Sept. 27, 1927. 1,643,538

W. E. H. BELL

CLOSURE SECURING DEVICE

Original Filed Nov. 20, 1924

Fig. 2

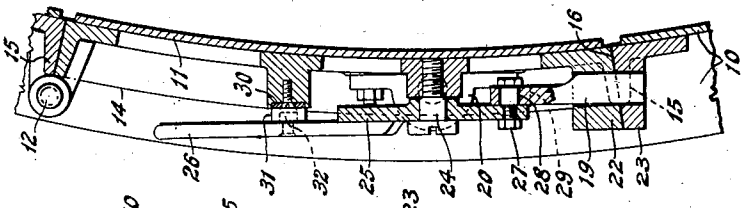


Fig. 1

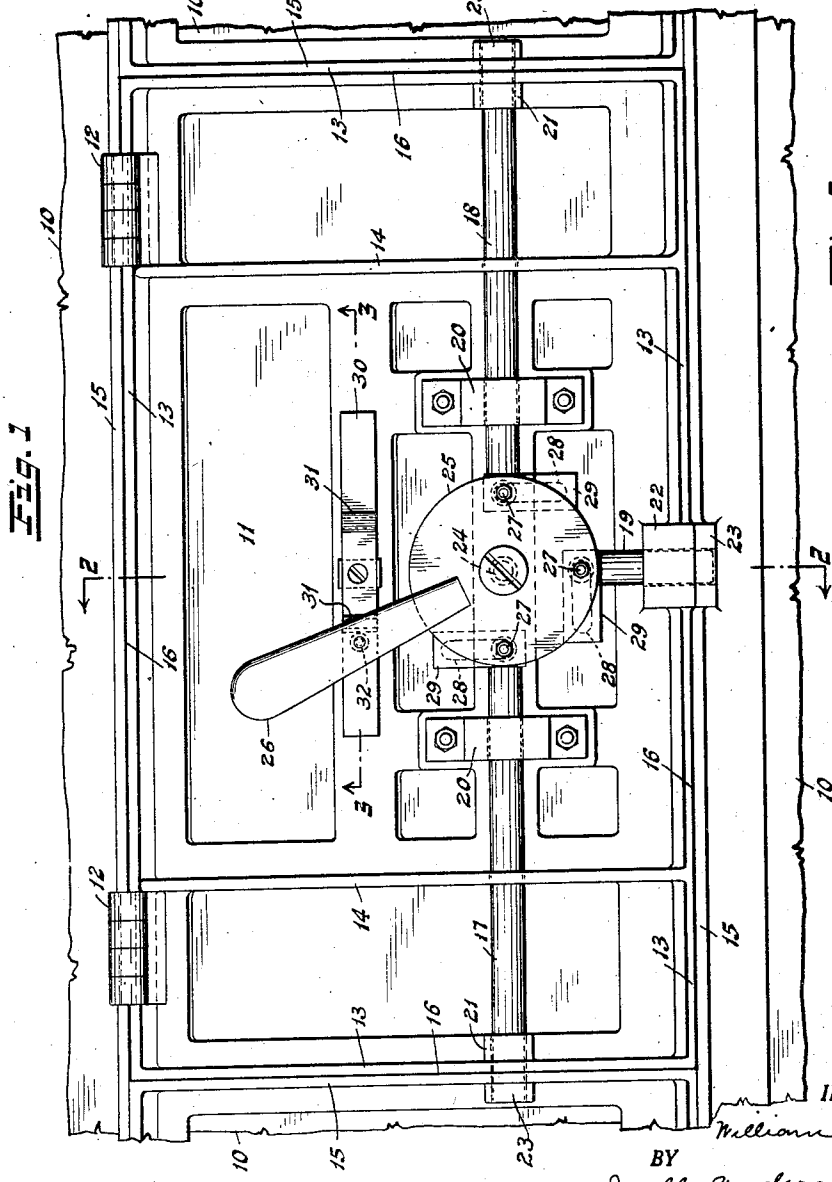
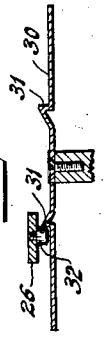


Fig. 3



INVENTOR.
William E. H. Bell
BY
Duell, Anderson & Duell
ATTORNEYS.

