

No. 658,103.

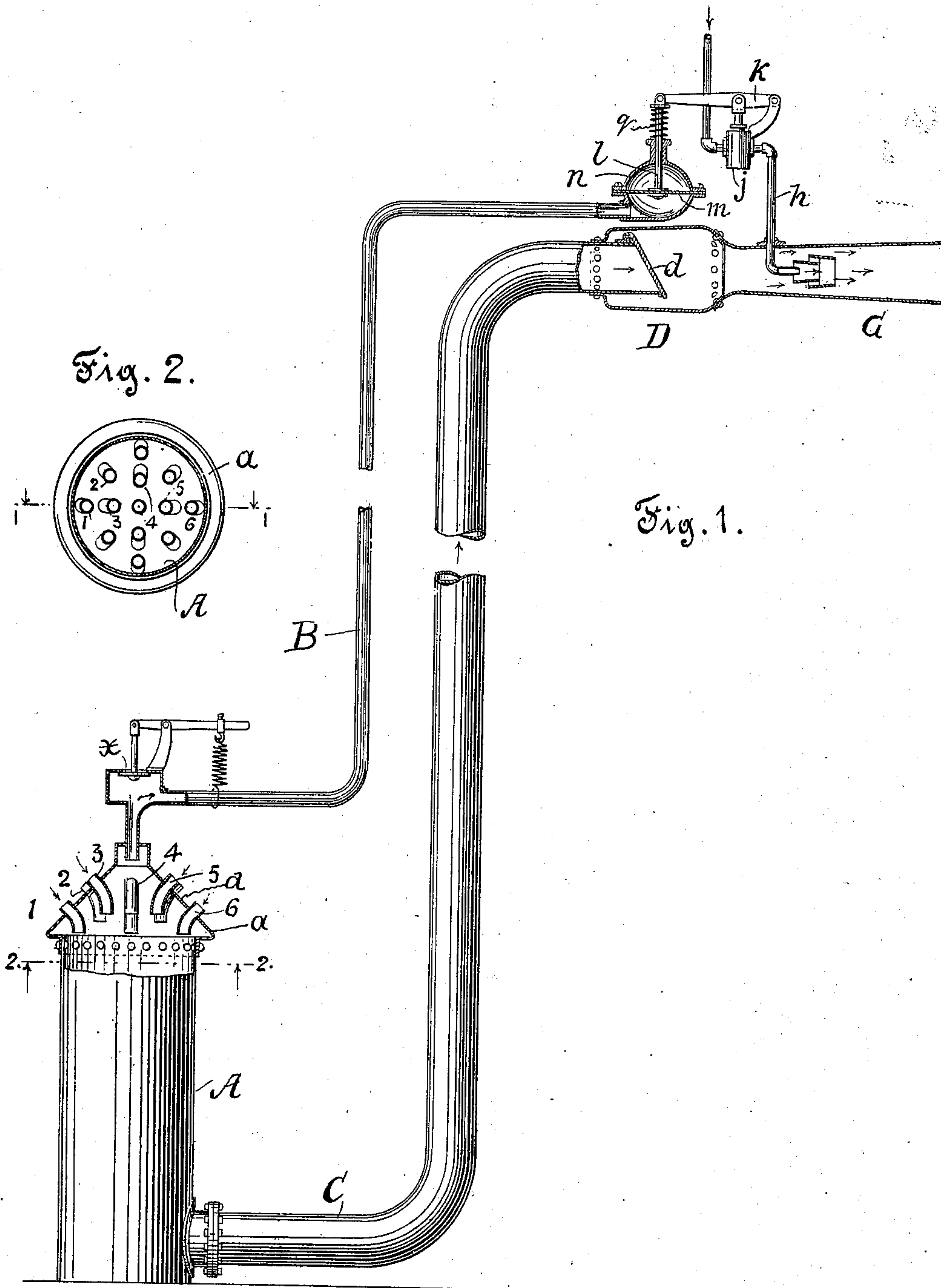
Patented Sept. 18, 1900.

C. S. BAVIER & J. R. HAWKES.
PNEUMATIC DESPATCH SYSTEM.

(Application filed Feb. 26, 1900.)

(No Model.)

