

No. 696,305.

Patented Mar. 25, 1902.

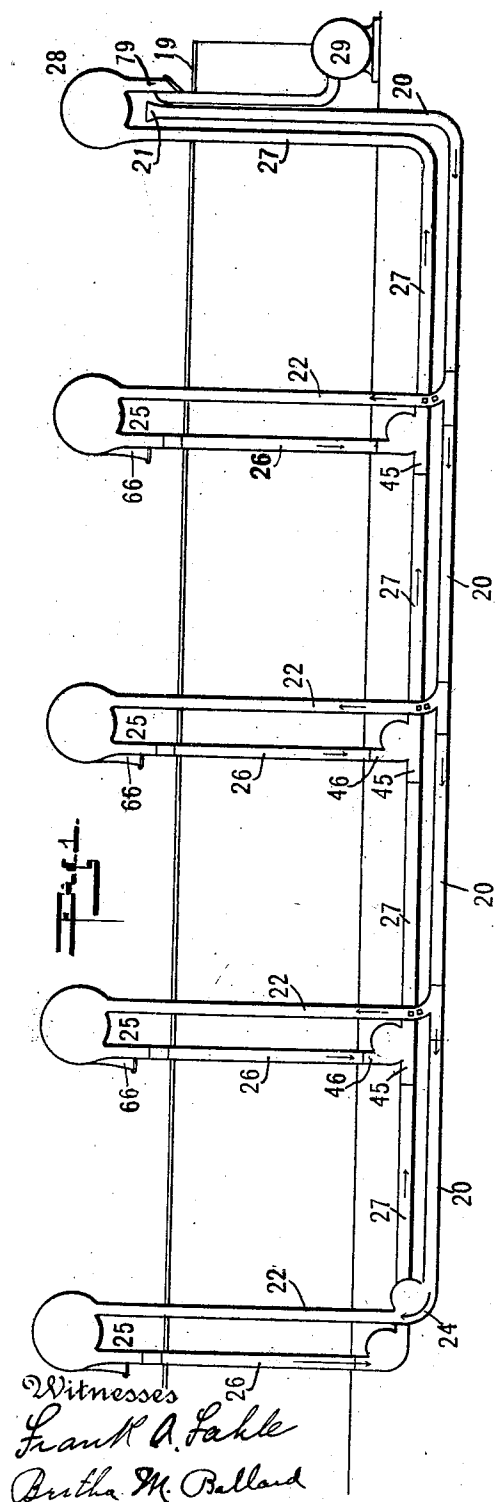
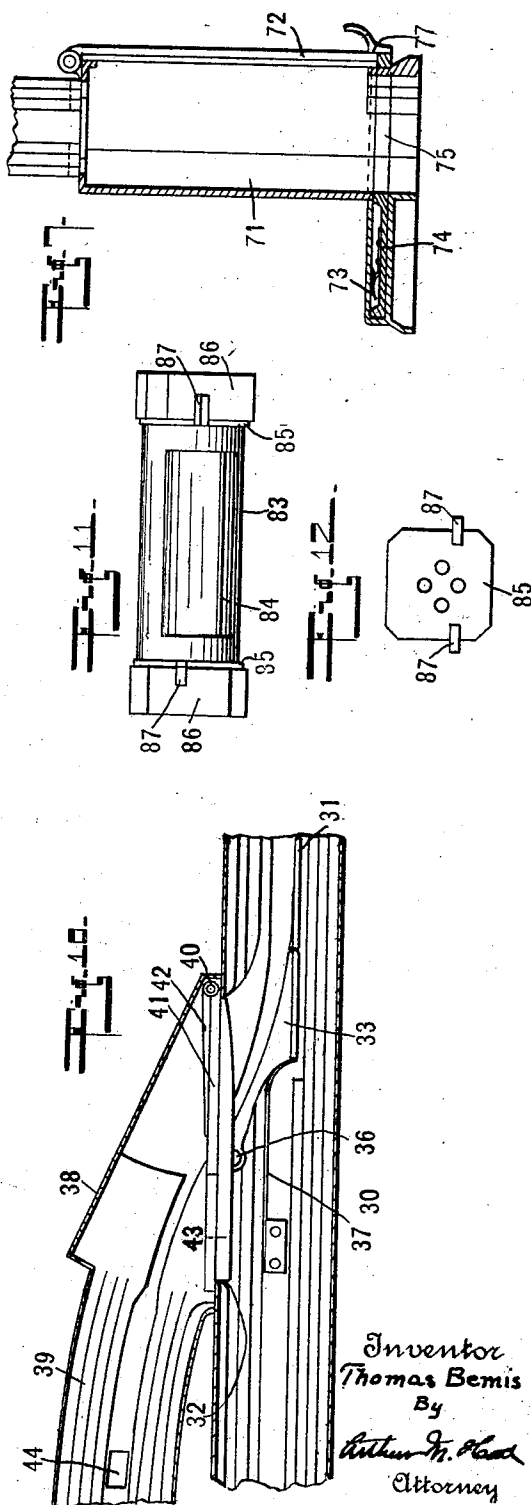
T. BEMIS.

PNEUMATIC DESPATCH TUBE SYSTEM.

(Application filed Sept. 25, 1901.)

(No Model.)

