

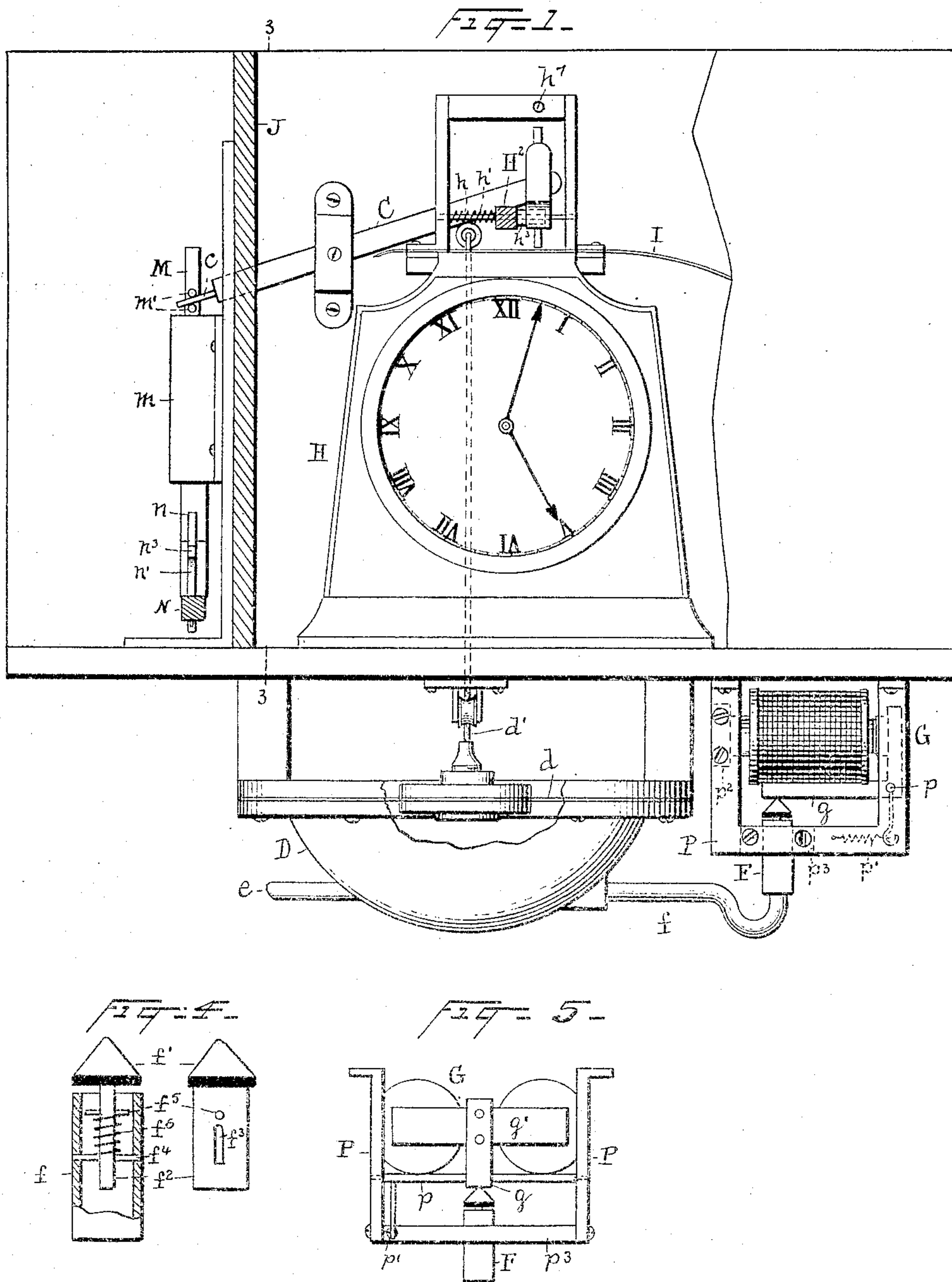
No. 781,048.

PATENTED JAN. 31, 1905.

A. E. COLGATE.
SIGNAL RECORDING MECHANISM.

APPLICATION FILED NOV. 9, 1896.

