

(No Model.)

3 Sheets—Sheet 1.

C. O. YALE & J. H. AMES.
PNEUMATIC TRANSMITTER OR STORE SERVICE.

No. 520,664.

Patented May 29, 1894.

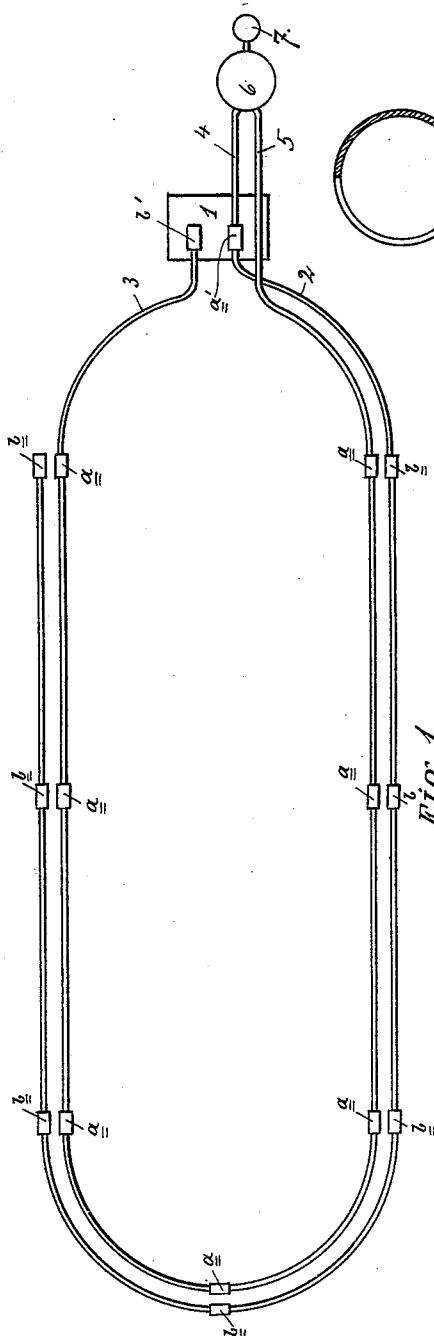


Fig. 1.

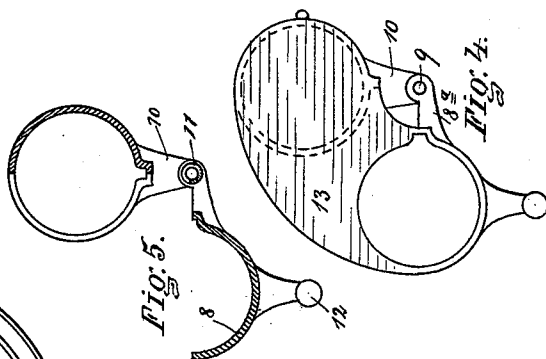


Fig. 5.

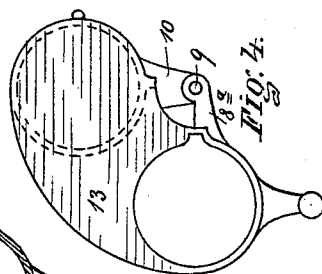


Fig. 4.

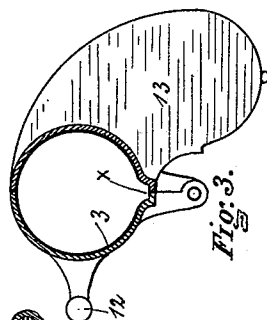


Fig. 3.

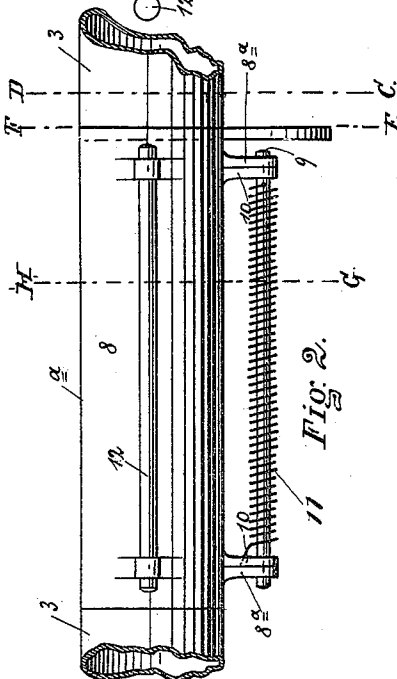


Fig. 2.