2 Sheets—Sheet 1.



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By their Attorney
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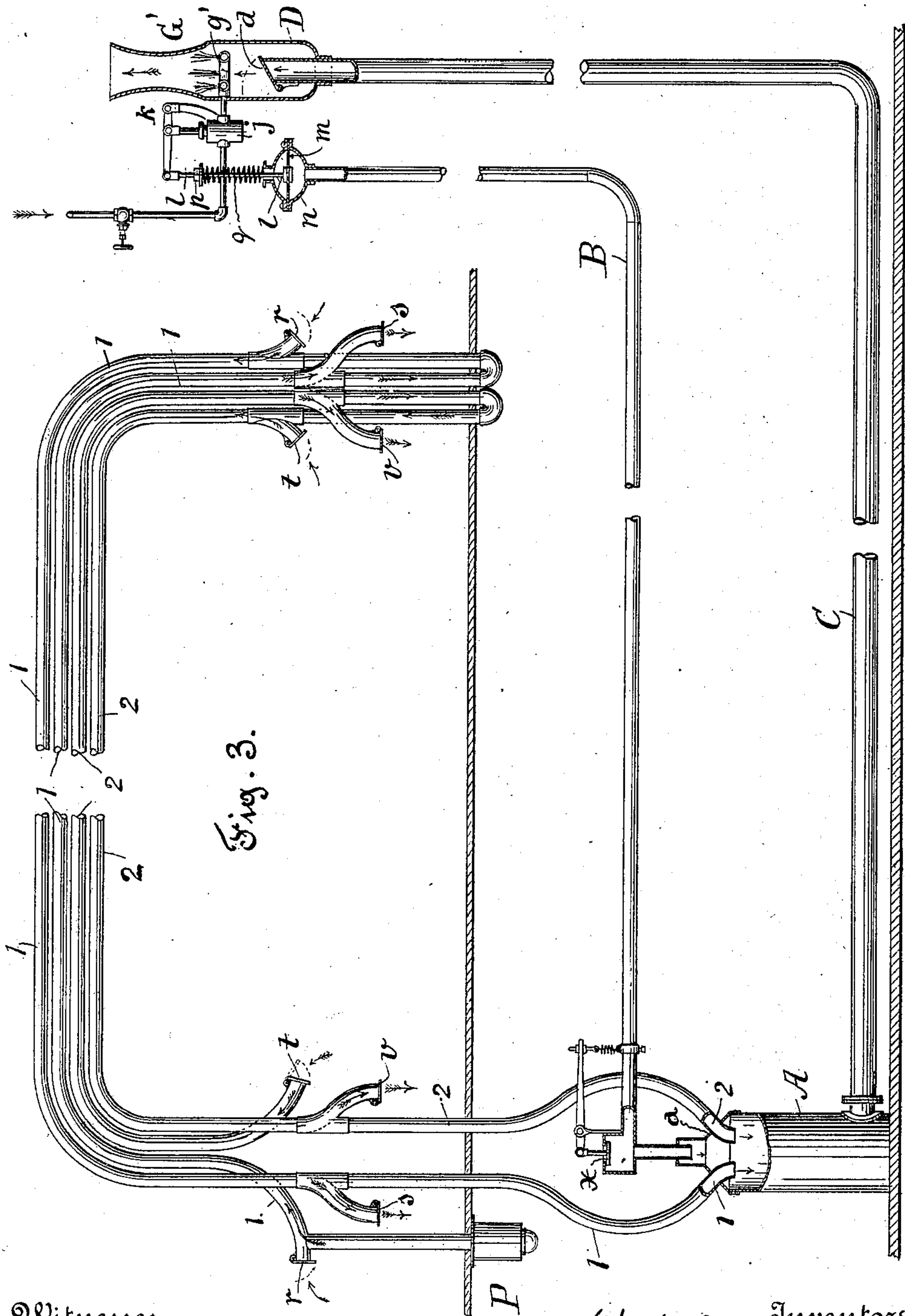
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UNITED STATES PATENT OFFICE.

CHARLES S. BAVIER AND JAMES R. HAWKES, OF NEW YORK, N. Y.

PNEUMATIC-DESPATCH SYSTEM.

SPECIFICATION forming part of Letters Patent No. 658,103, dated September 18, 1900.

Application filed February 26, 1900. Serial No. 6,483. (No model.)

To all whom it may concern:

Be it known that we, CHARLES S. BAVIER and JAMES R. HAWKES, citizens of the United States, and residents of the borough of Manhattan, in the city of New York, State of New York, have invented certain new and useful Improvements in Pneumatic-Despatch Systems, of which the following is a specification.

