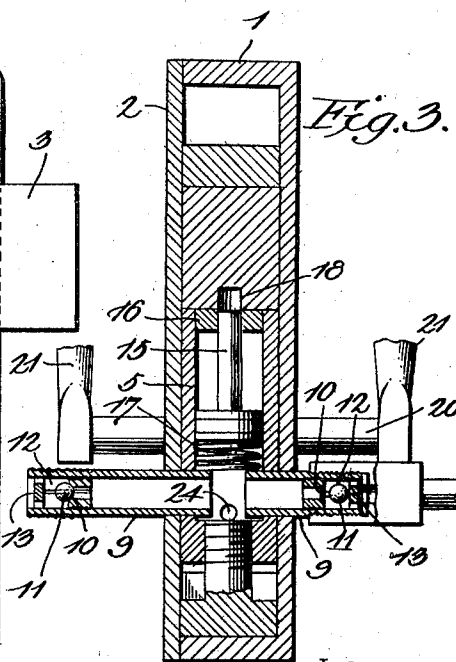
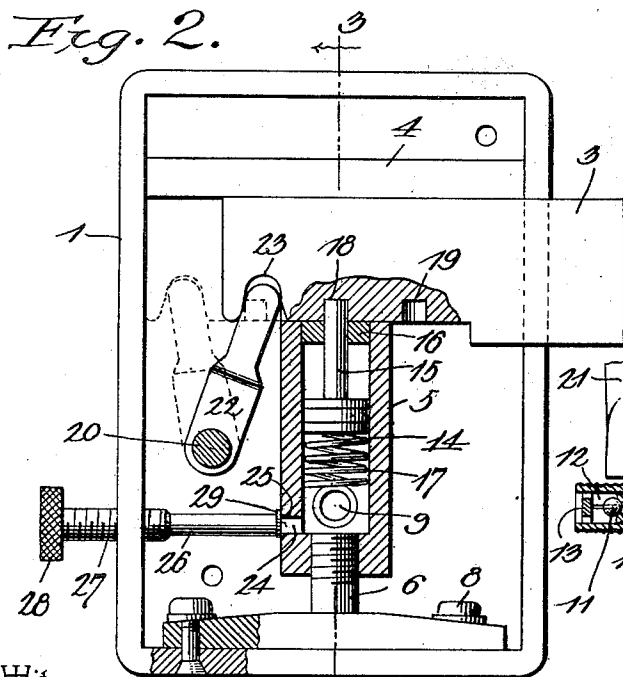
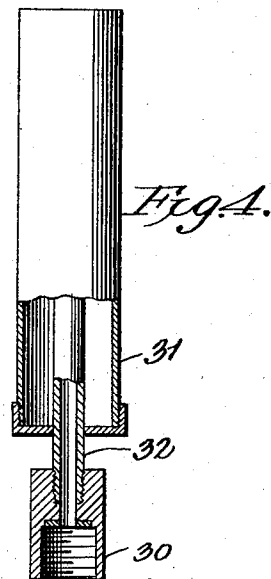
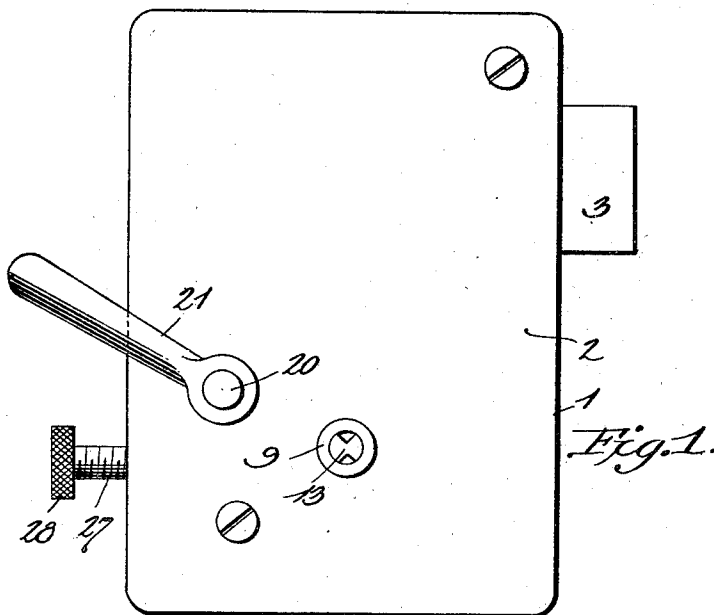


J. SINES.
PNEUMATIC LOCK.

APPLICATION FILED SEPT. 17, 1902.

