

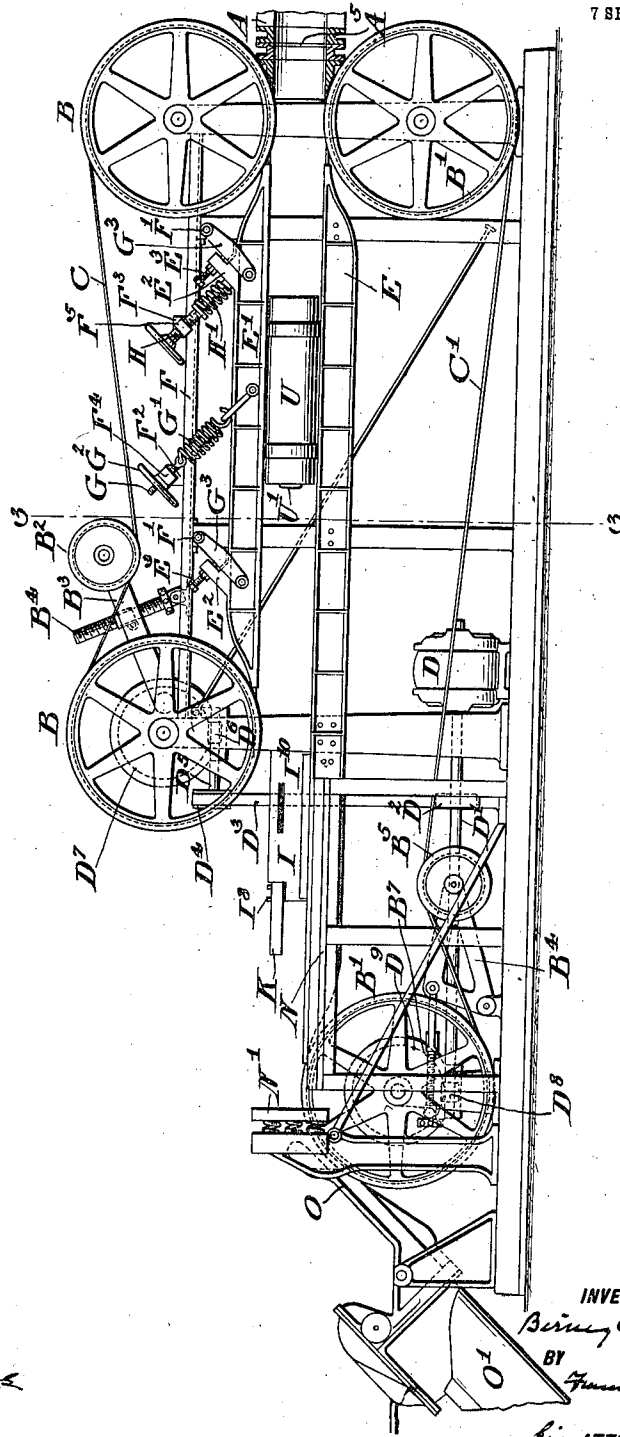
B. C. BATCHELLER.  
PNEUMATIC TUBE SYSTEM.  
APPLICATION FILED MAY 1, 1905.

961,999.

Patented June 21, 1910.

7 SHEETS—SHEET 1.

FIG. 1.



WITNESSES:

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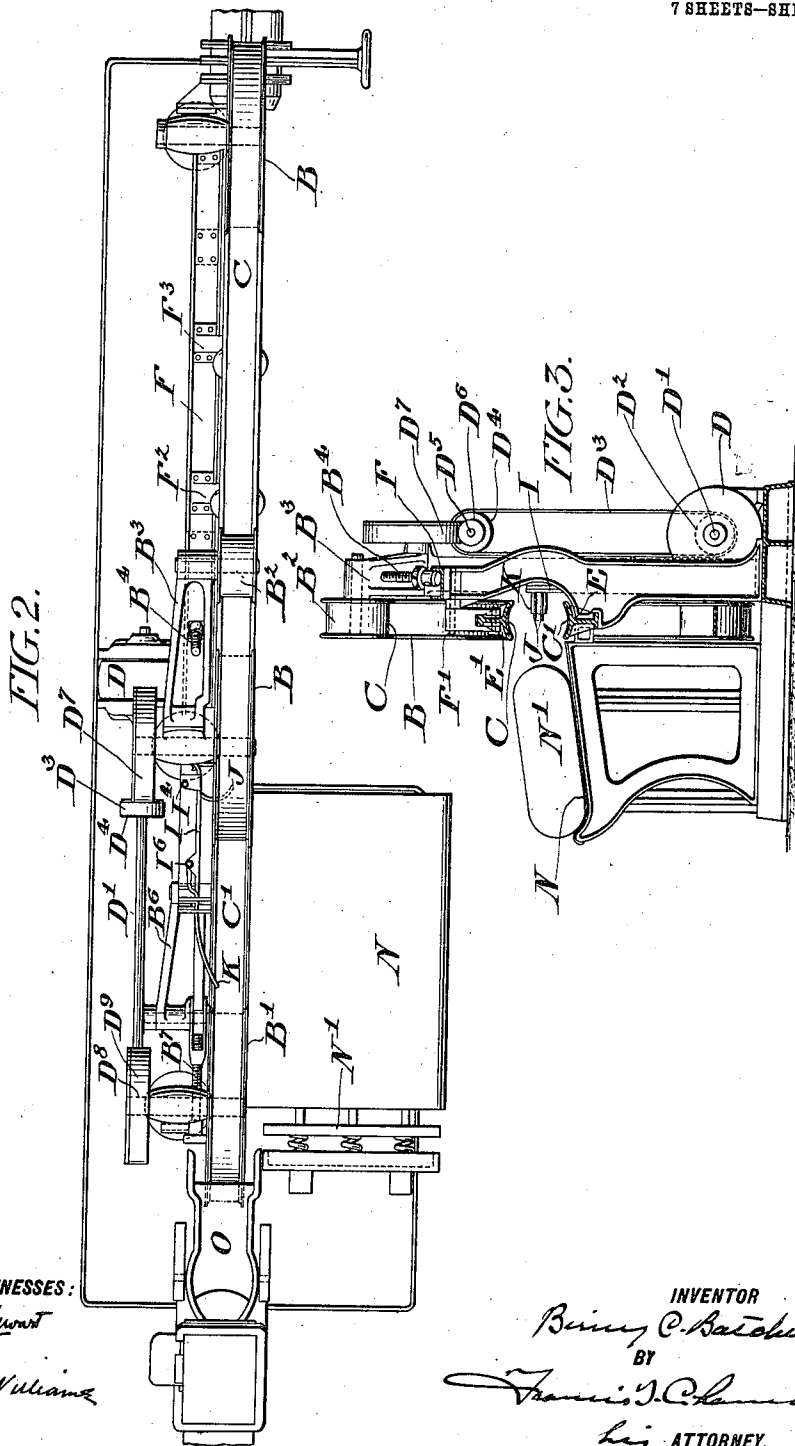
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961,999.

Patented June 21, 1910.

7 SHEETS—SHEET 2.



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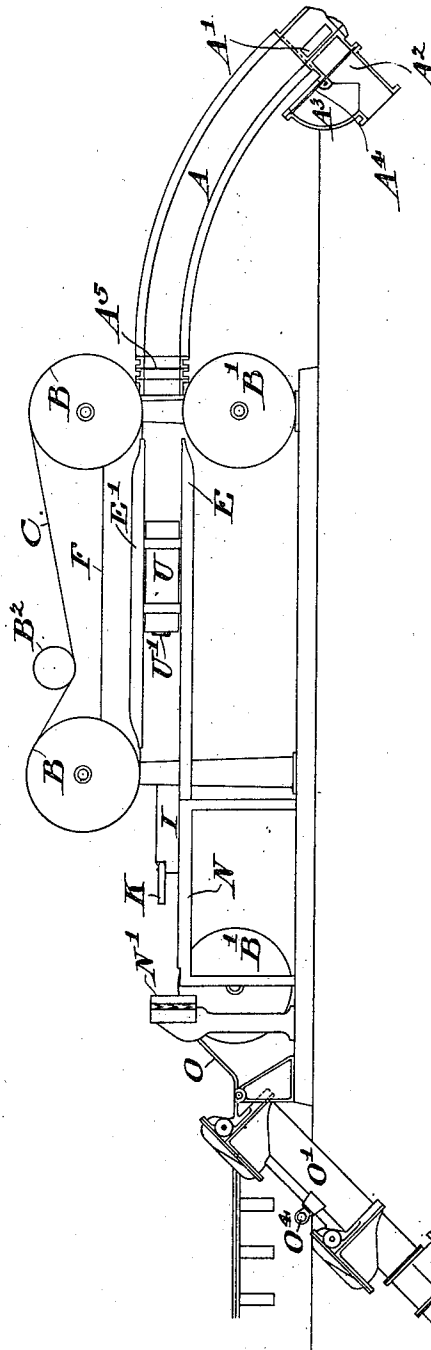
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7 SHEETS—SHEET 3.

FIG. 4.



WITNESSES:

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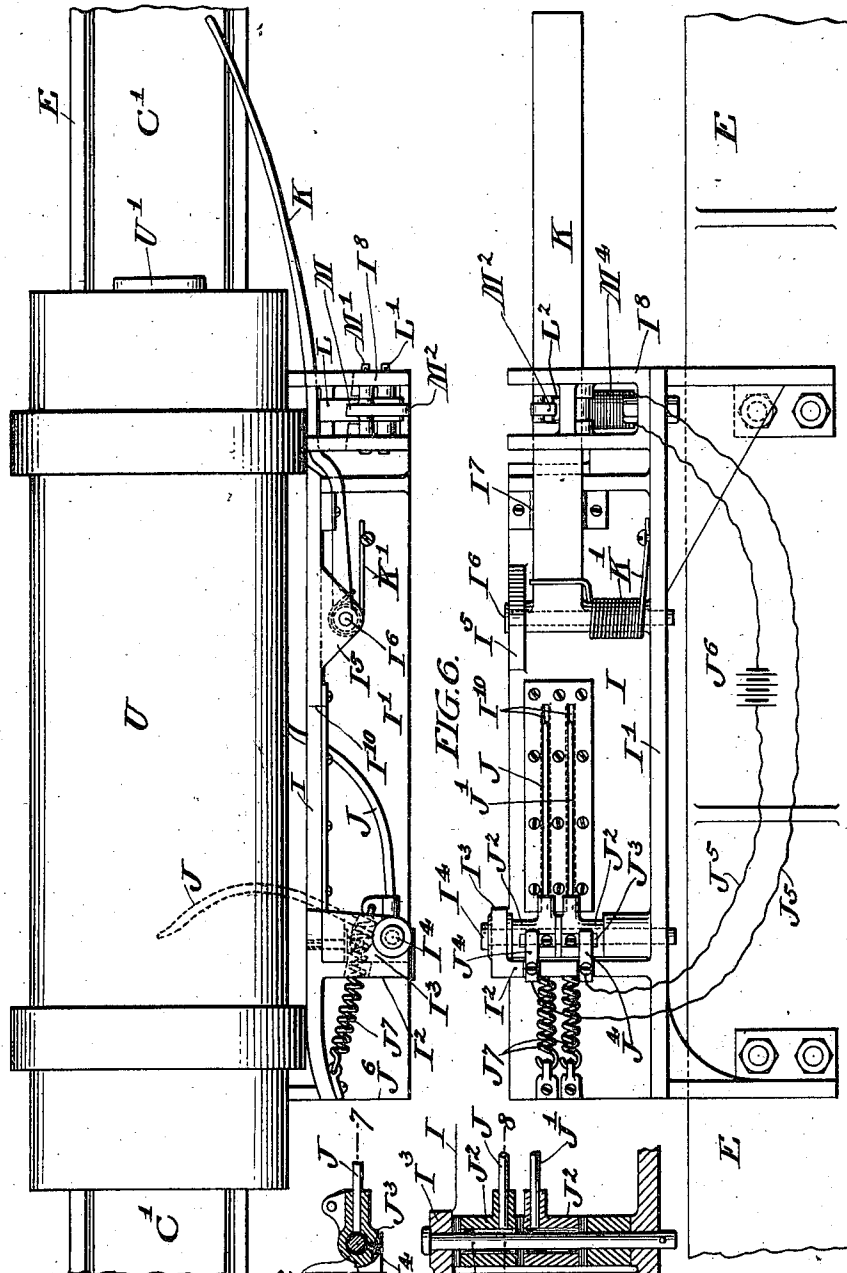
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961,999.

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7 SHEETS—SHEET 4.

FIG. 5.



WITNESSES:

*H. K. Hart*

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FIG. 8.

FIG. 7.

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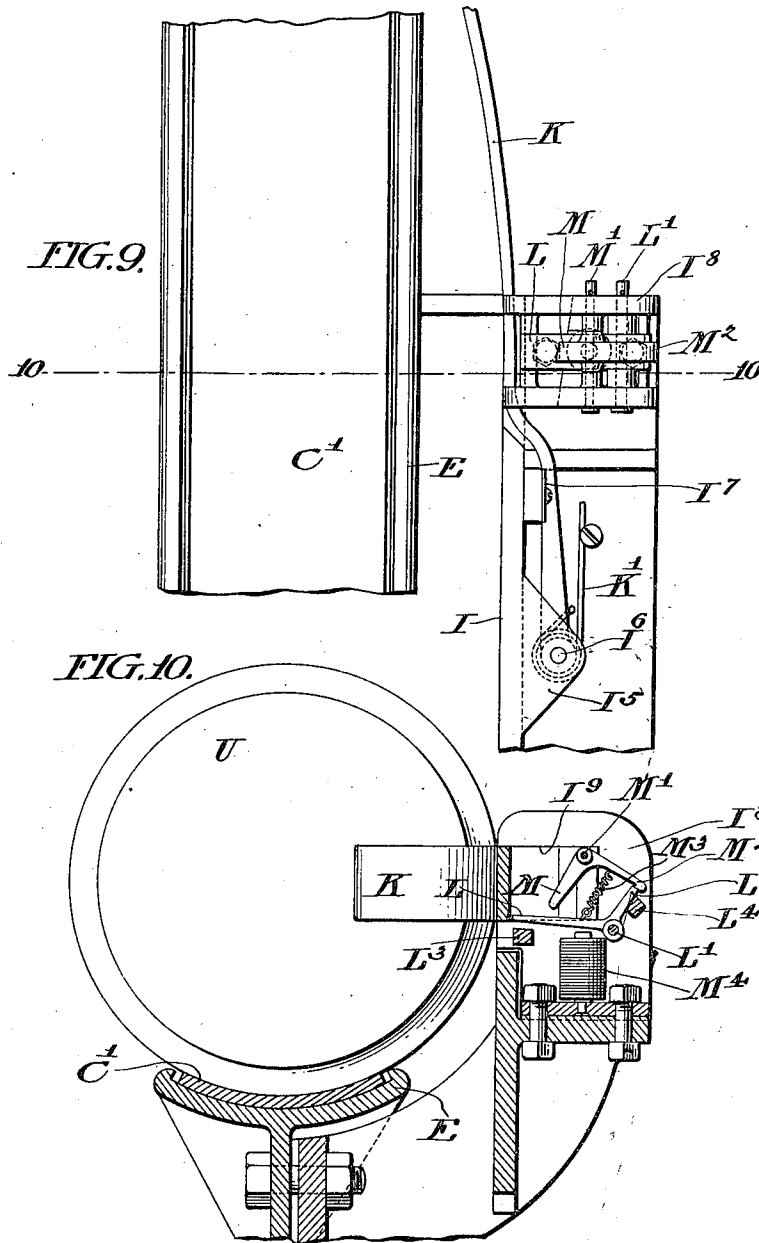
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PNEUMATIC TUBE SYSTEM.  
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7 SHEETS—SHEET 5.