Our invention relates to improvements in pneumatic-despatch systems.

It is the object of our invention to secure a practically-equal degree of vacuum or pressure at the outlets of every pneumatic-despatch tube, in the system, and where the governor of the exhauster is operated by variations of pressure or vacuum to insure that the degree of vacuum in the air-tube which connects with the governor shall be the same as that at the outlets of the said pneumatic-despatch tubes. Such equality of pressure or vacuum is essential to the proper sensitiveness and quick responsiveness of the governor to the conditions prevailing at any instant in one or more of the pneumatic-despatch tubes and with that approach to perfect equality which we attain with our invention we secure a very high degree of sensitiveness in the governor and a very quick response to the varying conditions in the pneumatic-despatch tubes. In effecting this we lead all the pneumatic-despatch tubes into a receiver and take the tube of the governor from the same receiver. This receiver is intermediate between the ends of all said tubes and the exhauster and is of such shape and construction and the ends of all said tubes are brought into it in such a manner that at any instant there is practically the same degree of pressure or vacuum at the ends of all said tubes. To aid in attaining the desired result and to obviate the effect of the cross-currents from one despatch-tube into another, which might seriously affect the equality of the pressure and vacuum we seek to obtain, we preferably project the ends of all the tubes a little inward beyond the shell of the receiver and place all at practically the same distance from the exhauster by preferably arranging them substantially radially around the receiver, which is connected at a point distant from the ends of all the tubes with a pipe which leads to the exhauster. In this

manner, no matter at what speed the exhauster may be running, there will be substantially the same degree of pressure or vacuum at the ends of all the tubes.

Referring to the drawings which accompany the specification to aid the description and which show the governor as a diaphragm operated by varying degrees of pressure or vacuum, Figure 1 is an elevation partly sectioned and broken and showing the receiver, governor, exhauster, the connecting-pipe from the receiver to the exhauster, the connecting-tube from the receiver to the governor, and the ends of several pneumatic-despatch tubes entering the receiver. Fig. 2 is a horizontal section on the line 2 2 of Fig. 1, as seen from below. Fig. 3 is an elevation partly sectioned and broken and showing two pneumatic-despatch tubes, together with the governor, exhauster, and connecting pipes and tubes. One despatch-tube is shown provided with an automatic terminal inlet-valve similar to that described in our application for United States Patent, filed October 10, 1899, Serial No. 733,124, and the other despatch-tube is shown provided with a terminal flap or valve manipulated by hand. In this figure the ejector is shown as a ring with outlets for steam-jets. This figure also shows means for varying the tension of the spring on the rod of the diaphragm.

A is a receiver of suitable strength and capacity, into which are brought the ends of any desired number of pneumatic-despatch tubes 1 2 3 4 5 6. Each of said tubes may be provided at its inlet with the automatic valve device set forth in our application filed in said United States Patent Office October 10, 1899, Serial No. 733,124, and now pending, and which device is indicated at P in Fig. 3 of the drawings of the application, or may be provided with a flap which is opened and closed by the user of the line, as shown at t on the pneumatic-despatch tube. We prefer to form said receiver with an arched or conical top A, as shown, though this form is not indispensable, and to bring the ends of the tubes in through said top substantially radially and then turn them parallel with the direction of flow of the air, as shown. The end of the tube B with which the governing device is operatively connected, as will be hereinafter explained,

is brought through said top *a* above and not very far from the ends of said tubes 1 2 3 4 5 6. With this or equivalent arrangement injurious cross-currents from one despatch-tube which might interfere with the other despatch-tubes or the tube B are avoided, and the ends of all said tubes are subjected to the same condition of vacuum or pressure. Consequently any governing device which is connected with tube B will be operated by that same condition of vacuum or pressure to which the ends of said despatch-tubes are subjected. At a suitable point somewhat remote from the ends of said tubes 1 2, &c., the receiver A is connected with the pipe C, which connects with any suitable exhaustor. In the drawings said pipe C is shown entering the head F of an Eynon-Korting blower, *d* being a check-valve opening outward from receiver A. The steam-pipe *h* of the ejector coming from any suitable steam-generator is controlled by a valve *j*, the valve-stem of which is connected to the lever *k*, which in turn is connected with the spring-operated rod *l* of the diaphragm *m*, which is arranged in the usual manner in the vessel *n*, and said vessel *n* communicates with the pipe B from the receiver A. A nut *p*, Fig. 3, on rod *l*, may be used to vary the tension of the spring *q* as desired.

