No. 834,264. PATENTED OCT. 30, 1906.

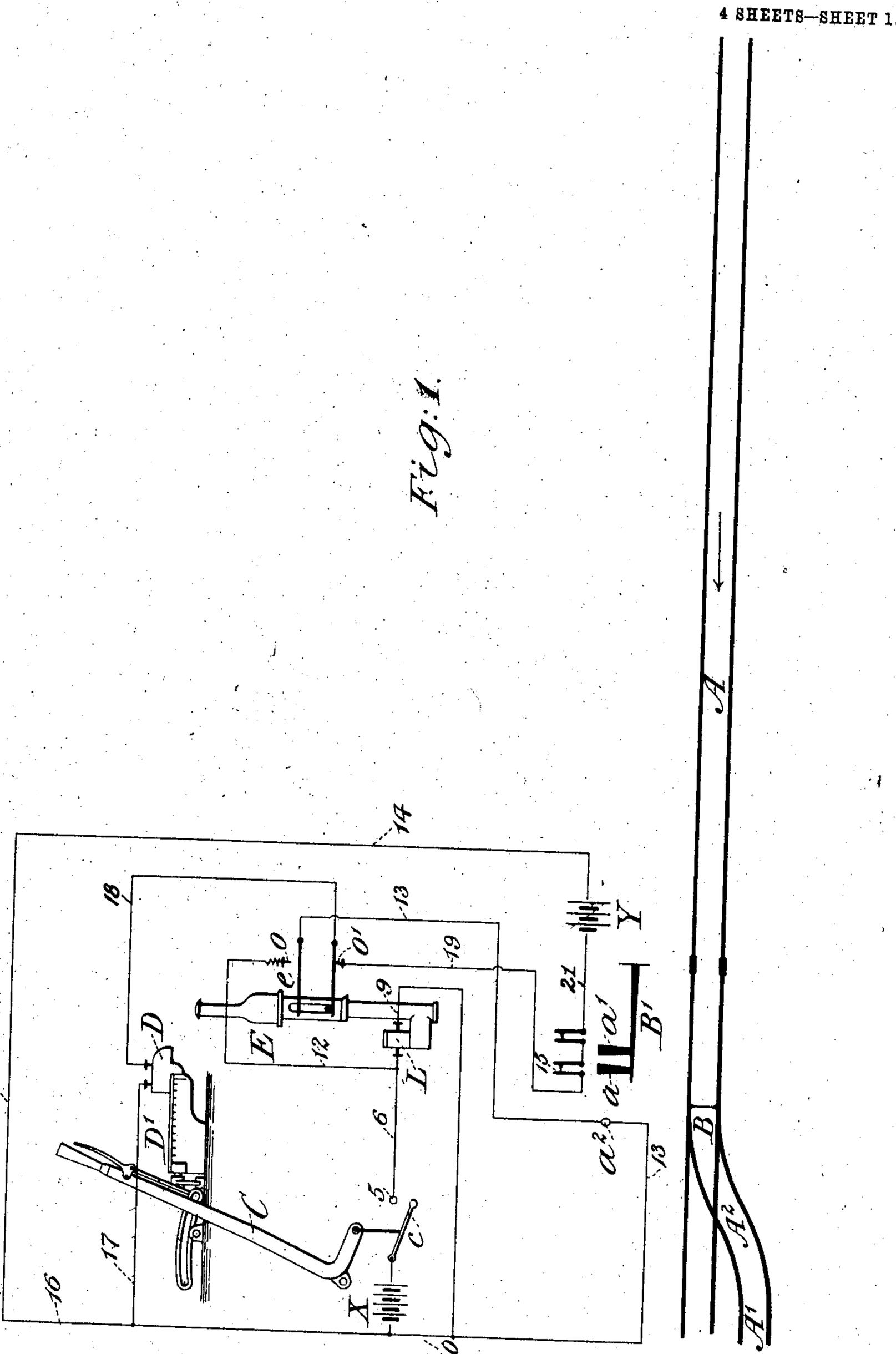
J. P. COLEMAN.

TIME RELEASING DEVICE FOR LEVERS CONTROLLING RAILWAY APPLIANCES.