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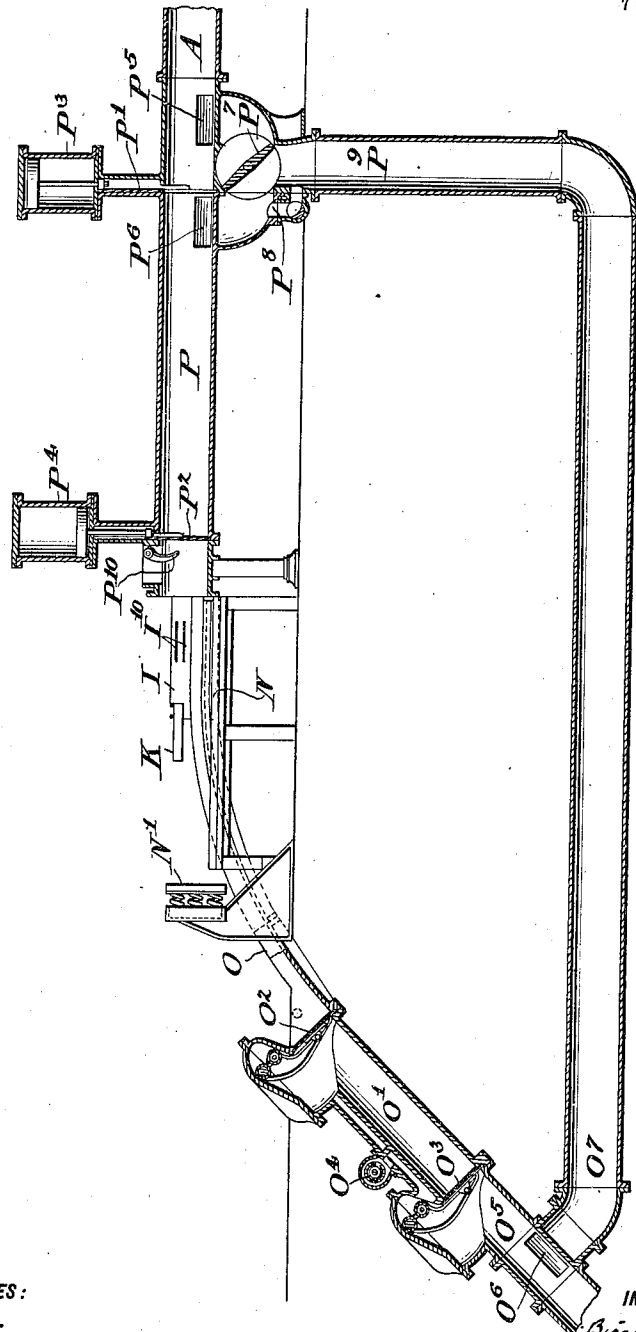
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PNEUMATIC TUBE SYSTEM.  
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961,999.

Patented June 21, 1910.

7 SHEETS—SHEET 6

FIG. 11.



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APPLICATION FILED MAY 1, 1905.

961,999.

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7 SHEETS—SHEET 7.