In place of the exhaustor shown any other suitable exhaustor might of course be connected with the pipe C and arranged to be controlled by the pressure in receiver A; but an ejector-exhaustor has the advantage of great sensitiveness and is peculiarly fitted for use in pneumatic-despatch systems. In Fig. 3 the ejector *g'* is shown as a ring with orifices for the steam-jets.

A safety-valve *x*, opening inward, is placed on the pipe B or receiver A to obviate danger of collapse of the receiver through any accidental causes that might lead to too-rapid exhaustion of the air therefrom.

The invention operates in the following manner, assuming, first, that the terminal inlets and despatching-inlets of every pneumatic-despatch tube are closed and no carrier is in any tube. In these conditions, the ejector-exhaustor G or G' having developed the desired degree of vacuum in the receiver A, the diaphragm *m* being depressed by the vacuum in tube B, the valve *j* will shut and the blower will cease to draw air from the receiver. Now suppose the despatching-inlet *r* of any tube, as 1, to be opened to insert a carrier. Air will enter that tube and pass to the receiver, diminishing the vacuum there and to the same degree also diminishing it in tube B. Supposing the tube 1 to be equipped with our automatically-operating terminal inlet-valve P, this valve will remain open after the carrier has been inserted, and the carrier will be moved through the tube by the excess of pressure on its rear end; but the air which has entered receiver A reducing the vacuum therein and in pipe B, the spring *q* will raise

the diaphragm *m*, and thus open valve *j* and start up or accelerate the blower, which will now exhaust air from the receiver A, lowering the vacuum therein and causing the carrier to travel with considerable speed through its tube. When the carrier issues from its discharge-outlet *s*, (which outlet is provided with a flap to allow said carrier to be discharged, said flap then immediately closing,) the valve at the terminal air-inlet P closes, as described in our said other application, and the vacuum in receiver A quickly reaches that degree which draws down diaphragm *m* and closes valve *j*, again stopping the blower.

If instead of our terminal air-inlet the end of the despatch-tube, as 2, is provided with a flap *t* that is opened and closed by hand, then the user, having opened the flap and inserted a carrier, will hold the flap open until the sound tells him the carrier has issued from its discharge-outlet, whereupon he will close the flap. The exhaustor under these circumstances will start and stop, as before.

Now, having described our improvements, we claim as our invention—

1. The combination in a pneumatic-despatch system, of a pneumatic-despatch tube provided with inlets and outlets for carriers, means operatively connected with said tube and adapted to be actuated by the varying pressure in said tube, a device for exhausting air from said pneumatic-despatch tube, and a governor for said device operatively connected with said means, substantially as and for the purpose described.

2. The combination in a pneumatic-despatch system, of a plurality of pneumatic-despatch tubes provided with inlets and outlets for carriers, an exhaustor, a receiver intermediate between and connected with said tubes and said exhaustor, a governor for said exhaustor, and a connection between said governor and said receiver, whereby the variations of pressure or vacuum in said receiver actuate said governor, substantially as described.

3. The combination in a pneumatic-despatch system, of a plurality of pneumatic-despatch tubes provided with inlets and outlets for carriers, an exhaustor, a receiver connected with said tubes and said exhaustor, means for controlling said exhaustor, and a diaphragm operatively connected with said receiver and with said means, substantially as described.

4. The combination in a pneumatic-despatch system, of a plurality of pneumatic-despatch tubes provided with inlets and outlets for carriers, an ejector-exhaustor, a receiver connected with said tubes and said exhaustor, a valve controlling said exhaustor, and a diaphragm operatively connected with said receiver and said valve, substantially as described.

5. In a pneumatic-despatch system, the combination of a receiver, an exhaustor, and a governing device therefor, of pneumatic-de-

spatch tubes and a tube from said governing device, the ends of all said tubes being carried in beyond the shell of the receiver, substantially as and for the purpose described.

5 6. In a pneumatic-despatch system, the combination of a receiver operatively connected with the pneumatic-despatch tubes, the exhaustor and the governor therefor, and a safety-valve to prevent collapse of said receiver, substantially as described.

In witness whereof we have hereunto set our hands, this 24th day of February, 1900, at the city of New York, N. Y., in the presence of two witnesses.

CHARLES S. BAVIER.
JAMES R. HAWKES.

Witnesses:

HENRY V. BROWN,
DAVID WALTER BROWN.