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UNITED STATES PATENT OFFICE.

WILLIAM E. H. BELL, OF GLENSIDE, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO H. W. BUTTERWORTH & SONS COMPANY.

CLOSURE-SECURING DEVICE.

Original application filed November 20, 1924, Serial No. 750,985. Divided and this application filed June 1, 1925. Serial No. 34,005.

This invention relates to improvements in locking or similar securing mechanisms, and more particularly in some of its details to improvements in plural bolt locking mechanisms particularly adapted for securing in closed position the closures of receivers for dyeing machines or the like.

It is a general object of the invention to provide an improved or perfected locking mechanism of the class mentioned which is simple in nature and susceptible of easy operation for locking closures or the like firmly in closed position.

A more particular object is to provide an improved locking mechanism of the class mentioned with a simple durable and satisfactory securing arrangement, operating automatically for locking or securing the lock in locked position.

Another object is to provide an improved plural bolt locking mechanism for closures, being adapted to support closures in closed position at a plurality of points, preventing springing of the closure away from the jamb and being simultaneously operable by an improved mechanism automatically held in locking position.

Other objects will be in part obvious in connection with the following detailed description and in part pointed out therein.

The invention accordingly comprises the features of construction, combinations of elements, and arrangement of parts, which will be exemplified in the construction hereinafter set forth and the scope of the application of which will be indicated in the claims.

For a more complete disclosure of the nature and objects of the invention, reference is made to the following detailed description and to the accompanying drawings disclosing a preferred embodiment of the invention, and in which

Figure 1 is a plan view of a locking mechanism embodying the invention as applied to a tank or receiver drum for dyeing machines or the like;

Fig. 2 is a section taken approximately on the line 2—2 of Fig. 1; and

Fig. 3 is a detailed section on the line 3—3 of Fig. 1.

The subject-matter of this application is disclosed in applicant's prior application for locking mechanism, Serial No. 750,985, filed November 20, 1924. This application is therefore a division of said prior application.

Referring to the drawing for a detailed description of the illustrative embodiment of the invention there shown, a fragment of a metallic cylindrical tank or receiver is shown at 10 being fitted with a closure or door 11 hinged at 12 to close an opening leading through the walls of the tank. The door is preferably metallic and formed with marginal ribs 13 extending along the longitudinal edges of the door. Transverse stiffening ribs 14 may also be provided intermediate the marginal ribs 13. The tank walls are preferably reinforced at the margins of the opening with metallic angle bars or similar metallic members forming door jambs 15 having inclined faces cooperating with complementary inclined faces on the door edges so the doors may be forced into position to form a tight wedging joint with the jamb.

The lock in the embodiment shown is of the plural bolt type having operating mechanism which may be housed and protected in a suitable manner being preferably positioned in a cavity 16 formed between members of the supporting frame. The bolts 17, 18 and 19 are supported for sliding longitudinal movement, extending from the operating mechanism to different edges of the closure. Bolts 17 and 18 are supported in lugs 20 disposed toward their inner ends and in the frame members 13 and 14 at their outer or locking ends in openings formed in integral bosses 21 formed in the door frame members. The third bolt 19 due to its shorter length is supported principally at its outer end in an integral boss 22 formed in the door frame 13. Bosses 23 are also formed in the jamb members 15, having openings for registry with the bolts when the closure is in closed position so the closure is wedged

and locked firmly in closed position when the bolts are projected.

The supporting frame for the lock carries a centrally disposed stud 24 upon which is rotatably mounted a bolt operating or shifter plate 25 having an operating handle 26 extending to an accessible position for convenient manual operation of the plate. A lug 27 is provided for each locking bolt being preferably in the form of pins or bolts mounted in circumferentially spaced positions on the shifter plate and having bearing surfaces or rollers projecting respectively into elongated slots 28 formed in transverse heads or lugs 29 disposed transversely of the longitudinal axes of the bolts, and preferably integral therewith. The slot of each lug 29 extends longitudinally thereof and is preferably disposed substantially at right angles to the longitudinal axes of the bolts.