3 Sheets—Sheet 1.



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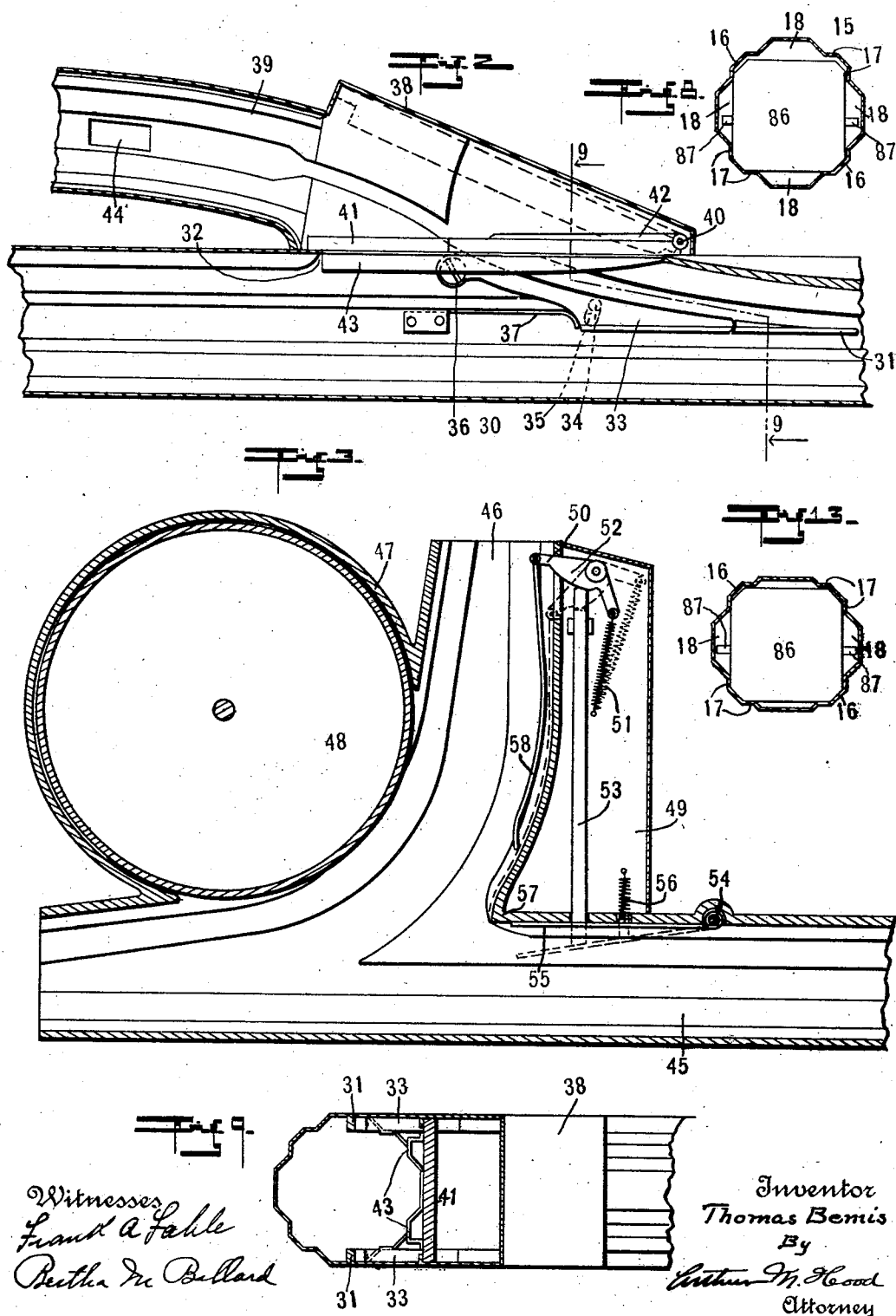
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3 Sheets—Sheet 2.



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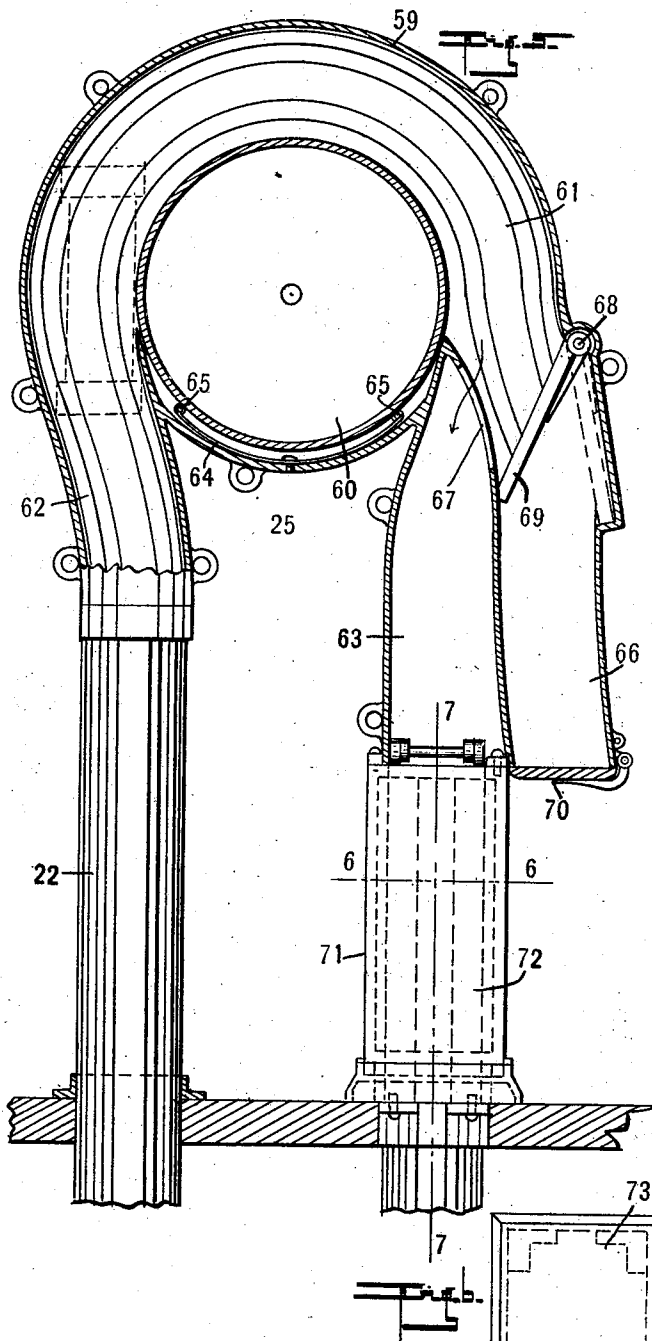
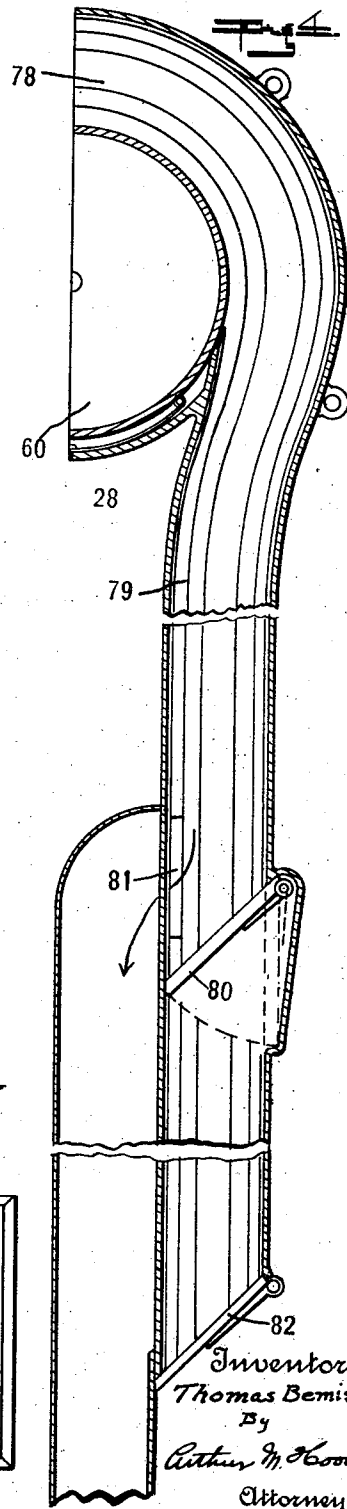
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

