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R. K. NOTTINGHAM

2,544,611

LATCH

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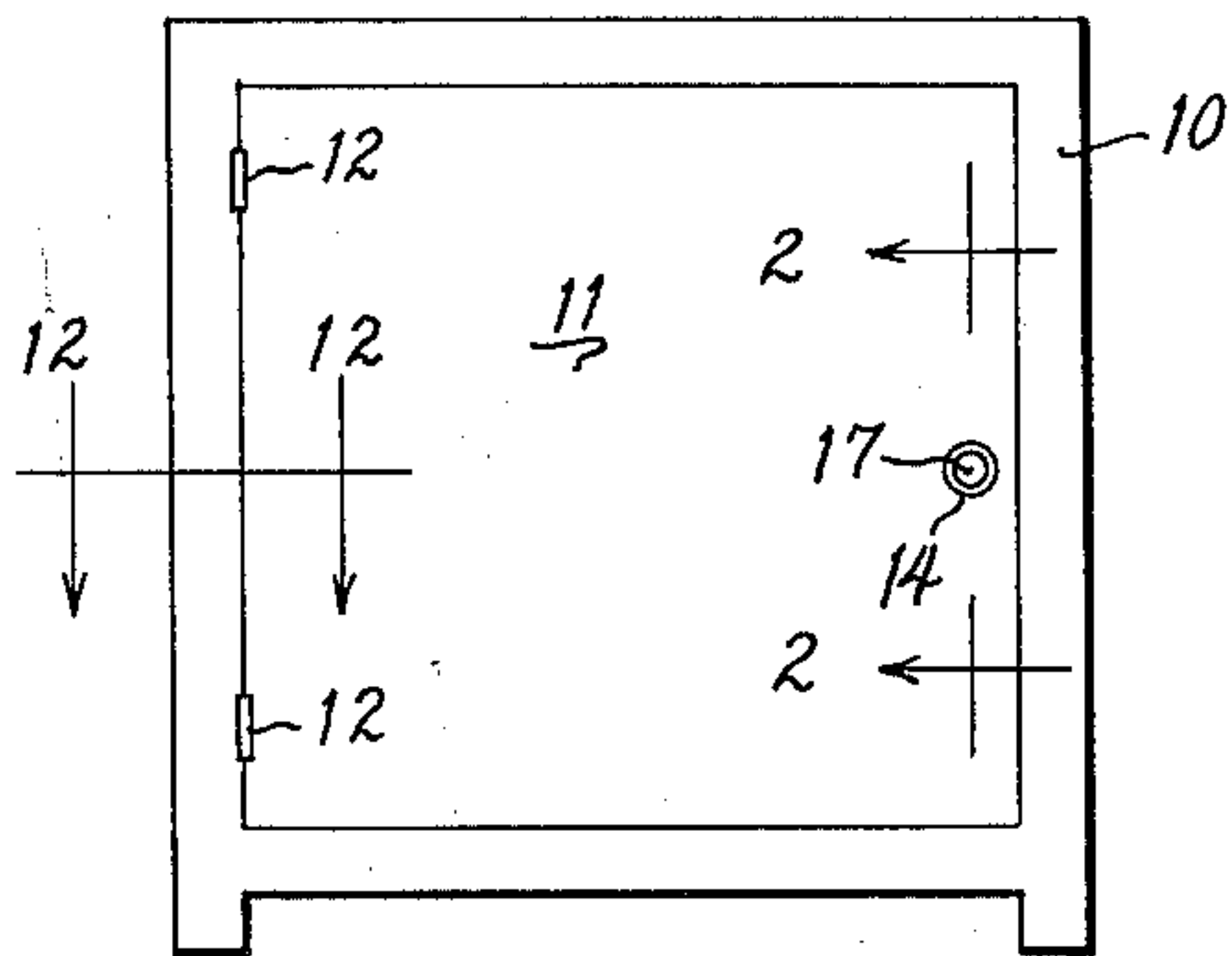