3 SHEETS—SHEET 1.



Witnesses
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 W. Blyer

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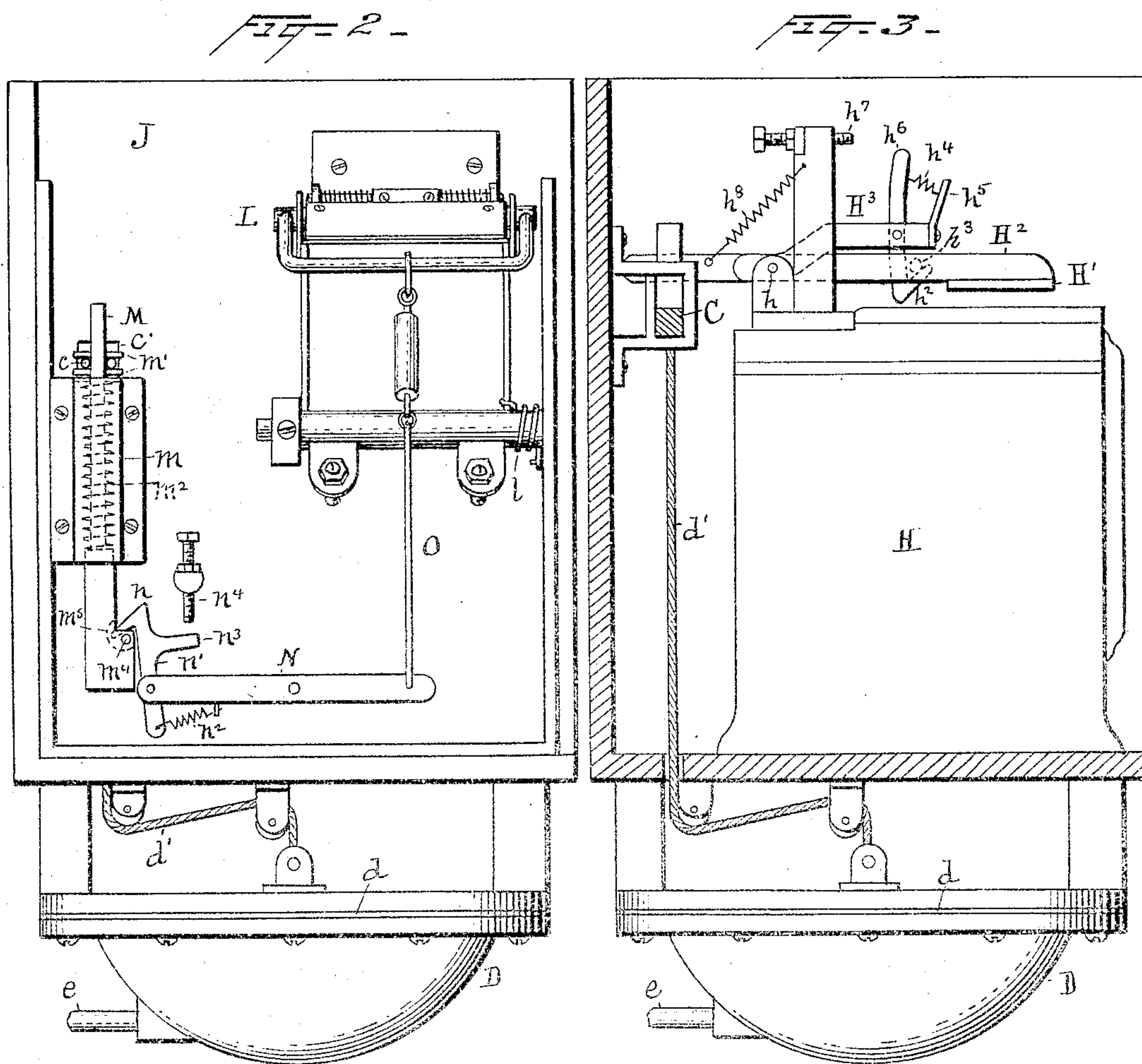
