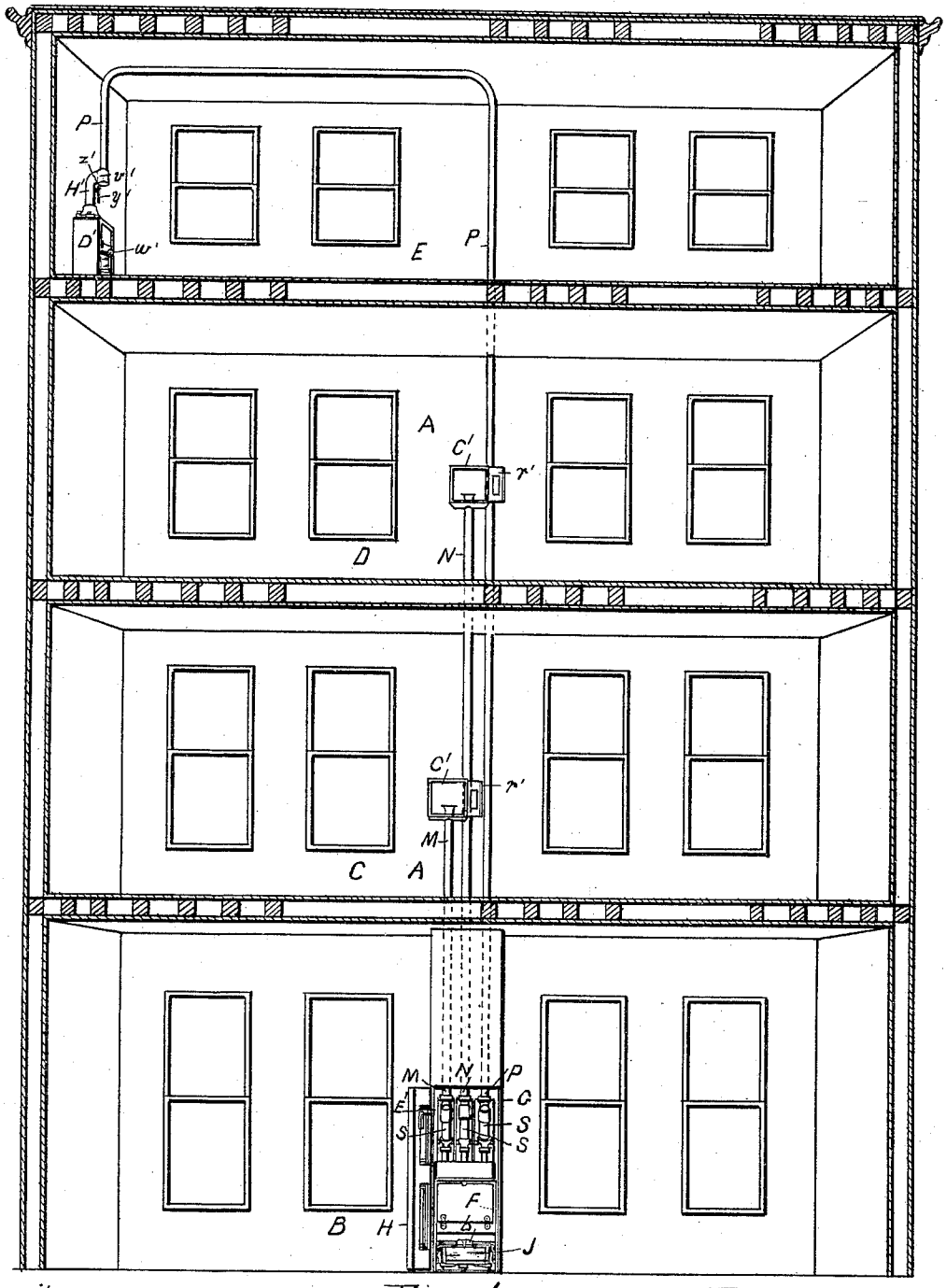
(No Model.) 3 Sheets—Sheet 1.

J. L. GIVEN & G. B. KELLY.

PNEUMATIC MAIL DISPATCH APPARATUS.