Fig. 1

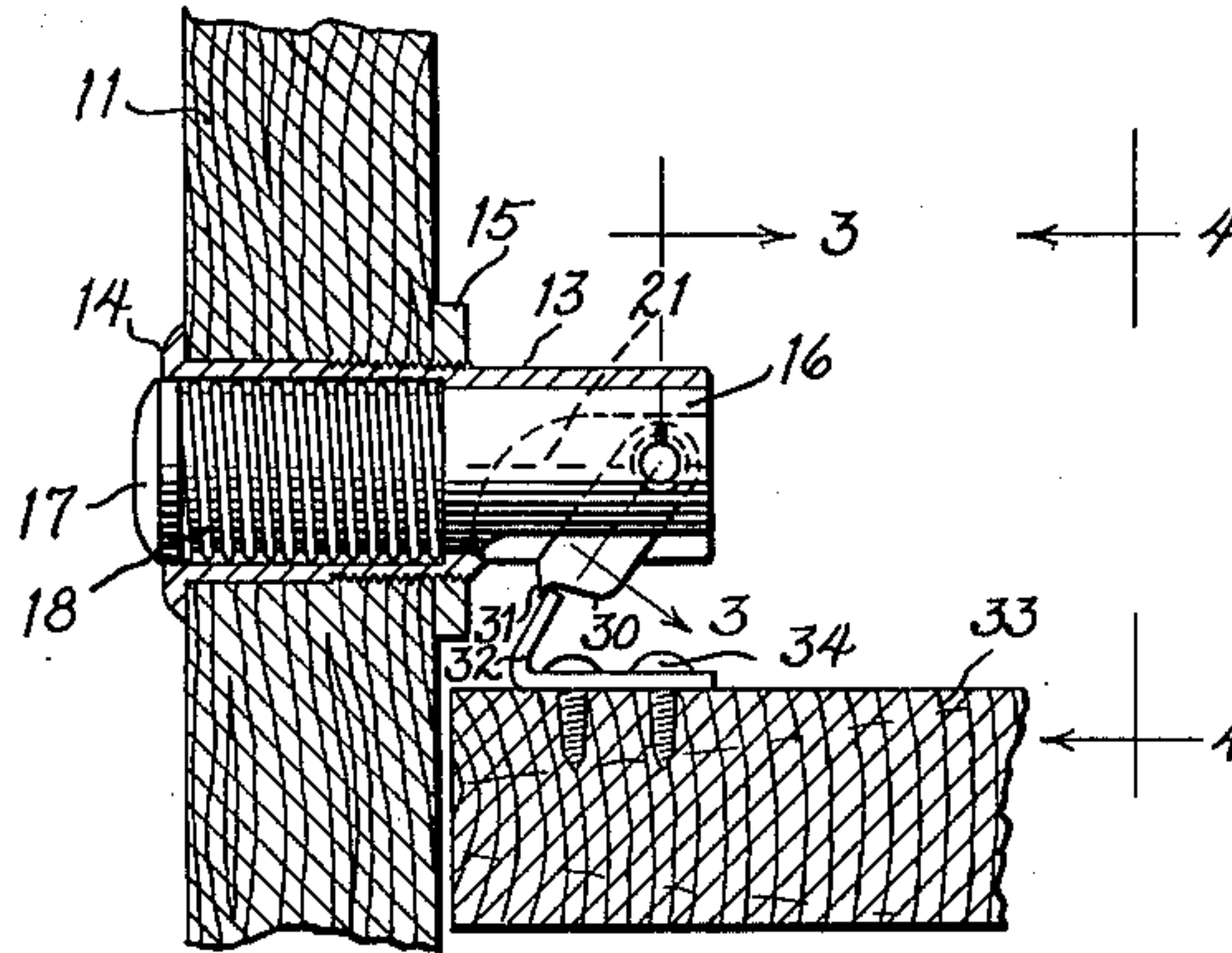


