

No. 712,479.

Patented Nov. 4, 1902.

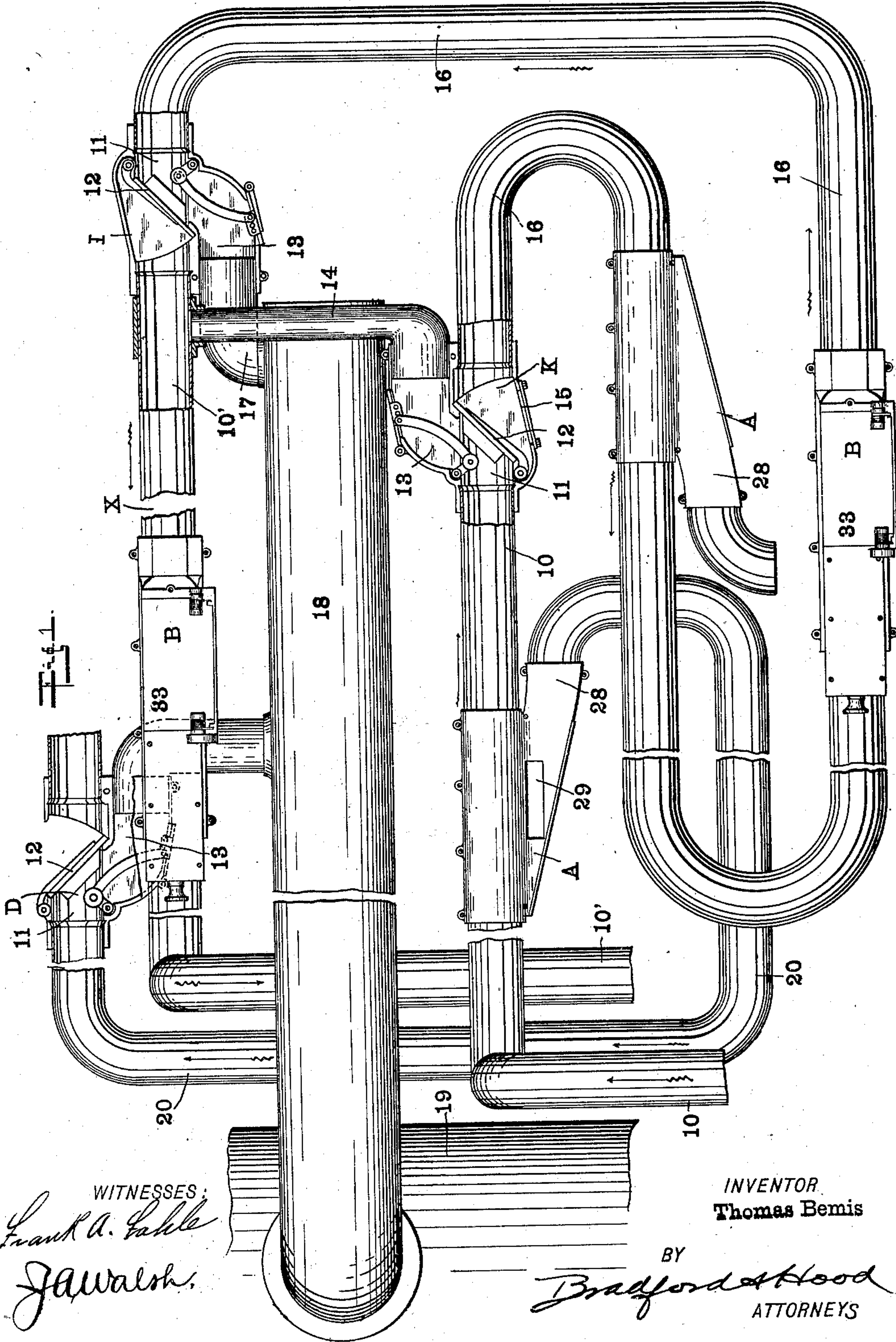
T. BEMIS.

PNEUMATIC DESPATCH TUBE SYSTEM.

