

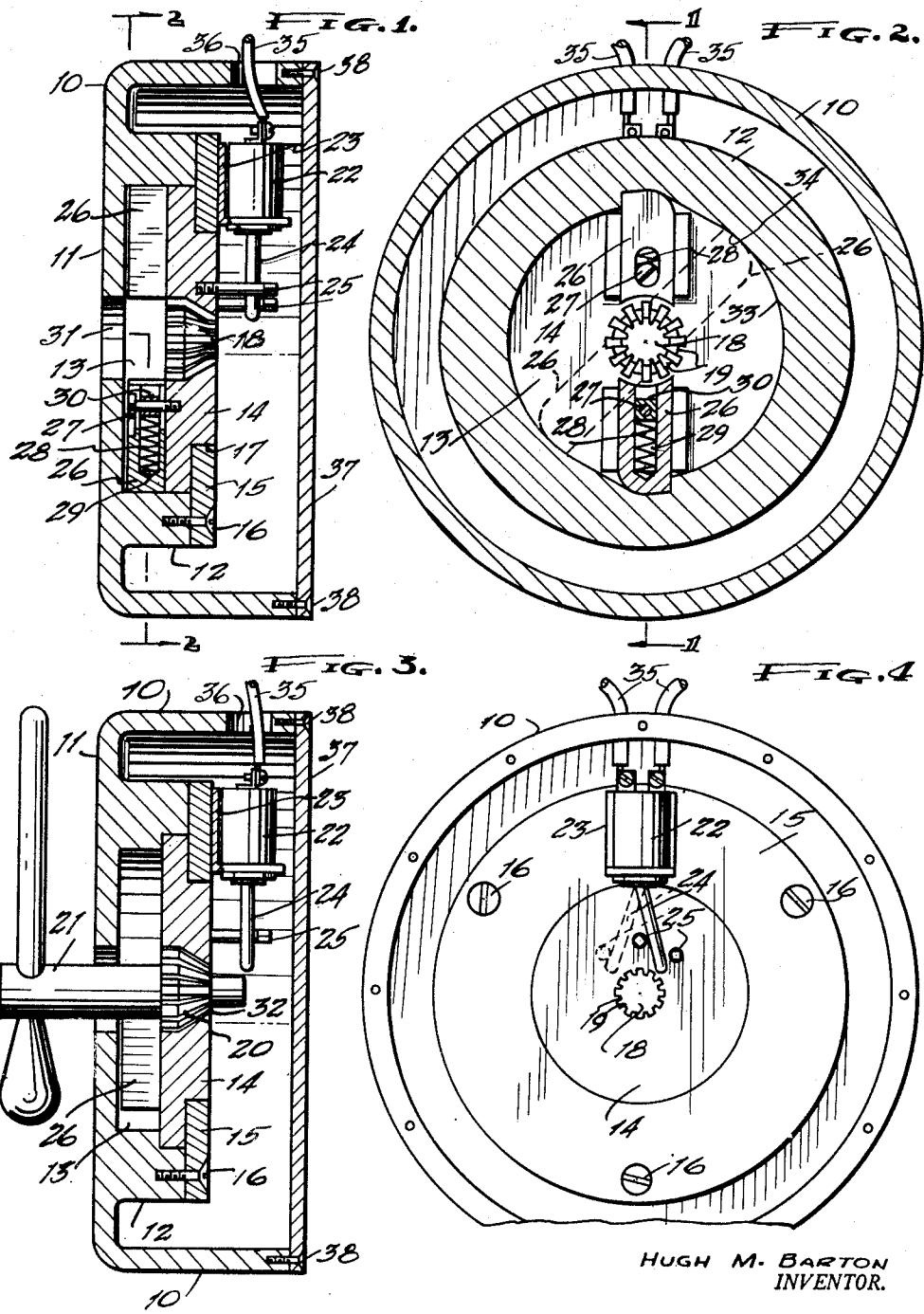
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SAFETY SWITCH

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SAFETY SWITCH

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2 Claims. (Cl. 200-44)

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This invention relates to safety switches for electrical circuits for operating machinery, such as lathes and similar machines, and it has particular reference to an enclosed switch capable of operation to be opened or closed only by a lathe wrench or chuck key, or other tool used on the machine in whose circuit the switch is installed, and its principal object resides in the provision of a compact housing in which a conventional electrical service switch can be installed and which is accessible only through an opening suited to the reception of a lathe chuck key, or a similar instrument, by which the switch can be operated to open or close the circuit.

A prime object of the invention is that of providing a safety switch by which a lathe, for example, cannot be operated without employing a chuck wrench or key to actuate the switch and which must remain in the switch housing as long as the circuit is closed and be incapable of withdrawal therefrom until the switch is turned to open the circuit to stop the machine, the chuck wrench or key not being usable on the machine as long as the circuit is closed and the machine is in operation.

Another object of the invention resides in the provision of a simple and inexpensive structure capable of being economically installed in any machine circuit and arranged upon or near the machine in easy access to the operator so that a wrench or key employed on the machine can be used on the latter when the same is not in operation, yet must be utilized as a means for actuating the switch to cause the machine to function, thus preventing injury and damage to the operator and property by the inadvertence or carelessness of the operator in leaving the chuck wrench or key on the machine while it is in motion.