No. 411,333. Patented Sept. 17, 1889.



Witnesses
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Fig. 1.

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(No Model.) 3 Sheets—Sheet 2.

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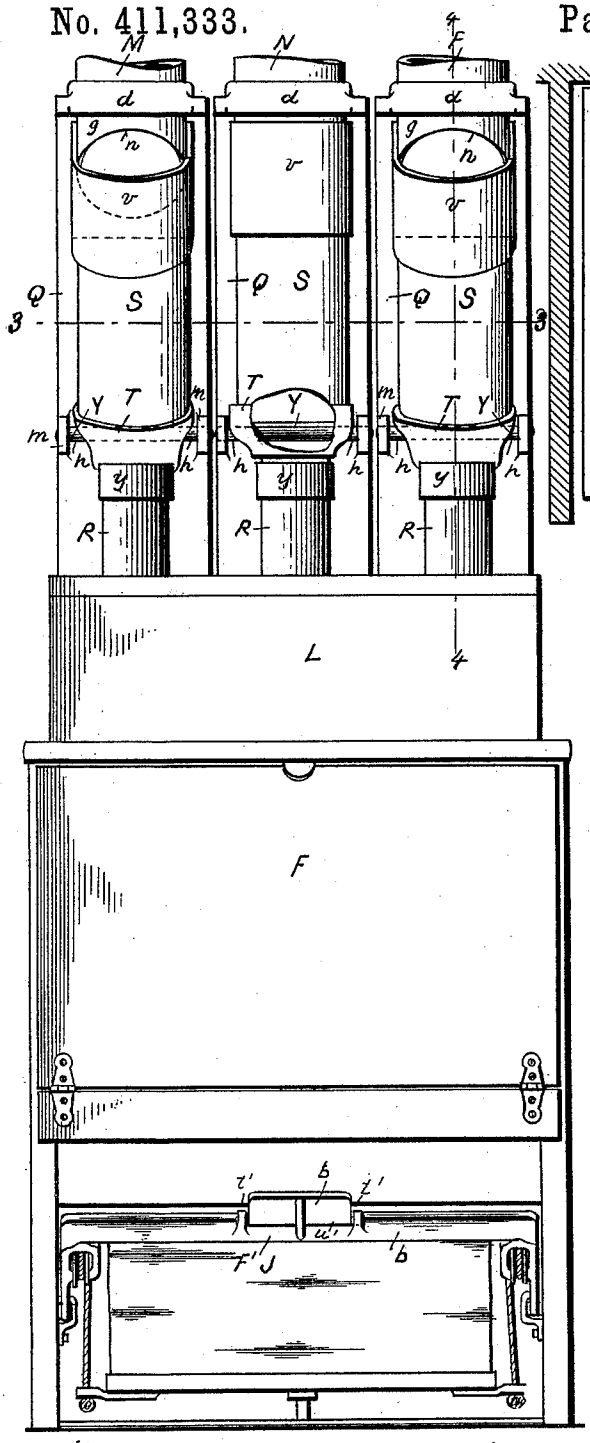


Fig. 2.

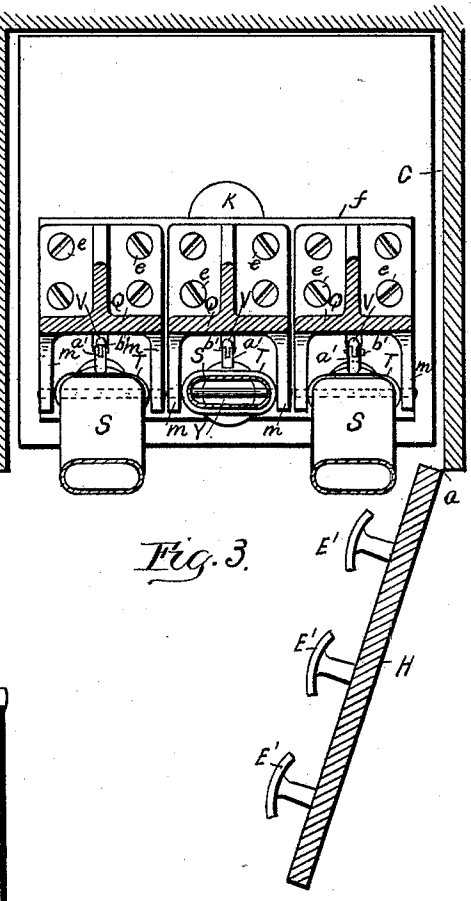


Fig. 3.