(Application filed May 17, 1902.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES:

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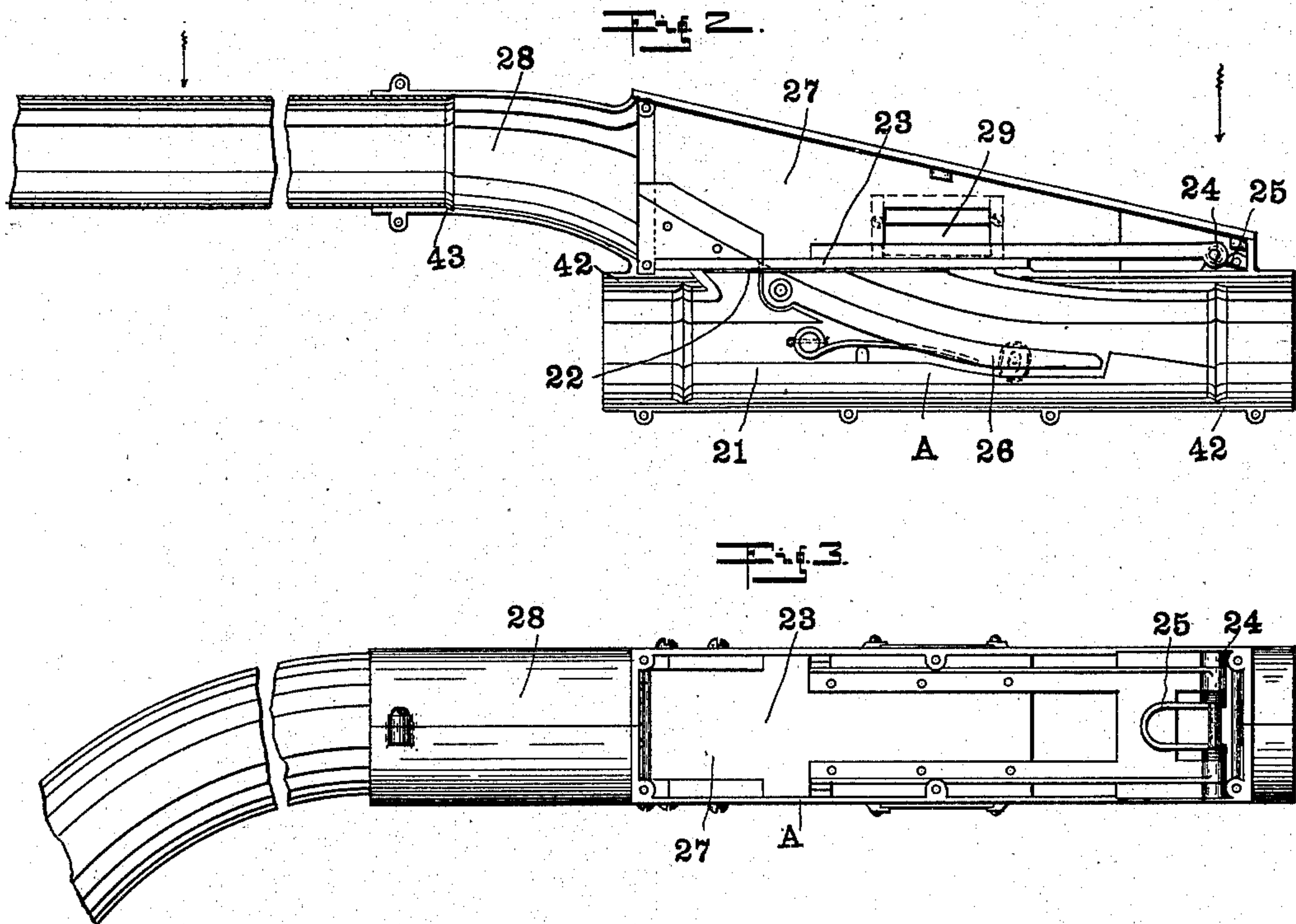