WITNESSES.

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Wm. C. Constat.

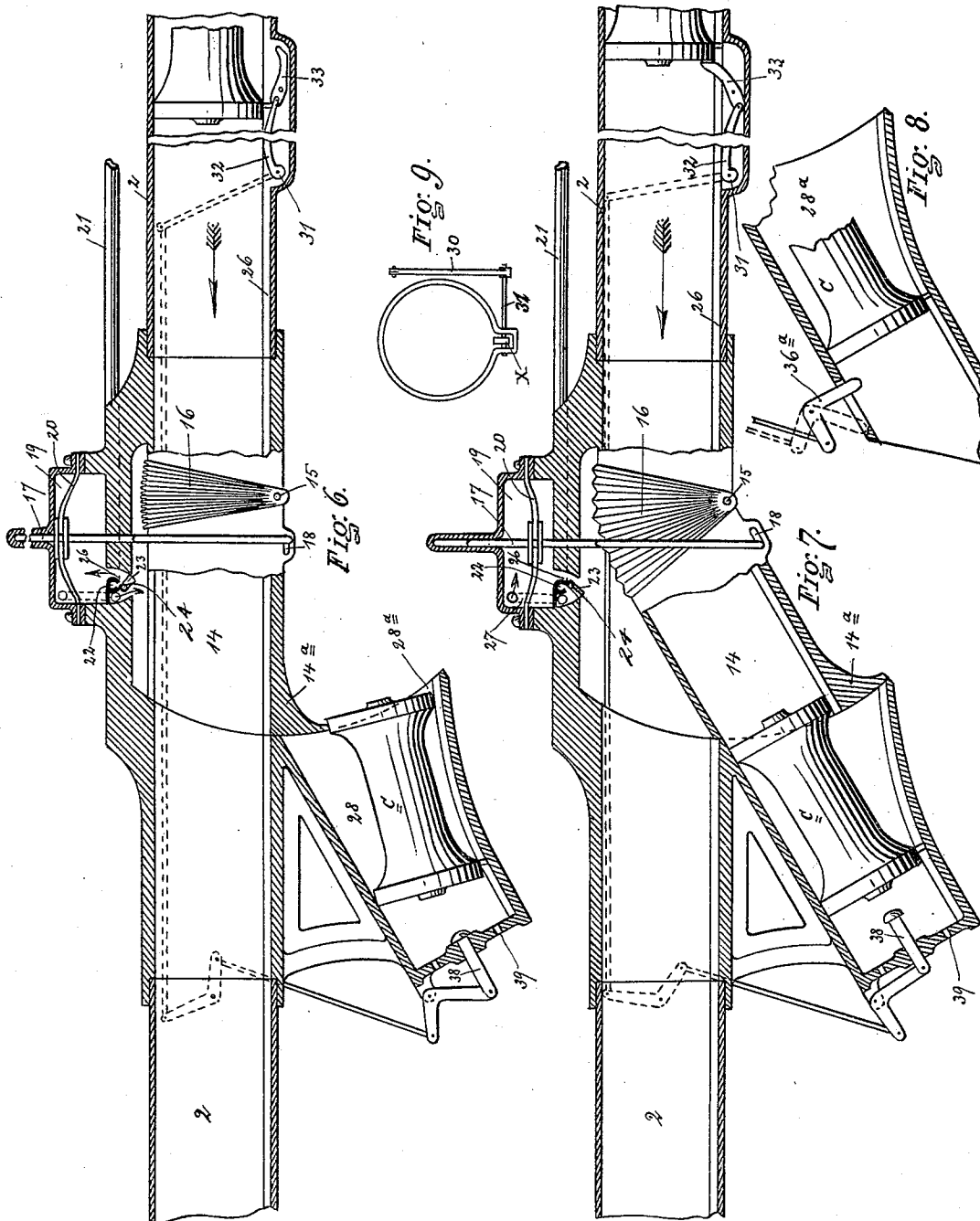
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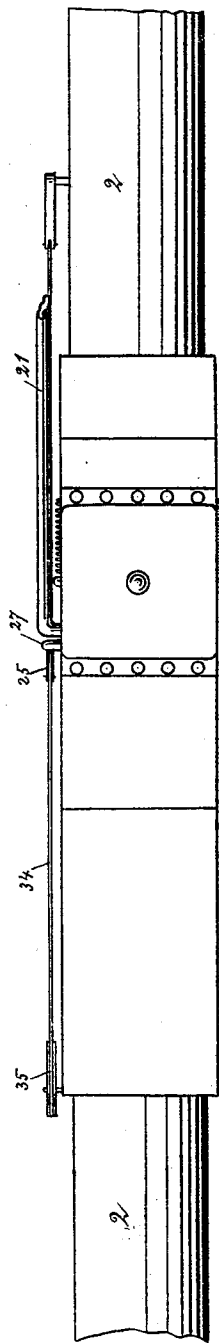