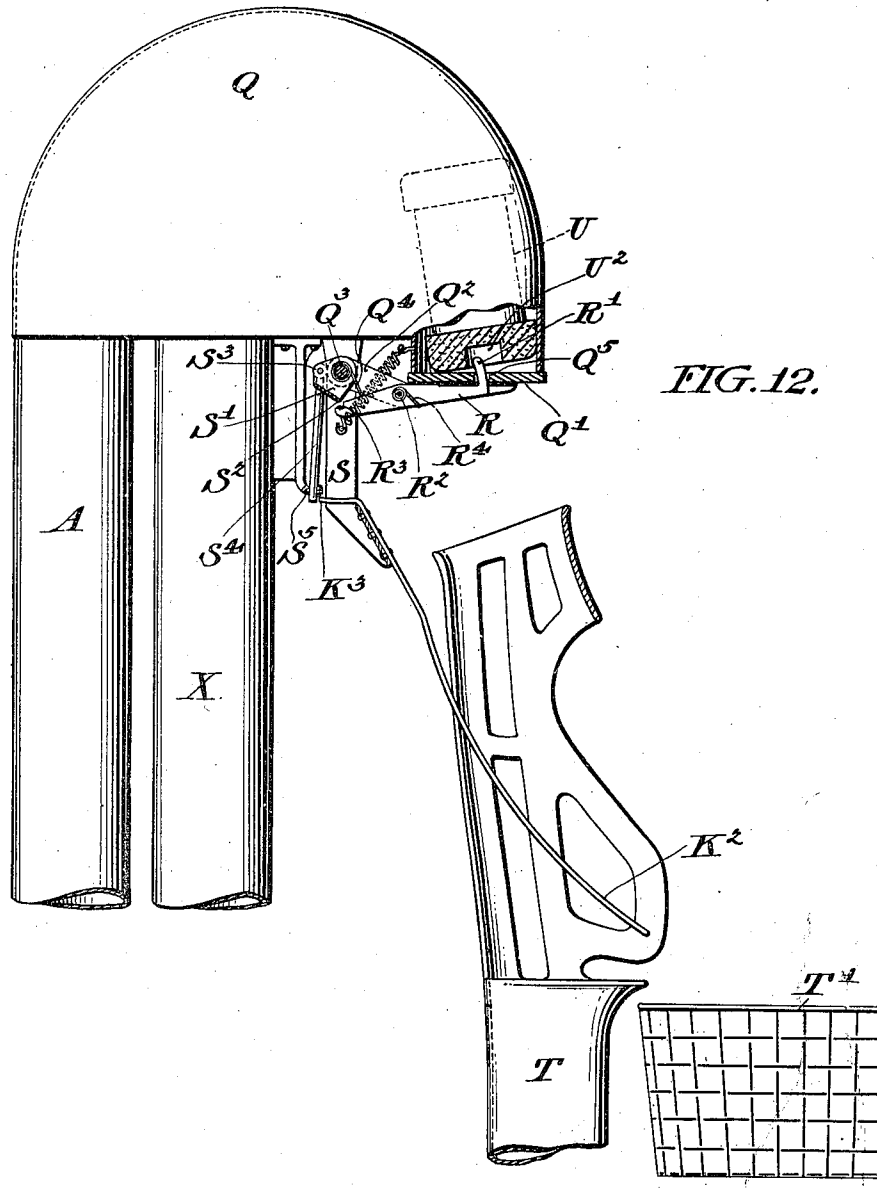


FIG. 12.

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# UNITED STATES PATENT OFFICE.

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## PNEUMATIC-TUBE SYSTEM.

961,999.

Specification of Letters Patent. Patented June 21, 1910.

Application filed May 1, 1905. Serial No. 258,291.

### *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-Tube Systems, 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 tube systems of the kind in which carriers issue from the tube at an intermediate station and are either held there or transmitted to a second tube for transmission to a further station.

The object of my invention is to provide means at such intermediate station by which the carriers are either automatically delivered to the outgoing tube or shunted off at the intermediate station in accordance with selective devices on the carriers, and in connection therewith to provide means by which the impetus of the incoming carriers is checked before they come in contact with the selective mechanism and switch and before they are injected into the outgoing tube.

The nature of my improvements will be best understood as described in connection with the drawings in which—

Figure 1, is a side elevation of my intermediate station appliances in what I believe to be their best and most effective forms. Fig. 2 is a plan view of the same mechanism. Fig. 3, an end view. Fig. 4, a view indicating the same general construction shown in Fig. 1, but drawn on a smaller scale so as to show additional features of the system. Fig. 5, is a plan view on an enlarged scale of the selective and switch mechanism. Fig. 6, a side elevation of the same devices. Fig. 7, a detailed sectional view on the line 7—7 of Fig. 8. Fig. 8, a cross-section on the line 8—8, of Fig. 7. Fig. 9, an enlarged detail of a partial mechanism shown in Fig. 5. Fig. 10, a cross-sectional view on the line 10—10 of Fig. 9, with the carrier shown in place. Fig. 11, is a side elevation of a modified intermediate station appliance also embodying my invention, and Fig. 12, is a side elevation of still another modification of the intermediate station appliances.

A, indicates the incoming tube, near the

end of which is situated a gate A<sup>5</sup>, by which the passage of air can be cut off when desired and which incoming tube, as shown in Fig. 4, has attached to it lateral pipe A<sup>2</sup>, communicating with the tube through ports A<sup>1</sup>, and having an open elbow A<sup>3</sup>, a gate A<sup>4</sup>, being provided so that the pipe A<sup>2</sup>, which is connected with the suction end of a compressor can either draw its supply entirely from the tube A or from the open elbow A<sup>3</sup>, or partly through one opening and partly through the other in accordance with the adjustment of the gate A<sup>4</sup>. This appliance is similar to that described in my former patent of September 12th, 1899, Number 632,690.

