Feb. 10, 1942. O. S. FIELD 2,272,552

LOCK SCREW

Filed Jan. 31, 1939

FIG. 1.

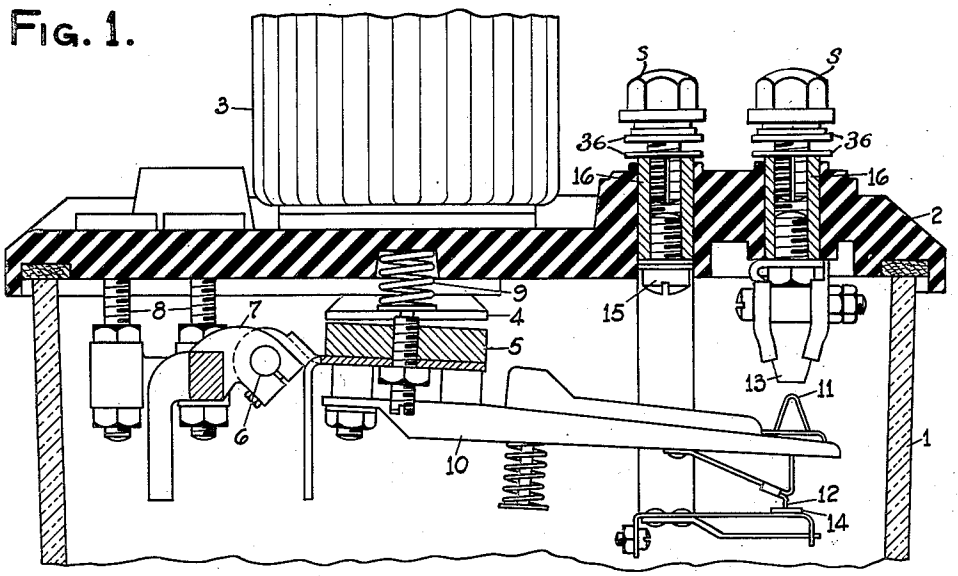
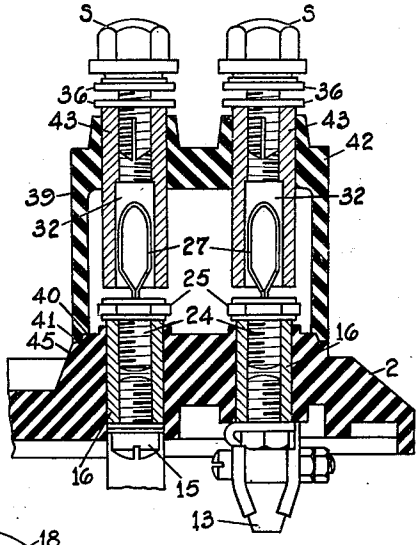


FIG 2



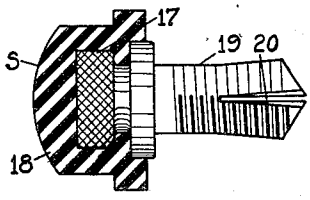


FIG. 3

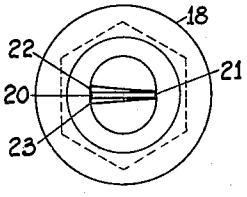


FIG. 4

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UNITED STATES PATENT OFFICE

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LOCK SCREW

Oscar S. Field, Rochester, N. Y., assignor to General Railway Signal Company, Rochester, N. Y.

Application January 31, 1939, Serial No. 253,857

1 Claim. (Cl. 151—32)

This invention relates, in general, to relays, particularly of the type employed in railway operation, and is more particularly directed to improvements therein.

A main object of the present invention is to provide a self-locking bolt or screw which is cheap to manufacture, and very effective in performing its locking function.

Further objects, purposes and characteristic features of the present invention will appear as the description progresses, reference being made to the accompanying drawing, showing, solely by way of example, and in no manner whatsoever in a limiting sense, one embodiment of the invention. In the drawing—

Fig. 1 is a side section, with parts shown in elevation, of a relay employing the invention.

Fig. 2 is a fragmentary sectional view of a second application of the invention.

Fig. 3 is a side view with parts in section, of the self-locking screw.

Fig. 4 is an end view of the self-locking screw.

Referring now to the drawing, and first to Fig. 1, there is here shown a portion of a relay which is of the general type disclosed in the U. S. Patent to O. S. Field, No. 2,199,335, of April 30, 1940, filed October 14, 1938, for Time element relays. Accordingly, the relay structure, other than the part relating particularly to the present invention, need be described in no great detail.