APPLICATION FILED JULY 16, 1906.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
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4 SHEETS—SHEET 2.

Fig: 2.

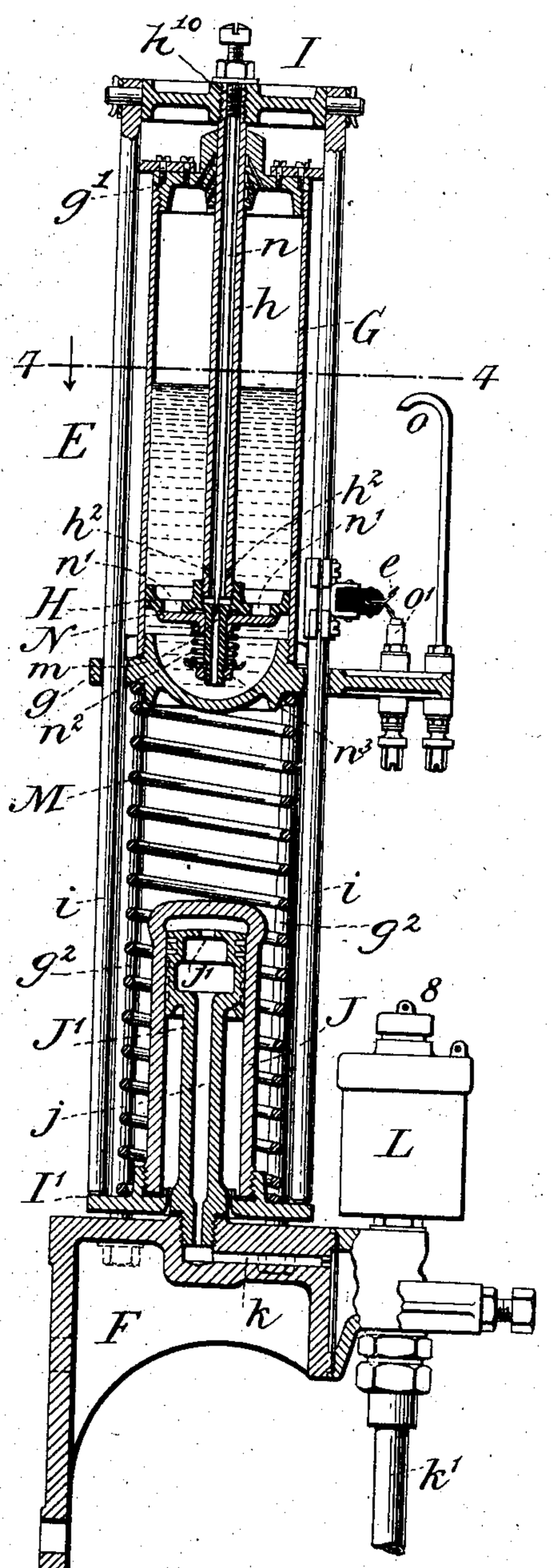
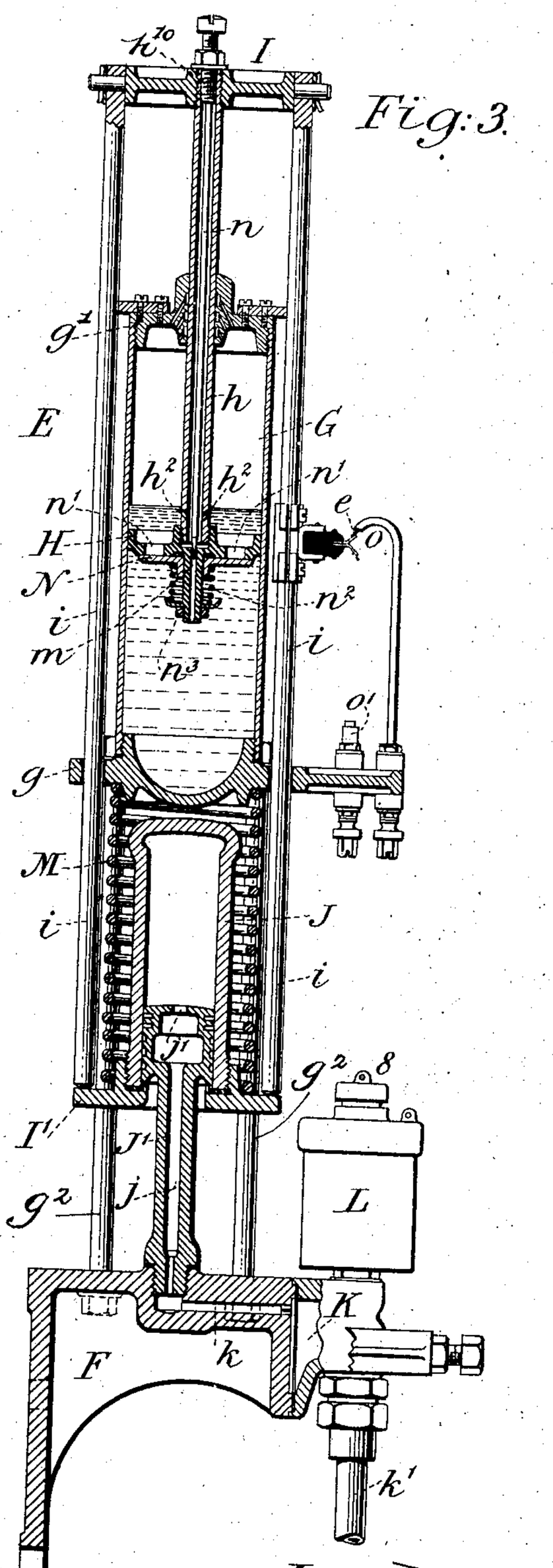