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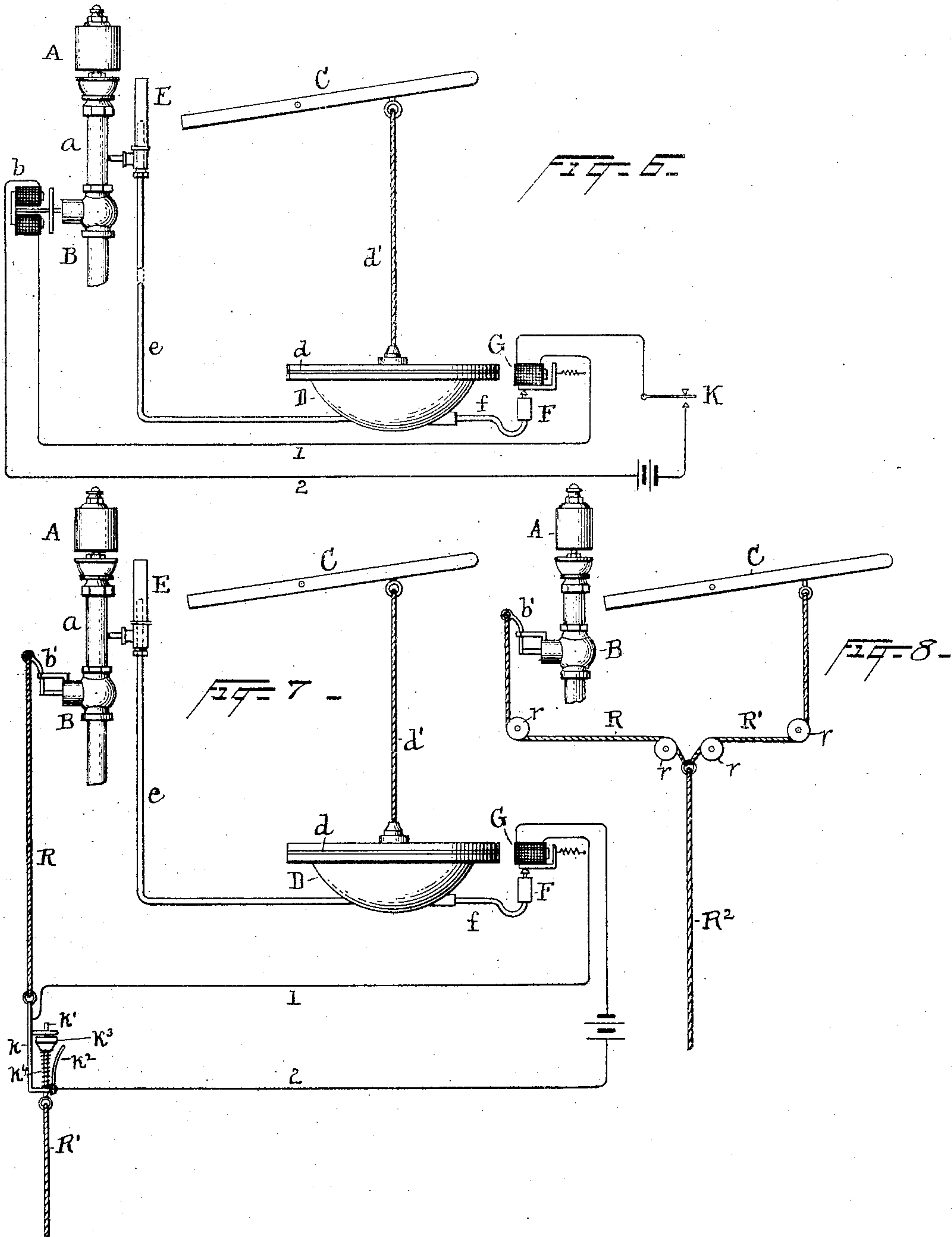
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3 SHEETS—SHEET 3.