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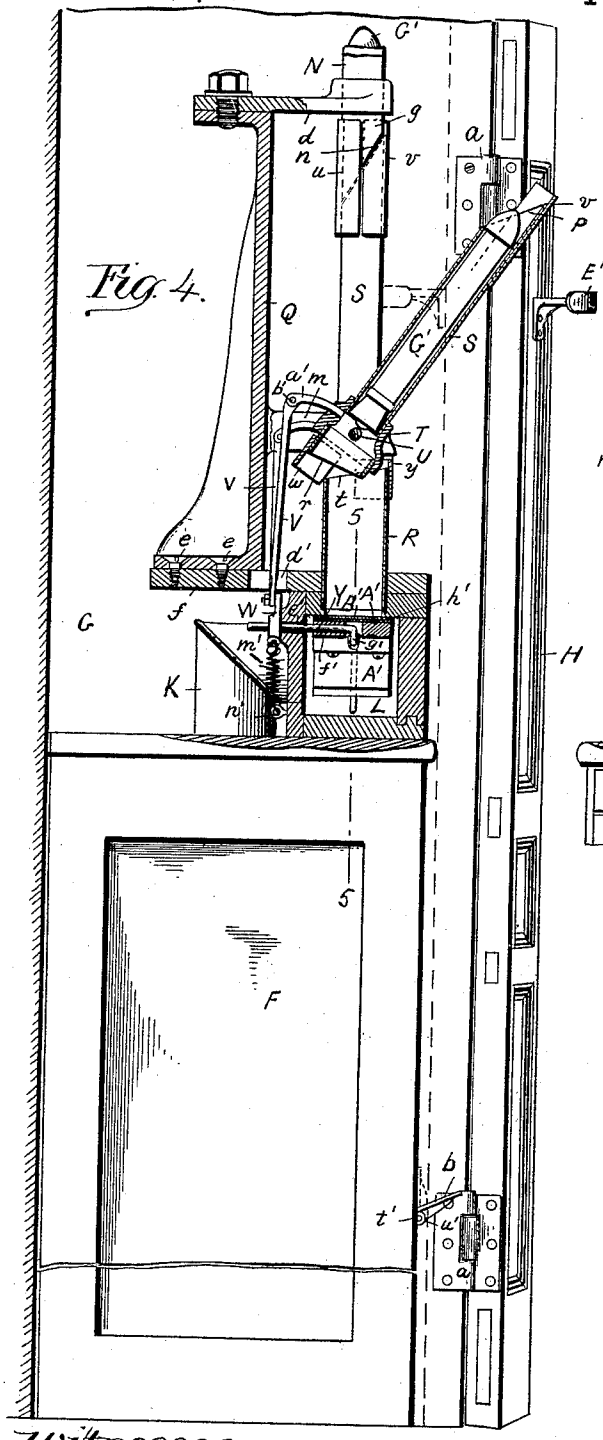
(No Model.) 3 Sheets—Sheet 3.

J. L. GIVEN & G. B. KELLY.

PNEUMATIC MAIL DISPATCH APPARATUS.

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Fig. 4.