Fig: 3.



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4 SHEETS—SHEET 3.

Fig: 4.

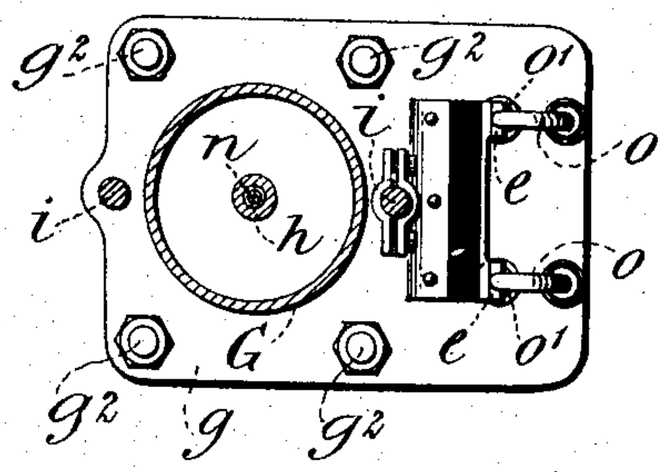

Fig: 5.

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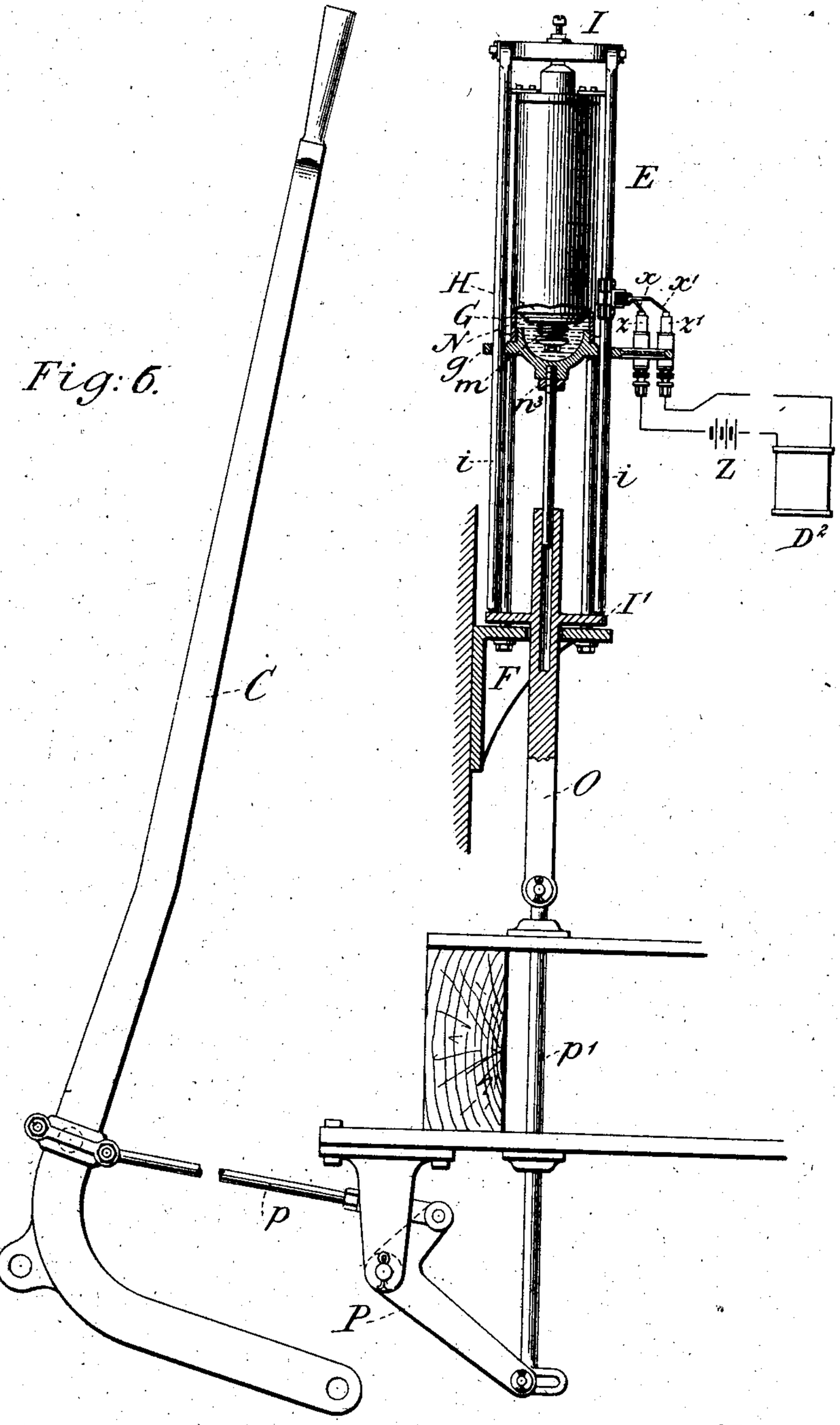
4 SHEETS—SHEET 4.

Fig: 6.



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UNITED STATES PATENT OFFICE.

JOHN PRESSLEY COLEMAN, OF EDGEWOOD PARK, PENNSYLVANIA, ASSIGNOR TO THE UNION SWITCH AND SIGNAL COMPANY, OF SWISSVALE, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

TIME RELEASING DEVICE FOR LEVERS CONTROLLING RAILWAY APPLIANCES.

No. 834,264. Specification of Letters Patent. Patented Oct. 30, 1906.

Application filed July 16, 1906. Serial No. 326,346

To all whom it may concern:

Be it known that I, JOHN PRESSLEY COLEMAN, a citizen of the United States, residing at Edgewood Park, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Time Releasing Devices for Levers Controlling Railway Appliances, of which the following is a specification.

My invention relates to a time releasing device for a lever operating or controlling the operation of a railway part or appliance. The time releasing device is designed to prevent an operator moving a lever controlling or operating a railway part or appliance until after an interval of time has elapsed. For example, after certain levers have been moved to set up a route over which a car or train is to pass the time releasing device is also operated to a position that will prevent an operator from suddenly changing the track conditions until after a period of time has elapsed. I will describe a time releasing device and a modification thereof embodying my invention and then point out the novel features in claims.

In the accompanying drawings, Figure 1 is a diagrammatic view showing an application of my invention. Fig. 2 is a vertical sectional view of a time releasing device for effecting a slow release of an electric lock of a controlling-lever, the parts being in normal position. Fig. 3 is a view similar to Fig. 2, but showing the parts in their positions after an operation of the lever to clear a signal. Fig. 4 is a horizontal sectional view taken on the line 4 4 of Fig. 2. Fig. 5 is a view, partly in section, of a modified form of time releasing device applied to a form of mechanical interlocking for an operating-lever. Fig. 6 is a sectional view showing the application of the time release device illustrated in Fig. 5 to control the release of an electric lock for an operating-lever.

