

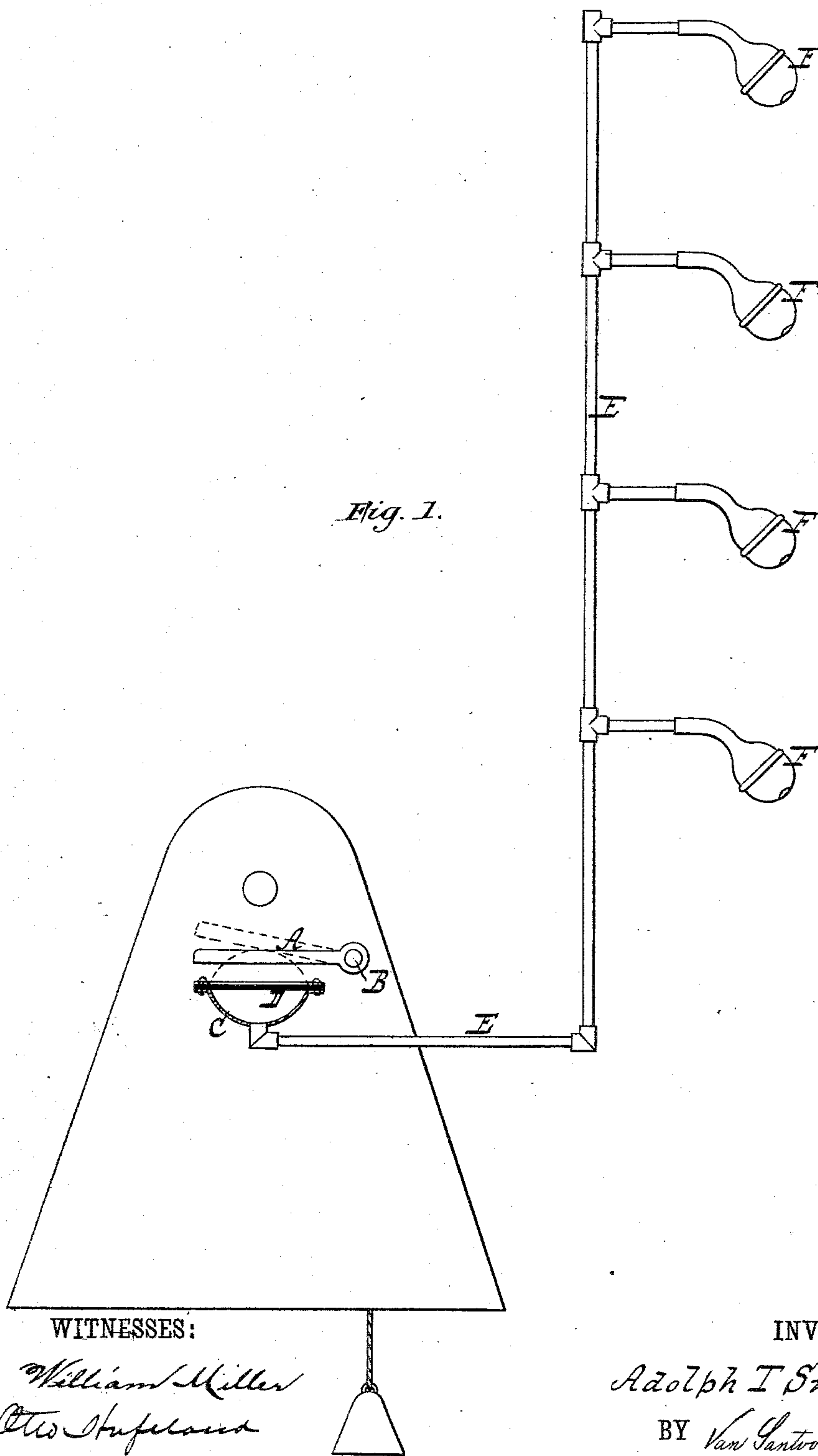
(No Model.)

3 Sheets—Sheet 1.

A. T. SMITH.  
PNEUMATIC DOOR OPENER.

No. 281,148.

Patented July 10, 1883.