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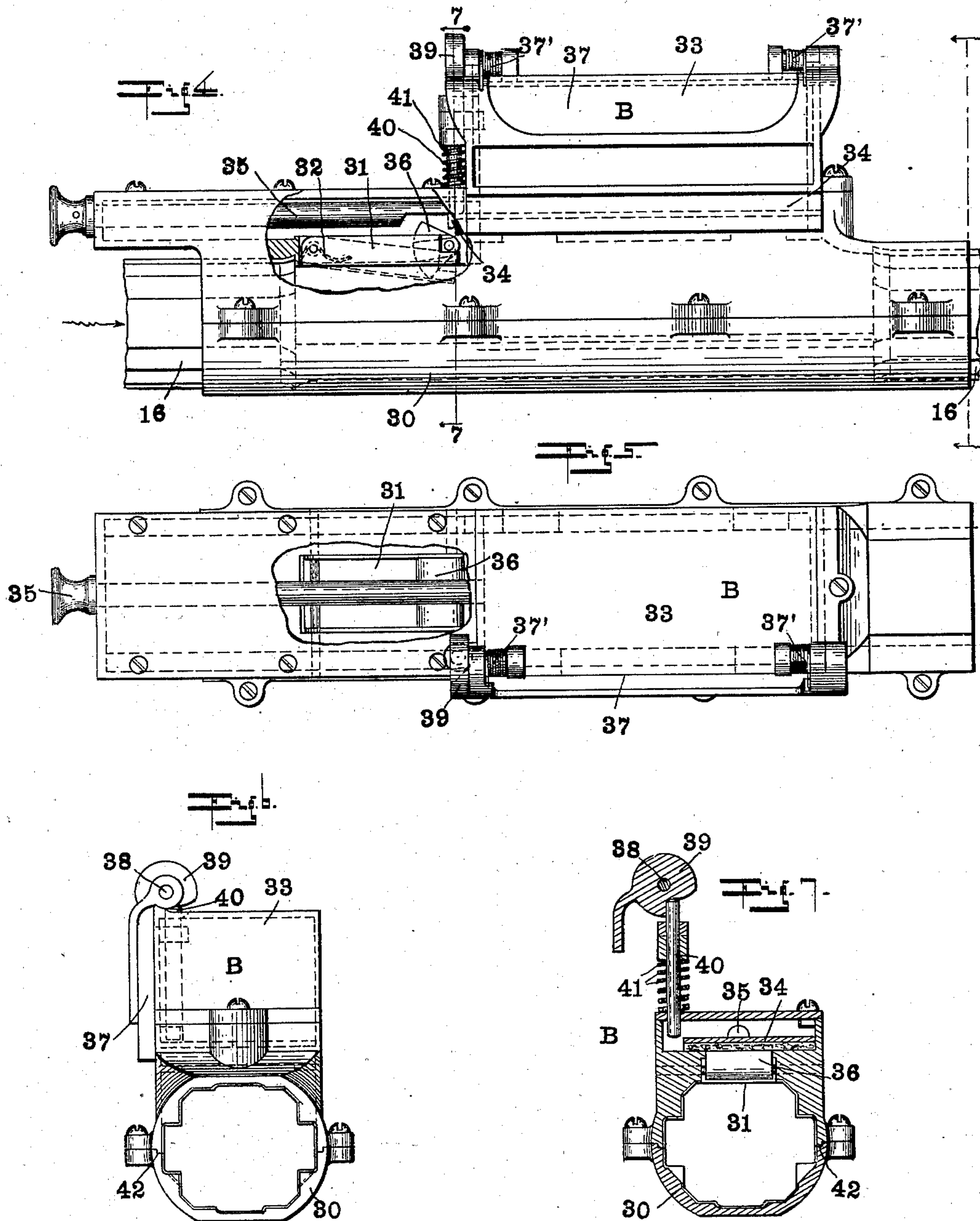
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(No Model.)