Similar characters of reference designate corresponding parts in all of the figures.

Referring now to Fig. 1, A designates a portion of a railway-track; A′, a portion of a second railway-track onto which cars or trains are directed from the track A through the switch B. A two-arm railway-signal B′ is located adjacent the switch B, the upper blade *a* of which controls the passage of a car or train along the track A past the switch B, while the lower blade *a′* controls the passage of cars or trains from the track A onto the track A′ through the switch B. Usually these blades stand in their horizontal or danger position and are cleared—that is, moved to an inclined or clear position by an operator in an adjacent tower upon the approach of cars or trains of which he is advised. This is all well understood in the art.

Each blade *a a′* is provided with a suitable type of operating mechanism (one being designated a^2) the operation of which is controlled by a lever. Both mechanisms may be controlled from the same or independent levers, as is well known in the art. In the drawings I have shown one lever C as controlling the operation of the mechanism a^2. A lever is also provided for operating or controlling the operation of the switch B, which lever (not shown) is suitably interlocked by mechanical interlocking D′ with the lever C. This mechanical interlocking is so arranged that when the lever C is operated to clear the blade *a* the lever for the switch B is locked against movement, and the lever for the switch B can only be moved when the lever C is given its final movement to put it in its "normal" position and the blade *a* is in its horizontal or danger position. This is well understood in the art. With this understanding of the diagram of Fig. 1 it will be seen that after the blade *a* has been cleared to permit a car or train to proceed past the switch B along the track A it is possible for the operator to again put the blade to its danger position and then operate the switch B to direct the approaching train onto the track A′. To prevent this being done—in short, to prevent any lever controlling a railway appliance being completely moved to release other levers controlling other railway appliances until after an interval of time has elapsed, thereby giving a warning or indication to the operator of what he is doing—is an object of my invention. This is accomplished by the devices illustrated in Figs. 2, 3, 4, 5, and 6 of the drawings.

A time releasing device embodying my invention comprises a cylinder containing, preferably, a liquid, a piston, the piston and cylinder being relatively movable—that is, one part is preferably fixed, while the other is

movable—means for permitting a relative movement in one direction of the movable part and a slow relative movement of the movable part in a reverse direction. After the movable part has completed its slow movement it releases a lock, which may be either a mechanical or an electric lock. Figs. 2, 3, and 6 illustrate a circuit-controller operated by the movable part, while Fig. 5 illustrates a mechanical lock. The movable part may be automatically or manually operated, and any desired means may be employed for this purpose.

Referring now to Figs. 2, 3, and 4, F designates a bracket which is adapted to be fixed to some suitable support. Extending upwardly from the bracket F are rods g^2, to the ends of which are secured a plate g for supporting a cylinder G. As shown, the plate g forms an end for the cylinder. The cylinder contains a quantity of fluid, (preferably a liquid,) and movable within the cylinder is a piston H. The piston is designed to have a free movement in one direction through the liquid and a slow movement in a reverse direction. The free movement is permitted by reason of the opening or openings n' in the piston, with which a suitable form of valve N coacts. As shown, the valve is yieldingly held against the piston to close the openings n' by means of a spring n^2 being held against the valve N by a nut and washer n^3. Of course when the piston is moved upward the liquid in the cylinder forces the valve N away from the openings, so that the liquid may pass through the openings beneath the piston. When the piston descends, the valve N is forced and held against the piston both by the spring n^2 and liquid. The descent of the piston produced by the weight of the parts connected with it is permitted by the liquid passing through a passage m in the piston-head, past a valve n, and through openings h^2 in the piston. The openings h^2 are formed in a tube h, which serves as a stem for the piston-head, one end being secured to the piston and its other end passing through the other head g' of the cylinder and secured to a head I. The valve n is within the tube h and is adjustable through a screw-thread h^{10}, provided at its upper end. Thus the rapidity of flow of the liquid past the end of the valve n through the passage m may be regulated, thereby obtaining different degrees of speed for the descent or reverse movement of the piston.

