

(No Model.)

W. F. TROAST & S. R. SLAYMAKER.
PADLOCK.

No. 488,231.

Patented Dec. 20, 1892.

Fig. 1.

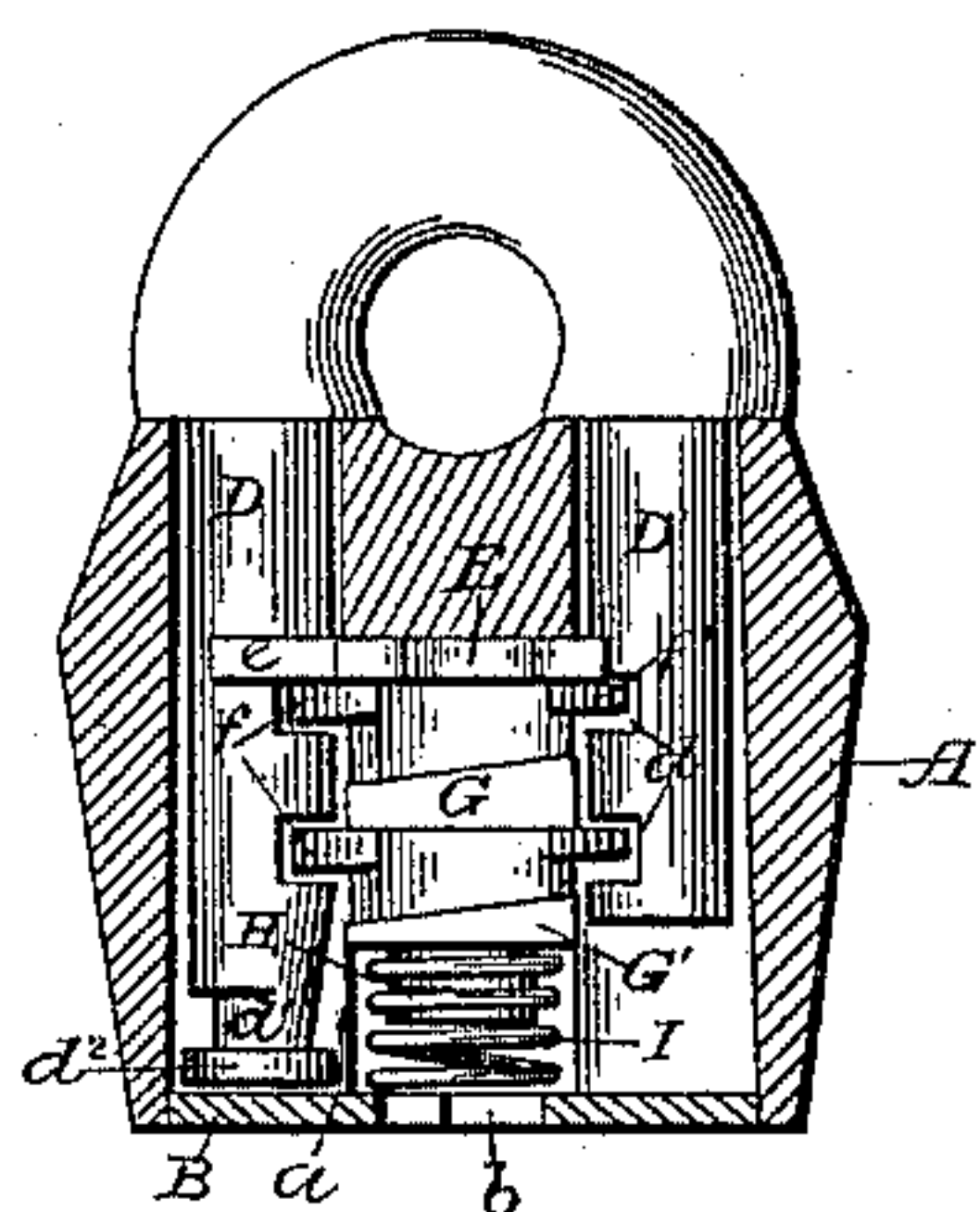


Fig. 2.

