H. E. LEPPERT.

INTERLOCKING MECHANISM.

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1,040,705.

Patented Oct. 8, 1912.

Fig. 1.

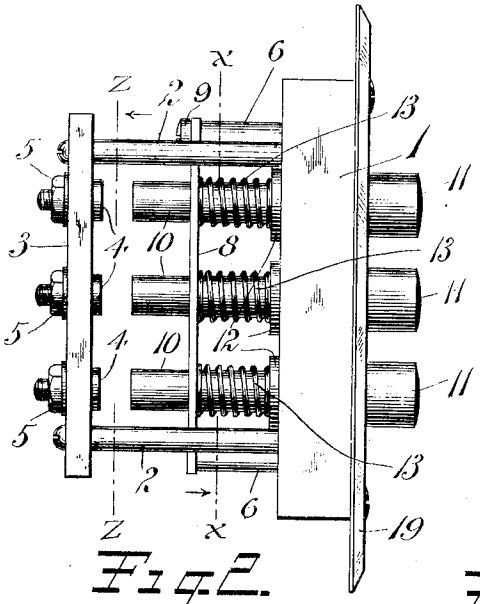


Fig. 2.

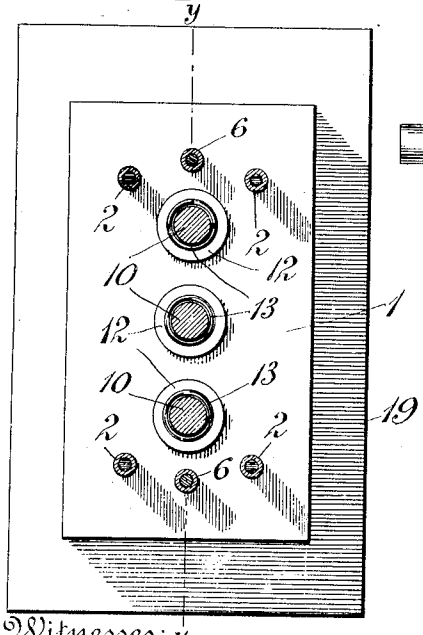


Fig. 3.

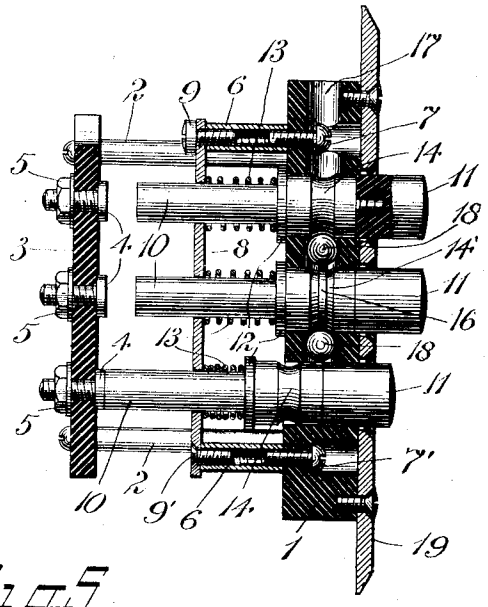


Fig. 5.

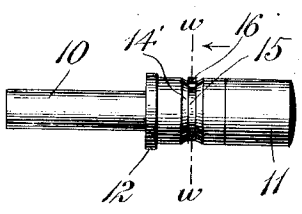


Fig. 4.

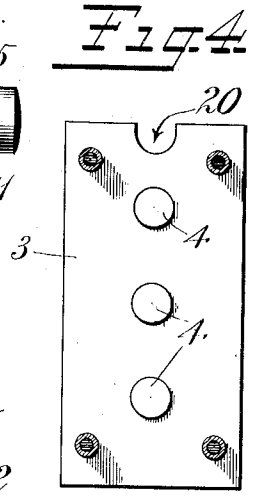
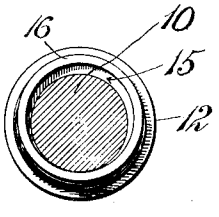


Fig. 6.



Witnesses: y

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INTERLOCKING MECHANISM.

1,040,705. Specification of Letters Patent. Patented Oct. 8, 1912.

Application filed March 14, 1911. Serial No. 614,320.