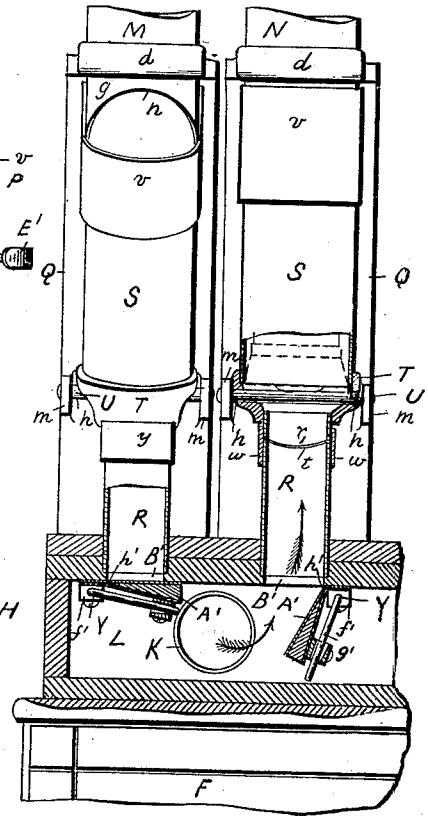


Fig. 5.

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UNITED STATES PATENT OFFICE.

JOHN L. GIVEN, OF MELROSE, AND GEORGE B. KELLY, OF BOSTON, MASSACHUSETTS.

PNEUMATIC MAIL-DISPATCH APPARATUS.

SPECIFICATION forming part of Letters Patent No. 411,333, dated September 17, 1889.

Application filed March 6, 1889. Serial No. 302,045. (No model.)

To all whom it may concern:

Be it known that we, JOHN L. GIVEN and GEORGE B. KELLY, respectively of Melrose and Boston, in the counties, respectively, of Middlesex and Suffolk, and State of Massachusetts, have invented certain new and useful Improvements in Pneumatic Mail-Dispatch Apparatus, of which the following is a full, clear, and exact description.

This invention relates to a pneumatic mail apparatus for the transmission of mail or other matter through a pneumatic tube or tubes, and more especially intended for use in buildings containing apartments or offices for the delivery of mail by the postman directly to each apartment or office in the building or story or office, as the case may be, from the street or lower floor or hall or story or from any central point, obviating the necessity of his climbing the stairs to deliver such mail-matter to the persons in their respective stories or rooms; and the invention consists in the combination, with a building or other structure having a series of stories or floors or rooms, of a series of pneumatic tubes leading from some central point or place on the main floor or hall or story or other place—one to each room or story or floor—and connected at such central point or place to any suitable air-pressure or exhaust apparatus for forcing or transmitting the mail or other article through the tube or tubes to the floor or room or story desired.

The invention also consists in the working parts of the apparatus being each inclosed in a suitable inclosure in the building or structure, provided with a door or other suitable cover arranged to be opened, all substantially as hereinafter fully described; and the invention also consists of certain construction and arrangement of parts in a pneumatic mail apparatus for the transmission of mail or other matter through a pneumatic tube or tubes, all substantially as hereinafter fully described.

In the accompanying sheets of drawings is illustrated the present invention.

Figure 1 represents in vertical cross-section and perspective a building, showing four stories, the main or hall or lower floor and three stories above the main floor. Fig. 2 is a front view of the operating parts of the apparatus detached from the building. Fig. 3 is a horizontal cross-section on line 3 3, Fig. 2, and the apparatus in an inclosure, which is also in cross-section. Fig. 4 is a vertical central section from front to rear on line 4 4, Fig. 2. Fig. 5 is a detail section on line 5 5, Fig. 4.

In the drawings, A represents a building in perspective, the walls and floors being in section, looking into its several rooms, having a main floor or room B and first, second, and third stories C, D, and E, respectively, above the main floor, and all constructed as usual in buildings and needing no particular description herein.

The operating parts of the pneumatic dispatch apparatus for distribution of mail are inclosed and supported within and on a casing or box F, which box or casing is placed, preferably, within the wall of the building, and all inclosed in a closet G, having a door H, hinged at *a*, and arranged to be opened and closed, and when closed to be locked with a key, which key, or a duplicate thereof, it is proposed to be given to the postman who delivers the mail to the building.

The box F has inclosed within and properly secured to it a bellows J, arranged to be operated by a treadle *b*, which bellows has communication by a pipe K with a box or chamber L above said bellows. This bellows, which is a force-bellows, is constructed and arranged for operation substantially as described and shown in Letters Patent of the United States issued to W. F. Davis for improvement in bellows, dated August 2, 1887, No. 367,744, and needs no particular description herein. It can be constructed and arranged, however, for operation in any suitable manner.