WITNESSES:

*William Miller*  
*Otto Stufelander*

INVENTOR

*Adolph T. Smith*

BY *Van Santvoord & Hauff*

ATTORNEYS

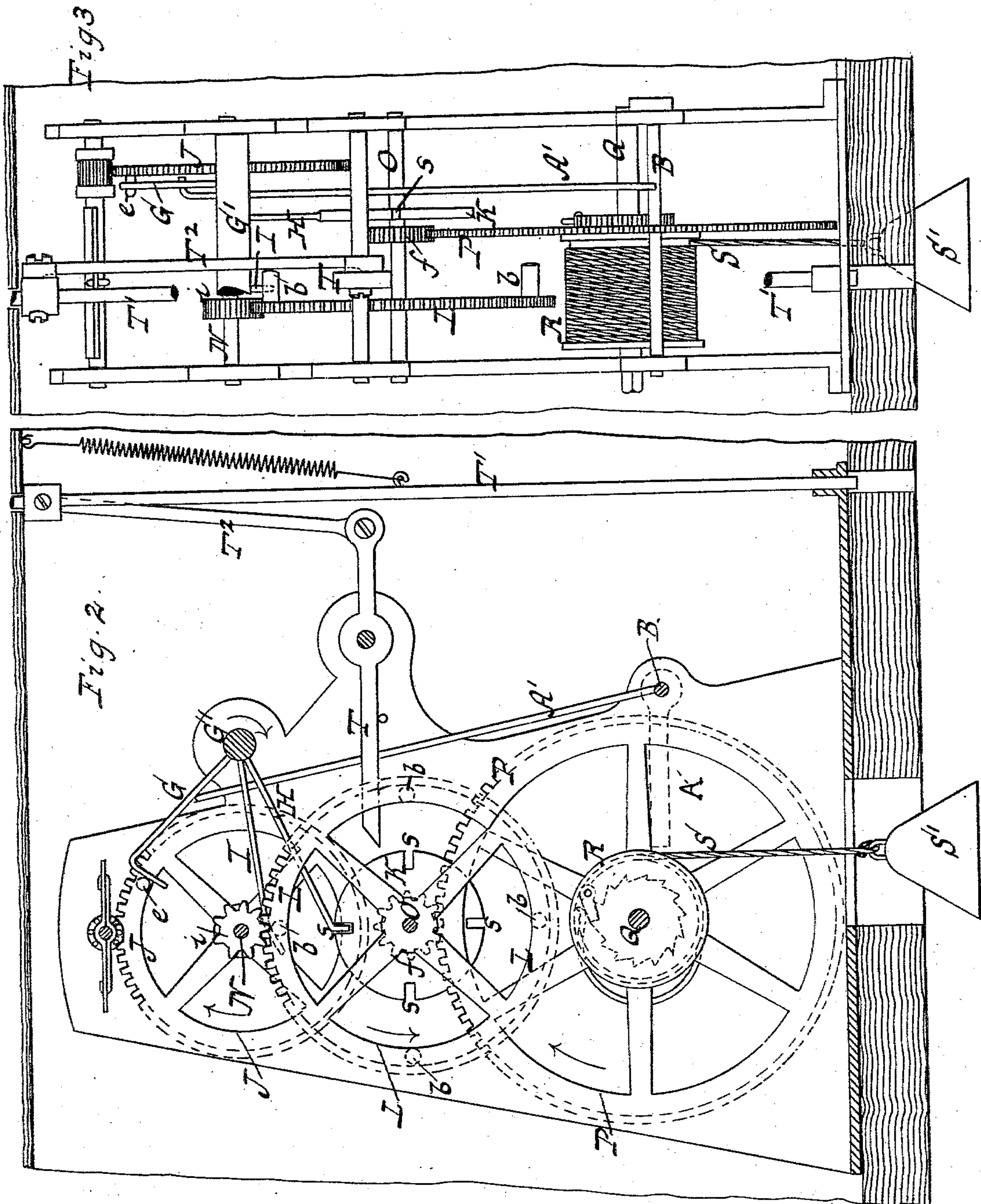
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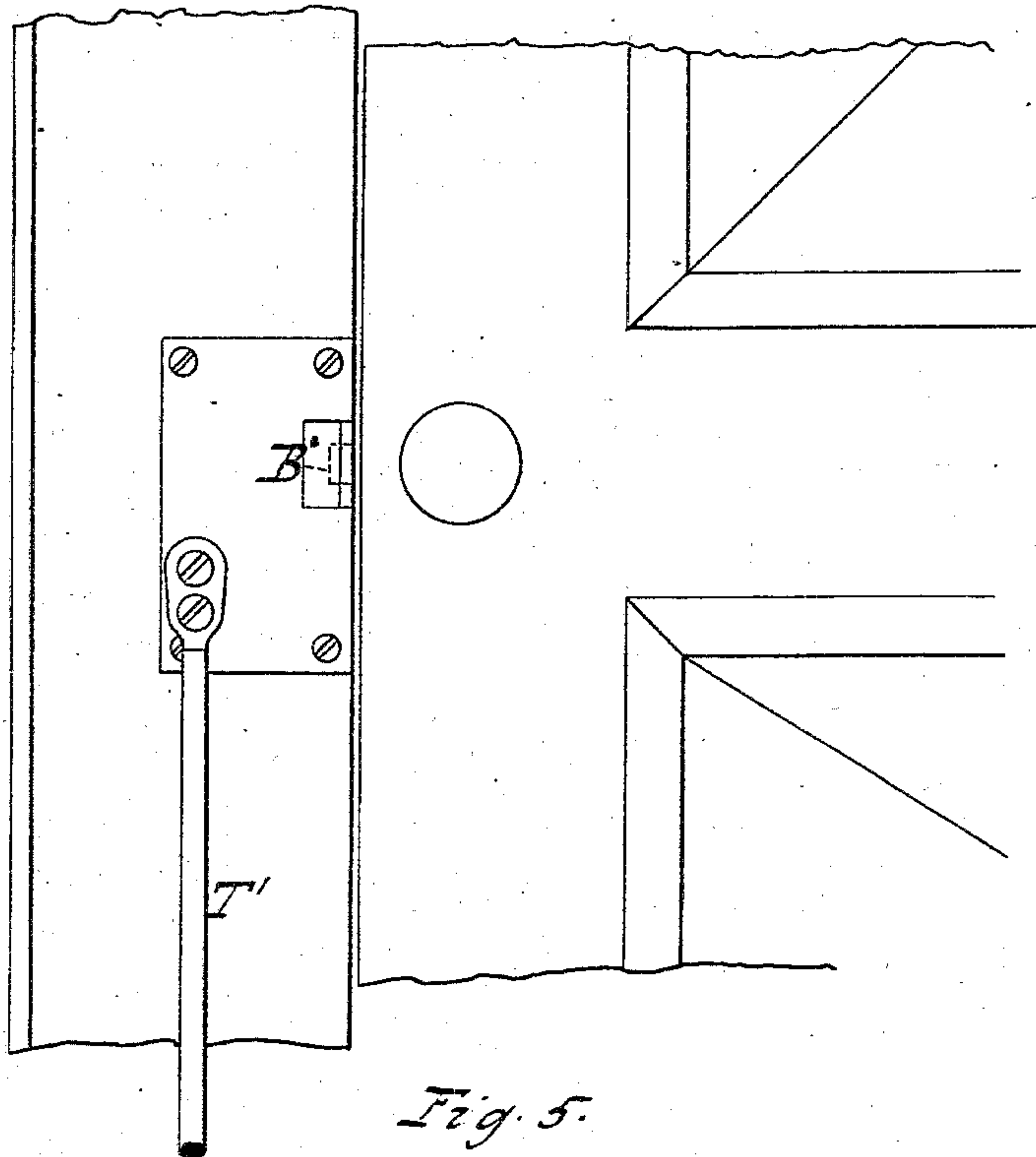