Still referring to the main construction of Figs. 1 and 2 etc., B, B, are belt wheels arranged above and in front of the mouth of the tube A, and B', B', similar belt wheels arranged above and below the mouth of the tube. B<sup>2</sup>, indicates a belt tightener for the upper belt wheels consisting of a pulley fastened on a rock lever B<sup>3</sup>, which is adjusted by means of a screw B<sup>4</sup>, a similar belt tightener B<sup>5</sup>, for the lower belt is fastened on a rock lever B<sup>6</sup>, and adjusted by a screw B<sup>7</sup>. C, is the upper and C', the lower belt. D, is a motor driving a shaft D', which as shown is provided with a belt wheel D<sup>2</sup>, which through a belt D<sup>3</sup> drives a pulley D<sup>4</sup>, on a shaft D<sup>5</sup>, said shaft having a worm D<sup>6</sup>, which drives a worm wheel D<sup>7</sup>, attached to the shaft of one of the pulleys B. The shaft B', has also attached to it the worm D<sup>8</sup>, which engages and drives the worm wheel D<sup>9</sup>, attached to the shaft of one of the pulleys D'. E, is a frame or guideway, preferably grooved, and which supports in its groove the upper side of the belt C'. E', is a pressure bar on the under face of which runs the lower face of the belt C. This bar E', is connected with a longitudinal frame member F, by parallel motion levers G<sup>3</sup>, G<sup>3</sup>, and is provided with lugs E<sup>2</sup>, E<sup>2</sup>, which support set screws E<sup>3</sup>, acting against the links G<sup>3</sup>, G<sup>3</sup>, as shown and by which the bar E', is prevented from moving downward beyond a determined point. The bar F, is provided with a laterally extending lug F<sup>2</sup>, supporting a spindle block F<sup>4</sup>, through which passes a screw G, to which is attached the tension spring G', connected with the bar E', a threaded wheel G<sup>2</sup>, being

provided to adjust the tension. Another lateral lug  $F^3$ , of the bar  $F$ , supports a threaded swivel block  $F^5$ , in which works a screw  $H$ , which adjusts the tension of a compression spring  $H'$ , the other end of which rests against the bar  $E'$ . By adjusting these springs any desired pressure of the bar  $E'$ , on the belt  $C$ , can be provided for.  $I$ , is a plate supported on the frame of the machine alongside of the belt supporting channel  $E$  and as shown having on its outer face the laterally extending horizontal flange  $I^1$ , and a vertical flange  $I^2$ , with horizontal top flange  $I^3$ , the pivot pin  $I^4$ , being supported on these flanges, as best shown in Figs. 5, 6, 7 and 8. The plate  $I$ , has also a laterally extending flange  $I^5$ , serving as a support for one end of the pivot pin, indicated at  $I^6$ , and near its right hand end it is provided with a buffer indicated at  $I^7$ . The horizontal flange  $I^1$ , of the plate  $I$ , also supports the frame  $I^8$ , in which are secured the electromagnet and latching devices to be described, the walls of this frame being cut away as shown at  $I^9$ , Fig. 10, to permit of the free motion of the switch bar. The plate is also, as shown, formed with slots  $I^{10}$ , best shown in Fig. 6, to give passage to the selective fingers  $J, J'$ , which are secured on slotted heads  $J^2, J^3$ , turning on the pin  $I^4$ , the heads having non-conducting pads  $J^3$ , secured on their faces and operating in connection with spring terminals  $J^4, J^5$ , connected with the electric circuit wires  $J^6, J^7$ ,  $J^8$ , being a battery and the wires connecting with the electromagnet indicated at  $M^4$ .  $J^7, J^8$ , indicate springs which normally hold the selective fingers  $J, J'$ , in the position indicated in dotted lines in Fig. 5.  $K$ , is a switch bar or finger pivoted on the pin  $I^6$ , and normally held in position in which it projects over the belt  $C'$ , as shown in Fig. 5, by a spring  $K'$ .  $L'$ , see Fig. 10, is a pivot pin on which is pivotally secured the locking lever  $L$ , a spring  $M^3$ , being attached to this lever to hold it normally in the position shown in Fig. 10, and prevents the movement of the switch bar  $K$ , out of the path of the carriers. A lever arm  $L^2$ , attached to the locking lever is adapted to engage with the hooked end  $M^2$ , of a lever  $M^2, M$ , pivoted at  $M'$ , and the end  $M$ , of which lies in position to be struck and pressed in by the switch as it moves inward under the pressure of a carrier.  $L^3$ , and  $L^4$ , are stop blocks for limiting the motion of the locking lever  $L$ , and  $M^4$ , is an electromagnet arranged when energized to act on the lever  $L$ , drawing it back against the stop  $L^3$ , so as to give freedom to the switch to move inward.  $N$ , see Figs. 2 and 3, is the local delivery platform, at the end of which is placed a buffer  $N'$ . In line with the upper surface of the belt  $C'$ , is the chute  $O$ , which leads downward into an air lock

device  $O'$ , shown in section in Fig. 11, having gates  $O^2$ , and  $O^3$ , and a valve  $O^4$ , operated by the action of the gates and by which air under pressure is admitted to the lock  $O'$ , after a carrier has passed the gate  $O^2$ . The carriers issue from the air lock  $O'$  into outgoing tube  $O^5$ , which is supplied with compressed air through a lateral connection  $O^7$ . The construction of this air lock device is that of my former patent of May 20th, 1902, Number 700,607, and need not be particularly described.