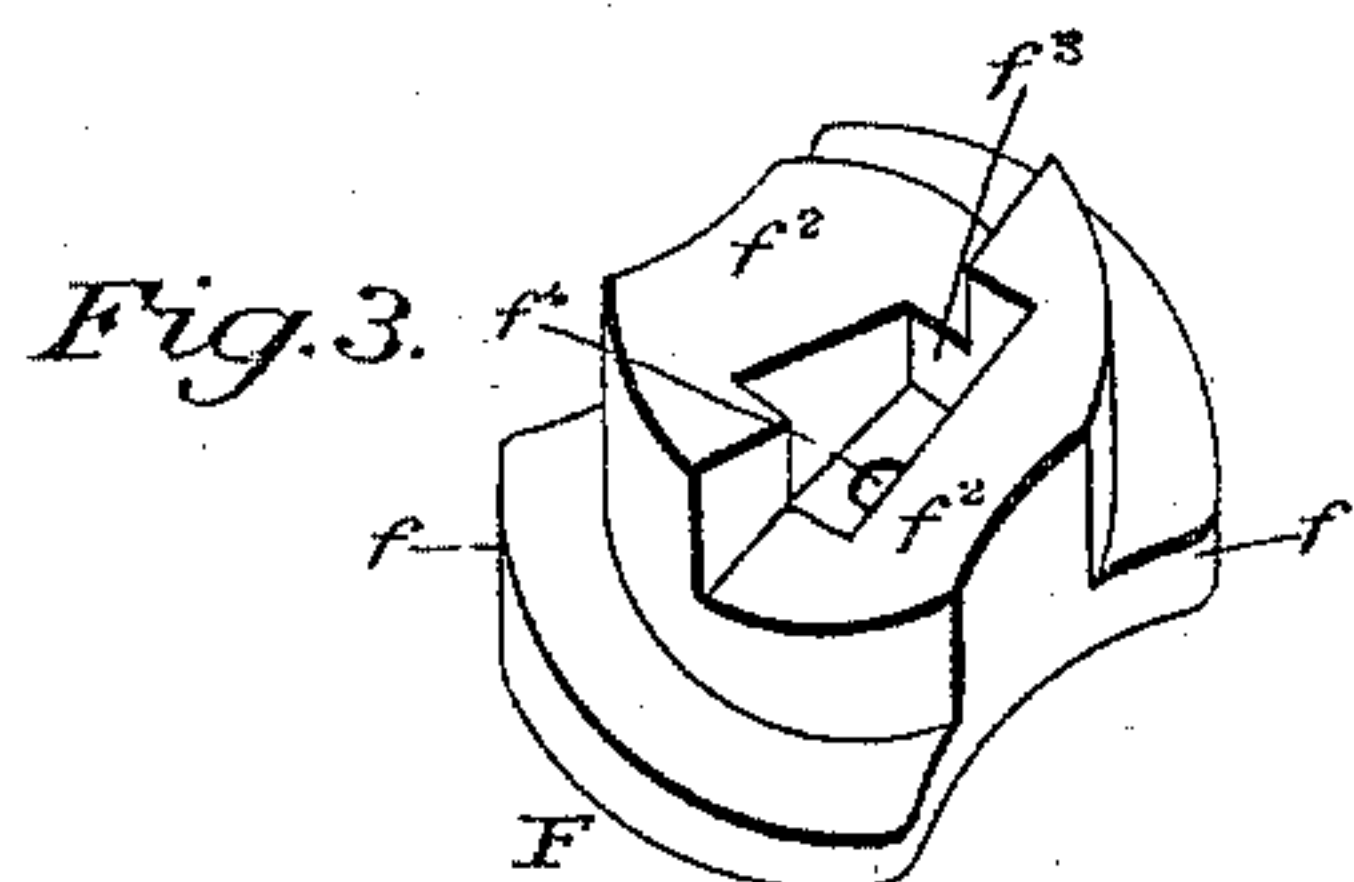