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PNEUMATIC-DESPATCH-TUBE SYSTEM.

SPECIFICATION forming part of Letters Patent No. 696,305, dated March 25, 1902.

Application filed September 25, 1901. Serial No. 76,453. (No model.)

To all whom it may concern:

Be it known that I, THOMAS BEMIS, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented a new and useful Pneumatic-Despatch-Tube System, of which the following is a specification.

My invention relates to an improvement in the receiving, switching, guiding, and discharging mechanism of pneumatic-despatch service.

The object of my invention is to provide a pneumatic-despatch-tube system having a series of stations adapted to receive a carrier from and discharge said carrier into a common main line leading from and to a common station, the arrangement being such that no carrier passes to or through any station but that to which it belongs.

Further objects of my invention are to provide improved switching mechanism, to provide improved means by which the carriers may be carried around curves of exceedingly short radius, to provide an improved station terminal, to provide a cashier's terminal of such form that the carriers cannot stick therein, and to provide such improvements in details of construction as shall be hereinafter pointed out.

The accompanying drawings illustrate my invention.

Figure 1 is a diagrammatic view of my improved system. Fig. 2 is an axial section of the switch. Fig. 3 is a similar section of the junction between the main-line return and the return from a station. Fig. 4 is an axial section of the discharge end of the cashier's terminal. Fig. 5 is an elevation, partly in axial section, of a station-terminal. Fig. 6 is a section on line 6 6 of Fig. 5. Fig. 7 is a section on line 7 7 of Fig. 5. Fig. 8 is a cross-section of an approved form of delivering-tube. Fig. 9 is a section on line 9 9 of Fig. 2. Fig. 10 is a view similar to Fig. 2 on a smaller scale and with switch in a different position. Fig. 11 is a side elevation of the carrier. Fig. 12 is a detail of a portion of the carrier. Fig. 13 is a section of an approved form of return-tube.

In the drawings, 15 indicates the main tubes of the system, the said tubes being preferably formed with a series of axial grooves 16,

adapted to receive the corners of the heads of the carriers, the grooves forming short shoulders 17 upon which the carriers slide. Tube 15 is also provided with one or more axial grooves 18, the purpose of which will appear.

My system is formed of tubes of the character described, and arranged in the following manner:

Leading from the cashier's desk 19 to a main-line tube 20 is a tube having an open receiving end 21, into which the carrier may be dropped. Leading from the main tube 20 are a series of branch tubes 22, a switching-Y being placed in the point of separation. As many stations may be supplied from the main line 20 as may be desired, and the last station is connected to an elbow 24. Each tube 22 leads to a station-terminal 25, from which leads a return-tube 26, each of the return-tubes being led into a main return-tube 27, the said main return-tube returning to a cashier's terminal 28 before a cashier's desk and through said terminal to the suction-pump 29. At the point of juncture between the main line 20 and a branch 22 I provide a switching mechanism 23, which consists of a tubular portion 30 of the same size in cross-section as the main tube 20 and adapted to form a continuation of said main tube. Arranged in two preferably diametrically opposed grooves 18 of this section I mount a rib 31, the said rib being so arranged as to interfere with a properly-placed portion of a carrier and serving to deflect the carrier toward an opening 32, formed in the side of the portion 30. Forming a continuation of the rigid rib 30 is a yielding buffer 33, which is pivoted at 36 in the tubular portion 30. The free end of the buffer 33 is held in alinement with the switch-rib 31 by means of the spring 37, and the displacement of said buffer is prevented by a pin 34, moving in a slot 35. Arranged adjacent the opening 32 and preferably formed integral with the section 30 is a casing 38, the end 39 of which corresponds in cross-section to the branch tubes, so that the branch 22 may be connected thereto. If the main tube 20 is provided with two pairs of grooves 18, the branch tubes may omit one pair of such grooves, as they are not needed.

Pivoted at 40 in the casing 38 is a valve 41,

the main portion of which is preferably of leather, reinforced at the back by hinge 42 and at the front by wearing-strips 43, which when the valve is closed aline with the shoulders 17. If desired, a spring may be provided to hold the valve 41 normally closed over the opening 32; but said spring is not essential, as will be made to appear. Formed through the side of casing 38 beyond the valve 41 is an air-supply opening 44, which may be provided with an adjustable cover-plate, if desired.