Fig. 10.

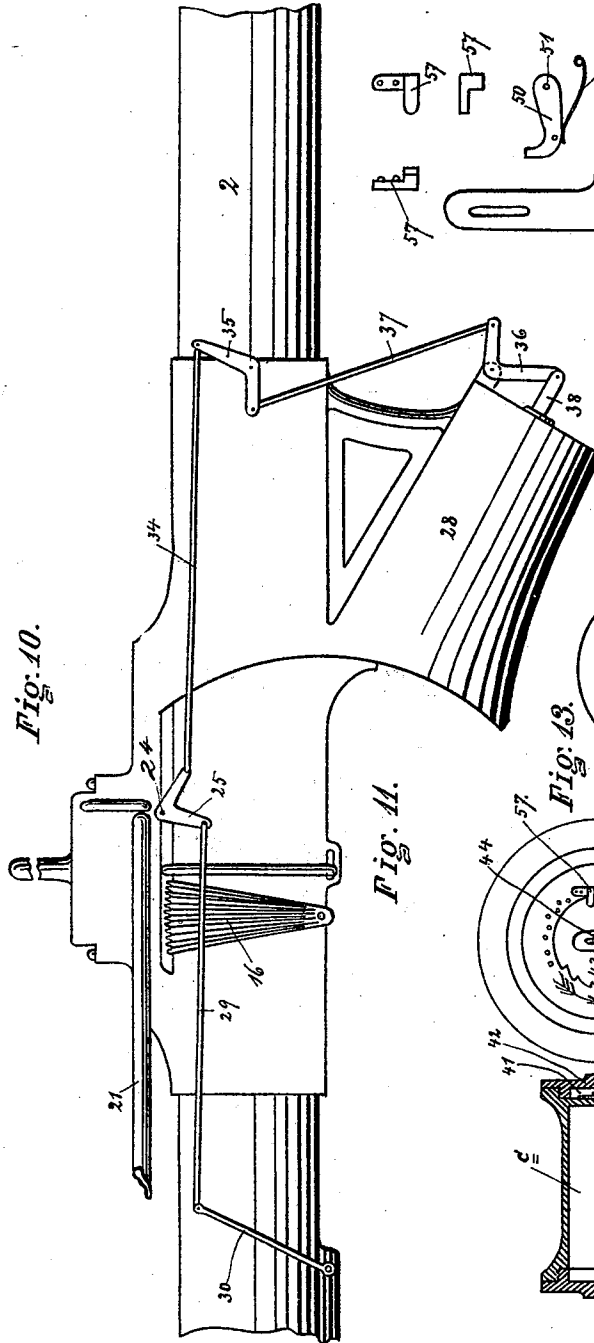


Fig. 11.