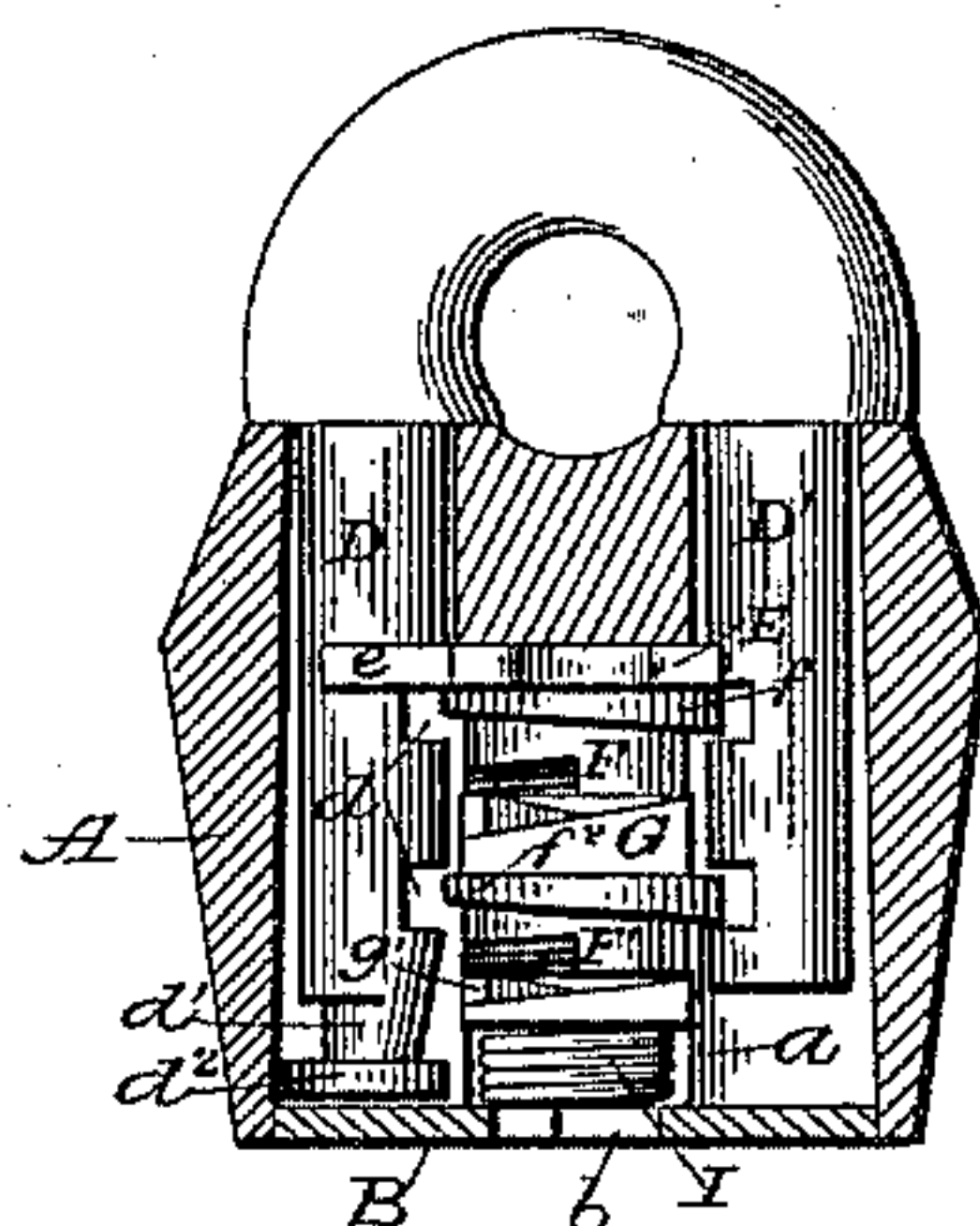


