(No Model.) 2 Sheets—Sheet 1.

A. BRYSON, Jr.

PNEUMATIC DISPATCH APPARATUS.

No. 422,498. Patented Mar. 4, 1890.

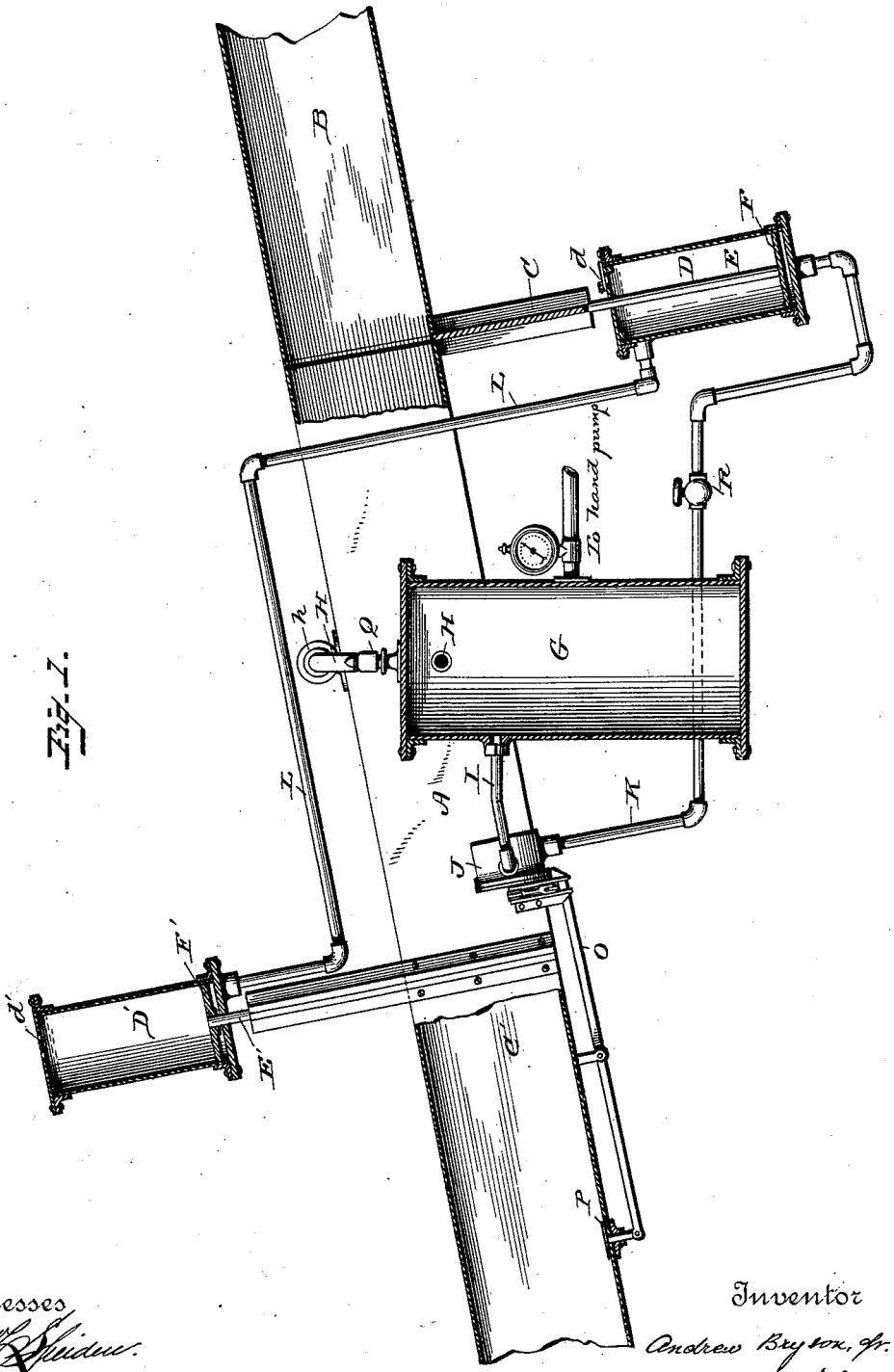

Fig. 1.

Witnesses
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Albert Speidel.

Inventor
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By his Attorney Woodbury & Lowery

(No Model.) 2 Sheets—Sheet 2.