3 Sheets—Sheet 3.



WITNESSES:

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THOMAS BEMIS, OF INDIANAPOLIS, INDIANA.

PNEUMATIC-DESPATCH-TUBE SYSTEM.

SPECIFICATION forming part of Letters Patent No. 712,479, dated November 4, 1902.

Application filed May 17, 1902. Serial No. 107,800. (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 certain new and useful Improvements in Pneumatic-Despatch-Tube Systems, of which the following is a specification.

In pneumatic-despatch-tube systems difficulty is experienced in the operation of long lines where the station-terminal is a considerable distance from the cashier's terminal and the pressure-creating device; and the object of my invention is, therefore, to produce a tube system the essential feature of which consists in the provision of a loop-circuit and a second or supplemental circuit which is connected to the two arms of the loop, so that a carrier starting in one arm of the first circuit will be discharged from said arm of the first circuit into the first arm of a second circuit, and from thence returned to the second arm of the first circuit.

A further object of my invention is to provide a convenient switch mechanism by means of which a carrier may be cut out from the line and discharged into a terminal or into an independent line, to provide an improved form of carrier-injector by means of which a carrier may be injected into the system, 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 diagrammatical view of a simple form of my system. Fig. 2 is a sectional detail of my improved switch. Fig. 3 is an elevation thereof in the direction indicated by the arrow in Fig. 2, the cover-plate being removed, so as to expose the valve. Fig. 4 is a side elevation, with parts broken away, of my improved carrier-injector. Fig. 5 is a plan thereof with parts broken away. Fig. 6 is an end elevation in the direction indicated by the arrows in Fig. 4, and Fig. 7 is a section on line 7 7 of Fig. 4.

In the drawings, 10 indicates a pipe forming the first arm of the first or loop circuit of my system. Arranged in pipe 10 is one of my improved switches A, the relay-pipe from which leads to a distant cut-out D, like the

cut-out D described and claimed in a companion application, Serial No. 107,799, filed May 17, 1902. At the end of pipe 10 I arrange one of my cut-outs K, which is described and claimed in the aforesaid companion application. The end of pipe 10 enters the rear end of the carrier-passage 11 of the cut-out K, and arranged in said carrier-passage is a valve 12, which normally prevents communication between the two ends of the carrier-passage and also serves to deflect the air-current from pipe 10 into the air-passage 13 of the cut-out. Communicating with this air-passage 13 is a pipe 14, which leads into a pipe 10', which forms the return-arm of the first circuit. Mounted in the return-arm 10' of the first circuit may be one of my carrier-injectors B.

Leading into the farther or forward end of the carrier-passage 11 of the cut-out K is an air-inlet 15, and leading from said portion of the carrier-passage 11 is a pipe 16, which forms the first arm of the second or supplemental circuit, and this pipe leads to a cut-out I, which is provided with a valve 12, carrier-passage 11, and air-passage 13, like the cut-out K, and differs from cut-out K only in the omission of the air-inlet 15. The forward end of the carrier-passage 11 of cut-out I communicates with pipe 10', while the air-passage 13 thereof communicates, through a pipe 17, with a non-carrier-receiving trunk-line 18, which leads into the suction drum or device 19. As has been previously stated, the pipe 16 leads from cut-out K to cut-out I and has mounted therein one or more switches A and carrier-injectors B.

The switch A is similar in most respects to the switch described and claimed in my Patent No. 696,305 and consists of a main carrier-channel 21, in one side of which is formed an opening 22, normally closed by a valve 23, pivoted at its rear end at 24 and normally held closed by a spring 25. Within the channel 21 is located a switch 26, which is adapted to engage switch-pins on predetermined carriers, so as to deflect them from the main channel 21 through the opening 22 into a chamber 27, which surrounds valve 23 and from which leads a branch 28, which may lead immediately to a discharge-terminal, as shown at the second switch, or form a relay-line for

a distant station, as shown at the first switch. In order to facilitate the opening of the valve of this switch by the carriers and also to adapt the switch for use with a relay-line for a station at a distant point from the switch, it is necessary to provide an air-inlet leading into the branch 28, so that an independent air-current may be established through said branch. In my prior patent heretofore mentioned this air-inlet was located in the branch beyond the valve. In the present construction instead of arranging the air-inlet in the branch 28 beyond the valve 23 I arrange said inlet 29 so as to lead into the chamber 27 immediately to the rear of the valve 23, so that as soon as the valve 23 is engaged by a carrier which has been thrown in that direction by switch 26 the valve will cross the inlet 29, so that air may be drawn in through said inlet into the main carrier-channel 21, thus resulting in an immediate equalization of pressures upon both sides of the valve, so that the valve may be very easily opened by the moving carrier.