Fig. 4.

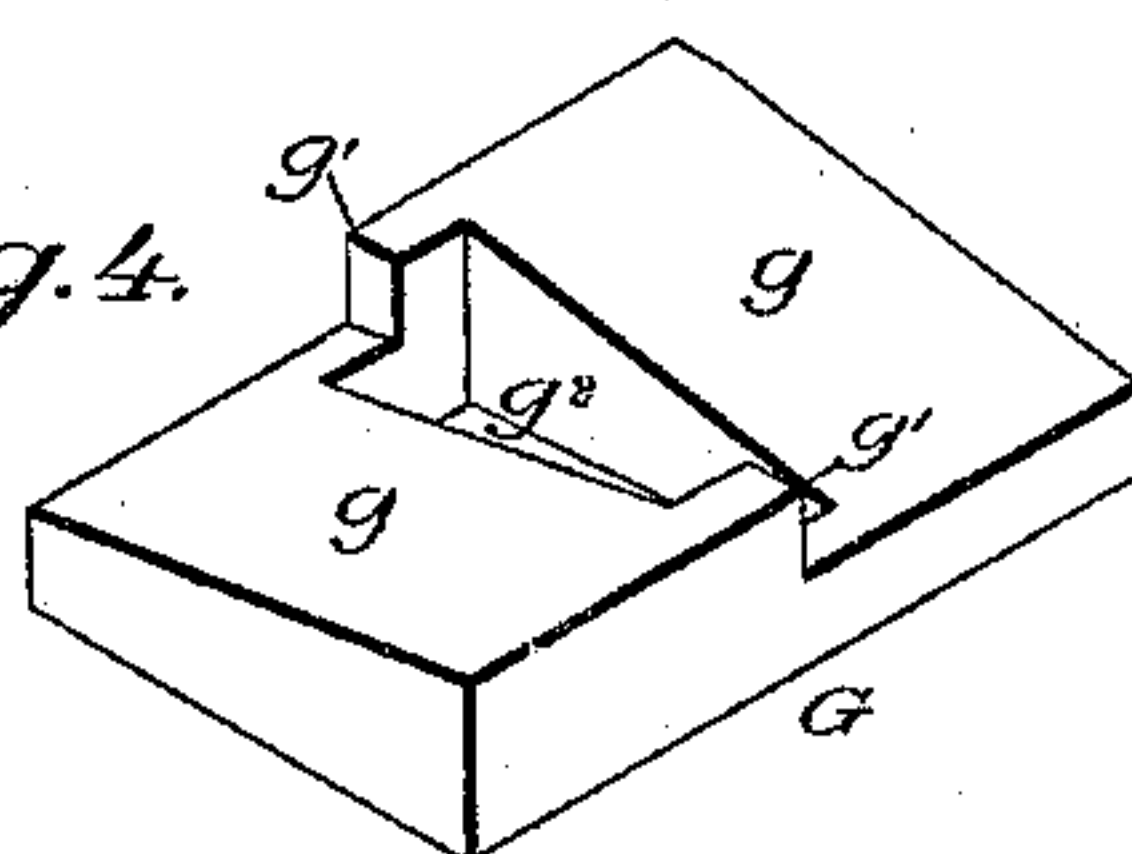


Fig. 5.

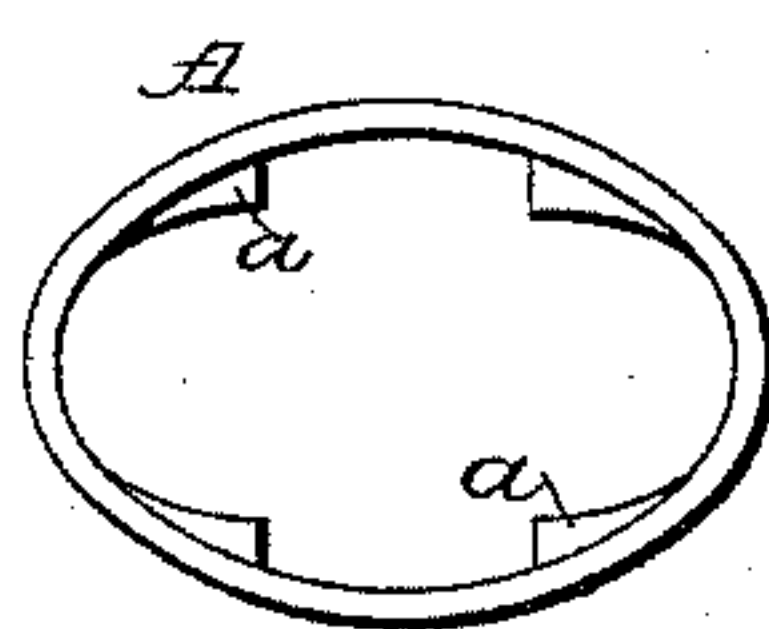


Fig. 6.

