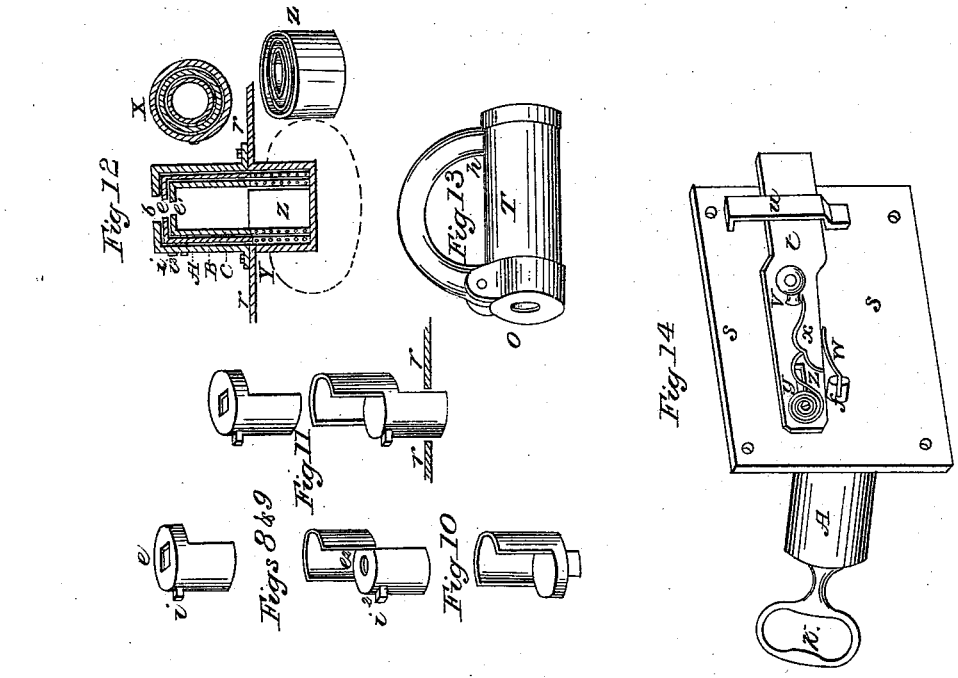
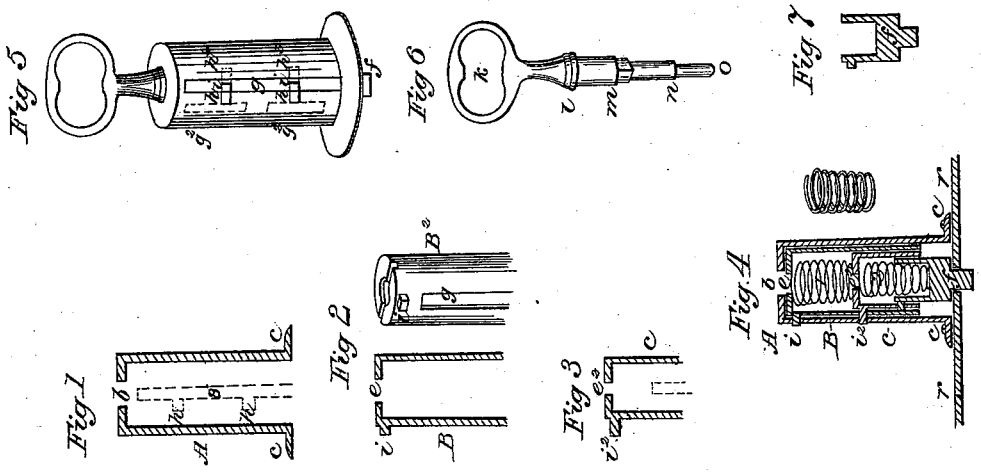
C. F. Voorhies,

Latch,

No. 3,125. Patented June 9, 1843.





UNITED STATES PATENT OFFICE.

CHS. F. VOORHIES, OF NEWARK, NEW JERSEY, ASSIGNOR TO WM. AND J. N. TUTTLE.

DOOR AND OTHER LOCK.

Specification of Letters Patent No. 3,125, dated June 9, 1843.

To all whom it may concern:

Be it known that I, CHARLES F. VOORHIES, of Newark, in the county of Essex and State of New Jersey, have invented a new and useful Lock for Doors and other Purposes; and I do hereby declare that the following is a full and exact description.