In the modified construction shown in Fig. 11, the belt mechanism is dispensed with, the incoming tube  $A$ , opening into a tube section  $P$ , having gates  $P^1, P^2$ , actuated by cylinders and pistons indicated at  $P^3$ , and  $P^4$ , lateral openings  $P^5$ , and  $P^6$ , on each side of the gate  $P^1$ , opening through appropriate connections into a pipe section  $P^7$ , which, as shown in Fig. 11, communicates with the pipe section  $O^7$ , a gate  $P^7$ , being provided by which the flow of air from the tube  $A$ , into the pipe  $P^8$ , may be drawn from either of the lateral openings  $P^5$ , or  $P^6$ , and a restricted by-pass  $P^8$ , being provided so that when the valve is turned to connect the opening  $P^5$ , with the pipe  $P^8$ , a restricted quantity of air under pressure will still be communicated to the chamber  $P$  to act to force the carrier out of said chamber when the gate  $P^2$ , is opened. The finger  $P^{10}$ , is provided for setting in operation the mechanism for restoring the gates to normal position, all of which is the same as that described in my former Patent Number 749,152, and need not here be further described. In other respects the appliances shown in Fig. 11 do not differ materially from those already described.

In the construction shown in Fig. 12, the incoming air tube  $A$ , opens into the head  $Q$ , from which leads the air pipe  $X$ , the carriers entering the head passing around the curved surface thereof and coming in contact with the outlet gate  $Q'$ , which is held on an arm  $Q^2$ , pivoted at  $Q^3$ , and normally held closed by the spring  $Q^4$ . A lever  $R$ , is pivoted at  $R^2$ , on the arm  $Q^2$ , and provided at one end with a finger  $R'$ , which projects through the gate  $Q'$ , as shown, the other end of the lever being provided with a notch  $R^3$  for purposes to be described, and the lever being normally held in the position illustrated by a spring  $R^4$ . The switch bar, here indicated at  $K^2$ , is supported on an arm  $S$ , pivoted on the pivot  $Q^3$ , of the gate, on which is also pivoted the head  $S'$ , having an edge  $S^2$ , which is adapted to engage with the notched end  $R^3$  of the lever  $R$ , when the finger  $R'$ , is pressed outward by the head of a carrier. The head  $S'$ , turns freely on the pivot  $Q^3$ , and has connected to it at  $S^3$ , a locking bar  $S^4$ , guided in an arm  $S^5$ , and normally lying in position to prevent the re-

traction of the switch bar  $K^2$ , as shown. In this construction  $T$ , indicates the outgoing tube and  $T'$ , the basket for receiving carriers shunted out at the intermediate station. The construction of the head  $Q$ , and its connections in Fig. 12, is similar to that described in the patent to Cowley, No. 726,030 of 21st April, 1903.

I have indicated the carriers by the letter  $U$ , and for use in the construction of Fig. 1, I have shown the carriers as provided with metallic selecting plates  $U'$ , which form a selecting device which will also be used in the modification of Fig. 11; for the modification of Fig. 12, the selecting device consists simply of a cavity  $U^2$ , formed in the end of the felt head of the carrier.

In the construction of Fig. 1, the carrier issues from the tube  $A$ , at full speed directly between the belts  $C$ ,  $C'$  which are driven in the same direction as that in which the carrier is moving and at the reduced rate of speed with which it is desired the carrier should travel when it comes in contact with the switch or passes to the outgoing tube. The impetus of the incoming carrier is checked by frictional contact with the belts regulated by the residual weight of the friction regulating bar  $E'$ , which is adjusted by means of the springs  $H'$ , and  $G'$ , so that it will exert any desired pressure upon the upper belt and through it upon the carrier. The upper belt is shorter than the lower one and when issuing from between the belts and while still carried forward by the lower belt the front of the carrier comes in contact with the fingers  $J$ ,  $J'$ , and if provided with a metallic plate of such size and disposition that it makes contact with both of these fingers, the electric circuit is closed and the magnet  $M^4$ , energized with the result that the stop lever  $L$ , is drawn backward so as to clear the switch bar  $K$ , in which position it is caught and retained by the engagement of the hook  $M^2$ , with the lever arm  $L^2$ . The carrier on coming in contact with the switch bar  $K$ , presses said switch bar out of its way and passes forward on the carrier belt  $C'$ , which finally dumps it into the chute  $O$ , from which it falls into the outgoing tube. The bar  $K$ , when pressed inward comes in contact with the lever arm  $M$ , pressing it inward and raising the hook arm  $M^2$ , so as to disengage the lever arm  $L^2$ , in consequence of which on the return of the switch bar to normal position the stop lever  $L$ , at once resumes its normal position beneath the switch bar, as shown in Fig. 10. In case the selective disk  $U'$ , is omitted or is of such a character as not to contact with both of the fingers  $J$ ,  $J'$ , the electric circuit is not closed, consequently the stop lever  $L$ , is not withdrawn and the carrier on coming in contact with the switch bar  $K$ , is deflected sidewise on to the table  $M$ , for local delivery.