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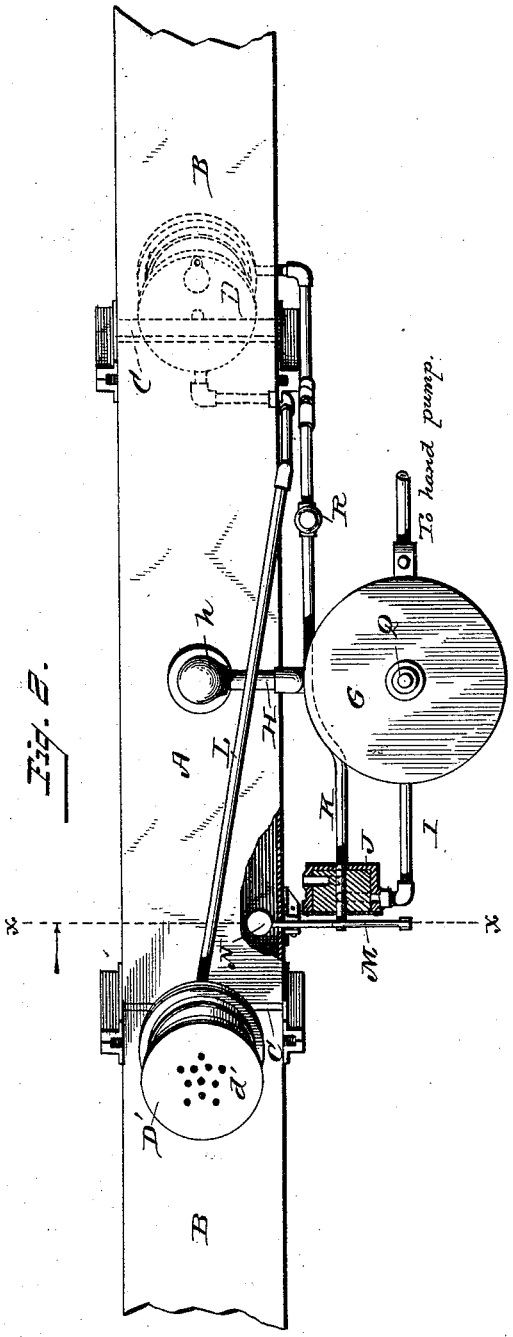

Fig. 2.

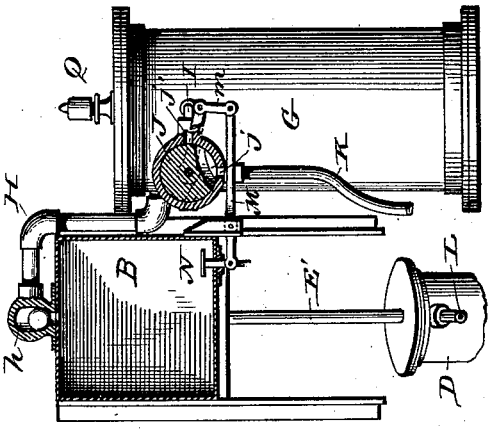

Fig. 3.

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UNITED STATES PATENT OFFICE.

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PNEUMATIC DISPATCH APPARATUS.

SPECIFICATION forming part of Letters Patent No. 422,498, dated March 4, 1890.

Application filed December 13, 1889. Serial No. 333,620. (No model.)

To all whom it may concern:

Be it known that I, ANDREW BRYSON, JR., a citizen of the United States, residing at New York, in the county and State of New York, have invented new and useful Improvements in Receivers for Pneumatic Dispatch, of which the following is a specification.

My invention relates to receivers of that description in which the incoming carrier is brought up against an air-cushion; and it consists in means whereby an abutment is automatically and continuously presented in the tube for the compression of the air at all times while a carrier is passing into or out of the receiver; and my invention consists of two gates located in the tube in such relation to each other that an incoming carrier compresses the air against one of the gates on approaching the receiver and on entering the receiver closes the gate in its rear and opens the gate in front of it by means of mechanism actuated by the compressed air; and it further consists in a device whereby on the exit of the carrier from the receiver the normal position of the gates is again automatically restored.

In the accompanying drawings, which illustrate my invention, Figure 1 is a side view, partly in section, of a pneumatic tube provided with my receiver. Fig. 2 is a top view of the same; and Fig. 3 is an end view on the line *x x* of Fig. 2, partly in cross-section, of the air-reservoir, valve, and tube.

A is a receiver at the end of a closed pneumatic tube B, the other end of the tube being connected to the side of a main or branch tube through which a carrier is to be sent. The tube B, which is located at the extremities of the main tube and of its branches, is on a grade, as shown, to insure the passage of the carrier by its own momentum to the extreme end of the receiving-box A after having left the main tube and plunged into the open end of tube B.

C C′ are valves or gates at each end of the receiver A, actuated by the cylinders D D′, to which they are connected by the rods E E′ and pistons F F′. The gates C C′, with their respective cylinders D D′ and connections, are located the one below the other above tube B, as shown in Figs. 1 and 2, so that they may be moved in one direction by gravity. The top of cylinder D′ is pierced with a number of apertures *d′* for the exit and entrance of air on the rise and fall of the piston F′, and cylinder D is also provided with an adjustable valve *d* for the exit of the air on the rise of its piston F.

