

No. 746,267.

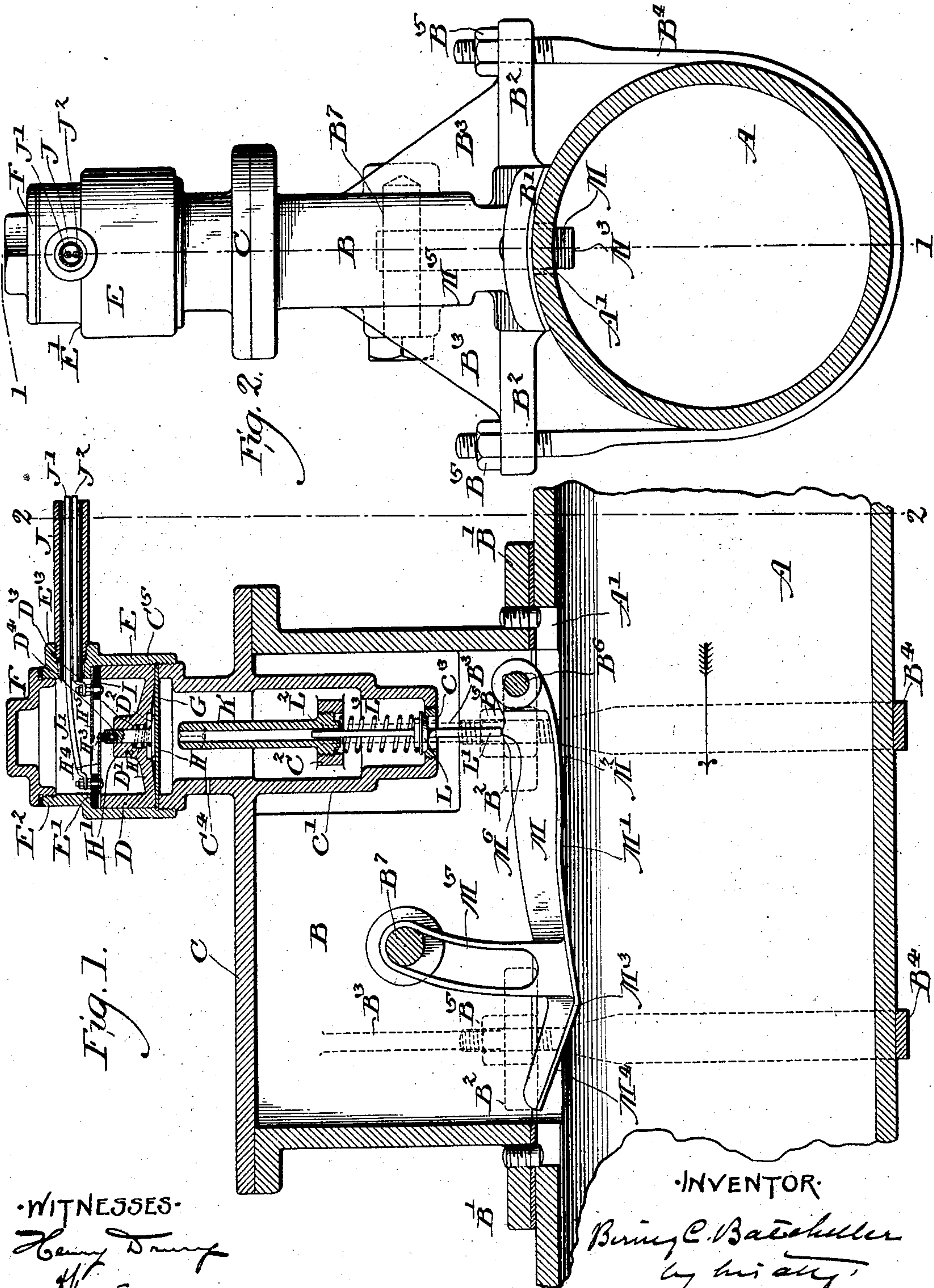
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B. C. BATCHELLER.

PNEUMATIC DESPATCH APPARATUS.

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NO MODEL.



WITNESSES.

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# UNITED STATES PATENT OFFICE.

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## PNEUMATIC-DESPATCH APPARATUS.

SPECIFICATION forming part of Letters Patent No. 746,267, dated December 8, 1903.