The carrier-injector consists of a main tubular body 30, into opposite ends of which are secured sections of the pipe-line 16, and pivoted at its rear end within this channel is a stop-plate 31, which is held normally up out of the line of the channel in body 30 by means of a spring 32. Arranged at the forward end of the stop-plate 31 is a receiving-chamber 33, which is substantially of the length of a carrier. Arranged between chamber 33 and the channel in body 30 is a valve 34, which may be withdrawn from between the chamber and channel by means of an operating-plunger 35. Arranged adjacent the forward end of the plate 31 is a cam 36, which is adapted to be engaged by valve 34, so as to throw plate 31 down into the channel of body 30 as soon as valve 34 starts in its retractive movement from between the receiver 33 and the channel in body 30. One side of chamber 33 is open and is normally closed by a door 37, which is pivoted at 38 to the receiving-chamber 33 and provided with a cam 39. Reciprocably mounted on chamber 33 is a plunger 40, which at its outer end is in engagement with the cam 39, while its inner end is extended through into position in transverse alinement with one end of the valve 34, as shown in dotted lines in Fig. 4, the plunger being held in normal engagement with cam 39 and out of longitudinal alinement of valve 34 by a spring 41. Door 37 is normally held closed by springs 37'.

The several fixtures, such as the parts A, B, K, I, and D, are preferably made in longitudinal sections or halves, and difficulty has heretofore been experienced in making the joints air-tight. For this purpose I form on the mating face of one section suitable ribs 42 and in the mating face of the other section suitable grooves in which the ribs may lie. In order to secure the ends of pipes into the fixtures, the channels of said recesses are re-

cessed internally, as at 43, and the end of the pipe correspondingly flared so as to fit the recess. In assembling such a construction suitable cement may be laid on the ends of the pipes and the two parts of a fixture clamped thereon, thus making a cheap but very efficient air-tight connection. Two sections of pipe may be similarly connected where no cut-out is desired by a two-part coupling similarly provided with internal recesses for the reception of the flared ends of the pipe.

In operation an air-current is set up through pipe 10 and the rear end of passage 11 of cut-out K, air-passage 13 of said cut-out K, pipe 14 and pipe 10', passing through the body 30 of the connected carrier-injector B and returning to the cashier's terminal, (not shown,) and from thence to the suction device, this current forming what I have heretofore denominated the "loop-circuit," an independent air-current starting through opening 15 of the cut-out K, and passing from thence through pipe 16 and the connected switch and carrier-injector B to the cut-out I, from whence it passes through the passage 13 of said cut-out I and through pipe 17 to the non-carrier-receiving trunk-line 18, and from thence to the suction device, this current being what I have denominated the "supplemental air-current," and an independent air-current passing through the inlet 29 of the first switch A, and from thence through its pipes 20 to the cut-out D, from which it is discharged into any suitable receiver. (Not shown.)

If desired, a suitable switch and carrier-injector may be introduced at any point in the pipe 10'—at the point X, for instance.

I claim as my invention—

1. In a pneumatic-despatch-tube system, the combination, with a suction device, of a loop-circuit pipe-line, a supplemental-circuit pipe-line, one end of said supplemental pipe-line being connected to the first arm of the loop, and the other end of the supplemental pipe-line being connected to the second arm of the loop, a cut-out arranged at the point of junction between the first arm of the loop-circuit and the beginning of the supplemental circuit, said cut-out being provided with means for allowing the passage of a carrier therethrough from one circuit to another, a cut-out arranged at the point of junction between the supplemental circuit and the second arm of the loop-circuit and provided with means for allowing the transfer of a carrier from the supplemental circuit to the loop-circuit, and an air-passage between the supplemental pipe-line and the suction device.

