

J. ANGERSTEIN & W. BÜRGERHAUSEN.
PNEUMATIC DOOR LATCH OPERATING MECHANISM.
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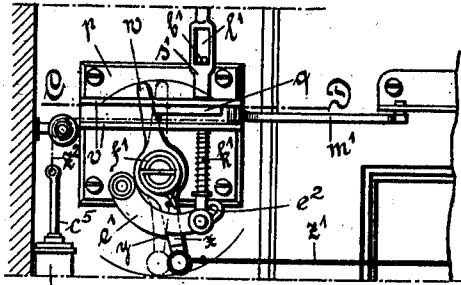


Fig. 5.

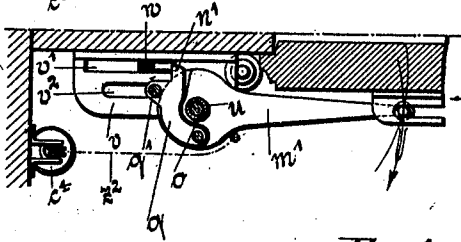


Fig. 6.

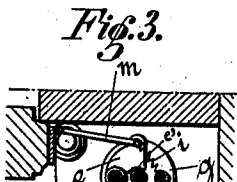


Fig. 3.

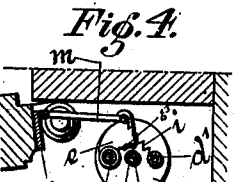


Fig. 4.

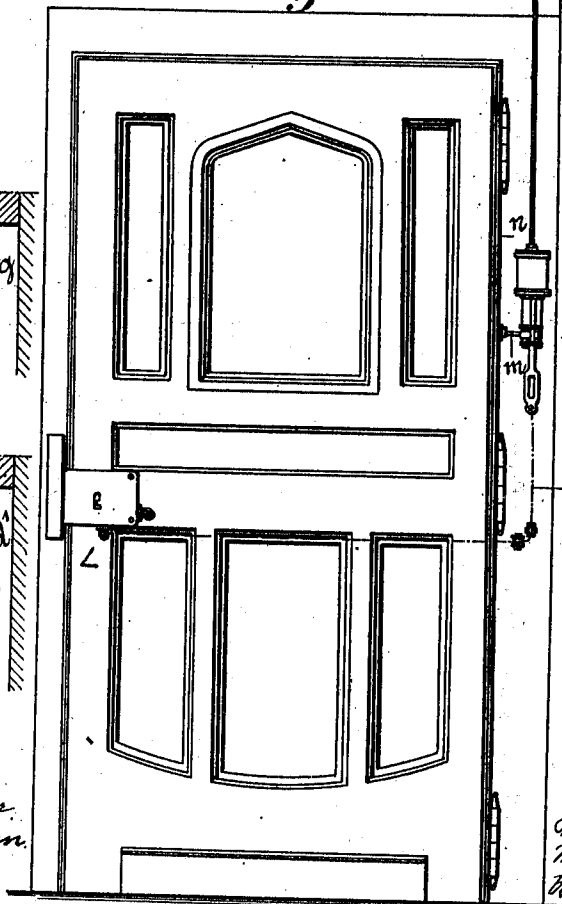


Fig. 1.

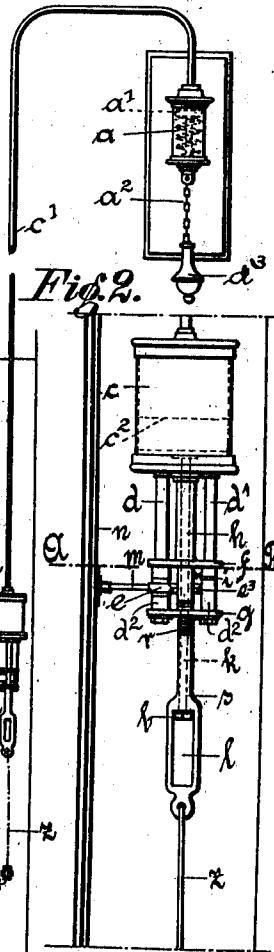


Fig. 2.

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PNEUMATIC DOOR-LATCH-OPERATING MECHANISM.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, JOSEF ANGERSTEIN and WILHELM BÜRGERHAUSEN, both citizens of the German Empire, and residing at München-Gladbach, Germany, have invented new and useful Improvements in Pneumatic Door-Latch-Operating Mechanism, of which the following is a specification.

This invention relates to novel means for pneumatically retracting the latch of a door and for maintaining it in this position until the door is opened, whereupon the latch is automatically released to return to its normal position.

In the accompanying drawing: Figure 1 is a front elevation of a door provided with our improved pneumatic opener; Fig. 2 a detail of the latch operating mechanism; Fig. 3 a horizontal cross section on line A—B, Fig. 2; Fig. 4 a similar section showing the parts in a different position; Fig. 5 a front view of a modification of the latch operating mechanism; and Fig. 6 a cross section on line C—D, Fig. 5.