Witnesses
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UNITED STATES PATENT OFFICE.

ARTHUR E. COLGATE, OF NEW YORK, N. Y., ASSIGNOR TO THE SIGNAL AND CONTROL COMPANY, OF BROOKLYN, NEW YORK, A CORPORATION OF WEST VIRGINIA.

SIGNAL-RECORDING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 781,048, dated January 31, 1905.

Application filed November 9, 1896. Serial No. 611,448.

To all whom it may concern:

Be it known that I, ARTHUR E. COLGATE, a citizen of the United States, residing at New York city, in the county and State of New York, have invented a certain new and useful Improvement in Signal-Recording Mechanism, of which the following is a specification.

My invention relates to mechanism for recording signals, and more particularly the blast of a whistle.

In carrying my invention into effect I employ a clock having a time-stamp mechanism, which is actuated each time the whistle gives a signal, whereby the time of giving the signal is recorded upon a paper tape or other recording-surface. I also employ a feeding mechanism for feeding forward the paper tape before or after each impression. A signal-recorder of this general type controlled by air-pressure is shown in Letters Patent No. 579,221, issued March 23, 1897, upon an earlier application filed by me, and my present invention is a modification of that signal-recorder.

The main object of this invention is to provide a recorder in which the time-stamp mechanism and the paper-feeding mechanism are operated by one actuating device and which device may be operated either manually or by means of air-pressure.

In carrying my invention into effect I preferably employ devices similar to those described in the patent above referred to.

The accompanying drawings, which illustrate my invention, show in Figure 1 a front elevation and partial section of a clock provided with a time-stamp mechanism. Fig. 2 is a side elevation of the apparatus, showing the mechanism for feeding forward the paper tape. Fig. 3 is a vertical section on the line 3 3 of Fig. 1, showing in side elevation the clock and the time-stamp mechanism. Fig. 4 is a detail view of a valve employed with the preferred form of actuator for the time-stamp and feeding mechanism; Fig. 5, a detail view of an electromagnet for controlling the valve of Fig. 4; and Figs. 6, 7, and 8 are diagrammatic views showing three different

ways for controlling and operating the signaling device and recording mechanism.

Referring now to Figs. 6, 7, and 8, A is the signaling device, which in this instance is a steam-whistle, and B is the controlling-valve. In Fig. 6 the valve is controlled by an electromagnet *b* and in Figs. 7 and 8 by the ordinary manually-operated lever *b'*. C is the actuating-lever for operating the time-stamp and paper-feeding mechanism. In Figs. 6 and 7 this lever is actuated by an air-pressure device comprising a chamber D, a diaphragm *d*, and a connection *d'* between the diaphragm and lever C, which connection is preferably a chain or cord. The diaphragm is depressed by the external air-pressure to actuate lever C upon the production of a vacuum within the chamber D. The vacuum is produced by the exhaust-pipe *e*, leading to the exhaust-nozzle E, which is connected with the steam-pipe *a* above the valve B, so that upon the opening of the valve to admit steam to the whistle steam will escape through the nozzle and draw the air from chamber D, as will be well understood. In order to obtain a quick relief of the diaphragm and insure a rapid return of the mechanism to normal position after each operation, I provide a valve F for admitting air to the chamber D after each blast of the whistle; otherwise the return of the diaphragm might be too slow to insure the proper action of the recording mechanism for rapid successive blasts of the whistle. This valve is connected to chamber D by a pipe *f* and is normally open. When the whistle is operated, the valve F must be closed, so that a vacuum can be obtained in chamber D, and for this purpose I provide an electromagnet G, which when energized closes the valve through the attraction of its armature. In Fig. 6 the magnet G is in series with the magnet *b*, and upon the closing of the circuit by means of a key K or other circuit-controller the magnets are energized, the magnet *b* causing the opening of the valve B to admit steam to the whistle and magnet G causing the closure of the valve F to prevent the entrance of air to the chamber D. The instant

the circuit is opened at key K magnets b and G become deenergized and valves B and F resume their normal positions; the latter opening to admit air to the under side of diaphragm d , whereby said diaphragm and the mechanism actuated by it resume their normal positions. In Fig. 7, where the valve B is operated manually, I insert a controller between the two lengths R and R' of the operating-rope to control the circuit to the magnet G. This controller comprises a metal frame k , to which the length R of the rope is attached, a sliding rod k' , to which the length R' of the rope is attached, and a contact-spring k^2 , which is insulated from the frame k . The circuit-wires 1 2 are connected to the frame k and spring k^2 , respectively. The rod k' carries a head k^3 , which when the rope is pulled is drawn into contact with the spring k^2 to close the circuit, and as the head reaches the limit of its movement the pull on the rope R' is imparted to rope R. Thus the valves B and F are almost simultaneously opened and closed, respectively, as in the arrangement of Fig. 6, and when the pull on the rope is relaxed the circuit to the magnet F is opened by the return movement of the rod k' by means of spring k^4 . In Fig. 8 the lever b' and the lever C are both manually operated by means of the ropes R, R', and R², the ropes R and R' passing over suitable sheaves v .