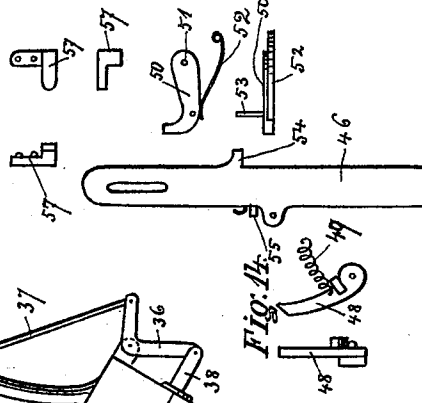


Fig. 12.

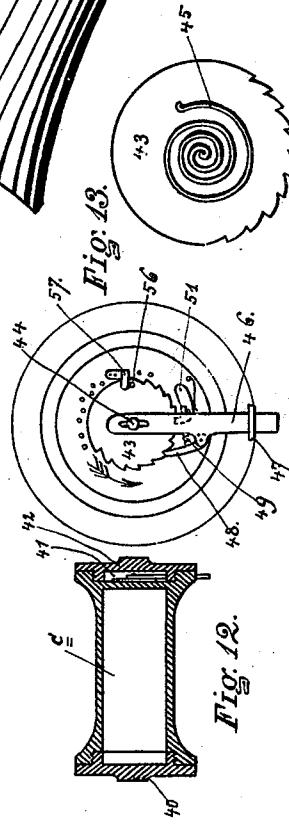


Fig. 13.

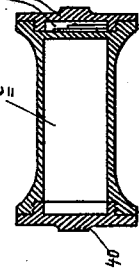


Fig. 14.

WITNESSES.
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UNITED STATES PATENT OFFICE.

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PNEUMATIC TRANSMITTER OR STORE-SERVICE.

SPECIFICATION forming part of Letters Patent No. 520,664, dated May 29, 1894.

Application filed March 28, 1892. Serial No. 426,652. (No model.)

To all whom it may concern:

Be it known that we, CHARLES O. YALE, of the city, county, and State of New York, and JOHN H. AMES, of the city of St. Paul, in the State of Minnesota, have invented certain new and useful Improvements in Pneumatic Transmitters or Store-Service; and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and numerals of reference marked thereon, which form part of this specification.

Our invention relates to improvements in pneumatic store services.

One of the particular objects of these improvements is to provide means of transmitting packages to several stations through the same conveyer or conductor, and providing the packages or carriers and conveyer or conductor with means for selecting the proper package or carrier for the several stations and producing its delivery at the proper station, without materially interrupting the movement of other carriers in the same conveyer.

In the several figures of the drawings, similar letters and numerals of reference refer to the same parts.

Figure 1 shows a diagram or general plan of a store service, providing means for receiving and transmitting packages to and from a main station through two separate conveyers, a forwarding and returning conveyer, although, with slight modifications the forwarding and receiving could be accomplished through one circuit. Fig. 2 shows, in side elevation, a carrier dispatcher in connection with portions of the conductor. Fig. 3 shows an end view of the carrier dispatcher, with a cross-section of the conductor taken on line C—D of Fig. 2. Fig. 4 shows an end view of the dispatcher at line E—F of Fig. 2, in open position. Fig. 5 shows a section of the dispatcher on line G—H of Fig. 2, in open position. Fig. 6 shows, in section, parts of the conductor and the package discharger in normal or closed position. Fig. 7 shows the same parts in discharging position. Fig. 8 shows a modified form of package receiver.

Fig. 9 shows a cross-section of the conductor at the tripping lever, and including a portion of the tripping lever connections. Fig. 10 is a top or plan view of the discharger, being the same parts shown in Figs. 6 and 7. Fig. 11 shows the same parts shown in Figs. 6 and 7 in full lines, from the opposite side to that shown in Fig. 6. Fig. 12 shows a longitudinal section of the carrier including an end view of the same on a larger scale, with the end cover removed. Figs. 13 and 14 show in details, the parts of the carrier selecting devices.