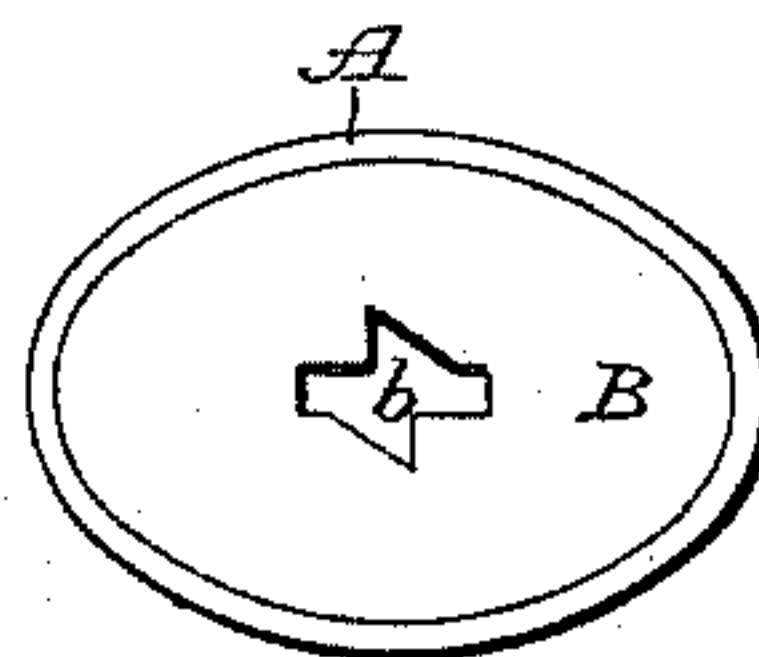


Fig. 7.



Fig. 8.

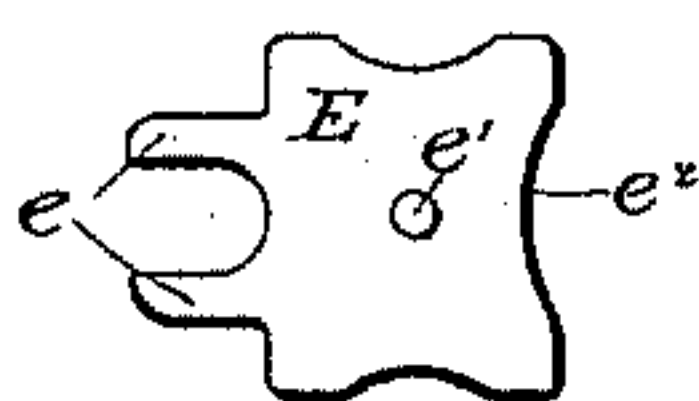
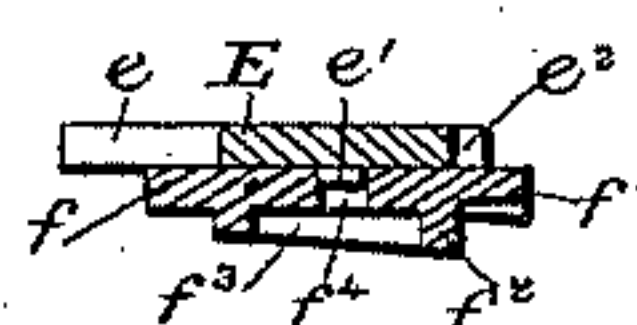


Fig. 9.



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PADLOCK.

SPECIFICATION forming part of Letters Patent No. 488,231, dated December 20, 1892.

Application filed February 20, 1892. Serial No. 422,211. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM F. TROAST and SAMUEL R. SLAYMAKER, citizens of the United States, residing at Lancaster, in the county of Lancaster and State of Pennsylvania, have invented certain Improvements in Padlocks, of which the following is a specification.