Figure I, A, is a longitudinal section of a hollow tube or cylinder, having a head or cap in which is a round aperture at *b*, and a rim *c c* for fastening. A longitudinal slit *g* runs from its lower end (which end is open) extending quite through the tube, and terminating at or near the cap. The place of this is shown by dotted lines. From this lateral slits *h h*, branch off.

Fig. II, B is another similar section of a tube just enough smaller in diameter than the preceding to slide within it—is also hollow and has the aperture *e* in the head squared. The lower end is entirely open like A, Fig. 1. *i*, seen also in B (which is a perspective of the same tube) is a projecting piece or bit. This tube has also a longitudinal slit *g* of the width of that of A, but has no lateral or horizontal ones.

Fig. III, C is another tube to slide within B in the same manner that the latter slides within A. This tube has no slit like the others, but has a small one at its lower end, (see dotted lines), for a purpose hereafter to be shown. i^2 is a bit similar to *i* in the last figure, but longer for a reason which will be seen when these tubes are put together. e^2 the aperture, which is smaller than that of B. The tubes may be of brass, wrought, or cast iron, or any other suitable material.

It may now be seen that when B, (Fig. 2) is placed within A, (Fig. 1)—its upper end first,—the bit *i* in the former will pass freely through the whole length of the slit *g* of the latter, the head or cap of B being thereby brought into close proximity to the cap of A. The bit *i* (see B^2 Fig. 2) must be in a line with its slit *g*, so that when it (the bit) passes through the slit of A, (Fig. 1) the said slit *g* of B^2 Fig. 2, will correspond with the longitudinal one of A, (Fig. 1), and be directly beneath it. The bit i^2 of C, (Fig. 3) plays in the slit of B, (Fig. 2) as the latter does in the slit of A, (Fig. 1). Having to reach through both the tubes B (Fig. 2) and A, (Fig. 1) in order to come to the outer surface of the latter, the bit of C must be necessarily longer than that of B, by just the thickness of the tube C.

Fig. IV, is a sectional view of the several tubes placed one within another as described. A small slit as before referred to is made in the lower end of the tube C (Fig. 3) to receive a bit attached to the piece *f* which piece works the latch or bolt. 1 and 2 are spiral springs of brass or other material (one of which is shown separately at the right of this figure) placed within and between the heads or caps of the tubes to keep them properly separated. *r r* is a plate or box upon, or within which the external tube A is fastened by means of the rim *c c*, or otherwise. This tube is of course stationary, having no motion while the inner ones B and C have both a longitudinal and lateral motion within it, when acted upon by the key.

Fig. V, represents perspectively the tube A, (Fig. 1,) not attached to the latch plate, and with the two inner tubes B, (Fig. 2) and C (Fig. 3) supposed to be within it. *i i* are the bits of these tubes seen in the slit *g*, and directly opposite to the lateral slits *h h*.

Fig. VI, the key *l m n* are shoulders or bearings to be varied in different locks. Directly underneath the shoulder *m* the shaft is square, to correspond in size with the square aperture *e* of the tube B (Fig. 2). Instead of this square on the key, I purpose also to make a bit or bits to project from the key at *m* and to shape the aperture *b* of A Fig. 1 accordingly that the said bits on the key may enter, and be received into a cut made across the head or cap of B, (see B^2) which will serve instead of the square for giving the inner tubes their proper horizontal or lateral motion. In this case *e* of Fig. 2 will be round, and correspond in size with *b* of Fig. 1.

The parts being put together as in Fig. 4 suppose the key to be applied. As it passes through the aperture *b* of the external tube A, and the apertures *e* and e^2 of the inner ones, its shoulders *m* and *n* strike simultaneously or in succession on the sides of the latter apertures, and overcoming the force of the springs (1) and (2), press the inner tubes (which are shorter than the outer one A) downward to a certain point determined by the place of the shoulder *l* of the key,

which shoulder does not pass into A, but bears upon the sides of the aperture. Suppose these points to be indicated by the lateral slits *h h* (see Fig. 5) it is evident that the square part of the key, being in the square aperture *e* of the tube B, will turn the tube B and with it its bit, and also the tube C and its bit, into the said lateral slits *h h*: and the piece *f* which works the latch or bolt, being connected with the tube C by a bit passing into a slit of the latter as before explained, will also be turned with the tubes. In order that the bits on the tubes may be brought back more readily from the lateral slits into the longitudinal one after the lock has been unlocked, a spring is attached to the piece *f*, or the latch upon which it acts. The bits have the power of moving beyond these points, and would do so if this shoulder was taken off.