Referring more specifically to the reference numerals and letters marked on the drawings, in a more particular description of the device, 1 indicates the main discharging and receiving station from which extends the forwarding conductor 2, and to which extends the receiving conductor 3. From the conductors 2 and 3 extend communicating tubes 4 and 5 to a reservoir or pressure tank 6. The systems may be used, with slight alterations, either by an air pressure in the tubes or exhausting the tubes, as seems more expedient. The system as shown and described is intended for using an air pressure in the tubes. Hence, 7 indicates a pump or blower for producing an air pressure in the tank 6 and in the tube 3. In the forwarding tube at the main station is provided, as shown at *a'*, a dispatching device. In the same tube at the various stations, are provided discharging devices *b b*, &c. In the conductor 3 there is provided, at the main station 1, a discharger *b'*, and at the several stations in the same tube are provided dispatchers *a, a*, &c. The conductors or conveyers are preferably circular in cross-section, as shown in Fig. 9, with an internal groove or depression *x* extending lengthwise of the tube. The dispatching apparatus consists of a hinged cover 8 mounted upon projecting arms 8^a which are pivoted on a shaft 9 held in downwardly extending projections 10 on the under side of a half of the conductor. The cover 8 is, in cross-section, a half of the conductor cut on a vertical line through the longitudinal depressions in the bottom of the conductor. The cover 8 may be held in closed position by a spring 11, provided on the shaft 9 or in any other suitable position. The cover may also be pro-

vided with a handle as 12 for opening the dispatcher. On one end of the cover 8 and on the end of the tube toward the pressure tank 6, is provided a gate 13 which plays across the end of the pipe 2 and closes the same when the cover 8 is opened. The carrier discharger 14 consists of a movable section of the conductor, pivoted at one end at 15 to the stationary portion of the conductor and having its swinging end cut or formed on a circle with the pivot 15 as a center. The pivotal end of the discharger 14 is coupled onto the stationary portion of the conductor by a flexible material 16, which opens and closes in a bellows-like manner. The discharger 14 is operated by a piston rod 17, which is provided with a circular loop at its lower end which surrounds the discharger 14 and engages the same within a slotted opening 18 on the lower or under side of the discharger. The upper end of the piston rod 17 passes through a chamber 19 in which is located a flexible diaphragm 20 which engages the piston rod 17. Connecting with the chamber 19 is a pressure pipe 21, which at its entrance to the pressure chamber is provided with a slotted side forming a passageway, as shown at 22. In a suitable seat at the inner end of the pressure pipe 21 is provided a rocking valve 23 mounted upon a shaft 24 which extends to the outside of the chamber and on which is secured a bell crank 25. At one side of the inner end of the pressure pipe 21 is an opening connected by tube 27 to that portion of the chamber 19 above the flexible diaphragm 20. The pressure pipe 21 extends along the side of the conductor pipe 2 to a point where it is not likely to be disturbed by the operation of the discharging apparatus, and is connected with the pipe 2. At the swinging end of the discharger 14 is provided, as shown in Figs. 6 and 7, a receiver or pocket 28, adapted to receive the carrier from the discharger. The mouth of the pocket 28^a is made a deep oval in shape so that the carrier can be removed therefrom below the discharger, when the discharger is in position to complete the conductor tube 2. On the under side of the discharger 14 is provided a lip 14^a adapted to close the end of the pocket 28 when the discharger is in its lower position. From one of the ends of bell crank lever 25 extends a connecting rod 29, which is connected to a lever 30 on the outer end of a shaft 31 (see Fig. 9) which shaft 31 extends into a pocket on the under side of the conductor 2 and has attached thereto a tripping lever or fixture 32, which curves upward and lies in the groove or channel *x* of the conductor tube. The opposite or swinging end of the tripper lever 32 engages one end of movable pivoted stopper 33 lying in the same pocket and adapted to have its swinging end projected up into the conductor to stop the carriers therein. From the other arm of bell crank 25 extends a connection 34, which is connected by means of intermediate bell cranks

and connecting rods 35, 36 and 37 with a bumper 38 extending into the pocket 28. The end of the pocket 28 is provided with air passages 39.