In the construction of Fig. 11, the impetus of the incoming carrier is entirely taken up in the air chamber  $P$ , in which it comes to rest and from which it is propelled after the gate  $P'$ , is closed, and the gate  $P^2$ , opened by the limited body of air passing into the air lock through the restricted passage  $P^3$ . The energy developed by this body of air is only sufficient to propel the carrier out of the air lock with such moderate speed as is not objectionable. In other respects the operation of the carrier on leaving the air lock is precisely the same as described in connection with Fig. 1 except that the motion of the carrier through the switching mechanism and through the outgoing tube is produced entirely by the impetus given it in the air lock no belt being employed.

In the construction of Fig. 12 carriers having recesses  $U^2$  of such form and dimensions that the head of the carrier does not come in contact with the inwardly projecting finger  $R'$  of the lever  $R$ , impinges directly on the gate  $Q'$ , pushing said gate open, the notched end  $R^3$ , of the lever  $R$ , moving backward without engaging the head  $S'$ , or in any way moving the stop finger  $S^4$ , consequently the carrier on coming in contact with the switch bar  $K^2$ , finds it locked in position and is deflected thereby into the basket  $T'$ , for local delivery. If however the head of the carrier is not recessed or the recess is of such a character as not to give clearance to the finger  $R'$ , the incoming carrier impinges first upon said finger, pressing it downward and pressing the notched end  $R^3$ , of the lever upward into position to engage with the head  $S'$ , so that when the gate  $Q'$ , opens the head  $S'$ , is rotated backward and upward, lifting the finger  $S^4$ , so that when the carrier impinges on the switch  $K^2$ , it presses said switch backward out of its path and passes freely into the outgoing tube  $T$ .

From what has been said it will be seen that my invention is capable of embodiment in many forms and modifications and I wish it to be distinctly understood that save where special features of construction are referred to in the claims and made limiting elements thereof my said claims are not intended to be limited to the specific mechanical devices illustrated.

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

1. In a pneumatic tube system, a station having non-continuous delivery and receiving tubes in combination with a switch situated in the path of the carriers issuing from the delivery tube and adapted when locked to direct the carriers to a point of local delivery, and when unlocked to be deflected by the carriers to permit the latter to pass to the receiving tube, and a lock for the

switch adapted to be actuated by selecting devices on the front ends of the carriers.

2. In a pneumatic tube system, a station having non-continuous delivery and receiving tubes, and in which the mouth of the receiving tube is set in the direct path of the carriers issuing from the delivery tube, in combination with a switch situated in the path of the carriers issuing from the delivery tube and adapted when locked to direct the carriers to a point of local delivery, and when unlocked to be deflected by the carriers to permit the latter to pass to the receiving tube, and a lock for the switch adapted to be actuated by selecting devices on the front ends of the carriers.

3. In a pneumatic tube system, a station having non-continuous delivery and receiving tubes, in combination with means situated at the mouth of the delivery tube for checking the velocity of the carriers and propelling them forward at reduced speed, a switch situated outside of the delivery tube and in the path of the slowly moving carriers issuing therefrom and controlling the direction of carriers to the receiving tube or to a point of local delivery, and switch actuating mechanism adapted to be operated by selecting devices on the carriers.

4. In a pneumatic tube system, a station having non-continuous delivery and receiving tubes in combination with means situated at the mouth of the delivery tube for checking the velocity of the carriers and propelling them forward at reduced speed, a switch situated outside of the delivery tube and in the path of the slowly moving carriers issuing therefrom and controlling the direction of carriers to the receiving tube or to a point of local delivery and switch actuating mechanism also situated in the path of the slowly moving carriers and adapted to be operated by selecting devices on the carriers.

5. In a pneumatic tube system, a station having non-continuous delivery and receiving tubes in combination with friction and propelling belts situated in front of the delivery tube and adapted to check the velocity of issuing carriers and carry them forward at reduced speed, a switch situated in the path of the slowly moving carriers and controlling the direction of carriers to the receiving tube or to a point of local delivery, and switch actuating mechanism adapted to be operated by selecting devices on the carriers.

6. In a pneumatic tube system, a station having non-continuous delivery and receiving tubes in combination with friction and propelling belts situated in front of the delivery tube and adapted to check the velocity of issuing carriers and carry them forward at reduced speed, an adjustable belt weight E', resting on the upper belt and by which its pressure on the carriers is regulated, a switch situated in the path of the slowly moving carriers and controlling the direction of carriers to the receiving tube or to a point of local delivery and switch actuating mechanism adapted to be operated by selecting devices on the carriers.

7. In a pneumatic tube system a station having non-continuous delivery and receiving tubes in combination with positively acting means for conveying a carrier from the delivery tube to the receiving tube, a switch located outside of both tubes and in the path of carriers issuing from the delivery tube for diverting carriers to a point of local delivery, and mechanism operated by selecting devices on the carriers for rendering said switch inoperative.

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Witnesses:

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