Referring now to Figs. 1, 2, and 3, H is the clock, and H' is the hammer of the time-stamp. The hammer is carried by a lever H², pivoted near its end on a spindle h . A spring h' is coiled around this spindle, Fig. 1, one end being attached to the bearing of the spindle and the other end to the lever H², so that when the lever is raised the spring is placed under tension. The lever H² is raised by means of a lever H³, which carries a pivoted hook h^2 , engaging with a pin h^3 on lever H². A spring h^4 is connected between the shank of the hook and a finger h^5 on the free end of the lever H³, the object of the spring being to cause the engagement of the hook h^2 with the pin h^3 . The rear end of lever H³ projects under the upper end of actuating-lever C, as shown in Figs. 1 and 3, and when lever C is drawn downward through the agency of diaphragm d and connection d' or the hand-pull R' of Fig. 8 lever H³ is tilted, its forward end rising and through hook h^2 raises hammer H' against the tension of spring h' . To produce an impression upon the paper tape I by a blow from the hammer, the levers H² and H³ are disengaged by the tripping of the hook h^2 . This is done by the end h^6 of the hook striking the adjustable stop h^7 . When released, the lever H² is thrown downward by means of the spring h' , causing the hammer to drive the tape I against the character-wheels (not shown) to produce an impression upon the tape. When the pull on the lever C is relaxed, the spring h^8 returns lever H³ to

its normal position, and the hook h^2 reengages the lever H². The mechanism just described is mounted directly upon the clock.

The mechanism for feeding the paper tape I is mounted upon the partition J. The feeding device, which may be of any suitable construction, (the form illustrated in my Patent No. 579,221, above referred to, being preferred,) is shown at L, Fig 2, and is operated by the lever C through a lifting-rod M, a pivoted lever N, and a connecting-rod O. The lifting-rod works within a box m , secured to the partition J, and at the upper end it is provided with two pins m' , between which extend the prongs c , projecting from the end of the lever C, the lever projecting through a hole c' in the partition. A spring m^2 within the box m is provided to force the rod M downward after being raised by the lever C. The lower end of the rod has a head which is recessed, as shown by the dotted curved line m^5 , and at which point a pin m^4 passes through the head. A hook n engages with pin m^4 , and this hook is carried by a shank n' , pivoted at the end of the lever N, and a spring n^2 is provided to throw the hook into engagement with the pin m^4 . The shank of the hook is provided with a finger n^3 , which engages with the adjustable stop n^4 to disengage the lifting-rod M and lever N after each feeding movement, which permits spring l to return the feeding device to its normal position independently of the return movements of the lifting-rod and lever C. When the lifting-rod M descends after the pull on lever C is relaxed, the head on the lower end of the rod tilts hook n , and when the rod reaches the limit of its movement spring n^2 moves the hook into engagement with pin m^4 and the feeding mechanism will then be in position for the next operation.

In the form shown in Fig. 4 the air-valve for the vacuum-chamber D comprises a cylinder f and a normally spring-opened valve f' . The valve is carried by a plate f^2 , which has a slot f^3 , through which a retaining-pin f^4 passes. Between the pin f^4 and a pin f^5 on plate f^2 is seated a spring f^6 , which opens the valve. The valve is controlled by the L-shaped lever g , which carries the armature g' of the magnet G. This lever is pivoted between the U-shaped plates I² by an arbor p , and a spring p' is connected with the arbor to raise the lever g when the magnet is demagnetized. The magnet is carried between plates P by a plate p^2 , and the valve F is carried by a plate p^3 .

What I claim is—

1. The combination with a whistle and its valve, of a blast-recorder comprising a time-stamp mechanism, a paper-feeding mechanism, a lever for operating both the time-stamp and the paper-feeding mechanisms, a pneumatically-operated device for operating said lever, means for producing a vacuum in the

chamber of said device upon the opening of the whistle-valve and means for admitting air into the chamber upon the closing of the whistle-valve, substantially as set forth.

5 2. The combination with a whistle and its valve, of a blast-recorder comprising a time-stamp mechanism, a paper-feeding mechanism, a lever for operating both the time-stamp and the paper-feeding mechanisms, an air-chamber having a diaphragm connected with
10 said lever, and means for producing a vacuum in said chamber upon the opening of the whistle-valve, substantially as set forth.

15 3. The combination with a whistle and its valve, of a blast-recorder comprising a time-stamp mechanism, a paper-feeding mechanism, a single actuating device for operating both the time-stamp and the paper-feeding mechanism, an air-chamber having a movable
20 device connected with said actuating device, an exhaust-nozzle connected with said chamber, and a connection between said nozzle and the whistle-pipe whereby the escape of pressure through said nozzle will exhaust the air
25 from said chamber, substantially as set forth.

