism for closing said valve, a valve controlling the supply of compressed air to the despatch-tube, means for holding said valve normally closed, mechanism for opening said air-supply-controlling valve, means for holding said air-supply-controlling valve open, a cylinder for receiving compressed air when the air-supply-controlling valve is open, a piston movable in said cylinder and provided with a piston-rod extending beyond the cylinder, mechanism for releasing said air-supply-controlling valve to allow it to close and operated by the movement of said piston driven by the compressed air admitted to said cylinder, an opening in said cylinder through which air from the cylinder is forced by the movement of the piston as it moves in one direction to release the air-supply-controlling valve, and an air-inlet valve to said cylinder opened by the movement of the piston to admit compressed air into the cylinder to move the piston in the opposite direction upon the closing of the air-supply-controlling valve.

2. In an apparatus of the character described, a despatch-tube, a source of compressed air, a valve for closing the despatch-tube after the insertion of the carrier, mechanism for closing said valve, a valve controlling the supply of compressed air to the despatch-tube, means for holding said valve normally closed, mechanism for opening said air-supply-controlling valve, means for holding said air-supply-controlling valve open, a cylinder for receiving compressed air when the air-supply-controlling valve is open, a piston movable in said cylinder and provided with a piston-rod extending beyond the cylinder, mechanism for releasing said air-supply-controlling valve to allow it to close and operated by the movement of said piston driven by the compressed air admitted to said cylinder, an opening in said cylinder through which air from the cylinder is forced by the movement of the piston as it moves in one direction to release the air-supply-controlling valve, means for adjusting said opening, and an air-inlet valve to said cylinder opened by the movement of the piston to admit compressed air into the cylinder to move the piston in the opposite direction upon the closing of the air-supply-controlling valve.

3. In an apparatus of the character described, a despatch-tube, a source of compressed air, a valve normally open for closing the despatch-tube after the insertion of the carrier, a valve controlling the supply of compressed air, mechanism operated by compressed air for opening said air-supply-controlling valve upon the closing of the despatch-tube valve, means for holding said air-

supply-controlling valve open, a cylinder, a piston in said cylinder operated by compressed air in both directions, mechanism operated by the movement of said piston in one direction for releasing said air-supply-controlling valve to allow it to close, means for regulating the movement of said piston to operate said releasing mechanism, and an air-inlet valve to said cylinder opened by the movement of said piston in one direction to admit compressed air into the cylinder to move the piston in the opposite direction upon the closing of the air-supply-controlling valve.

4. In an apparatus of the character described, a despatch-tube, a source of compressed air, a valve normally open for closing the despatch-tube after the insertion of the carrier, a valve controlling the supply of compressed air for opening said air-supply-controlling valve upon the closing of the despatch-tube valve, means for holding said air-supply-controlling valve open, a cylinder, a piston in said cylinder operated by compressed air in both directions, mechanism operated by the movement of said piston in one direction for releasing said air-supply-controlling valve to allow it to close, means for regulating the movement of said piston to operate said releasing mechanism, and an air-inlet valve to said cylinder opened by the movement of said piston in one direction to admit compressed air into the cylinder to move the piston in the opposite direction upon the closing of the air-supply-controlling valve and adapted to be closed upon the return of the piston to its normal position.

5. In an apparatus of the character described, a despatch-tube, a source of compressed air, a valve normally open for closing the despatch-tube after the insertion of the carrier, a valve controlling the supply of compressed air, mechanism operated by compressed air for opening said air-supply-controlling valve, a catch for holding said air-supply-controlling valve open, a piston operated by compressed air in both directions, mechanism operated by the movement of said piston in one direction for moving said catch to release said air-supply-controlling valve to allow it to close, a cylinder in which said piston is located and provided with an air-vent for controlling the escape of air in front of the piston during its movement in one direction to release said air-supply-controlling valve, and an air-inlet valve to said cylinder opened by the movement of said piston in one direction to admit compressed air into the cylinder to move the piston in the opposite direction upon the closing of the air-supply-controlling valve.