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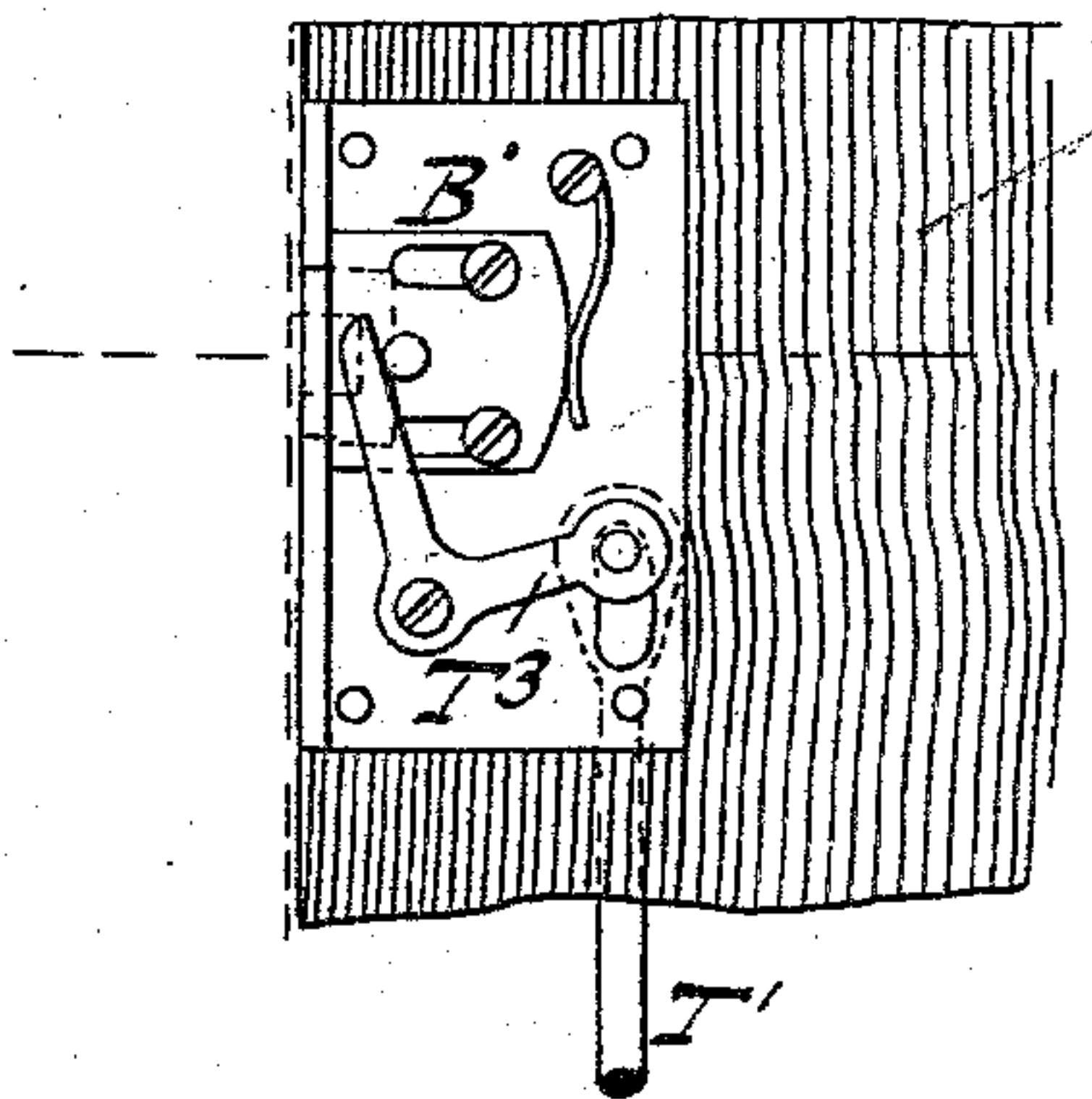
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*Fig. 4.*