G is an air-reservoir of suitable capacity, connected by a tube H to the receiver A, and having a valve *h* so adjusted that when the pressure of the air in the receiver exceeds that in the reservoir the valve *h* lifts and the air is forced through the tube H until the pressure is equalized, when the valve *h* closes and prevents the escape of the air from the reservoir.

I is a tube leading from the reservoir G to a valve J, having two ports *j j′*.

K is a tube connecting the valve J with the bottom of cylinder D, and L is a tube connecting the lower end of cylinder D′ to cylinder D at a sufficient distance from the top of the latter to allow of the passage of air from one to the other when the piston F is at the top of its cylinder. A pivoted lever M and bar *m* connect the valve J with a plate N in the receiver A in such wise that when the plate N is depressed the valve J is revolved so as to connect pipes I and K through ports *j* and *j′*, thus putting the reservoir G and cylinder D into communication. A second lever O, having a plate P at one extremity, projecting into the tube B beyond the gate C′, has its other arm connected to lever M, so that on depressing the plate P the plate N is raised and the valve J is revolved back, closing port *j′* and opening port *j* of the tube K.

Q is a safety-valve on the reservoir G.

R is a regulating-valve located in tube K, to control the escape of the air from cylinder D through the port *j* of the valve J.

The receiver A being in the normal position shown in Fig. 1, in which the gate C′ is closed, the gate C open, and port *j′* closed by the elevation of plate N, its operation is as follows: The incoming carrier compresses the air against gate C′ as it approaches, the compressed air opening valve *h*, and charging the reservoir G through pipe H, until the pressure in the reservoir and the receiver becoming equal, the valve drops to its seat, closing the reservoir and preventing any es-

cape of air in that direction. Passing through the open gate C, the carrier reaches the farther end of the receiver A, where it rides over the plate N, depressing the lever M, and revolves the valve J, putting the compressed air in the reservoir G into communication with the cylinder D through pipe I, ports *j* and *j'* of valve J, and pipe K. The compressed air entering the cylinder D raises piston F and closes gate C, the air in the rear of the piston escaping through the adjustable valve *d*. Gate C being now closed, the way is opened for the compressed air through tube L to cylinder D', where it lifts the piston F', and with its rise opens gate C', the air in the rear of the piston escaping through the apertures *d'*. The carrier now passes out, depressing plate P in its exit, and returning valve J and plate N to their first positions by means of the levers O M *m*. The return of the valve J closes the communication between the reservoir G and cylinders D D', opens port *j*, and allows the compressed air in the cylinders D and D' to escape, gate C' closing and gate C opening by gravity and expelling the air by their weight.

As it is desirable to have gate C' close more rapidly than gate C opens, I make the pipe L of larger dimensions than pipe K and adjust the valve *d* in cylinder D and the regulating-valve R in such wise that after piston F has fallen below the opening of pipe L it will move more slowly, while the air from the cylinder D' will escape more rapidly through the valve *d*. I thus accomplish the desirable result of always having one or the other of the gates C C' at each end of the receiver closed so as to secure a dead end of pipe being always exposed to an incoming carrier, enabling the carrier to compress the air in front of it, and thus gradually be brought to a state of rest. Where carriers are sent from two or more stations at about the same instant, all bound for the same station, the first to arrive, as it passes from the branch or main tube, plunges down by its own momentum into the open end of the tube B, "sucks" the air behind it through the open end, enters the receiver, closes the gate C, and the following carrier is thus at once provided with an air-cushion against the closed gate.

The reservoir G is of sufficient size to operate the gates for several carriers in succession without recharging, but when the interval between arriving carriers is not too short the recharging is done automatically by the carrier and the pressure is kept up, as I have described. A gage is, however, provided, and a hand air-pump, so that in case of leakage or a failure of the supply the reservoir may be recharged in a short time; but this will rarely happen, and the pump is provided only as a precaution against a remote contingency.

It is evident that in place of charging the reservoir G by means of the compression produced by the approaching carrier, I may dispense with the pipe H and its valve *h* and charge the reservoir by other means, as shown, as by steam, and use only the plate and lever connections for throwing the reservoir into and out of connection with the gate-cylinders without departing from the spirit of my invention, and in this case it is not essential that the gate to be operated be located in the tube.

In place of locating the gates and their cylinders above and below the tube they may be placed at the sides and connected with counter-weights in any well-known way.

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

1. The combination, with a pneumatic tube, of a carrier and a gate closing the tube and actuated by the air compressed by the momentum of the carrier, substantially as described.