For holding the shifter plate 25 either in bolt projecting position or bolt retracting position, a locking plate 30 of spring metal is secured to the closure having lugs 31 projecting from the upper face thereof for cooperation with a lug 32 in the underside of the handle 26. The lugs 31 are formed at their outer faces with abrupt abutments for cooperation with the lug 32 but are inclined on their inner face so the lug 32 may slide thereover forcing the spring plate downwardly as the handle 26 is moved in one direction or another. When it is desired to unlock the shifter plate from the position shown in Fig. 1, the spring plate is pressed downwardly moving the lug 31 from engagement with lug 32 whereupon the handle may be swung to the right, as viewed in Fig. 1, to retract the locking bolts.

The operation of the improved mechanism which is set forth to some extent in the foregoing description may be summarized as folfows. Assuming the bolts to be projected in locking position as in Fig. 1, the locking bolts are locked in this position by engagement of the lug 32 with the lug 31 of the spring locking plate as mentioned above. When in this position it will be noted that the lines of movement of the locking bolts extending through the contact point of the pin 27 with the slot 28 coincide with and are in parallelism with the radii of the shifter plate passing through said pins. Also the slots 28, at the points of contact with the pins, are disposed substantially at right angles with the lines of movement of the bolts. By means of this relation, there is no tendency to rotate the shifter plate 25 from locking position by inward endwise thrust upon the locking bolts. Or in other words, the operating mechanism is irreversible when in locking position by endwise thrust upon the bolts themselves thereby avoiding the tendency to rotate the shifter plate and relieving the locking lugs 31, 32 from stresses and wear.

When it is desired to retract the bolts to unlocked position, the spring locking plate 30 is depressed so as to permit rotation of the shifter plate to move all the bolts inwardly simultaneously. As the handle is swung to the right in Fig. 1, the locking lug 32 engages the inclined surface of the opposite lug 31 thereby depressing the spring and automatically locking the shifter plate, and through said shifter plate, locking the bolts in unlocked or retracted position. Similar automatic locking engagement takes place when the handle 26 is swung from right to left to lock the shifter plate in the position shown in Fig. 1.

Since certain changes may be made in the above construction and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statments of the scope of the invention, which, as a matter of language, might be said to fall therebetween.

Having described my invention what I claim as new and desire to secure by Letters Patent, is:

1. In a securing mechanism for swinging closures, in combination, a plurality of securing bolts extending to different edges of the swinging closure, and mounted for projection for cooperation with closure jambs for securing said closure in closed position, a rotary shifter plate for said bolts mounted upon the closure intermediate the edges thereof, a pin and slot connection between each of said bolts and said shifter plate, the longitudinal axes of the slots of said pin and slot connections, at the points of contact with the pins of said connections, being substantially at right angles to the radii of said plate intersecting the respective pins when the bolts are in securing positions, an operating handle for said shifter plate and a pair of spring-pressed lugs cooperating with said handle and automatically aperative to hold said shifter plate and securing bolts in closure securing position or in releasing position.

2. In a securing mechanism for swinging closures, in combination, a plurality of securing bolts mounted upon the closure for longitudinal sliding movement thereon and extending to different edges of the closure for projection into cooperative position with closure jambs for securing the closure in

closed position, transversely disposed lugs on said bolts having rectilinear elongated slots disposed substantially at right angles to the direction of bolt movement, a rotary shifter plate for said bolts, operating lugs mounted on said shifter plate and engaging respectively in said slots, the longitudinal axes of said bolts aligning respectively with the radii of said plate passing through said lugs when the bolts are projected into securing position, and automatic means for securing the shifter plate in position to hold said bolts in securing or releasing position.

In testimony whereof I affix my signature.

WILLIAM E. H. BELL.