The carrier *c* consists of a hollow cylinder having enlarged heads or ends, one of which, 40, is removable to provide access to the interior of the carrier for the purpose of introducing or removing the matter to be carried. The other end of the carrier is provided with a chamber 41, for containing the automatic sorting mechanism, which chamber is provided with a cover 42. The sorting or carrier-selecting mechanism consists of a ratchet tooth-disk 43 pivoted at 44 on the end of the carrier and provided with a coiled spring 45 having one end attached to the carrier and the other to the disk and tensioned to rotate the disk in the direction indicated by the arrow in Fig. 12. Engaging on the outer end of the pivotal pin 44 by means of a slotted opening therein is a movable actuator 46 which, at its opposite end is held by a retainer 47. The actuator 46 projects from the side of the carrier and is adapted to enter the groove in the conductor and successively engage the fixtures or trippers in the groove. On the actuator 46 is provided a pawl or dog 48 which is held by a spring 49 in engagement with the ratchet teeth of the disk 43. 50 is a detent also engaging in the ratchet tooth-disk 43 and pivoted at 51 to the end of the carrier and held in engagement with the teeth of the disk by a spring 52. The detent is also provided with a projecting pin 53 which is adapted to be engaged by projection 54 on the actuator 46, when in its lowest position and throw the detent out of engagement with the ratchet teeth. 55 is a stop on the actuator 46 adapted to engage the pawl 48 and hold the pawl out of engagement with the disk 43 when the actuator is in its lowest position. 56 is a projecting pin on disk 43 adapted to engage with stop block 57 secured on the end of the carrier and adjustable around the circumference of the disk by removing the screws or fastenings therefrom and replacing them in any of the series of holes provided in the end of the carrier around the circumference of the disk thereby altering the mechanism to pre-determine the station at which the corner will be discharged. The parts of the sorting or selecting mechanism described may be changed also for the same purpose by giving the actuator 46, one or more movements before introducing the carrier in the conductor.

As the operation of the device is substantially the same at any one of the stations, the operation of dispatching and receiving will be described generally and will be equally applicable to any of the stations, although a modified form of receiving and discharging devices might be provided at the main or central station.

The pressure of air being maintained in the reservoir or tank and the conductors by

means of a pump or blower as before stated, a carrier containing the message or matter to be transmitted may be introduced into the conductor by grasping handle 12 and turning the movable cover 8 down and laying the carrier therein with the actuator 46 projecting into the groove of the conductor. When the cover 8 is open, the gate 13 shuts off the conductor and maintains the pressure of air therein. When the cover 8 is closed, the pressure of air actuates the carrier, and conveys it on its way through the tube, and if in the tube marked 3 in the drawings, the package will be conveyed directly to the main station. If, however, the carrier is introduced into the tube marked 2 at the main station as it proceeds on its travels, the actuator on the carrier will come in contact with the several trippers 32 located in the groove of the conductor. When the carrier is not in the conductor the actuator 46 will assume the lowest position of which it is capable and which the slotted opening in its end will permit and in which position the dog 48 and detent 50 are held out of engagement with the ratchet teeth of the disk 43 and the disk will be rotated into the position shown in Fig. 12 with the pin 56 in contact with the stop block 57. The carrier cannot be introduced into the conductor by reason of the depth of the groove of the conductor until the actuator has been slightly pushed in so that the dog 48 and the detent 50 become engaged with the tooth disk 43. This slight movement may be produced by the introduction of the carrier into the conductor tube. As the carrier proceeds along the conductor tube and reaches the first tripping lever 32, the actuator 46 is thrown upward by riding over the tripper 32 and as it is so thrown upward the disk 43 is hitched ahead one tooth by the pawl 48, where it is caught by the detent 50 and as the carrier passes beyond the tripper 32, the actuator 46 falls down and the dog or pawl 48 is retracted to engage the next tooth and as the carrier reaches the second tripping lever the actuator is again thrown up, moving the disk 43 another tooth. This operation is repeated as the carrier passes each tripping lever until the pin 56 comes in contact with the side of the actuator 46 and the dog 48 is in engagement with the tooth disk 43, in which position the actuator cannot be thrown up so that as it reaches the next tripping lever the actuator not being thrown up, depresses the tripper. This operation through the lever 30, connection 29, bell crank 25 and rocking valve 23 transfers the pressure, by rocking the valve 23, from the under side of the diaphragm 20 to the upper side, the pressure being carried through the tube 27 to the upper side of the diaphragm. As the pressure is exerted on the upper side of the diaphragm, the piston rod 17 is forced downward, which movement drops the movable section of the tube or discharger 14 into coinciding position with the receiving pocket 28, and as the carrier con-