I design to make the piece *f*, or the lower end of one of the inner tubes move a bolt and thus adapt the lock to the purposes of locks in general. To effect this, the bits *i i* (Fig. 5) will not require to be brought back by the spring just mentioned into the longitudinal groove *g*, but carried on quite through the lateral slits *h h* into other longitudinal slits running parallel with *g*, shown by the dotted line g^2 g^2. Into these the bits fall back when the key is withdrawn into their natural places, and the bolt is thereby prevented from moving back unless the bits are carried by the key through the lateral slits again into the longitudinal one *g*. I also purpose to continue the lateral slits *h h* on the opposite side of the longitudinal one *g* so that the bits and key may be turned either way to unlock the latch or lock. These are shown by dotted lines (see h^2 h^2 Fig. 5).

In the drawings I have represented the lock with but two bits, and two inner tubes or sections; but I purpose to construct them with a greater number, for additional security.

In part 2, and at the right of the figures already described are shown other modes which I intend to employ in constructing the lock. Figs. 8, 9 and 10, are sections or parts so formed, that when they are joined lengthwise they will appear like a single tube or cylinder. In Figs. 8 and 9, *e* and e^2 are the apertures—*i* and i^2 the bits. Fig. 10 is the piece which works the latch or bolt. These sections are placed lengthwise into the external tube A (see Fig. 1), with springs between them as in Fig. 4. It is plain that these sections will slide one upon another longitudinally without being fully detached, and without allowing of any horizontal motion of one without the rest, and that the same result will be gained as by the tubes before described. I intend also to dispense with the section 10, corresponding to the piece *f* in Fig. 4, and make one of the other sections or tubes to pass through the latch plate or box *r r* (as in Fig. 11) for working the latch or bolt, its spring in this case resting upon the latch plate.

Fig. XII is a plan upon which I also intend to construct the locks. The tubes and bits are similar to those already described, and are placed one within another in the same manner, but without springs between them. When the outer tube A is fastened to the latch, box or plate, the lower ends of the inner tubes pass through the said plate and appear on its opposite surface like so many concentric circles one within another; resembling *x* at the right of this figure (which shows 3 tubes protruding). A circular box Y containing as many springs as there are inner tubes, and which springs are separated from one another by partitions (see Z) is now placed on the side of the latch plate *r r*, opposite to that upon which the outer tube A is fastened in such a manner that the springs in the box will come directly against the ends of the aforesaid tubes (each tube having its own spring, which is of the same diameter as itself) and thus keep the tubes and bits in their places in the upper part of the outer tube A. This spring box may be in one piece with the latch plate if deemed advisable, as in the figure; and a knob, as shown by the dotted lines may work over to conceal said box, which knob works the latch or bolt. The effect of this arrangement is to make the springs and tubes act more independently of one another, and make it unnecessary to have the tubes so long as if the springs were within and between them, thus saving room and allowing of more variation for the bits. I intend also to apply this principle to the construction of padlocks. Fig. 13 shows how this may be done by confining a tube similar to A, (Fig. 1) within another tube T, having no slit or opening except one for the key at *o*, and another for the end of the hasp *h* to enter where it is secured in a manner not described by the action of the key. The particular form of the lock, and the particular manner of securing the end *h* of the hasp, I deem it not necessary to describe. Besides padlocks, the principle of the improvement may be applied to other purposes, one of which is to secure stop cocks or faucets of hydrants in cities, which might be described if necessary.

Fig. 14 is a perspective view of a lock made on the plan described in Fig. 4. A, the external tube, K, the key. *s s* the plate *t* the latch, *w* a horn or follower firmly attached to the piece *f* for raising the latch *x* a projection on the latter on which a spring *y* bears, for keeping it down. *z* a

slit in the latch that it may be drawn back when not in use by the knob *v* the aforesaid spring keeping it in its place.

In carrying out of the principle of this invention, I wish to confine myself to no particular arrangement.

What I claim and desire to be secured in by Letters Patent in this invention is—

The combination of tubes or sections working within or against one another in the manner and for the purposes mentioned and referred to; and in connection with said tube, the movable bits attached to them, which, following the motion of the tubes or sections, are when acted on by the key, carried to certain points of the longitudinal slit of the outer tube, as described, at which points the said bits may be turned into the lateral slits and the latch or bolt moved. And I also claim the peculiar modification of the key viz. the combination of shoulders or bearings of the same by which it may be varied by making the distances between said shoulders different for different locks.

CHARLES F. VOORHIES.

Witnesses:
SMITH ROBERTS,
M. I. SNYDER.