The head I is secured to the upper ends of rods i, the lower ends of which rest upon a plate I'. The plate I' has secured to it an inverted cylinder J, within which is a piston J', which, as shown, is suitably fixed in the bracket F. The stem of the piston is formed with a passage j, which communicates at one of its ends with a passage k, suitably provided in the bracket F, and at its other end with an opening j', formed in the piston-head. Fluid-pressure from a suitable source is supplied through a connection k', the control of such pressure being obtained through an electrically-operated valve device L, which may conveniently be substantially of the construction shown and described in United States Patent No. 357,109, granted February 1, 1887, to G. Westinghouse, Jr.

M designates a helical spring which is located between the plate I' and plate g. Its function is to return the plate I' and cylinder J to their normal positions after the compressed air has been cut off and exhausted from the cylinder J.

The movement of the piston H is made to operate a circuit-controller, which, as shown, comprises a spring contact-plate e, secured in insulation, which is held by suitable means secured to a rod i, and contacts o o', suitably secured and insulated in the plate g. The arrangement of the contacts is more clearly set forth in Fig. 4.

The operation of the device illustrated in Figs. 2, 3, and 4 is as follows: When the electromagnetic valve device is energized, fluid-pressure is admitted to the cylinder J above the piston J' through the passages k j and opening j'. The cylinder J, under the influence of the fluid-pressure, moves upward, carrrying with it the plate I' and the piston H, which is moved through the rods i and head I, and compressing the spring M. The movement of the piston H in the cylinder G permits the liquid therein to flow through the openings n', past the valve N, and beneath the piston and also moves the contact-plate from the contacts o' to engage the contacts o. In other words, admitting fluid-pressure to the cylinder J causes the parts to assume the positions shown in Fig. 3. The parts will be maintained in the positions shown in Fig. 3 so long as fluid-pressure is retained in the cylinder J. When it is cut off, the spring M acts immediately to restore the cylinder J and plate I' to the position shown in Fig. 2, leaving the piston H suspended in the cylinder G by the fluid beneath the cylinder. The fluid then gradually flows past the valve n, through the passage g', and thus permits a slow descent of the piston H and parts connected with it. Thus the contact at o' will not be made until after an interval of time has elapsed. In order that the function of the device may be clearly understood, reference will be had to Fig. 1. Assume a train to be moving on the track A in the direction of the arrow. Before it can proceed past the switch B along the track A the blade a must be cleared. To do this, the operator moves the lever C to close a circuit at 5 by circuit-controller c. Current will then flow from battery X through a circuit which may be traced as follows: circuit-controller c, contact 5, wire 6, electrically-operated valve L, and wires 9 10 to battery X. The electric-

ally-operated valve will then admit air under pressure to the cylinder J, and the cylinder J, piston H, and rods *i* will be moved to the position shown in Fig. 3. During such movement the resistance offered by the fluid in the cylinder G will force the valve N from its seat, and most or all of the fluid will flow through the openings *n'* to below the piston H. The movement will also break the circuit at *o'* and close another circuit at *o*. A circuit will then be established from battery X, which may be traced as follows: circuit-controller *c*, contact 5, wires 6 12, contacts *e o*, wire 13, operating mechanism a^2 of blade *a*, and wires 13 10 to battery X. Blade *a* will then be moved to "safety" to permit the train to pass. If now the operator should desire to change the route—as, for example, by setting the switch B for track A^2—he would be unable to do so immediately. Although he could put the signal *a* to "danger," he cannot operate the switch-lever until the lever C is put in its final position, and this cannot be done until the lock D is released. The circuit for the lock D comprises a circuit-controller 15, which is closed only when the blade operating it is in its danger position, and the contacts *o'* of the time releasing device E, which contacts are only closed when the piston H is in its lowermost position. Consequently when the operator moves the lever C to break the circuit on the mechanism a^2, as well as the valve device L, the contacts *o'* will not be closed for a period of time, thus acting as an indication to the operator of what he is doing. The circuit for the lock D may be traced as follows: From battery Y it is wires 14 20 16 17, lock D, wire 18, contacts *e o'*, wire 19, circuit-controller 15, and wire 21 to battery. When this circuit is closed, the lock D will be released, thereby enabling the operator to give the final movement to the lever C to put it in its normal position, and thus through the mechanical interlocking release the lever controlling or operating the switch B.