tinues on its passage after operating the tripper 32 it passes through the discharger 14 into the pocket 28. When it enters the pocket it strikes the bumper 38, which, through the connections before described, resets the tripper 32 and rocks the valve 27 so that the air pressure is exerted on the under side of the diaphragm 20 and removed from the upper side and this pressure, acting through the piston rod 17 and connecting parts, operates to elevate the swinging end of the discharger 14 into its normal position, as a portion of the conductor tube. It will be noticed that as the valve 27 is rocked, an escape is provided beneath the valve either from the upper or lower portion of the chamber 19, as the case may be. After the discharger has resumed its normal position the carrier may be removed from the pocket 28 through the open end beneath the discharger.

When the tripper 32 is depressed to actuate the discharger 14, the stopper 33 is projected into the conductor tube in a manner to engage and detain any following carriers until the section 14 has become replaced.

The station at which the carrier will be delivered is determined by the position of the stop 57, so that the carrier may be discharged at the first station from the main station or at any number of stations from the main station up to the number of teeth contained on the disk 43 and the carrier may be adjusted to stop at any of the stations by adjusting the stop 57.

In the modified form of construction shown in Fig. 8 in lieu of the pocket or receiver 28 we provide a receiver 28^a having an open end and dispense with the bumper 38 and modify the bell crank 36 so as to be as 36^a projecting into the receiver 28^a into position to be engaged by the end of the carrier and operated to produce the results described with reference to that construction. In this way the device will not become clogged by reason of a carrier being in the pocket 28, when another carrier for the same station, arrives. One of the tubes 2 or 3 may be dispensed with and the forwarding and returning done through one and the same tube, by having the tube make a complete circuit from the main station back to the main station and providing both the dispatching and discharging mechanisms in the same tube. In this case it will be desirable to provide a tube or conductor with two depressions as *x*, one in the upper side and one in the lower side, so that in returning the carriers to the main station, the actuator could be allowed to travel in one of the grooves in which there were no tripping levers located. It is also obvious that the groove *x* could be provided in the top as well as in the bottom of the conductor or in any other position than the bottom, in which case it would be necessary and desirable to provide a spring for actuating and projecting outward, the actuator 46. It will be understood that the carrier *c* will travel either end first

through the conductors, with equal facility. An ordinary piston may be provided instead of the diaphragm 20 and would be an equivalent in operation.

5 It is evident that many other modifications, alterations and changes than those described may be made, without departing from the equivalents of our construction.

What we claim as new, and desire to secure
10 by Letters Patent, is—

1. The combination in a pneumatic transmitter of a conductor having a continuous groove, a discharger consisting of a movable section hinged at one end on the side of the
15 groove and swinging at the other out of the line of the conductor, a tripper for operating the discharger, and a carrier having a projection extending into the groove for operating the tripper and through it the discharger, substantially as set forth.

2. The combination in a pneumatic transmitter of a conductor tube having a longitudinal groove, a discharger, a discharge-tripper located in the groove, and connecting mechanism
25 between the tripper and discharger, a carrier and a projection on the carrier running in the groove, substantially as set forth.

3. The combination in a pneumatic transmitter of a conductor having a longitudinal
30 groove, a dispatcher consisting of a cover forming a movable half of a section of the conductor divided through the groove, and a carrier having a projection extending into the groove, substantially as set forth.