6. In an apparatus of the character described, a despatch-tube, a source of compressed air, a valve normally open for closing the despatch-tube after the insertion of the carrier, a valve controlling the supply of compressed air, mechanism operated by com-

pressed air for opening said air-supply-controlling valve, a catch for holding said air-supply-controlling valve open, a piston operated by compressed air in both directions, mechanism operated by the movement of said piston in one direction for moving said catch to release said air-supply-controlling valve to allow it to close, a cylinder in which said piston is located and provided with an air-vent for controlling the escape of air in front of the piston during its movement in one direction to release said air-supply-controlling valve, and an air-inlet valve to said cylinder opened by the movement of said piston in one direction to admit compressed air into the cylinder to move the piston in the opposite direction upon the closing of the air-supply-controlling valve and adapted to be closed upon the return of the piston to its normal position.

7. In an apparatus of the character described, a despatch-tube, a source of compressed air, a valve normally open for closing the despatch-tube after the insertion of the carrier, a valve controlling the supply of compressed air, mechanism operated by compressed air for opening said air-supply-controlling valve, a catch for holding said air-supply-controlling valve open, a piston operated by compressed air in both directions, mechanism operated by the movement of said piston in one direction for moving said catch to release said air-supply-controlling valve to allow it to close, a cylinder in which said piston is located and provided with an air-vent for controlling the escape of air in front of the piston during its movement in one direction to release said air-supply-controlling valve, means for varying the area of said vent thereby regulating the movement of said piston, and an air-inlet valve to said cylinder opened by the movement of said piston in one direction to admit compressed air into the cylinder to move the piston in the opposite direction upon the closing of the air-supply-controlling valve.

8. In an apparatus of the character described, a despatch-tube, a source of compressed air, a valve normally open for closing the despatch-tube after the insertion of the carrier, a valve controlling the supply of compressed air, mechanism operated by compressed air for opening said air-supply-controlling valve, a catch for holding said air-supply-controlling valve open, a piston operated by compressed air in both directions, mechanism operated by the movement of said piston in one direction for moving said catch to release said air-supply-controlling valve to allow it to close, a cylinder in which said piston is located and provided with an air-vent for controlling the escape of air in front of the piston during its movement in one direction to release said air-supply-controlling valve, means for varying the area of said vent thereby regulating the movement of said piston, and an air-inlet valve to said cylinder

opened by the movement of said piston in one direction to admit compressed air into the cylinder to move the piston in the opposite direction upon the closing of the air-supply-controlling valve and adapted to be closed upon the return of the piston to its normal position.

9. In an apparatus of the character described, a despatch-tube, a source of compressed air, a valve normally open for closing the despatch-tube after the insertion of the carrier, mechanism for closing said valve, a valve controlling the supply of compressed air to the despatch-tube, means for holding said valve normally closed, mechanism operated by compressed air for opening said air-supply-controlling valve, means for holding said air-supply-controlling valve open, mechanism operated in one direction by compressed air for releasing said air-supply-controlling valve to allow it to close and operated in the opposite direction by compressed air for returning it to its normal position upon the closing of the air-supply-controlling valve, means for regulating the movement of said mechanism to release said air-supply-controlling valve, and an air-inlet valve to said cylinder opened by the movement of said piston in one direction to admit compressed air into the cylinder to move the piston in the opposite direction upon the closing of the air-supply-controlling valve.

10. In an apparatus of the character described, a despatch-tube, a source of compressed air, a valve normally open for closing the despatch-tube after the insertion of the carrier, mechanism for closing said valve, a valve controlling the supply of compressed air to the despatch-tube, means for holding said valve normally closed, mechanism operated by compressed air for opening said air-supply-controlling valve, means for holding said air-supply-controlling valve open, mechanism operated in one direction by compressed air for releasing said air-supply-controlling valve to allow it to close and operated in the opposite direction by compressed air for returning it to its normal position upon the closing of the air-supply-controlling valve, means for regulating the movement of said mechanism to release said air-supply-controlling valve, and an air-inlet valve to said cylinder opened by the movement of said piston in one direction to admit compressed air into the cylinder to move the piston in the opposite direction upon the closing of the air-supply-controlling valve and adapted to be closed upon the return of the piston to its normal position.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 25th day of April, A. D. 1901.

MARTIN BARRI.

Witnesses:

E. L. HARLOW,
A. L. MESSER.