2. The combination, with a pneumatic tube, of a gate closing the tube, an air-reservoir, and a suitable connection between the tube and reservoir, whereby the air compressed against the gate by an approaching carrier is caused to charge the reservoir, substantially as described.

3. The combination, with a pneumatic tube, of a gate located in the tube, a cylinder and piston actuating the gate, and suitable connections between the tube and cylinder, whereby the air compressed by the approaching carrier is caused to operate the gate, substantially as described.

4. The combination, with a pneumatic tube, of a gate located in the tube, its actuating cylinder and piston, an air-reservoir, and suitable connections between the tube, the air-reservoir, and the gate-cylinder, whereby the air compressed by an approaching carrier is caused to charge the reservoir and then to operate the gate, substantially as described.

5. The combination, with a pneumatic tube, of a gate, its actuating cylinder and piston, an air-reservoir, suitable connections between the reservoir and cylinder, and a device located in the tube for connecting and disconnecting the reservoir and cylinder, whereby a carrier passing through the tube will automatically connect and disconnect the cylinder and reservoir, substantially as described.

6. The combination, with a pneumatic tube, of a receiver consisting of two gates located in the tube, their actuating cylinders and pistons, suitable connections between the cylinders and the tube, and a carrier, whereby the passage of a carrier through the tube automatically opens and closes the gates alternately, substantially as and for the purpose set forth.

7. The combination, with a pneumatic tube, of a receiver consisting of two gates located in the tube, their actuating cylinders and pistons, an air-reservoir, and suitable connections between the air-reservoir, the cylinders, and the tube, whereby the approach of a carrier to and passage through the receiver au-

tomatically charges the reservoir and alternately closes and opens the gates, substantially as described.

8. The combination, with a pneumatic tube, of a receiver consisting of two gates located in the tube, their actuating cylinders and pistons, an air-reservoir, suitable connections between the cylinders and reservoir, and a device located in the tube for connecting and disconnecting the reservoir and cylinders, whereby a carrier passing through the tube will automatically connect and disconnect the reservoir from the cylinders, substantially as set forth.

9. The combination, with a pneumatic tube, of a receiver consisting of two gates located in the tube, suitable connections between the gates and the tube automatically actuated by the passage of a carrier, and a carrier, whereby on the passage of a carrier through the tube the gates are automatically and alternately opened and closed, substantially as and for the purpose described.

10. The combination of the tube B, the gate C′, the reservoir G, the pipe H, and the valve *h*, whereby on the approach of a carrier the air is compressed against the gate and the reservoir charged, substantially as set forth.

11. The combination of the tube B, the gate C, its cylinder D, having the valve *d* and piston F, the reservoir G, the tube I, the valve J, and the tube K, whereby the air from the reservoir passes into the cylinder and escapes again for the purpose of raising and lowering the gate, substantially as set forth.

12. The combination of the tube B, the gate C, its cylinder D, valve *d*, and piston F, the reservoir G, the tube I, the tube K, the valve J, the plate N, and its lever-connections, whereby on the passage of a carrier over the plate the valve J is caused to connect the reservoir and cylinder, substantially as and for the purpose set forth.

13. The combination of the tube B, the gate C, its cylinder D, valve *d*, and piston F, the reservoir G, the tube I, the tube K, the valve J, the plate N, the plate P, and their connections O M *m*, whereby on the passage of a carrier the valve J is alternately caused to connect and disconnect the reservoir and cylinder, substantially as and for the purpose set forth.

14. The combination of the tube B, the gate C′, closing the end of the tube, the reservoir G, its connecting-pipe and valve H *h*, the gate C, its cylinder D, valve *d*, and piston F, the tube I, the tube K, the valve J, the plate N, and its connections M *m*, whereby on the passage of a carrier the reservoir is charged and on its passing over the plate gate C is closed, substantially as described.

15. The combination of the tube B, the gate C′, its cylinder D′, apertures *d*′, and piston F′, the reservoir G, the gate C, its cylinder D, valve *d*, and piston F, the tubes I, K, and L, the valve J, the plates N and P and their connections O M *m*, and means for charging the reservoir, whereby on the passage of a carrier through the tube the gates are alternately closed and opened, substantially as and for the purpose set forth.

16. The combination of the tube B, the gate C′, its cylinder D′, aperture *d*′, and piston F′, the reservoir G, its connecting-pipe and valve H *h*, the gate C, its cylinder D, valve *d*, and piston F, the tubes I, K, and L, the valve J, the plates N and P, and their connections O M *m*, whereby on the approach and passage of a carrier the reservoir is charged and the gates alternately opened and closed, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ANDREW BRYSON, JR.

Witnesses:
WOODBURY LOWERY,
M. P. CALLAN.