35 4. In a pneumatic transmitter, in combination a conductor, a discharger, a tripper and a connection between the tripper and discharger, and a carrier having a movable tripper actuator, substantially as set forth.

40 5. In a pneumatic transmitter, in combination a conductor, a discharger, a tripper and connecting mechanism between the discharger and tripper, and a carrier having a movable tripper actuator and mechanism for
45 locking the actuator, combined substantially as set forth.

6. The combination in a pneumatic transmitter of a carrier having a movable projection and a variable locking mechanism for
50 securing the movable projection, a carrier conductor and fixtures in the conductor engaged by the movable projection from the carrier, and means permitting the removal of the carrier from the conductor, substantially
55 as set forth.

7. The combination of a conductor having a continuous groove, a fixture or series of fixtures in the conductor, a carrier having a
60 movable projection extending into the groove, and locking mechanism on the carrier for securing the movable projection, substantially as set forth.

8. The combination of a conductor having an inwardly extending fixture, a carrier having
65 a movable projection operated by the inwardly extending fixture, and a locking mechanism

for securing the movable projection, substantially as set forth.

9. The combination of a longitudinally grooved conductor having a series of inwardly
70 extending fixtures in the groove, and a carrier having a movable projection, and an alterable locking mechanism for securing the projection on the carrier, substantially as set forth.

10. The combination of a carrier conductor, a carrier, a movable tripper actuator on the carrier, a discharger tripper operating to move the actuator or be moved by the actuator, a discharger and a connection between
80 the tripper and discharger, and mechanism for arresting the movement of the actuator after a given number of movements, substantially as set forth.

11. The combination in a pneumatic conductor of a series of dischargers located therein, a tripper for each discharger, a connecting mechanism between the tripper and discharger, a carrier, a movable tripper actuator mounted on the carrier, and a mechanism for
90 arresting the movement of the actuator after a given number of movements caused by engagement with the trippers in passing, substantially as set forth.

12. In a pneumatic transmitter, a conductor having a series of fixtures or projections therein, in combination with a carrier having a movable projection adapted to engage the fixtures or projections in the conductor, and a ratchet wheel, a stop for the ratchet wheel,
100 a pawl on the movable projection engaging the wheel, all on the carrier, substantially as set forth.

13. The combination in a pneumatic conductor of a series of dischargers located therein, a tripper for each discharger, a carrier, a movable tripper actuator, a pawl thereon, a ratchet wheel engaged by the pawl, a stop for limiting the movement of the ratchet, a detent for engaging the ratchet wheel, and a
110 spring for returning the ratchet wheel to its normal position, substantially as set forth.

14. In a carrier transmitter, in combination a conductor having a longitudinal groove, a discharger consisting of a movable section
115 of the conductor pivoted at one end on the side of the groove, a rod for operating the discharger, a chamber containing a movable diaphragm connected with the rod, a valve for regulating and directing the pressure to either
120 side of the diaphragm, and a tripper located in the groove of the conductor and connected with the valve, substantially as set forth.

15. The combination in a pneumatic transmitter of a conductor, a discharger consisting
125 of a movable section of the conductor pivoted at one end and swinging at the other, a tripping device located in the conductor for operating the discharger, a receiver into line with which the discharger swings to deliver
130 the carrier, and a projection or bumper in the receiver adapted to be actuated by the car-

rier and re-set the tripper, substantially as set forth.

16. The combination in a pneumatic transmitter of a conductor, a discharger, a tripper
5 for operating the discharger located in the conductor, and a carrier stopper operated by the tripper, substantially as set forth.

17. The combination in a pneumatic transmitter, of a conductor having a longitudinal
10 groove, a dispatcher consisting of a cover forming a movable half of a section of the

conductor through the groove, and a carrier having a movable projection adapted to extend into the groove, substantially as set forth.

In witness whereof we have affixed our signatures in the presence of two witnesses.

CHARLES O. YALE.

JOHN H. AMES.

Witnesses:

JONATHAN MARSHALL,

RICH. A. GEORGE.

15