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*To all whom it may concern:*

Be it known that I, BIRNEY C. BATCHELLER, a citizen of the United States of America, residing in the city and county of Philadelphia, in the State of Pennsylvania, have invented a certain new and useful Improvement in Pneumatic-Despatch Apparatus, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My invention relates to pneumatic-despatch apparatus, and particularly to the construction of the fingers commonly used in pneumatic-despatch systems which are arranged in the transmission-tubes so as to be moved by a passing carrier and to impart movement to other features of the system, my invention also relating to the means directly acted upon by the fingers and through which the movements of such fingers are made effective.

The object of my invention is primarily to avoid the destructive effect incident in the usual construction to the impact of the carrier upon the finger and, in the second place, to provide for a more gradual and permanent effect from the movement of the finger than has heretofore been convenient and practicable; and with these objects in view my invention consists, first, in so constructing the finger that a carrier moving with substantially uniform speed will move the finger in gradual and substantially uniform acceleration, the first movement of the finger being very gradual and its speed of movement increasing gradually to a maximum. Preferably also I so construct the finger that it will maintain contact with a receding carrier, and thus be returned gradually to its normal position.

My invention further consists in arranging, in combination with the finger, an air-chamber having a movable wall, preferably a diaphragm, and means for gradually exhausting compressed air contained therein, causing the movement of the finger to admit compressed air to such chamber and combining with the movable wall or diaphragm means for opening and closing the electric circuit, so that the admission of the compressed air to the chamber will either open or close the circuit and hold it in this condition until the air is gradually exhausted from the chamber.

Thus the maintenance of the desired condition is made independent of the movement of the finger after it has once acted upon the admission-valve.

Reference being now had to the drawings, in which my invention is illustrated, Figure 1 is a sectional elevation through a pneumatic tube and devices embodying my invention connected therewith, the section being taken as on the line 1 1 of Fig. 2; and Fig. 2 is an end elevation of the same, taken as on the section-line 2 2 of Fig. 1.

A indicates the pneumatic tube, having, as shown, a longitudinal slotted opening A' in its top.

B is a finger-chamber extending above the slotted opening A' and having flanges B', which fit on the pipe and against intermediate packing around the slotted opening. As shown, the chamber has a removable cover, (indicated at C.) The casting in which the chamber B is formed is also provided with outwardly-extending flanges B<sup>2</sup>, connected, as shown, to the upright walls of the chamber by webs B<sup>3</sup>, and through the flanges B<sup>2</sup> the casting is secured to the pipe A by straps B<sup>4</sup>, B<sup>5</sup> indicating bolts by which the straps are secured to the flanges B<sup>2</sup>.

B<sup>6</sup> is a pivot upon which the finger turns, and B a stop-pin which supports the finger in its normal position. C, as already stated, is the cover for the finger-chamber B, and it is formed with a chamber C', which projects down into the finger-chamber and also extends above the top of the plate C, as indicated. This chamber is formed with a web C<sup>2</sup>, extending across it and having an internally-threaded perforation, which has also an opening C<sup>3</sup>, by which it is connected through the chamber B with the tube A. It has also a restricted opening C<sup>4</sup> for the escape of compressed air and an open-ended tube, (indicated at C<sup>5</sup>,) upon which rests a flexible diaphragm G, to the upper side of which is attached a plate H, having a rod H' projecting from it and supporting at its upper end a non-contacting button H<sup>3</sup>, by which it is connected with a flexible circuit-terminal, (indicated at H<sup>4</sup>.) A spring H<sup>2</sup> normally presses the diaphragm down toward the chamber C', while in its upper position it presses up the terminal H<sup>4</sup> until it makes contact with the terminal H<sup>5</sup>.



The diaphragm is held in position by the head D, the lower face of which is made cone-shaped, as shown at D', recessed at D<sup>2</sup> to permit the plate H to move freely up into it and perforated at D<sup>3</sup> to give free passage to the rod H'. The head D is clamped down by means of the clamping-ring E, which is threaded, so as to screw down upon the externally-threaded upper end of chamber C', and provided with a shoulder E', which extends over the top of the head D, as shown. The upper end of the clamping-ring (indicated at E<sup>2</sup>) is internally threaded and is closed by an externally-threaded head, (indicated at F.) The ring E is provided with an opening, (indicated at E<sup>3</sup>,) into which screws a pipe J, through which extend the wires of an electric circuit, (indicated at J' and J<sup>2</sup>,) said wires connecting, respectively, with the terminal H<sup>4</sup> and the terminal H<sup>5</sup>.

K indicates a guide-tube screwing into the partition C<sup>2</sup> and serving as a guide for the rod L<sup>2</sup>, extending from the upper side of a valve L, which by means of a spring L<sup>3</sup> is pressed down, so as to close the opening C<sup>3</sup>, the valve having a downwardly-extending rod L', as shown.