Great difficulty has heretofore been found in providing means for forcing the carrier around the curves, and it has heretofore been customary, especially in main lines, to provide curves of long radius, and even then carriers accidentally stick. This sticking is due to friction and cramping of the carrier in the tube, and in order to provide and at the same time make an exceedingly short turn possible I provide a junction-casing, which consists of a tubular portion 45, which corresponds in internal cross-section to the return-tubes 27, so that said return-tubes may be secured thereto. Leading into the portion 45 is a curved tubular portion 46, the radius of curve of which is comparatively small. The inner side of tube 46 is provided with a substantially circular recess 47, within which is rotatably mounted a wheel 48, the periphery of which is tangent or approximately tangent to the line of the inner curve of the tube 46.

At some times perhaps two carriers will reach a junction at substantially the same time, and in such case there is a possibility of such interference between the carriers as to stick both in the tubes. In order, therefore, to prevent any possible interference, I have provided a mechanism which is operated by the passage of any carrier toward a junction in such manner that the first carrier reaching the junction is given the right of way, while the second carrier is automatically held just long enough to allow complete passage of the first-arriving carrier past the junction. Forming part of a junction-casing is a chamber 49, in which is pivoted a lever 50, the free end of which projects into the branch 46, the said lever being held normally projected into the branch by means of a light spring 51. Lever 50 carries a cam 52, which is adapted to engage and operate a plunger 53, the lower end of which is projected into the tubular portion 45. Pivoted in portion 45 at 54, a short distance to the rear of plunger 53, is a plate 55, which is held in engagement with the lower end of plunger 53 by a light spring 56, the said spring tending to hold the plate 55 close to the side wall of the tube 45 and out of the path of the carrier moving therein. Plate 55 is preferably extended, so that its free end reaches close to the point of juncture 57, between the tube 45 and the branch 46. Pivoted to the end of lever 50 and hanging freely therefrom is a plate 58, which is formed so as to conform with the

curve of the outer wall of the branch 46, the said plate 58 being of such length that when the lever 50 is turned so as to withdraw its free end from the tube 46 the plate 58 will reach substantially to the point 57.

The station-terminal consists of a hollow head 59, within which is pivoted a wheel 60, similar to the wheel 48, the said wheel being preferably mounted at the center of the curve on the outer portion of the head 59 and being of such diameter as to form a channel 61, within which the carrier may travel. Head 59 is provided with a pair of tubular branches 62 and 63, the branch 62 being adapted to be secured to the end of one of tubes 22. In order to prevent the continuous rotation of the wheel 60, due to the air-currents, and also in order to prevent passage of sufficient air around the back side of the wheel 60 to create counter currents, I provide a spring 64, having ends 65, which are held yieldingly against the face of the wheel, thus forming a check. Spring 64 and ends 65 should be of substantially the same width as the face of the wheel. Spring 64 may be dispensed with, if greater care is exercised in fitting the wheel into its chamber. Head 59 is also provided immediately adjacent its branch 63 with a branch 66, which is led from the channel 61, parallel with branch 63, and forms substantially a continuation of channel 61. The inner wall of branch 66 is slotted at 67 to provide passage for the air from channel 61 into the branch 63. Pivoted at 68 in the branch 66 is a door 69. Door 69 may be held normally closed by a spring; but such spring is not necessary, as the door will be normally held closed by suction. The branch 66 is of a length below door 69 greater than the length of the carrier, and the lower end of the branch is normally closed by a spring-door 70 of the usual type. Communicating with branch 63 is a receiving-box 71, the interior of the main portion of which is of substantially the same cross-section as the return-tube 26. One face of the body 71 is opened and is closed by a door 72, preferably hinged at its top to the body 71. Formed at the bottom of body 71 is an extension 73, within which is slidably mounted a valve-plate 74, having an opening 75 therethrough, through which a carrier may drop. The valve 74 is provided with a shoulder 77, adapted to engage the lower end of the door 72 and hold the same closed. The normal position of the valve-plate 74 is that shown in Fig. 7, the opening 75 being then in alinement with the tube 26.

The cashier's terminal consists of a hollow head 78, similar to the station-terminal heads 59 and provided with the wheel 60 and a check-spring 64. The discharge branch 79 of the head 78, however, has a straight drop of several carrier lengths, and about two carrier lengths, more or less, from the beginning of the curve I pivot a door 80, which is held normally closed by the suction of air passing through openings 81, formed in the opposite

wall of the branch, into a tube 27'. The momentum of a carrier is considerably checked by passage of the carrier around the curve of head 78, and the distance between said curve and the door 80 is made such that by gravity alone the carrier will attain sufficient momentum to open door 80 and successfully pass the openings 81. The branch 79 is extended below door 80 a distance such that the carrier will by gravity alone after its passage past the door 80 attain sufficient momentum to open a normally closed door 82, which closes the lower end of the branch. The lengths of branch 79 above door 80 and between said door and door 82 should be equal to two or more carrier lengths to allow for a rapid succession of carriers without preventing the proper closing of the two doors.

Any suitable carrier may be used in this system, but I prefer that shown in Figs. 11 and 12, in which the main body consists of a pair of telescoped cylinders 83 and 84, the said cylinders forming a body substantially like ordinarily used. Secured to each end of the body thus formed is a plate 85, which is substantially the shape shown in Fig. 12, being such as to fit across the tubes in the grooves 16 and slide upon shoulders 17. Secured to one face of each plate 85 is a felt head 86, which is a trifle larger than the plate, so that it is the felt head which rides upon the shoulders in the tube rather than the plate. Each plate 85 carries upon two opposite sides projecting guide-pins 87, the said guide-pins being so arranged upon the plate that they project into opposite grooves 18 of the despatch-tubes and in position to be engaged by one or another of the switch-ribs 31. Said pins may be attached to the plate in any desired manner. By placing pin 87 to one side of the center of the plate 85, as shown in Fig. 11, at least four stations may be served from the same main line in the following manner: No. 1 by the arrangement shown in Fig. 11, No. 2 by turning the said plate or turning the entire carrier through an angle of ninety degrees, No. 3 by turning the face of each plate in opposite direction with relation to the carrier-body, and No. 4 by again turning the plate through ninety degrees on the body. Instead of pins 87 equivalent grooves may be formed in the heads of the carriers, the switch-ribs being fitted thereto. The last or fifth station may be served by providing carriers with no switch-pins. It will be readily understood that as many stations as are desired may be served from one main line, the number depending merely upon proper relative arrangement of pins 87 on the carriers and the switch-ribs 31 in the main despatch-tube. In order to aid the cashier in properly placing the carriers in the receiving-tube 20, it is advisable that a distinguishing-mark be placed upon one side of the head end of the carrier or the carrier and tubes made of such form that the carrier can only be inserted one way.