Fig. 2

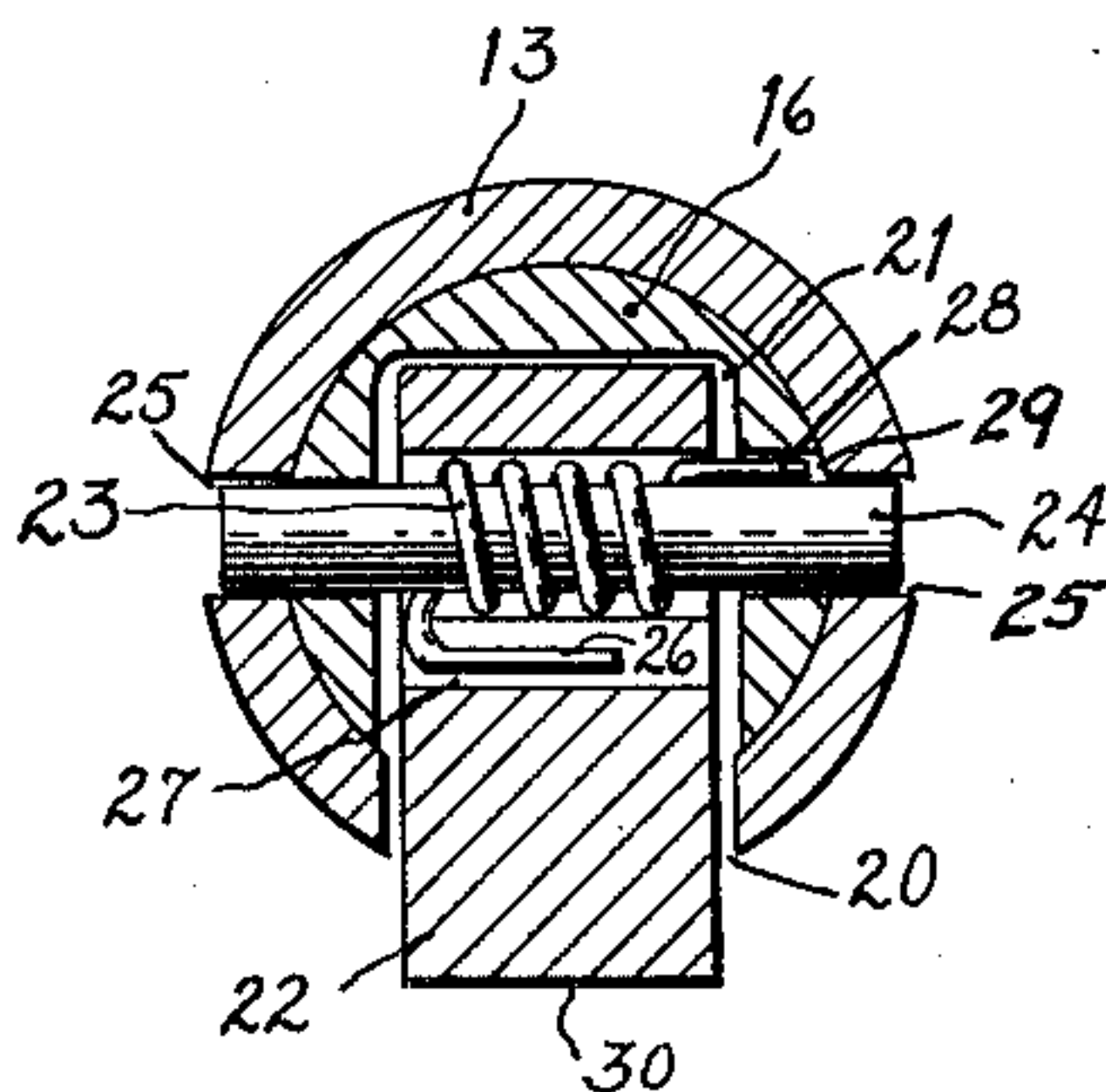


Fig. 3