M N P are three pneumatic tubes, their lower ends being secured side by side, each in a bracket-arm *d* of an upright support Q, secured by screws *e* to a back extension of the top board *f* of the air-chamber L, and the description of one, with all its connecting parts, will answer for the others, each being a duplicate of the other.

Secured in the top of the air-chamber, and directly underneath and a short distance below the end *g* of the pneumatic tube, is a short tube R, having communication with the air-chamber L and open at its upper end.

S is another short tube secured within a ring T, and through and diametrically across this sectional tube and ring extends a wire or rod U, its end *h* projecting outside of the ring at each side, forming pivots for the sectional tube S to oscillate or swing backward and forward within certain limits in bearings in the horizontal arms *m* of the upright Q, and when swung up into a vertical position it makes a close joint with the lower end of the main tube and the upper end of the tube R, leading from the air-chamber, and when in such position it and the tube R are practically one continuous tube with the main tube.

The lower end of the main tube is cut crosswise downwardly in an angular or inclined direction, as at *n*, from front to rear, and the upper end of the swinging sectional tube is cut correspondingly at such angle, but in the reverse direction, as at P; also, the lower end of the sectional tube is cut slightly angular downward from front to rear, as at *r*, to fit the angular cut of the upper end *t* of the air-chamber tube, all as shown in Fig. 4 more particularly in cross-section, and when the sectional tube is swung up so as to be in line with the main tube the several joints are practically closed.

The end of main tube has on its back side a downwardly-extending flange *u*, which extends forward half-way the circumference of the tube, and on the upper end of the sectional tube is a similarly-projecting flange *v*, but on its front side and extending half-way round the circumference. On its lower end and the upper end of the tube R of air-chamber are respectively similarly-projecting flanges *w y*, but on the reverse sides, as shown in Fig. 4 in cross-section, so that when the sectional tube is swung up in line with the main tube these flanges will pass by and cover up the end joints of the three parts, so that practically no air can pass out or in at the joints, and they also serve as stops to the sectional tube in closing to bring it in true or in proper line or connection with the main tube for a practical continuation of and as one with it.

Projecting from the rear side of the ring T is an arm *a'*, to which is pivoted at *b'* by one end a pitman-rod V, which extends freely down through an opening *d'* in the top board of the air-chamber, its other end being pivoted to an arm W of a rod or wire Y, extending through an opening *e'* of the side of and into the air-chamber and there adapted to rock in a horizontal bearing in a block *f'*, secured to the under side of top board of the air-chamber and having a right-angular arm *g'*, which is connected by its outer end to the under side of a valve A', hinged at *h'* to the under side of the top board and adapted to close and open, when properly moved upon its hinge, the opening B', leading to the tube.

Connected to an extension of the arm W of the rod Y on the opposite side of the rod is a spiral spring *m'*, which by its other end is connected at *n'* to the side of air-chamber, which acts by its tension to keep the valve A' closed against its seat and to cause it to close upon its seat when open and free to be moved. This valve is thus connected by the pitman-rod V to the oscillating sectional tube, so that when it is swung up to make its connection and continuation with the main tube and short tube R it will move the valve A' and open it, as shown at the right in Fig. 5, and when swung outward, as shown in Fig. 4, will close it, being assisted by the action of its spring, so that by moving this oscillating tube in one direction or the other the valve will be opened or closed accordingly, and thus open or close air communication of the bellows J with the main tube in connection therewith.

The main tubes extend upward from the bellows and lead to their respective rooms or stories, the tube M terminating by its upper end in a box C' set in the wall in the first story or room C, the tube N terminating by its upper end in a similar box C' in the wall of the second story or room D, as shown in Fig. 1, the upper end of each tube being flaring somewhat and rising a short distance above the bottom of the box, as shown, each box also having a door *r'*, which can be closed and opened, as desired. The tube P extends up into the third story or room E, and thence, running to the left along or in the ceiling and then down the other wall, is connected with a bellows similar to the bellows J in a casing D', the construction and operation of which will be hereinafter more particularly described.