To all whom it may concern:

Be it known that I, HENRY E. LEPPERT, a citizen of the United States, residing at New Britain, Hartford county, State of Connecticut, have invented certain new and useful Improvements in Interlocking Mechanism, of which the following is a full, clear, and exact description.

My invention relates to interlocking mechanism and has for its object to produce a simple multiple plunger device in which the several plungers shall interlock so that only one can be actuated at a time. It is particularly useful in connection with multiple push button switches.

The following is a description of a multiple push button switch constituting an embodiment of my invention, reference being had to the accompanying drawings, in which—

Figure 1 shows a side elevation of a switch embodying my invention. Fig. 2 is a transverse section through the same on the line *x—x*, Fig. 1. Fig. 3 is a vertical section through the same on the line *y—y*, Fig. 2, with one plunger in closed position. Fig. 4 shows a section on the line *z—z*, Fig. 1, looking toward the left. Fig. 5 is a detail of the central plunger. Fig. 6 shows a section of the plunger on the line *w—w*, Fig. 5.

Referring more particularly to the drawings, 1 is a base carrying four supports 2 to which is secured a plate 3 carrying contacts 4 having binding nuts 5, by which circuits can be electrically connected to the contacts 4.

6 are two supplemental supports carried by the base 1 being secured thereto by screws 7, 7′. These supplemental supports carry a plate 8 secured thereto by screws 9, 9′. The screw 9 also serves as a binding screw by which a common return conductor can be connected to the plate 8.

The plate 8 and the base 1 have three perforations through which extend plungers having metal shanks 10 and insulating outer ends 11. The metal portions have projections 12. Between these projections and the plate 8 are spiral springs 13. The outer shanks each have a circumferential groove 14 and the shank of each of the intermediate plungers, in the present instance one in number, has a similar groove 14′ with a supplemental circumferential recess 15 (Fig. 5), in which lies a ring 16 whose outer diameter is substantially equal to the diameter of the corresponding perforation in the base 1, less the depth of the groove 14′, and whose inner diameter is slightly larger than the diameter of the shank at the bottom of the recess 15. The thickness of the ring 16 equals the depth of the recess 15 so that when one link of the ring is seated in the recess 15, the opposite link is in line with the edge of the perforation in which its plunger lies. The projections 12 engage the base 1 and limit the outward movement of the plungers. The base 1 has a longitudinal recess 17 in which are balls 18 located between the three plungers and adapted to partially enter the grooves therein, the diameter of said balls being equal to the distance between a perforation in the base 1 and the bottom of the groove in the next plunger.

19 is a perforated face plate secured to the base 1 so as to give the same a proper finish.

The plungers are all electrically connected with the binding post 9 by the plate 8 and the springs 13. The notch 20 permits the return conductor to be easily led to the screw 9.

When an intermediate plunger is forced in so as to engage its contact 4, the balls 18 are forced outward into the grooves 14 of the other adjacent plungers, locking them against movement. When either of the outer plungers is forced into engagement with its contact 4, the ball 18 adjacent thereto is forced into the groove 14′ of the adjacent plunger, locking it against movement, and also forcing the ring 16 to one side. The ring 16, when so moved, pushes the other engaging ball 18 into the recess 14 of the third plunger, thus locking it also against movement, so that the three plungers are completely interlocked. Since none of the interlocking devices 18 and 16 pass through a plunger but all engage circumferential grooves, the three plungers are always free to turn on their axes, so that there is little danger of their cramping or binding, moreover the recesses can easily be formed without a separate operation.

What I claim is:

1. In an interlocking device, the combination of a base, three openings therein, a series of three plungers in said openings respectively, each plunger having a circumferential recess, a detent between each pair of adjacent plungers, and a ring loosely seated at the bottom of the recess in the inter-

mediate plunger and adapted to be engaged by each detent.

2. In an interlocking device, the combination of a base, three openings therein, a series of three plungers in said openings respectively, each plunger having a circumferential recess, a ball detent between each pair of adjacent plungers, and a ring loosely seated at the bottom of the recess in the intermediate plunger and adapted to be engaged by each ball detent.

3. In an interlocking device, the combination of a base, three openings therein, a series of three plungers in said openings respectively, each plunger having a circumferential recess, a detent between each pair of adjacent plungers, a ring loosely seated at the bottom of the recess in the intermediate plunger and adapted to be engaged by each detent, and springs normally tending to retract said plungers.

HENRY E. LEPPERT.

Witnesses:
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