2. In a pneumatic-despatch-tube system, a loop-circuit pipe-line, a supplemental pipe-line, means for maintaining independent air-currents through the loop-circuit pipe-line and the supplemental pipe-line, means for automatically transferring a carrier from one arm of the loop-line to the supplemental line, and means for automatically transferring a

carrier from the supplemental line to the other arm of the loop-line.

3. In a pneumatic-despatch-tube system, the combination with a loop-circuit pipe-line, of a supplemental-circuit pipe-line, means for maintaining independent air-currents in the two pipe-lines, means for automatically transferring a carrier from the first arm of the loop-circuit to the supplemental circuit, means for automatically transferring a carrier from the supplemental circuit to the other arm of the loop-circuit, and carrier-discharging and carrier-injecting means arranged in said circuits.

4. In a pneumatic-despatch-tube system, a switch consisting of a main carrier-passage having an opening in one side thereof, a branch carrier-passage leading from said opening, a valve arranged to normally cover said opening, means for deflecting a carrier from the main passage into engagement with the valve, and an air-inlet leading into the branch passage immediately beyond the valve whereby, as soon as the valve starts to open, a current of air may pass through said inlet into the main carrier-passage.

5. In a pneumatic-despatch-tube system, a carrier-injector therefor consisting of a tubular main body adapted to receive a forwarding-pipe of the system, a carrier-receiving chamber communicating with said main body, a door normally closing the entrance of said chamber, a valve arranged to close communication between the carrier-chamber and the main body, a stop arranged in said main body, intermediate connections between said stop and valve whereby a withdrawal of the valve from between the receiving-chamber and the main body will project said stop into the line of the main body, and intermediate locking mechanism between the door and valve and operated by the movement of the door for preventing the opening of the door except when the valve lies between the carrier-receiving chamber and the main body and for preventing the withdrawal of the valve from between the receiving-chamber and the main body except when the door is closed.

6. In a pneumatic-despatch-tube system, a carrier-injector therefor consisting of a tubular main body adapted to receive a forwarding-pipe of the system, a carrier-receiving chamber communicating therewith, a valve arranged between said carrier-receiving chamber and the main body, a stop-plate mounted

in the main body, a cam arranged to engage said stop-plate and to be engaged by the valve whereby the withdrawal of the valve will operate to project the stop-plate into the line of the main body, a door closing the entrance into the carrier-receiving chamber, and intermediate locking mechanism between the door and valve whereby the door may not be opened except when the valve closes communication between the receiving-chamber and the main body and the valve may not be opened except when the door is closed.

7. In a pneumatic-despatch-tube system, a carrier-injector therefor consisting of a carrier-receiving chamber having inlet and outlet openings, a door arranged to close the inlet, a valve controllable by the operator arranged to close the outlet, a locking-pin, and means carried by the door for throwing said locking-pin into engagement with the valve, the arrangement being such that the door may at all times be opened when the valve closes the outlet and only then, and the valve may not be opened except when the door closes the inlet.

8. In a pneumatic-despatch-tube system, a carrier-injector therefor consisting of a carrier-receiving chamber having an inlet and an outlet, a door arranged to close said inlet, a valve controllable by the operator arranged to close the outlet, a lock-pin, a cam carried by the door and arranged to engage said lock-pin, and means for maintaining the pin in engagement with the cam, the arrangement being such that the valve will, through the lock-pin, prevent the opening of the door except when the valve closes the outlet, and the pin will prevent the opening of the valve except when the door is closed.

9. In a pneumatic-despatch-tube system, a pipe-line having an opening in its side, a slidable valve arranged to close said opening, a stop-plate pivoted at its rear end in the pipe-line and projecting toward the opening, and a cam arranged between the stop-plate and valve, substantially as and for the purpose set forth.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 13th day of May, A. D. 1902.

THOMAS BEMIS. [L. S.]

Witnesses:

ARTHUR M. HOOD,
JAMES A. WALSH.