The door H to the closet or inclosure of the bellows and apparatus on its inside has three horizontal projecting arms E', which are at a height and project such a distance from the door that when it is closed each arm will abut and press against an oscillating sectional tube S near its upper end and close it and hold it in such closed position as long as the door is closed; but when the door is opened the spring *m'*, attached to the arm W of the pivoted rod V of each valve, acts by its tension to close its respective valve, and also help swing the tube outward, as shown in Figs. 3 and 4, although the gravity of the oscillating tube also serves such purpose after it has started.

To save room, the treadle *b* is pivoted at *t'* to the bellows-operating frame F', so that to close the door H it is first swung up into the position shown by dotted lines in Fig. 4, and when the door is opened it drops by its own weight into and is held in proper position by a shoulder *u'* on its under side abutting against the frame F'.

The operation of the apparatus is as fol-

lows: The parts in their normal positions are as follows: The door H is closed and locked, which holds the oscillating sectional tubes up in their closed positions and in connection with their main tubes, the valves being also open, and in each room or story, preferably, the boxes closed, although not essential to the working of the apparatus, and a suitable carrier G′, for holding the mail-matter, is in each swinging tube, resting by its lower end upon the cross-pin U. When the postman arrives at the building with the mail, he unlocks and opens the door, which allows the tubes to swing outward into their inclined positions, the valve A′ to close, and at the same time the foot-piece to the treadle to fall into proper position for the operation of the bellows. He then removes the carrier G′ from the sectional swinging tube of the main tube leading to the room or story to which he desires to send the mail-matter, places therein the mail, and then replaces the carrier in the sectional tube, as shown in Fig. 4, and then closing the sectional tube by hand, its pitman-rod connection opening its valve A′, he operates the bellows, which forces air through the pipe K into the air-chamber L and from thence into the pneumatic tube, forcing the carrier up and along the same and out at the open end into the box C′ in the story or room to which such main tube runs, and having satisfied himself that the carrier has been delivered he lets the sectional tube swing or fall forward, which allows its valve A′ to be closed by its spring m', and then if he has any mail for another story or room he transmits it in the same manner through its pneumatic tube and allows its sectional tube to fall forward, and so on until he has transmitted the mail to all the stories or rooms connected to the apparatus, when he turns up the foot-piece of the treadle and closes the door, which pushes up and holds the several sectional swinging tubes in their closed positions. The person in the room to which the mail is sent opens the box into which the carrier has fallen (the box being large enough to allow for the carrier or other article to be discharged from the tube and fall outside of it in the box) and takes the mail from the carrier and replaces the carrier in the open end of the tube, when it falls down through the tube, and finally into the sectional tube (the sectional tube being at such time in its vertical or closed position) resting on the cross-pin, where it is in position ready for the postman the next time he delivers the mail. The valves being open, allow the carrier to freely fall down through the tube into the swinging tube. As when the sectional swinging tubes are all swung outward and the valves consequently closed air only passes from the bellows in the operation of the apparatus into the tube through which it is desired to send the mail, and which is the one which has its valve opened, as described, the carrier or other article in such tube will have the full force and effect of the bellows.

The pneumatic tubes are all preferably made of elliptical shape in cross-section, in order to the better correspond to the size and shape of usual mail-matter, and the carrier is made of a size and shape to properly fit the tube for its transmission therethrough and of any suitable construction otherwise to inclose all such mail-matter, and the sectional tube is made of a length to receive the carrier, so that it can be wholly or sufficiently within the same when placed in it to not interfere with the movements of the sectional tube.

The tubes leading to the rooms in the first and second stories in the building shown in the drawings are vertical, and in such case the carrier can be easily returned to the sectional tube by its gravity; but as in some cases it might be desirable to send mail-matter to a room at one side, or to one side of the room, so that the tube would have to deviate more or less from a vertical line, and perhaps deliver downward, the upper story in the building shown in the drawings shows the tube carried up to and along its ceiling and down into another part of the room; but as in such case more or less of the tube is above its delivery-opening and also horizontal, other means than the gravity of the carrier are employed to return the carrier to its sectional tube, and such are shown in the third-story room, which will now be described. In this the main tube is carried along the ceiling to another part of the room and then down, as shown in Fig. 1, where it is delivered through the open end of the tube through the head v' of a standard H′, secured to the box or casing D′, to which the end of the tube is secured, the casing inclosing a bellows similar to the one on the lower floor to be operated by its treadle w', the standard having communication with the tube and bellows. The opening in the head of the standard has a valve y', pivoted at z', which is adapted to be swung up to close the opening, and in operation the carrier is first inserted through such opening, the valve then closed and held by hand, and the bellows operated, which will force air into the tube P and return the carrier to the sectional swinging tube, ready to be again transmitted with mail-matter, as before.