Referring now to Fig. 5, I have illustrated a modified form of time releasing device and the application of a time releasing device embodying my invention to the locking-bar of a lever, which locking-bar is included in an interlocking machine. In this form of the invention the same arrangement of cylinder G, piston H, and valves N and *n* are employed. The principal difference is that instead of moving the piston H in one direction automatically it is manually moved, suitable mechanical connections *p*, P, *p'*, and O being employed between the lever C and piston H. The rod O rests on the end of the rod *p'* and carries with it the plate I', to which the rods *i* are fixed. The rod O is also provided with a centrally-arranged opening O', which receives a rod O^2, extending downwardly from the plate *g*, and with a recess o^4, which in the lowermost position of the rod O receives a roller d^2, carried by the end of a locking-rod *d*, comprised in the interlocking. The rod O^2 is for guiding the upward movement of the rod O when operated by the lever C. Assuming the lever C to be in its normal position when it is moved to its "reverse" position to operate a railway part or appliance, the rod O is moved upward, carrying with it the plate I, rods *i*, and piston H, just as in the form illustrated in Figs. 2 and 3. In moving upward the rod O forces the locking-rod inward against the action of a spring *d'*, thereby locking other levers comprised in the machine. When the lever is moved again to its normal position, the rod *p'* is moved away from the rod O, which, with its connected parts, is permitted to descend gradually, its time of descent being governed by the rapidity of flow of the liquid past the valve *n*. Until the rod O and parts reach its lowermost position the locking-bar is held against movement by the spring *d'*, and thus other levers in the machine are locked against movement for an interval of time.

Referring now to Fig. 6, precisely the same arrangement is shown as in Fig. 5, the difference being that the time release device is not associated with mechanical interlocking, but, on the contrary, is made to control the circuit of an electric lock D^2, which may be associated with a lever operating a railway part or appliance. *x x'* designate parts of a contact-spring which move with the piston H, and *z z'* stationary contacts. In this form of the invention the time release may be located some distance from the lever C, which operates it.

Having thus described my invention, what I claim is—

1. In a time releasing device, the combination with a cylinder containing fluid, a piston within the cylinder, means for producing a relative movement between the piston and cylinder in one direction, means for causing a slow relative movement between the piston and cylinder in the opposite direction, and a lock operated on the completion of the slow relative movement.

2. In a time releasing device, the combination with a cylinder containing a fluid, a piston within the cylinder, means for imparting a movement to the piston through the fluid in one direction, means for retarding the movement of the piston through the fluid in the opposite direction, and a lock for a lever operated upon the completion of the latter movement of the piston.

3. In a time releasing device, the combination with a cylinder containing a fluid, a piston within the cylinder, means for imparting a movement to the piston through the fluid in one direction, means for retarding the movement of the piston through the fluid in the opposite direction, comprising an adjustable

valve, and a lock for a lever operated when the piston completes its latter movement.

4. In a time releasing device, the combination with a cylinder containing a fluid, a piston within the cylinder, an automatic valve for controlling an opening in the piston, means for moving the piston in one direction to cause the fluid to flow from one side of the piston to the other through the valve-controlled opening, an adjustable valve controlling a passage in the piston through which the fluid passes upon a reverse movement of the piston, and a lock operated on the completion of the reverse movement of the piston.

5. In a time releasing device, the combination with a cylinder for containing a fluid, a piston within the cylinder, an automatically-operated valve for controlling an opening in the piston, automatically-operated means for moving the piston in one direction to cause the fluid to flow past the automatic valve from one side of the piston to the other, an adjustable valve for controlling a passage in the piston through which the fluid flows when the piston has a reverse movement, and a lock adapted to be released when the piston completes its movement in a reverse direction.

In testimony whereof I have signed my name to this specification in the presence of two subscribed witnesses.

JOHN PRESSLEY COLEMAN.

Witnesses:
GEO. E. CRUSE,
E. R. LOEHR.