4. The combination with a whistle and its valve, of a blast-recorder comprising a time-stamp mechanism, a paper-feeding mechanism, a single actuating device for operating
30 both the time-stamp and the paper-feeding mechanism, an air-chamber having a movable device connected with said actuating device, an exhaust-nozzle connected with said chamber, a connection between said nozzle and the
35 whistle-pipe whereby escape of pressure through said nozzle will exhaust the air from said chamber, and a valve for controlling the admission of air to said chamber, substantially as set forth.

40 5. The combination with a whistle and its valve, of a blast-recorder comprising a time-stamp mechanism, a paper-feeding mechanism, a single actuating device for operating both the time-stamp and the paper-feeding
45 mechanism, an air-chamber having a movable device connected with said actuating device, an exhaust-nozzle connected with said chamber, a connection between said nozzle and the whistle-pipe whereby the escape of pressure
50 through said nozzle will exhaust the air from said chamber, a valve for controlling the admission of air to said chamber, separate means for actuating said last-named valve and the whistle-valve, and a single device for control-
55 ling said valve-operators, substantially as set forth.

6. The combination with a whistle, of a blast-recorder comprising a time-stamp mechanism, a paper-feeding mechanism, a single
60 actuating device for operating both the time-stamp and the paper-feeding mechanism, an electrically-controlled valve for controlling the passage of pressure to the whistle, and means actuated by air-pressure for operating

the single actuating device upon the produc- 65
tion of a vacuum through the escape of pressure with each blast of the whistle, substantially as set forth.

7. The combination with a whistle, of a blast-recorder comprising a time-stamp mech- 70
anism, a paper-feeding mechanism, means for operating the time-stamp and the paper-feeding mechanism, an air-chamber having a movable device connected with said actuating
means, an exhaust-nozzle connected with said 75
chamber, a connection between said nozzle and the whistle-pipe, whereby the escape of pressure through said nozzle will exhaust the air from said chamber, an electrically-controlled valve for controlling the flow of pres- 80
sure to the whistle and said nozzle, an electrically-controlled valve for controlling the entrance of air to the air-chamber, and a circuit-controller for controlling the electrically-operated valves, substantially as set forth. 85

8. The combination with a whistle and its valve, of a blast-recorder comprising a time-stamp having a hammer for producing an impression on a recording-surface, a lever for
raising said hammer, an actuating-lever for 90
operating the first-named lever, a tripping device for disengaging the first-named lever from the hammer when elevated, a spring for throwing said hammer toward the character-
wheels of the time-stamp, means actuated by 95
air-pressure for operating said levers, said means operating upon the production of a vacuum, and a chamber having a pipe leading to an exhaust-nozzle on the whistle-pipe, sub-
stantially as set forth. 100

9. The combination with a whistle and its valve, of a blast-recorder comprising a time-stamp having a hammer for producing an impression on a recording-surface, a feeding
mechanism for feeding said recording-surface, 105
a lever for operating said feeding mechanism, a lifting-rod through which said lever is operated, a tripping device for disengaging said rod from said lever, means for returning the
feeding device to its normal position, means 110
actuated by air-pressure for operating said levers, said means operating upon the production of a vacuum, and a chamber having a pipe leading to an exhaust-nozzle on the whistle-pipe, substantially as set forth. 115

10. The combination with a whistle and its valve, of a blast-recorder comprising a time-stamp having a hammer for producing an impression on a recording-surface, a lever for
raising said hammer, a feeding mechanism for 120
feeding the recording-surface, a lever for operating said feeding mechanism, a lifting-rod through which said lever is operated, an actuating-lever for operating the lever which
raises the hammer and for elevating the lift- 125
ing-rod of the paper-feeding mechanism, a tripping device for disengaging the hammer from its elevating-lever, a spring for driving

said hammer against the recording-surface, a tripping device for disengaging the lifting-rod from the lever of the feeding mechanism, and a spring for returning the feeding mechanism to its normal position, means actuated
5 by air-pressure for operating said actuating-lever, said means operating upon the production of a vacuum, and a chamber having a

pipe leading to an exhaust-nozzle on the whistle-pipe, substantially as set forth. 10

This specification signed and witnessed this 6th day of November, 1896.

ARTHUR E. COLGATE.

Witnesses:

W. PELZER,

EUGENE CONRAN.