This invention relates to improvements in that class of padlocks in which a series of stationary plates support revoluble tumblers, which engage notches in the arms of the shackle to lock the same in the case; and the object of the improvement is to prevent the accidental disengagement of the tumblers from said notches.

The invention consists in the construction and combination of the various parts, as hereinafter fully described, and then specifically pointed out in the claims.

In the accompanying drawings, which form a part of this specification, Figure 1 is a longitudinal vertical section through the case, showing the interior mechanism, the tumblers being engaged with the arms of the shackle, and Fig. 2 a similar section, but showing the tumblers disengaged from the arms of the shackle. Fig. 3 is a perspective view of the bottom face of the upper tumbler, and Fig. 4 a similar view of the top face of the stationary plate next below said tumbler. Fig. 5 is a bottom plan view of the case with the bottom plate removed, and Fig. 6 a similar view, showing the bottom plate in place. Fig. 7 is a top plan view of the upper tumbler, and Fig. 8 a bottom face view of the stationary plate above it. Fig. 9 is a vertical longitudinal section through the upper tumbler and the stationary plate above it, showing those parts in the position they occupy in Fig. 1.

Similar letters indicate like parts throughout the several views.

Referring to the details of the drawings, A indicates the case; *a*, vertical ribs on opposite sides of the interior of the case; and B, the bottom plate having a centrally located key-opening *b*, the inner face of said plate bearing against the lower ends of ribs *a*.

D is the "fast" arm of the shackle, having an annular flange *d*² on its lower end and a

reduced neck *d'* formed therein above said flange.

D' is the detachable end of the shackle, and *d d* are notches in arms D D' adapted to be engaged by the tumblers to lock the shackle in the case. Against the top of the case there rests a stationary plate E, having jaws, *e*, which embrace the long arm D of the shackle and engage the flange *d*² on the lower end of said arm when the detachable arm D' is withdrawn from the case.

In the edge of plate E there is a recess, *e*², to allow the arm D' to be moved in and out of the case, and on the lower face of said plate there is formed a teat *e'*, which is engaged by an opening, *f*⁴, in the center of the tumbler F. The upper surface of this tumbler is flat and rests against the plate E, the ends being tapered crosswise on the lower face in the same direction, so that a thick corner, *f*, of each end is located opposite a thin corner, *f'*, of the other end, whereby the engagement of these ends with the notches in the shackle is facilitated and a closer fit therein attained. On the lower face of tumbler F there is a hub having oppositely inclined bottom faces *f*², the outwardly extended end of each of which terminates in a shoulder formed by the retracted end of the adjoining face. In the center of the lower face of the hub there is countersunk a ward *f*³, through the top of which is the opening *f*⁴.

Below tumbler F there is a stationary plate G having oppositely inclined faces *g* on its top surface terminating at their lower ends against shoulders *g'*, connected with the elevated ends of said inclined surfaces by a narrow horizontal face, as shown in Fig. 4; and through the center of said plate there is a rectangular key-passage *g*². The inclined faces of the plate G register with those of the hub of the tumbler F, the faces which register with each other being inclined in the same direction, so that when said tumbler is in engagement with the notches in the shackle the opposite faces of the hub and plate bear entirely against each other with the vertical surfaces of the shoulders of the hub resting against the like surfaces of the shoulders of the plate. Below stationary plate G there is located a tumbler

F', its upper face being flat and bearing against the similarly constructed lower face of stationary plate G. This tumbler is constructed in the same manner as tumbler F excepting that the ward therein extends entirely through the tumbler, the lower face of the hub of which rests on a stationary plate G', having oppositely inclined faces on its top surface similar to those on stationary plate G and a similar key-passage through it. On the lower face of stationary plate G' there is a short vertical hollow cylinder H, about which is coiled a spring I, resting on the bottom plate B around the key-opening b, and which, by its upward pressure, holds the tumblers and plates in contact with each other.

The wards in the tumblers, the central opening in tumbler F, and the key-passages in the stationary plates all register with the key-opening in the bottom-plate, as is usual, the stationary plates being prevented from revolving by engagement between the vertical ribs a.