In operation the pump 29 is operated so as to create a suction through the system of pipes in the directions indicated by the arrows thereon, the air being taken in at the cashier's receiving end 21 and also through each of the openings 44, which leads into the branch pipes 22, so that there is a positive movement of the air through each one of the station-terminals 25, yet the current of air which passes through any one of the station-terminals does not pass through any other station-terminal. All of the air is drawn through the cashier's terminal 28. The blower must therefore be of such capacity as to maintain the desired suction through the receiving end 21 and all of the openings 44. The cashier in returning the carriers places them head end into the end 21 of tube 20 and each carrier is carried along said tube in the usual manner. If a carrier is provided with pins 85, properly arranged to pass inside of the switch-ribs 31, opposite the first branch 22, the carrier will be deflected thereby, so as to strike the wearing-strips 43 of the valve 41 and force said valve open, the shock of change of direction being somewhat lessened by the yielding of the ribs 33. The oncoming carrier forces the door 41 back in the casing 38 into the position shown in dotted lines in Fig. 2. Until valve 41 is opened there is no air-current through the opening 32 past said valve, although there is an air-current through the opening 44 and through the farther end of the branch 22. When the oncoming carrier opens the valve 41, it passes through the opening 32, being forced therethrough by its momentum. The carrier passes into the branch tube 22, and the rear head of the carrier practically closes communication between the openings 44 and 32. As a consequence the valve 41 is immediately drawn shut by the suction of air through the main tube 20, and the carrier is drawn forward through the branch 22 by reason of the independent air-current which already exists in the said branch tube. When the carrier reaches a position in the station-terminal indicated by dotted lines in Fig. 5, there is a tendency to pinch or increase the friction against the inner wall of the curve; but as soon as this occurs the wheel 60 yields and rotates with the carrier, this relieving all friction along the inner wall, and the carrier passes around the channel 61 with sufficient momentum to drive valve 69 open, the air returning through the branch 63. The carrier after passing door 69 drops through the continued portion of branch 66 and, opening door 70, drops upon the counter. Each carrier proceeds through the main tube 20 until it reaches a branch tube opposite which the ribs 31 lie in such position as to coact with the pins 87, carried thereby, and if said carrier carries no pins it passes to the last branch and is discharged from the last station-terminal in the manner already described. The return of the valve 41 is practically instantaneous, and in addition to this

there is no tendency for any carrier other than the right one to be deflected into any branch tube even if the valve did not entirely close at the time such carrier reaches the opening, for the reason that the valve can only be open during the time a carrier is passing through its opening 32, and in such case any possible suction through the branch opening 32 will be very materially less the suction through the main line 20 and not enough to deflect a running carrier from the straight line of its projection through the main tube 20. A clerk in order to introduce a carrier into the system pulls out the valve-plate 74, so as to cover the adjacent end of the return-tube 26 and at the same time releasing door 72. This door may then be raised and the carrier placed in the body 71. The said body being substantially of the same cross-section as the heads 86 of the carriers, no especial care need be taken in introducing said carriers. The operator then drops door 72, so that there may be no intake of air through the opening of said body 71, and then returns the valve-plate to its initial position, bringing opening 75 thereof opposite tube 26, so that the carrier may pass therethrough. The carrier passing from the tube 26 into the branch 46 strikes the free end of lever 50, so as to throw said end out of the branch and plate 58 down against the outer wall. This movement causes cam 52 to shift plunger 53 so as to project plate 55 into the tube 45. As the carrier advances it strikes wheel 48, the said wheel rotating with the carrier and assisting the projection of said carrier into the main line 45. The rear end of the carrier trails along plate 58, so as to hold plate 55 in its projected position in tube 45 until the carrier has passed the point of junction 57. As a consequence if a carrier from another station reaches the junction during the time of the passage of the first carrier into the junction the second carrier will be held by the plate 55. As soon as the first carrier has passed point 57, however, springs 51 and 56 operate to return the parts to normal positions and allow the second carrier to follow the first carrier in the main line. If the first carrier to reach the junction is one passing along the main line toward the junction, it will be passed beneath plate 55 in such manner that said plate cannot be depressed until the carrier has passed the junction, so that if the second carrier reaches the junction through the branch 46 it will be held by the projected end of lever 50 until the first carrier has passed. All the carriers from the branch return-tubes 26 pass into the main return-tube 27 and up into the cashier's terminal head 78, being assisted around said terminal by wheel 60. The branch 79 of said terminal is a depending branch, and the distance between the center line of wheel 60 and the door 80 is such that every carrier, even if it has lost all of its momentum by the time it passes the wheel 60, will gain sufficient momentum by its own

weight to pass the opening 81 and open the door 80. It will then drop, so as to open the door 82.

The provision of a wheel, such as 48 or 60, at a curve forms a movable inner wall to the curve, which yields in the direction of travel of the carrier. It will be readily understood that instead of a wheel, such as is shown in the drawings, many other constructions—such as balls, an endless belt, a plurality of wheels, &c.—by which a wall movable in the direction of the travel of the carrier may be produced without departing from my invention. The movable wall may be provided on the outside of the curve instead of the inside, as shown, without departing from my invention.

