To all whom it may concern:

Be it known that JOSEPH J. STOETZEL, a citizen of the United States, residing at No. 2167 Harvard street, Chicago, in the county of Cook and State of Illinois, has invented certain new and useful Improvements in Relief-Valves for Vacuo-Pneumatic-Tube Systems, of which the following is a specification.

My invention relates to relief valves for vacuo-pneumatic tube systems, and has for its object to provide a mechanism which shall maintain a practically constant vacuum of any desired degree within the system.

In systems employing a constantly running blower; known as sealed systems, as distinguished from opened or constant current systems, the vacuum fluctuates in proportion to the number of carriers transmitted; sometimes the blower is taxed to its utmost capacity to furnish approximately one pound of vacuum necessary to properly transmit a large number of carriers requiring transmission; while on other occasions, that is when the business is very light, there is very little demand upon the blower for the actual transmission of carriers; but it is demonstrated that at such a period of comparative disuse of the system the consumption of horse power is greater than when the system is very busy, for the reason that the blower is pumping against a much higher vacuum.

The purpose of this valve is to afford such relief as will reduce this higher vacuum by automatically admitting external atmosphere to the vacuum drum or other part of the system whenever the vacuum rises above a predetermined amount.

In the drawings; Figure 1 is a diagrammatic view of so much of the vacuum system as is necessary to show the application of my invention; Fig. 2 is a longitudinal section of the relief valve and Fig. 3 is a cross section thereof on the line 3-3 of Fig. 2.

1 is the drum (shown partly broken away to indicate the direction of the air currents) and receiving the terminals of the transit tubes 2.

3 is a blower of any desired type, acting in this case as a vacuum pump taking 40 atmosphere from the system and discharging into the open air.

4 is a casing of a relief valve connected to the drum 1 in any suitable manner as by a pipe 5 and having at its lower portion an extension 6 provided with perforations.

45 7, such extension being preferably of about the same diameter as the pipe 5. That portion of the pipe 5 which extends within the casing 4 is provided with a series of slots 8 of any desired dimensions and number, such as may be found preferable for the regulation of the vacuum. Moving longitudinally of the inclosed portion of the pipe 5 is a valve 9 which has a good working fit in said pipe and which is provided with a stem 10 adapted to carry a series of radially slotted weights 11 in a manner readily understood.

The pipe 5 at the lower portion of the casing 4 rests against a resilient seat 12 which seat is extended inwardly sufficiently to also form an air tight seat for the valve 9 when in its lowestmost position.

55 It will be understood that I have described only the preferred form of my invention but that it may be readily modified by substituting an adjustable spring for the weights 12, if desired, whereupon the casing 4 and pipe 5 may have, if convenient, other than a vertical position.

The operation of the device is as follows; assuming that a vacuum of one pound per square inch is the preferable working vacuum, the valve stem 10 may be so loaded that the valve 9 will lift from the seat 12 at a vacuum anything in excess of one pound per square inch. If, however at this point, the number of carriers despatched continues to decrease, the valve 9 will lift higher and higher, exposing a greater length of the slots 8, whereupon the admission of air to the drum 1 will be increased, this air taking the course shown by arrows in Fig. 2.

65 It will be readily understood that the valve may be so weighted or its tension spring so regulated that it will maintain a practically constant vacuum within the drum 1, and will rest upon the seat 1-2 only at such times as the vacuum falls below the desired limit.

70 The advantages of my invention result from the regulation of the load upon the blower and the maintaining of that load not only constant but with the minimum amount of regulation of the motor for the efficient transmission of the carriers.

Many changes may be made in form and arrangement of my device without departing from the spirit of my invention; since

What I claim is—

1. In a vacuo-pneumatic despatch system, a chamber for receiving the terminals of a plurality of despatch-tubes, means for exhausting air from said chamber and means, comprising a tube having longitudinal slots and a valve automatically movable along said tube to admit variable quantities of air to said casing, and adjustable means for urging said valve toward its closed position, substantially as described.

2. A relief valve for vacuo-pneumatic despatch systems, comprising a slotted tube, a casing surrounding the slotted portion of said tube, a piston-valve movable in said tube to admit variable quantities of air to said casing, and adjustable means for urging said valve toward its closed position, substantially as described.

3. A relief valve for vacuo-pneumatic despatch systems, comprising a tube having a plurality of slots, a casing surrounding the slotted portion of said tube, and having an
inwardly-extending valve-seat in proximity to said slotted portion, a piston-valve movable in said tube, and adjustable means for urging said valve toward said seat; substantially as described.

4. A relief valve for vacuo-pneumatic despatch systems, comprising a tube slotted for a portion of its length, a casing surrounding said slotted portion and having an inwardly extending, resilient valve-seat below said slotted portion, a piston-valve movable in said tube and having a depending stem adapted to receive weights, and guiding means for said stem; substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH J. STORTZEL.

Witnesses:
DOROTHY M. CORSER,
FLORENCE L. MARIS.