By this invention the postman is saved the necessity of climbing the stairs to the various stories or rooms in the building, not only saving him from fatigue consequent thereof, but to a great extent saving time, as with this invention applied to an apartment-house or a building with various rooms or offices much time would be and can be saved in the delivery of the mail to its several stories or rooms, as is obvious.

The sectional swinging tube can be made and arranged to co-operate in connection with the main tube and the valve and the bellows in other ways than as herein particularly shown without departing from this invention;

also, in lieu of a force-bellows an exhaust-bellows can be used, although it is preferable when operated by a person for a force-bellows to be used; but when an exhaust is used it is preferable to use other power, such as a steam-engine and blower.

The carriers for the mail should always be in the swinging tubes ready for the postman or other person, and should be returned to such tube as soon after the person has received his mail-matter as possible, allowing sufficient time for the postman or person sending the mail to close and to swing up the swinging tubes into their proper positions.

If desired, any suitable signal device can be arranged between the lower room or story and the other rooms or stories for the announcement of sending and receiving the mails.

In arranging the tubes and the operating apparatus in the building they can be placed within the walls or ceilings in any suitable manner to get them out of the way and not encumber the rooms more than is necessary; or they can be covered up in any suitable and desirable manner.

Having thus described our invention, what we claim is—

1. The combination, with a building or other structure having a series of stories or rooms, of a series of pneumatic tubes, each leading from a room or story, as desired, to and all terminating at the lower floor or room, or in some desired room or story in such building or other structure, and there having communication with a suitable air-pressure apparatus, each of said tubes having an opening to receive a carrier to be transmitted and an oscillating sectional tube suitably arranged to open and close said opening, and all inclosed in a suitable inclosure having a door or cover arranged to be opened and closed, and when closed to engage with and hold said receiving-opening oscillating tubes closed, for the purpose specified.

2. The combination, with a building or other structure having a series of stories or rooms, of a series of pneumatic tubes, each leading from a room or story, as desired, to and all terminating at the lower floor or room, or in some desired room or story in such building or other structure, and there having communication with a suitable air-pressure apparatus, each of said tubes having an opening to receive a carrier to be transmitted and an oscillating sectional tube suitably arranged to open and close said opening, and also a valve to open and close communication between the air-operating device and its respective pneumatic or main tube, and all inclosed in a suitable inclosure having a door or cover arranged to be opened and closed, and when closed to engage with and hold said receiving-opening sectional oscillating tubes closed and, through their connection with the valves, such valves open, for the purpose specified.

3. The combination, with a pneumatic tube for the transmission therethrough of a carrier having communication with a suitable air-pressure apparatus, of a sectional oscillating tube pivoted to a suitable support and adapted to swing into line with the main or pneumatic tube and to receive such carrier, and connected to a valve between it and the air-motor, substantially as and for the purpose specified.

4. The combination, with a pneumatic tube for the transmission therethrough of a carrier having communication with a suitable air-pressure apparatus and an opening having its ends beveled or angular, provided with semicircular flanges or covers at such ends, of a sectional oscillating tube pivoted to a suitable support and adapted to swing into line with the main or pneumatic tube at such opening, and having its ends beveled or angular the reverse of the beveled or angular ends of the main tube, and provided with semicircular flanges or covers on its ends on the side opposite to those on the main tube, substantially as and for the purpose specified.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

JOHN L. GIVEN.
GEO. B. KELLY.

Witnesses:
EDWIN W. BROWN.
CARRIE E. NICHOLS.