It is to be understood that the tube, switch, junction, and carrier described and claimed in this application are equally applicable for use in a system where the carrier is driven by a means other than pneumatic pressures.

By shifting the switches to the station-terminals all carriers may be moved through the station preceding their own, in which case openings 44 will not be used. Receiving-box 71 will then be attached to a separate branch tube leading to the main return-tube, in which case the normal position of the valve-plate 74 would preferably be over the branch tube and adapted to be projected into the pocket after the carrier has been inserted and the outer valve closed.

I claim as my invention—

1. In a pneumatic-despatch-tube system, a curved tubular section, therefor, and a movable wall portion adapted to be moved in the direction of travel of a carrier passing around said curve.

2. In a pneumatic-despatch-tube system, a curved tubular section therefor, and a movable part mounted therein in position to be engaged by a carrier and movable in the direction of travel of the carrier.

3. In a pneumatic-despatch-tube system, a curved tubular section, and a revolvable wheel mounted therein in position to form a portion of the inner wall of the curve.

4. In a pneumatic-despatch-tube system, a discharge-terminal therefor consisting of a curved tubular head, and a revolvable wheel mounted therein in position to form a portion of the inner wall of the curve.

5. In a pneumatic-despatch-tube system, a station-terminal consisting of a hollow head, a wheel rotatably mounted therein so as to form a portion of the inner wall of a tubular channel for the passage of a carrier, a valved discharge branch leading from said head, an air branch leading from said head on the receiving side of the valve, a receiver mounted in said air branch, a door normally closing an opening into said receiver, and a movable valve-plate adapted to close the air branch in front of the receiver or to open said branch and allow a carrier to pass therein from the receiver.

6. In a pneumatic-despatch-tube system,

the combination with an air-tube, of a receiver therefor consisting of a tubular body forming part of the air-tube and having an opening therein, means for closing said opening, 5 a pocket formed in said body, and a valve housed in said pocket so as to be slidable in a straight line therein and adapted to be moved so as to close communication between the body and a portion of the air-tube and to 10 support a carrier.

7. In a pneumatic-despatch-tube system, the combination with an air-tube, of a receiver consisting of a tubular body forming part of said air-tube and having an opening in its 15 side, a door adapted to normally close said opening, a valve-plate mounted between said body and a portion of the air-tube and having an opening therethrough through which the carrier may pass, and means carried by 20 the valve for engaging the door to prevent the same from being opened so long as the valve is open, substantially as and for the purpose set forth.

8. In a pneumatic-despatch-tube system, a 25 station-terminal having a discharge branch and an air branch which are substantially parallel, guides for preventing the passage of a carrier into the air branch, and a valve arranged to close the discharge branch opposite 30 the mouth of the air branch with its lower end immediately below the same.

9. In a pneumatic-despatch-tube system, a station-terminal provided with a discharge-tube, an air-tube leading therefrom and sub- 35 stantially parallel thereto, guides at the mouth of the air-tube, a valve mounted in the discharge-tube opposite the mouth of the air-tube with its lower end immediately below and adjacent the same, and a second valve 40 arranged to close the discharge-tube beyond the first valve.

10. In a pneumatic-despatch-tube system, a station-terminal consisting of a curved chan- 45 nel having a depending discharge end, an air-tube having a portion immediately adjacent and substantially parallel to the discharge branch, an air-passage leading through the side of the discharge branch into the air-tube a considerable distance from the curved 50 portion of the terminal, and a valve arranged to close the discharge branch beyond the said air-passage.

11. In a pneumatic-despatch-tube system, a station-terminal consisting of a curved chan- 55 nel having a depending discharge end, an air-tube having a portion immediately adjacent and substantially parallel to the discharge branch, an air-passage leading through the side of the discharge branch into the air- 60 tube a considerable distance from the curved portion of the terminal, and a valve arranged to close the discharge branch immediately beyond said air-passage.

12. In a pneumatic-despatch-tube system, 65 a station-terminal consisting of a curved channel having a depending discharge end, an air-tube having a portion immediately adjacent

and substantially parallel to the discharge branch, an air-passage leading through the side of the discharge branch into the air-tube a considerable distance from the curved portion 70 of the terminal, a valve mounted in the discharge branch immediately beyond the air-passage, and a second valve arranged to close the discharge branch at least a carrier length 75 beyond the first valve.

13. In a pneumatic-despatch-tube system, a station-terminal having a depending dis- charge-channel, an air-passage leading there- from at a point below a substantially straight 80 portion of the tube of sufficient length to allow its gravitation to carry a carrier beyond said air-passage, and a valve arranged to close the discharge-tube beyond said air-pas- 85 sage.

14. In a pneumatic-despatch-tube system, a junction consisting of a pair of converging tubular portions, a stop normally projected into the line of one of said tubular portions, a second stop adapted to be projected into 90 the line of the other tubular portion but normally held out of projected position, and intermediate connections between said stops whereby the passage of a carrier through either of said tubular portions will serve to 95 project or retain projected the stop in the other tubular portion.

15. In a pneumatic-despatch-tube system, a junction consisting of a pair of converging tubular portions, a stop adapted to be pro- 100 jected into one of said tubular portions, a second stop adapted to be projected into the other tubular portion, a pair of plates one carried by each stop and extending along a portion of the length of the adjacent tubular 105 portion, and intermediate connections between said stops whereby the passage of a carrier through said tubular portion will serve to project or retain projected the stop in the other tubular portion. 110

16. In a pneumatic-despatch-tube system, a junction therefor consisting of a pair of converging tubular portions, a lever arranged to be normally but yieldingly projected into one of said tubular portions, a plunger adapt- 115 ed to be projected into the other tubular portion, and a cam carried by said lever and adapted to engage and project said plunger into its tubular portion when the lever is thrown out of its tubular portion, substan- 120 tially as and for the purpose set forth.