Within a conveniently located cylinder *a* plays a corresponding spring-influenced plunger *a'* which may be lowered by a chain *a²* and knob *a³*. Cylinder *a* is by tube *c'* connected with the upper end of a cylinder *c* containing a piston *c²*. From the latter depends a rod *k* which is surrounded by a sleeve *s* guided in a tubular socket *h* of cylinder *c*. The lower end of socket *h* is provided with a flange *f* through which pass screw bolts *d*, *d'* depending from cylinder *c*. Below flange *f* is arranged a second flange *g* spaced from flange *f* by sectional tubes *d²* fitted upon bolts *d*, *d'*. At its lower end sleeve *s* is provided with an elongated eye *l* within which plays the head *b* of piston rod *k*, eye *l* being connected to the latch *L* by a conveniently guided rope *z*.

Intermediate tubes *d²* there is pivoted to bolt *d* a sector-shaped lever *e* influenced by a spring *i*, and provided with a beveled curved edge *e³* that is adapted to engage the circumferential grooves *r* of sleeve *s*. Lever *e* is by link *m* connected to a plate *n* secured to the rear edge of the door. When pulling knob *a³*, plunger *a'* is lowered and the air above piston *c²* is consequently withdrawn from cylinder *c* to raise the piston and thereby retract latch *L* through rod *k*, sleeve *s*, and rope *z*. During the ascent of sleeve *s*, the knife edge *e³* will pass over grooves *r*,

the strength of spring *i*, however, being such as to temporarily retain the sleeve in its raised position. After releasing knob *a³*, piston *a'* returns to its raised position, to correspondingly lower piston *c²*, during which movement head *b* descends within eye *l* of sleeve *s*. As soon as the latch has been retracted in the manner described, the door may be opened by means of door springs, manual power or other mechanism independent of the latch operating means. By the opening of the door, link *m* swings sector *e* away from sleeve *s*, to permit latch *L* to be returned to its original position.

In the modification illustrated in Figs. 5 and 6, the eye *l'* of sleeve *s'* accommodates the head *b'* of a rod *k'* which is axially slidable in a bushing *u* of a lever *m'* operatively connected to the door. Lever *m'* is guided between a pair of brackets *v* projecting forward from a plate *p* secured to the door frame. To plate *p* is pivoted a two-arm lever *w* influenced by a spring *f'*, one arm of said lever being connected by rope *z'* with the latch to be operated, while its other arm is guided within corresponding slots *v'* of brackets *v*. To plate *p* is further fulcrumed a curved lever *e'*, to the slotted end *e²* of which rod *k'* is bolted. The lower arm of lever *w* is provided with an abutment *x* adapted to engage a shoulder *y* of lever *e'*, thereby maintaining spring *f'* under tension and retaining the latch in its normal position. Lever *m'* is recessed as at *o* for the accommodation of a curved lever *q* having a nose *n'* engaging the upper arm of lever *w*. Lever *q* is further provided with studs *q'* received within the slots *v²* of brackets *v*. Lever *m'* is by rope *z²* connected to the piston rod *c³* of a suitable brake *c⁴*.

By raising sleeve *s'*, rod *k'* lifts lever *e'* to withdraw shoulder *y* from abutment *x*. Spring *f'*, being thus liberated, swings lever *w* into the position indicated by dotted lines in Fig. 5, thereby retracting the latch through rope *z'*, in which position the parts will remain until the door is opened. Upon an opening of the door, lever *m'* moves lever *q* toward the left, so that nose *n'* returns lever *w* to its original position.

We claim:

1. In a device of the character described, a cylinder, an inclosed piston, means for actuating said piston, latch-retracting means operatively connected to the piston, means

for locking the latch in its retracted position, and means actuated upon an opening of the door for releasing said locking means.

5 2. In a device of the character described, a cylinder, an inclosed piston, means for actuating said piston, a piston rod, a sleeve surrounding said rod and operatively connected thereto, a latch-retracting rope
10 connected to the sleeve, and means for locking the sleeve in retracting position.

3. In a device of the character described, a cylinder, an inclosed piston, means for actuating said piston, a headed piston rod,
15 a sleeve surrounding said rod and having an eye that accommodates the piston rod head, a latch-retracting rope connected to the eye, means for locking the sleeve in retracting position, and means actuated upon an opening
20 of the door for releasing said locking means.

4. In a device of the character described,

a cylinder, an inclosed piston, means for actuating said piston, a piston rod, a sleeve surrounding said rod and operatively connected thereto, a locking lever adapted to engage the sleeve, a latch-retracting rope connected to the sleeve, and means actuated upon an opening of the door for operating the lever. 25

5. In a device of the character described, a cylinder, an inclosed piston, means for actuating said piston, a piston rod, a circumferentially grooved sleeve surrounding said rod and operatively connected thereto, 30 a locking lever adapted to engage the sleeve-grooves, a latch-retracting rope connected to the sleeve, and a link connecting the door with the lever. 35

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