The relay shown comprises an enclosed housing 1, made preferably of transparent material, such as glass, or other plastic material, and is closed by a top 2, of insulating material. Carried by the top is a coil 3, on a core which projects through the top and terminates in a pole shoe 4, cooperating with an armature 5, pivoted at 6 to a fixed member 7, carried by screws 8, supported by the top. The armature 5 has adjustable spring biasing means 9, and carries an articulated contact finger 10, having a movable front point 11, and a movable back point 12, to cooperate respectively with fixed front and back points 13 and 14.

The relay operates in the usual manner when its coil 3, (and of course the usual other coil, not shown), is energized, to pick up its armature 5 and close the front points, and to release the armature 5, on deenergization, to close the back points, which last is the condition as shown in Filg. 1.

The fixed front and back points are supported from the relay top 2, by means of screws 15, received in threaded sleeves 16, carried by the top, as by molding them therein, or in any other suitable manner. While not shown in the drawing, other parts of the relay to be connected to the external circuits are treated in the same manner as these front and back fixed points.

Referring now to Figs. 3 and 4, there is here shown the self-locking screw employed in this invention. This screw comprises a head 17, of steel or the like, which is encased in a block 18 of insulating material, of a form to receive a wrench or other suitable tool, and carries a threaded stem 19. This stem is slotted longitudinally of its length by means of a saw or the like, to form a slot 20, which is left undisturbed at the one end 21, but at the other end 22, it is spread apart, to cause the slot to assume a V-shape, when viewed from the end of the screw.

When the screw as thus formed is turned into a circular threaded opening, the sprung-apart halves frictionally bind against the threaded receiving socket to produce a locking action. Perhaps more important is that the two corners and edges of the V slot at the opened end of the V, tend to bite, or dig, into the receiving thread, one producing more effect when the screw is turned into the socket, and the other producing more when the screw is turned out of the socket, as is obvious, whereby to produce a screw which locks itself in any given position.

For example, if the screw be turned clockwise, as viewed in Fig. 4, the edge and corner 23 is what produces the biting-in or binding action, described just above.

Referring now to Fig. 2, there can here be seen the construction of the plug elements with which is employed the present invention.

Each plug element comprises a threaded stem 24, carrying a wrench receiving cup 25 having a rim 26. The plug itself includes a length of ribbon 27 of conducting material, relatively thin and wide, bent on itself to form a loop. The two free ends of the ribbon 27 are received in cup member 25, to be fastened therein as by spot welding, for example.

This plug element is receivable in a circularly drilled socket element 32, as can be seen in Fig. 2.

Referring again to Fig. 1, there is here shown a first application of the invention, wherein the threaded sleeves 16, carried by top 2, receive self-locking screws S, such as described above with reference to Figs. 3 and 4.

In this form, the washers 36, between which lead wires can be clamped, are carried by the stem of the locking screw S, and the screw locks itself in position in sleeve 16, and by being turned into

the sleeve, the head of the screw clamps the lead wires between the washers 36.

Thus, in this form of the invention, in which the self-locking screw is employed, various usual lock nuts are entirely unnecessary.

In a second form for connecting the wires to the relay, as shown in Fig. 2, the top 2, with its sleeves 16, are exactly the same as described above. In lieu, however, of self-locking screws for making the connections, a plug coupler is employed, and this includes a plug member 45, and a socket member 39, with interfitting matched edges or grooves 40 and 41, whereby the member 39 can be accurately fitted in place on the plug member 45.

The plug member is completed by screwing plug elements, as described above, into the threaded sleeves 16, the threaded stems 24 being adapted to be received therein.

The socket member includes a housing 42, of insulating material, such as Bakelite, or the like, carrying socket sleeves or elements 43, preferably molded in place. The socket elements 43 are internally threaded, at their outer ends, to receive self-locking screws S, as described above, on which are washers 36, between which lead wires can be clamped, in the same manner as described above in connection with Fig. 1.

The above rather specific description of one form of this invention, has been given solely by way of example, and is not intended, in any manner whatsoever, in a limiting sense. It is to be understood that the present disclosure contemplates covering all such modifications, variations and adaptations, as may appear desirable from time to time, so long as they are not specifically excluded by the appended claim.

Having described my invention, I now claim:

A screw or tap bolt for locking itself in a threaded socket by a gripping engagement comprising a threaded stem of resilient material, a head at one end of said stem for turning it, said stem being initially formed with a slot of uniform width extending diametrically through the stem and longitudinally from the outer end of the stem toward said head for a distance greater than the diameter of the stem, said slot dividing said stem near its outer end into bifurcated portions of semi-cylindrical form, said bifurcations then being spread apart by opposed torsional forces along one side of the stem only at its outer end and thus separated by dimensions progressively varying both longitudinally and transversely of said stem, said bifurcations thereby affording biting edges along one side of said stem adjacent its outer end to engage with the threads of the socket, the outer threaded end of said stem being beveled to facilitate initial engagement and meshing of the threads of the stem with the threads of the socket.

OSCAR S. FIELD.