When the parts of the operating mechanism are in their normal positions and the tumblers in engagement with the notches in the arms of the shackle, the inclined faces of the hubs rest on those of the stationary plates as shown in Fig. 1, with the shoulders of the hubs bearing against the shoulders of said plate. In this position the tumblers are prevented from accidentally revolving in one direction by contact of the shoulders on the hubs with those on the stationary plates, and in the other direction by the slope of the inclined faces from said shoulders upward.

In unlocking the tumblers from the shackle, the tumblers make a quarter of a revolution, the inclined faces of the hubs sliding up over those of the stationary plates until the shoulders terminating said faces on the hubs rest on the horizontal faces connecting the inclined faces of the stationary plates with the shoulders thereon, the spring I being at the same time contracted by the downward pressure, as shown in Fig. 2. The horizontal surfaces connecting the shoulders and the inclined faces of the stationary plates afford a rest for the tumblers when the inclined faces of the tumblers and said plates are disengaged from each other, but if desirable these surfaces may be omitted from the plates and the inclined faces be continued to the edges of the shoulders. By reason of the continuous incline of the contacting surfaces this movement of the tumblers is smooth and even, and is produced without any undue strain on the key or jarring or wear on the tumblers and stationary plates. In like manner, when the shackle is again locked in the case, the tumblers move back into their normal positions smoothly and evenly. This construction of the adjoining faces not only prevents the accidental movement of the tumblers when they are engaged with the shackle, but it also prevents the picking of the lock. Locks of this character are picked by releasing the tumblers

from the shackle successively, which cannot be done with this lock; for after one tumbler is so released from the shackle the pressure on its inclined face caused by attempting to release another tumbler forces the first tumbler to slide down the inclined face of the stationary plate on which it rests and again engage the shackle.

We do not limit ourselves to any particular construction of the hubs on the lower faces of the tumblers; neither do we restrict ourselves to any particular manner of forming inclined faces on the bottom bearing faces of the tumblers and the supporting faces of the stationary plates.

Our construction involves a radical departure in the construction and principle of operation in the tumblers and stationary plates of padlocks, the invention consisting, broadly, in a tumbler having an inclined bottom surface formed on its lower face adapted to engage and register with a similarly inclined top surface on the upper face of the stationary plate, whereby when the tumbler is revolved in a given direction said inclined surfaces slide upon each other and force the stationary plate and tumbler apart vertically, and a yielding support for the stationary plate and tumbler.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent, is—

1. In a padlock, the combination of a tumbler having an inclined bottom surface formed on its lower face adapted to engage and register with a similarly inclined top surface on the upper face of a stationary plate, whereby when the tumbler is revolved in a given direction said inclined surfaces slide upon each other and force the stationary plate and tumbler apart vertically, and a yielding support for the stationary plate and tumbler, substantially as and for the purpose specified.

2. In a padlock, the combination, with a stationary plate having a bearing face formed of oppositely inclined surfaces, of a tumbler having a bearing face formed of oppositely inclined surfaces adapted to register with the inclined surfaces of the stationary plate, and a yielding support for the plate and tumbler, substantially as and for the purpose specified.

3. In a padlock, the combination, with a stationary plate having a bearing face formed of oppositely inclined surfaces, one end of each of said surfaces terminating against a shoulder and the other being connected therewith by a horizontal surface, of a tumbler having a bearing face formed of oppositely inclined surfaces terminating in shoulders and adapted to engage the inclined surfaces of said plate, and a yielding support for the plate and tumbler, substantially as and for the purpose specified.

4. In a padlock, the combination, with a shackle having notched arms, the longer arm having an annular flange formed on the end

thereof, of a top plate having jaws adapted to embrace said long arm and engage the annular flange thereon, a teat formed on the lower face of said plate and constructed to be received in an opening in the tumbler below it, stationary plates having bearing surfaces formed of oppositely inclined faces terminating in shoulders, tumblers having the ends tapered in the same direction, hubs formed on the tumblers and having oppositely inclined faces terminating in shoulders adapted to engage the shoulders of the stationary plates, the lower stationary plate having a hollow cylinder formed on the bottom thereof, and a spring coiled around said cylinder and resting on the bottom plate of the case, substantially as and for the purpose specified.

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