*Fig. 5.*



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ATTORNEYS



# UNITED STATES PATENT OFFICE.

ADOLPH T. SMITH, OF NEW YORK, N. Y.

## PNEUMATIC DOOR-OPENER.

SPECIFICATION forming part of Letters Patent No. 281,148, dated July 10, 1883.

Application filed March 26, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, ADOLPH T. SMITH, 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 Pneumatic Door-Openers, of which the following is a specification.

The essential feature of this invention is the substitution of a pneumatic tube for the electric circuit which is described in Letters Patent of the United States granted to me and Adolph Pramann, March 6, 1883, No. 273,622, and which is used for releasing from the different floors or other parts of a building the mechanism which serves to retract the latch of the main or hall door or any other door that it may be desired to open.

In the accompanying drawings, Figure 1 illustrates the general arrangement of the pneumatic tube. Fig. 2 is a sectional side elevation of the latch-retracting mechanism. Fig. 3 is a sectional end view thereof. Fig. 4 is a front view of a portion of the door and its latch. Fig. 5 is a like view of the latch, omitting its face-plate.

Similar letters indicate corresponding parts.

In the drawings, the letter A designates a lever fixed to a rock-shaft, B, which is combined with the latch-retracting mechanism in such a manner that when the lever is displaced such mechanism is released to retract the latch, as hereinafter more fully described.

Opposite to the lever A is arranged an air-chamber, C, which is provided with an elastic diaphragm, D, as of india-rubber, and to which is connected one end of a pneumatic tube, E, thence extending upward through a building. This tube E is closed at the upper end, and is provided on each of the floors of the building, or at such other places as may be deemed expedient, with an air-compressing device, F, to be operated by hand, so that when such device is operated it acts on the air in the tube to compress the same in the chamber C, whereby the diaphragm D is forced outward, as to the position indicated in dotted lines, and, it coming in contact with the lever A, the latter is displaced by that means.

It should be remarked that a piston can be used in lieu of the diaphragm D, and also that the form of the air-compressing device F may

be variously modified, it consisting in this example, of an elastic bulb having an air-inlet valve.

The latch-retracting mechanism which I use is similar to that shown and described in the patent before mentioned, it being constructed as follows: To the rock-shaft B is fixed a secondary lever, A', which engages an arm, G, fixed to an arbor, G', in such a manner that when the operating-lever A is displaced the secondary lever acts on said arm to turn the arbor in the direction of the arrow shown in Fig. 2. The arm G is bent at the free end into the path of a pin, e, projecting laterally from a stop-wheel, J, and to the arbor G' are fixed additional arms. H I, the former of which is bent at the end to drop into one of a series of sockets, S, formed in the periphery of a regulating-wheel, K, while the arm I is bent at the free end into the path of a series of pins, b, projecting laterally from a trip-wheel, L, these pins being equal in number and opposite to said notches of the regulating-wheel. The stop-wheel J is fixed to a shaft, N, which is geared by means of a pinion, i, with the trip-wheel L, the latter being toothed for this purpose, and the trip-wheel, together with the regulating-wheel K, is fixed to a shaft, O. To a shaft, Q, is fixed a drum or windlass, R, carrying a weighted cord, S, so that when this cord is wound on the drum its weight S' acts on said shaft, with a tendency to turn it, together with the driving-wheel P, in the direction of the arrow shown in Fig. 2, while this wheel in turn acts on the shaft O, and thence on the shaft N through the described gearing, to turn said shafts and their wheels in the directions indicated. The arms G H, however, under normal conditions both act as stops to prevent the several shafts from turning—that is to say, until the arm G is actuated from the operating-lever A, when said arm is lifted out of the path of the pin e, and the arm H out of the socket s in which it may be contained. The shafts, &c., are then permitted to turn until the arm H drops into another or succeeding socket, s, and during this rotary movement one of the pins b of the trip-wheel comes in contact with and passes a lever, T, which is connected to the door-latch B, Figs. 4 and 5, in such a manner that the latch is retracted



by that means, thus allowing the door to open or to be thrown open by a suitable spring. The connection of the latch-operating lever T with the latch is effected by means of a reciprocating rod, T', which is connected to said lever by a link, T<sup>2</sup>, and to the latch by an elbow-lever, T<sup>3</sup>, Fig. 5. The stop-wheel J makes one complete revolution to each quarter-revolution of the regulating-wheel K, and when the gravitating arm H drops into successive notches s, the pin e of the stop-wheel comes in contact with the bent end of the arm G, and thus acts on the latter with a tendency to retain the gravitating arm in its notch. When the train of wheels is at rest the arm H lies immediately above one of the pins o of the trip-wheel, as shown in Fig. 2, and when the wheels begin to turn the pin acts on the bent portion of said arm with a tendency to keep it together with its fellow arms lifted, so that the gravitating arm H is not liable to fall back into the socket that it may have vacated. Said retracting mechanism, however, is capable of

various modifications, and may be composed entirely of the lever A, which then is connected directly to the latch. 25

What I claim as new, and desire to secure by Letters Patent, is—

The combination, substantially as hereinbefore described, with the operating-lever of a latch-retracting mechanism, of the air-chamber arranged opposite to said lever, and provided with a diaphragm or other similar device, the pneumatic tube connected to said chamber at one end, closed at the opposite end and provided with air-compressing devices, for the purpose specified. 30 35

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

ADOLPH T. SMITH. [L. S.]

Witnesses:

E. F. KASTENHUBER,  
WILLIAM MILLER.