M is the finger pivoted at B<sup>6</sup> and having an upwardly-extending slotted arm m<sup>5</sup>, through which passes the stop-rod B<sup>7</sup>. The shape of the finger M is such that in its normal position in which it extends into the tube A, its carrier-contacting face M' is given a shape, such as is shown, which as the finger is acted upon by a uniformly-moving carrier will cause it to move upward with gradual and substantially uniform acceleration, the carrier first coming in contact with this face at M<sup>2</sup> and leaving contact with this accelerating face at M<sup>3</sup>, beyond which point I preferably provide the finger with the contacting face M<sup>4</sup>, which as the carrier recedes from the point M<sup>3</sup> will maintain contact with it, allowing the finger to return to its normal position without shock or blow. As shown, a portion of the finger M (indicated at M<sup>6</sup>) lies directly beneath and in close relationship to the rod L', so that as the finger rises the rod is pushed up and the valve L opened.

The operation of the device as illustrated is as follows: A carrier moving in the direction of the arrow shown in Fig. 1 comes in contact with the finger M at M<sup>2</sup>, raising it first very gradually and then with constant and uniform acceleration as it approaches the point M<sup>3</sup>. In this way all destructive shock either on the finger or carrier is avoided and the receding carrier maintaining contact with the prolongation M<sup>4</sup> permits the finger to return to normal position also without shock. As the finger is raised it lifts the valve L from its seat, permitting air under pressure to enter the chamber C', the result of which is that the movable wall or diaphragm (indicated at H) is moved upward by the pressure in the chamber and the circuit-contacts H<sup>4</sup> and H<sup>5</sup> brought together, so as to close the cir-

cuit. After valve L closes the pressure in the chamber C' is maintained until the compressed air therein has an opportunity to escape through the restricted orifice C<sup>4</sup>, which may be regulated to any desired degree. Consequently the circuit is maintained in closed condition for any desired time after the finger is acted upon, this being highly desirable in many connections such as are acted upon by fingers in pneumatic-despatch apparatus.

It will be understood that the apparatus as shown and above described by me is given simply as what I believe to be the best and most convenient embodiment of my invention and that I do not wish to be understood as in any way limiting my claims on the specific constructions illustrated except where they are made specific and special elements of the claims.

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

1. In a pneumatic-despatch system, a pivoted finger normally extending into a pneumatic tube and having its carrier-contacting face M' formed as described to impart to the finger under the pressure of a carrier a substantially uniform acceleration of movement.

2. In a pneumatic-despatch system, a pivoted finger normally extending into a pneumatic tube and having its carrier-contacting face M' formed as described to impart to the finger under the pressure of a carrier a substantially uniform acceleration of movement and its face M<sup>4</sup> formed as described to restore the finger to normal position without shock as the carrier recedes from it.

3. In a pneumatic-despatch system a chamber C' having a movable wall, a connection with a source of air under pressure and means for exhausting compressed air contained therein, in combination with an electric circuit, means for opening and closing said circuit controlled by the movable wall of the chamber C', a normally closed valve for opening and closing the connection of chamber C' with the source of air under pressure, a pneumatic tube, and a movable finger normally projecting into said tube and arranged when moved by a passing carrier to open the valve aforesaid.

4. In a pneumatic-despatch system a chamber C' having a diaphragm H constituting a movable wall, a connection with a source of air under pressure and means for exhausting compressed air contained therein in combination with an electric circuit, means for opening and closing said circuit controlled by the movable diaphragm of the chamber C', a normally closed valve for opening and closing the connection of chamber C' with the source of air under pressure, a pneumatic tube, and a movable finger normally projecting into said tube and arranged when moved by a passing carrier to open the valve aforesaid.

5. In a pneumatic-despatch system, a chamber C' having a movable wall, a connection



with a source of air under pressure and a restricted orifice C<sup>4</sup> for exhausting compressed air contained therein, in combination with an electric circuit, means for opening and closing said circuit controlled by the movable wall of the chamber C', a normally closed valve for opening and closing the connection of chamber C' with the source of air under pressure, a pneumatic tube, and a movable finger normally projecting into said tube and arranged when moved by a passing carrier to open the valve aforesaid.

6. In a pneumatic-despatch system, a pneu-

matic tube and an electric circuit having a device for opening and closing it, in combination with a movable finger normally projecting into the tube, means actuated by the movement of said finger for actuating the circuit opening and closing device in one direction and means independent of said fingers and including a time escapement for moving said device in the other direction.

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Witnesses:

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