NO MODEL.



Witnesses
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UNITED STATES PATENT OFFICE.

JOHN SINES, OF CHARLOE, OHIO.

PNEUMATIC LOCK.

SPECIFICATION forming part of Letters Patent No. 722,258, dated March 10, 1903.

Application filed September 17, 1902. Serial No. 123,781. (No model.)

To all whom it may concern:

Be it known that I, JOHN SINES, a citizen of the United States, residing at Charloe, in the county of Paulding and State of Ohio, have invented a new and useful Pneumatic Lock, of which the following is a specification.

This invention relates to locks; and it has for its object to provide a device of this class which may be pneumatically operated to enable the bolt to be drawn in the act of either locking or unlocking the device.

My invention consists in the improved construction, arrangement, and combination of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

My invention is designed to be applied to all kinds of locks, padlocks, and the like. For purposes of illustration, however, I have shown it applied to a bolt-lock of extremely-simple construction.

In the accompanying drawings, Figure 1 is a side elevation of a lock constructed in accordance with the principles of my invention. Fig. 2 is a similar view showing the device partly in section and the covering-plate having been removed. Fig. 3 is a sectional view taken on the line 3 3, Fig. 2. Fig. 4 is a side view, partly in section, of an air-pump employed in connection with my improved lock as a key for the same.

Corresponding parts in the several figures are indicated by similar characters of reference.

A casing 1, illustrated in the drawings as being rectangular in shape, is provided with a detachable side plate 2, forming a closure. Said casing contains an ordinary laterally-slidable bolt 3, for the guidance of which a flange 4 may be provided.

5 designates an air-chamber disposed within the casing at right angles to the bolt 3 and held securely in position by any suitable means. In the drawings these means have been shown as consisting of a T-headed bolt 6, engaging one end of the air-chamber and itself secured to one end of the casing by means of bolts and nuts 7 8. Tightly connected with the air-chamber are tubes 9, extending through opposite sides of the casing and provided near their outer ends with seats

10 for outwardly-opening valves 11, which in the drawings have been illustrated as ordinary ball-valves guided between flanges 12, longitudinally disposed within the tubes, 55 notched or perforated diaphragms 13 being provided at the outer ends of the tubes to prevent said valves from escaping. I desire it, however, to be distinctly understood that any other form of outwardly-opening valves may 60 be used in connection with this part of my invention with equally satisfactory results and without departing from the spirit and scope thereof. The air-chamber 5 also forms a piston chamber or cylinder, in which is 65 mounted a longitudinally-slidable piston 14, the stem of which, 15, extends through what may be termed the "head" 16 of the cylinder. This piston is normally forced in an outward direction by means of a spring 17, 70 interposed between the inner end of the piston-head and the outer walls of the extended inner ends of the tubes 9, the action of said spring being to normally force the piston-stem 15 outward and into engagement with 75 the bolt 3, the adjacent edge of which is provided with recesses 18 and 19 to receive the end of the said piston-stem, which will thereby serve to retain the bolt 3 in a shot or in a drawn position, as the case may be. 80

A stem 20, journaled in the sides of the casing, through which it extends, is provided with handles 21 or knobs, by means of which it may be turned. Said stem also carries between the sides of the casing an arm 22, engaging a groove 23 in the bolt, which latter may thus be operated by said arm when not 85 detained by the piston-stem 15 engaging one of the recesses 18 or 19.

The air-chamber 5 is provided with a suitably-disposed small opening 24, which is normally held closed by means of the reduced end 25 of a pin 26, having a screw-threaded portion 27, whereby it is mounted in the edge of the casing, and provided with a milled knob 95 or handle 28, by means of which it may be conveniently manipulated. A packing-ring 29 is mounted upon the reduced inner end of the pin 26 to engage the outer end of the opening 24, and thus close the latter tightly when 100 the pin is turned in the proper direction. It is evident that by turning the said pin slightly

in a reverse direction it will be withdrawn from the opening 24 and the latter will be free to admit air into the chamber 5.