Broadly, the invention contemplates the provision of a safety device which is calculated to reduce accidents to machinists and machine operators due to thoughtlessness in leaving detachable tools secured to the lathe after the usual operative adjustments have been completed, making it necessary to remove the wrench from the lathe before the latter can be put in motion.

While the foregoing objects are paramount, other and lesser objects will become manifest as the description proceeds, taken in connection with the appended drawings wherein:

Figure 1 is a vertical cross-sectional illustration of the invention, taken on lines 1-1 of Figure 2, illustrating a conventional toggle-type of switch arranged within the housing, the switch actuating plate, and the key locking devices.

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Figure 2 is a vertical cross-sectional view, taken on lines 2-2 of Figure 1, showing the front cover removed, the rotatable switch-actuating member, and the key locking devices, their locked position being indicated in dotted lines.

Figure 3 is a vertical cross-sectional view, similar to that shown in Figure 1, illustrating the key in position and the locking devices retaining the same, and

Figure 4 is a rear internal view of the housing showing the back cover removed and illustrating the operative positions of the switch, partially in dotted lines.

Accordingly, therefore, the invention comprises a housing 10, preferably circular in form, and having one integral wall 11 providing the face or the front cover of the housing 10. It is preferable to form the housing with an integral annular flange 12 concentrically of the housing 10, as illustrated in Figures 1 and 2, which projects toward the rear of the housing providing a circular chamber 13 in which are arranged the operative parts of the switch-operating mechanism.

A disk 14, having a diameter adapting the same to a relatively close fit within the chamber 13, is secured in position therein by a ring 15 attached by screws 16 to the annular flange 12. The disk 14 is formed with an annular recess 17 about its rearmost side providing a seat for the ring 15, the rear surface of the disk 14 being flush with the ring 15, as apparent in Figures 1 and 3.

A conical milled opening 18 is formed in the disk 14, as shown in Figures 1 and 2, whose teeth 19 are conformable to the teeth 20 on the chuck wrench or key 21 which is employed to rotate the disk 14 to open or close the switch 22 secured by a suitable bracket 23 to the ring 15. The switch 22 has a toggle-type of operating lever 24 which depends, as in Figures 1, 3 and 4, and is capable of being moved to open or close the position of the poles by rearwardly projecting pins 25 arranged on each side of the depending lever 24 and secured in the rear surface of the disk member 14.

Attached to the outer face of the disk 14 is a pair of oppositely arranged detents 26, one on each side of the opening 18, as in Figure 2, which are slidably secured by screws 27 to the face of the member 14 and normally retained in retracted position by springs 28 arranged within bores 29 in each of the members 26, as shown in Figures 1 and 2, and bearing against the outer end of the bores 29 at one end, and against blocks 30 arranged about the screws 27 at the opposite end.

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In operation, therefore, the circuit is closed to operate the lathe, or other machine to which the safety switch is attached, by inserting the wrench or key 21 through an opening 31 in the front 11 of the housing 10, as illustrated in Figure 3, so that the toothed bur 32 on the key 21 engages the conical milled opening 13, the teeth 19 and 29 meshing, whereupon the disk member 14 can be rotated clockwise within the chamber 13, whose inner wall defines a pair of opposing cams against which the outer ends 34 of the members 26 normally bear, as in Figure 2, urging the members 26 inwardly, as illustrated in dotted lines in Figure 2, to positions behind the bur 32 of the wrench 21, locking the latter in position so that it cannot be removed until it is rotated counter-clockwise to the position illustrated in Figure 2 which automatically opens the switch 22 through the medium of the pins 25, as illustrated in Figure 4. The machine operator may then remove the wrench or key 21 and perform whatever adjustments he may require on the machine, but before the machine can be again placed in motion, the key 21 must be returned to the position shown in Figure 3, the key having been rotated clockwise to the position shown in dotted lines in Figure 2.

The switch 22 is preferably arranged in the upper portion of the housing 10 so that the service lines 35 can be connected thereto upon entering the housing 10 through a suitable opening 36 in its top, as in Figures 1 and 3.

Manifestly, the structure herein shown and described is capable of considerable modification from time to time, by persons skilled in the art, without departing from the spirit and intent of the invention or the scope of the appended claims.

What is claimed is:

1. In a safety switch for lathes, and the like,

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in combination with a toggle switch in an electrical circuit and a housing for said switch, a rotatable disk arranged in said housing and having a pair of pins projecting from the face thereof operatively engageable with the lever of said toggle switch, means comprising a milled opening formed in said rotatable disk adapted to receive a milled key for rotating same to actuate said toggle switch, tensioned latch members arranged on said rotatable member locking said key in position when said circuit is closed, and cam means forming part of said housing actuating said latch members.

2. In a safety switch for machines, and the like, in combination with a toggle switch in an electrical circuit and a housing for said toggle switch, a rotatable disk in said housing having a pair of pins projecting from the rear face thereof co-operating with said toggle switch and capable of engaging the lever of said switch when rotated, means comprising a milled opening in said disk for receiving a key for rotating the same, tensioned locking members securing said key in said key receiving means when said circuit is closed, and cam means forming part of said housing actuating said locking members when said key is rotated.

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