17. In a pneumatic-despatch-tube system, a junction therefor consisting of a pair of converging tubular portions, a lever, means for normally projecting one end of said lever 125 into one of said tubular portions, a plate carried by the free end of said lever and projecting toward the junction, a cam carried by said lever, a plunger arranged to be engaged by said cam, a plate pivoted in the 130 other tubular portion so as to project toward the junction and be engaged by the plunger, and means for normally but yieldingly retaining said plate against the wall of its tu-

bular portion and the plunger out of alinement of said tubular portion, substantially as and for the purpose set forth.

18. In a pneumatic-despatch-tube system, a junction therefor consisting of a main tubular portion, a branch tubular portion leading into the main tubular portion on a curve, and a portion forming a part of the wall of said curved branch and movable in the direction of travel of a carrier.

19. In a pneumatic-despatch-tube system, a junction therefor consisting of a main tubular portion, a branch tubular portion leading therein, and a portion forming part of one junction-wall and movable in the direction of travel of a carrier passing through said tubes.

20. In a pneumatic-despatch-tube system, a junction therefor consisting of a straight main tubular portion, a branch tubular portion leading therein upon a curve, and a wheel revolvably mounted at said junction so as to form a part of the inner wall of the curved branch.

21. In a pneumatic-despatch-tube system, a junction therefor consisting of a straight main tubular portion, a branch tubular portion leading therein upon a curve, a wheel revolvably mounted at said junction so as to form a part of the inner wall of the curved branch, a stop adapted to be projected into the line of one of said tubular portions, a second stop adapted to be projected into the line of the other tubular portion, and intermediate connections between said stops whereby the passage of a carrier through said tubular portion will serve to project or retain projected the stop in the other tubular portion.

22. In a pneumatic-despatch-tube system, a junction consisting of a straight main tubular portion, a branch tubular portion leading therein upon a curve, a wheel mounted at said junction so as to form a part of the inner wall of the curved branch, a stop adapted to be projected into one of said tubular portions, a second stop adapted to be projected into the other tubular portion, a pair of plates one carried by each stop and extending along a portion of the length of the adjacent tubular portion, and intermediate connections between said stops whereby the passage of a carrier through said tubular portion will serve to project or retain projected the stop in the other tubular portion.

23. In a pneumatic-despatch-tube system, a junction therefor consisting of a straight main tubular portion, a branch tubular portion leading therein upon a curve, a wheel revolvably mounted at said junction so as to form a part of the inner wall of the curved branch, a lever, means for normally projecting one end of said lever into one of said tubular portions, a plate carried by the free end of said lever and projected toward the junction, a cam carried by said lever, a plunger arranged to be engaged by said cam, a plate pivoted in the other tubular portion so as to project toward the junction and be engaged by the plunger,

and means for normally but yieldingly retaining said plate against the wall of its tubular portion and the plunger in alinement with its tubular portion.

24. In a pneumatic-despatch-tube system, the combination with a main tubular portion having an outlet-opening in its side, of a valve arranged to normally close said opening, a branch tubular portion leading from said opening beyond the valve, and switching mechanism arranged in the main tube in such manner as to engage and bring predetermined carriers into engagement with said valve whereby said carriers will operate to open said valve and allow the passage of said carriers into the branch tube.

25. In a pneumatic-despatch-tube system, the combination with a main tubular portion having an outlet-opening in its side, of a valve arranged to normally close said opening, and switching mechanism to deflect predetermined carriers from the main tube and through the valved opening without obstructing the main tube for immediate passage of another carrier.

26. In a pneumatic-despatch-tube system, the combination of the main tube having an opening in its side, a branch tube leading from said opening, a switch arranged in said main tube adjacent the opening so as to deflect predetermined carriers into said opening, and means for yieldingly supporting said switch to allow a limited movement thereof in the direction of travel of such carriers.

27. In a pneumatic-despatch-tube system, the combination of the main tube having an opening in its side, a switch arranged in said main tube adjacent the opening so as to deflect predetermined carriers through said opening, and means for yieldingly supporting said switch to allow a limited movement thereof in the direction of travel of such carriers.

28. In a pneumatic-despatch-tube system, the combination with the main tubular portion having an outlet-opening in its side, of a valve arranged to normally close said opening, a branch tubular portion leading from said opening beyond the valve, a switch arranged in the main tube adjacent the opening so as to deflect predetermined carriers into said opening, and means for yieldingly supporting said switch to allow a limited movement thereof in the direction of travel of such carriers.

29. In a pneumatic-despatch-tube system, the combination with the main tubular portion having an outlet-opening in its side, of a valve arranged to normally close said opening, a switch arranged in the main tube adjacent the opening so as to deflect predetermined carriers into said opening, and means for yieldingly supporting said switch to allow a limited movement thereof in the direction of travel of such carriers.

30. In a pneumatic-despatch-tube system, the combination with the main tube having

an opening in its side, of a valve arranged to normally close said opening, a branch tube leading from said opening, a switch arranged in the main tube in position to engage predetermined carriers and deflect the same toward the valve, an opening leading into the branch beyond the valve, and means for maintaining independent air-currents through the main tube and through the branch tube through its opening.

31. In a pneumatic-despatch-tube system, the combination with the main tube having an opening in its side, of a valve arranged to normally close said opening, means for deflecting predetermined carriers through said opening, a branch tube leading from said opening and having an opening leading therein beyond the valve and means for maintaining independent air-currents through the main tube and through the branch tube through the opening.

32. A tube for pneumatic-despatch-tube systems, having two independent sets of axial grooves formed in the wall thereof one set of said grooves being adapted to receive coacting guiding parts of a carrier and the other set being adapted to allow the passage of switching mechanism carried by the carriers.

33. In a pneumatic-despatch-tube system, a station-terminal having a discharge branch and an air branch connected thereto, guides for preventing the passage of a carrier into the air branch, and a valve arranged to close the discharge branch opposite the mouth of the air branch and pivotally supported at its rear end upon an axis located upon the side of the discharge branch opposite from the air branch.