The ends of the tubes 9 are exteriorly screw-threaded to engage or be engaged by the internally-threaded head 30 of an air-pump 31, having a tubular stem 32 and in all other respects of ordinary construction to form a suction-pump, which may be described as constituting the key of my improved lock.

To operate the latter, the pump-head is connected with a threaded outer end of either of the tubes 9 and operated to cause a suction, whereby a partial vacuum is created in the air-chamber 5 and in the opposite pipe 9. It is assumed that at this time the opening 24 is closed by the pin or plug, which operates to form a valve for the same. On the creation of the partial vacuum in the air-chamber the piston 14 and the stem thereof are drawn in an inward direction against the tension of the spring 17, thus momentarily releasing the bolt 3, which may now be shot or operated in either direction by turning the spindle or shaft 20 by means of one of the handles at either end thereof. This operation should of course be performed before sufficient air is admitted into the chamber 5 by leakage or otherwise to restore the piston and the stem thereof to operative position. After the bolt has been operated by the handle the restoration of the piston and the stem thereof to engagement with either of the recesses 18 or 19 is expected to take place and will naturally follow. It is obvious that when the air-pump is connected for operation with either of the tubes 9 the valve in the other tube will be automatically closed as soon as the suction begins to take place.

To prevent the lock from being tampered with, it is only necessary to open the auxiliary inlet 24 of the air-chamber, when sufficient air will be admitted into said chamber to prevent the withdrawal of the piston and stem by the exercise of the suction of the air-pump.

It is obvious that the closure for the auxiliary air-inlet 24 may be constructed and disposed in a different way from that illustrated in the drawings. It is preferable that it should be practically hidden from view and capable of being operated in a very simple and convenient manner to open the said air-inlet whenever the bolt of the lock is shot. I would likewise have it understood that I do not by any means limit myself to the details of construction and arrangement of the parts of the device herein described and illustrated, but reserve the right to any changes, modifications, and alterations which may be resorted to without departing from the spirit and scope or sacrificing the utility of the invention.

Having thus fully described my invention, I claim—

1. A lock comprising a pneumatically-operated piston having a bolt-engaging element,

and a bolt mounted to slide transversely to the movement of said engaging element and adapted to be engaged by the latter.

2. A lock comprising a pneumatically-operated piston having a bolt-engaging element, a bolt mounted to slide transversely to the movement of said engaging element and having recesses adapted to be engaged by the latter to be thereby retained in an "open" or "closed" position, and means normally tending to force the engaging element in the direction of the bolt.

3. A lock comprising a pneumatically-operated piston having a bolt-engaging element, a bolt mounted to slide transversely to the movement of said engaging element and adapted to be engaged by the latter, and means for operating said bolt.

4. In a lock, an air-chamber, a bolt-engaging element comprising piston disposed within, and having a stem extended beyond the head of said air-chamber, a sliding bolt having recesses to be engaged by said piston-stem, laterally-extended tubes connected with said air-chamber and outwardly-opening valves within said tubes.

5. In a lock, an air-chamber having a cylindrical bore, a piston within said bore having a stem extended through the head of the cylinder and adapted to engage a bolt, means for sliding the latter transversely with relation to the air-chamber, and recesses in said bolt adapted to be engaged by the piston-stem.

6. In a lock, an air-chamber, a spring-pressed piston within the same, having a stem extended to form a bolt-engaging element, laterally-extending valved suction-tubes and a spring interposed between the outer walls of the inner ends of said suction-tubes and the piston.

7. In a lock, an air-chamber, a spring-pressed piston within said air-chamber having a stem extended to form a bolt-engaging member, means for exhausting the air from said air-chamber to cause the piston to recede against the tension of the spring, and an air-inlet to the casing equipped with an independent closure.

8. In a lock, an air-chamber having a slidable spring-pressed bolt-engaging device adapted to be withdrawn from engaging the bolt by a suction created within the air-chamber, and air-tubes extended in opposite directions from the air-chamber through the lock-casing and having interiorly-disposed outwardly-opening valves whereby suction applied to one of said tubes shall close the valve of the opposite tube and tend to exhaust the air from the air-chamber.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOHN SINES.

Witnesses:

J. B. WEIBLE,

J. M. CARPENTER.