34. In a pneumatic-despatch-tube system, a station-terminal having a depending discharge-channel, an air-passage leading therefrom at a point below a substantially straight portion of the tube of sufficient length to allow its gravitation to carry a carrier beyond said air-passage, a valve arranged in the discharge-tube opposite the air-passage and pivoted at its rear end to that wall of the discharge-passage opposite the air-passage, and a second valve arranged to close the discharge-tube at least one carrier length below the first valve.

35. In a pneumatic-despatch-tube system, the combination with an air-tube, of a receiver therefor consisting of a tubular body forming a part of the air-tube and having an opening therein through which a carrier may be passed from the exterior, means for closing said opening, a pocket formed in said body, a valve adapted to close the air-tube arranged in line with said pocket and adapted to be projected therein, and means controlled by the valve for controlling the operability of the means for closing the external opening, without preventing the operability of the valve.

36. In a pneumatic-despatch-tube system,

the combination with the tubes thereof, of a carrier provided with a soft head, a separate switch-pin plate secured to the carrier, a switch-pin fixed upon the plate and projecting radially therefrom, and means carried in the tubes for engaging said pin.

37. In a pneumatic-despatch-tube system, the combination with the tubes thereof, of a carrier consisting of a tubular body having a soft head, a separate switch-pin plate secured to said body and angularly adjustable thereon, a switch-pin carried by said plate and projecting radially therefrom, and means arranged in the tubes for engaging said switch-pin.

38. In a pneumatic-despatch-tube system, the combination with the tubes thereof, of a carrier consisting of a tubular body provided with a soft head, a separate switch-pin plate secured to said body, a switch-pin of greater thickness than the plate carried by said plate and projected into a recess formed in the soft head, and means arranged in the tubes for engaging said switch-pin.

39. In a pneumatic-despatch-tube system, the combination with an air-tube, of a receiver therefor consisting of a tubular body communicating with the air-tube and having an opening therein through which a carrier may be passed from the exterior, means for closing said opening, a pocket formed in said body, a valve adapted to support a carrier, said valve being arranged to slide in a straight line into said pocket and adapted to close carrier communication between the body and a portion of the air-tube, and means controlled by the valve for controlling the operability of the means for closing the external opening without preventing the operability of the valve.

40. In a pneumatic-despatch-tube system, a station-terminal having a discharge branch, an air branch leading from the side of said branch, and a valve arranged to close the discharge branch, a portion of said valve lying in line with the mouth of the air branch.

41. In a pneumatic-despatch-tube system, a station-terminal provided with a discharge-tube, an air-tube leading from the side thereof, a valve arranged to close the discharge-tube and having a portion thereof in line with the mouth of the air-tube, and a second valve arranged to close the discharge-tube beyond the first valve.

42. In a pneumatic-despatch-tube system, a station-terminal having a discharge-tube, an air-tube leading from the side thereof, and a valve pivotally supported in the discharge-tube and adapted to close the same, the said valve having a portion in line with the mouth of the air-tube.

43. In a despatch-tube system, a junction consisting of a pair of converging tubular portions, a stop normally projected to the line of one of said tubular portions, a second stop adapted to be projected into the line of the

other tubular portion but normally held out of projected position, and intermediate connections between said stops whereby the passage of a carrier through either of said tubular portions will serve to project or retain projected the stop in the other tubular portions.

44. In a despatch-tube system, a junction consisting of a pair of converging tubular portions, a stop adapted to be projected into one of said tubular portions, a second stop adapted to be projected into the other tubular portion, a pair of plates one carried by each stop and extending along a portion of the length of the adjacent tubular portion, and intermediate connections between said stops whereby the passage of a carrier through said tubular portion will serve to project or retain projected the stop in the other tubular portion.

45. In a despatch-tube system, a junction therefor consisting of a pair of converging tubular portions, a lever, means for normally projecting one end of said lever into one of said tubular portions, a plate carried by the free end of said lever and projecting toward the junction, a cam carried by said lever, a plunger, arranged to be engaged by said cam, a plate pivoted in the other tubular portion so as to project toward the junction and to be engaged by the plunger, and means for normally but yieldingly retaining said plate against the wall of its tubular portion and the plunger out of alinement of said tubular portion, substantially as and for the purpose set forth.

46. In a despatch-tube system, the combination of the main tube having an opening in its side, a branch tube leading from said opening, a switch arranged in said main tube adjacent the opening so as to deflect predetermined carriers into said opening and means for yieldingly supporting said switch to allow a limited movement thereof in the direction of travel of such carriers.

47. In a despatch-tube system, the combination of the main tube having an opening in its side, a switch arranged in said main tube adjacent the opening so as to deflect predetermined carriers through said opening, and means for yieldingly supporting said switch

to allow a limited movement thereof in the direction of travel of such carriers.

48. A tube for despatch-tube systems, having two independent sets of axial grooves formed in the wall thereof, one set of said grooves being adapted to receive coacting guiding parts of a carrier and the other set being adapted to allow the passage of switching mechanism carried by the carrier.

49. In a despatch-tube system, the combination with the tubes thereof, of a carrier provided with a soft head, a separate switch-pin plate secured to the carrier, a switch-pin fixed upon the plate and projecting radially therefrom, and means carried in the tubes for engaging said pins.

50. In a despatch-tube system, the combination with the tubes thereof, of a carrier, consisting of a tubular body having a soft head, a separate switch-pin plate secured to said body and angularly adjustable thereon, a switch-pin carried by said plate and projecting radially therefrom, and the means arranged in said tubes for engaging said switch-pin.

51. In a despatch-tube system, the combination with the tubes thereof, of a carrier consisting of a tubular body provided with a soft head, a separate switch-pin plate secured to said body, a switch-pin of greater thickness than the plate carried by the plate and projected in a recess formed in the soft head, and means arranged in the tubes for engaging said switch-pin.

52. In a pneumatic-despatch-tube system, the combination with an air-tube, of a receiver consisting of a tubular body communicating with said air-tube, a valve controlling communication between the receiver and tube, a valve forming an access to the receiver-body, and means operated by the first valve for controlling the operability of the second valve, without preventing the operability of the first valve.

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