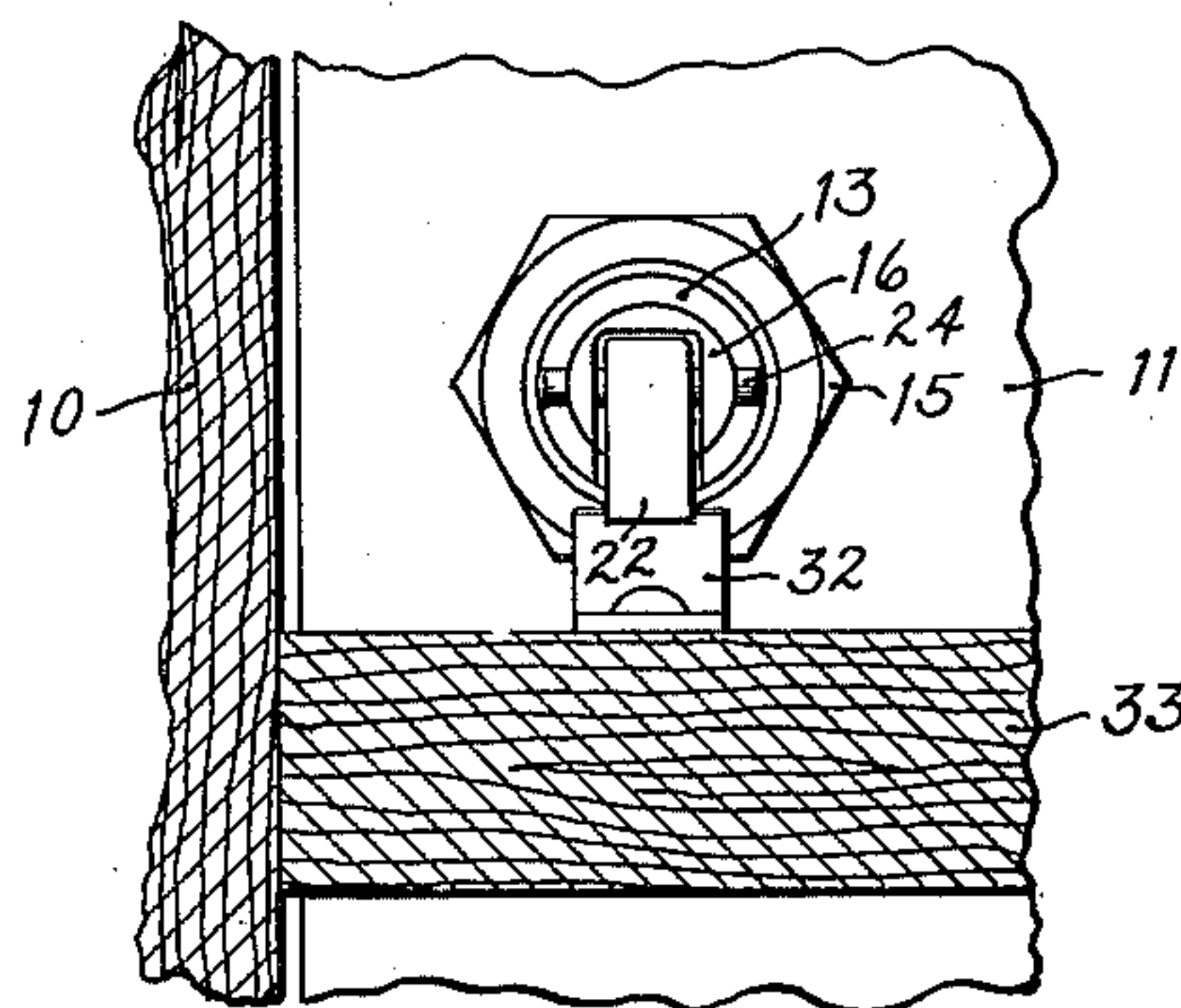


Fig. 4

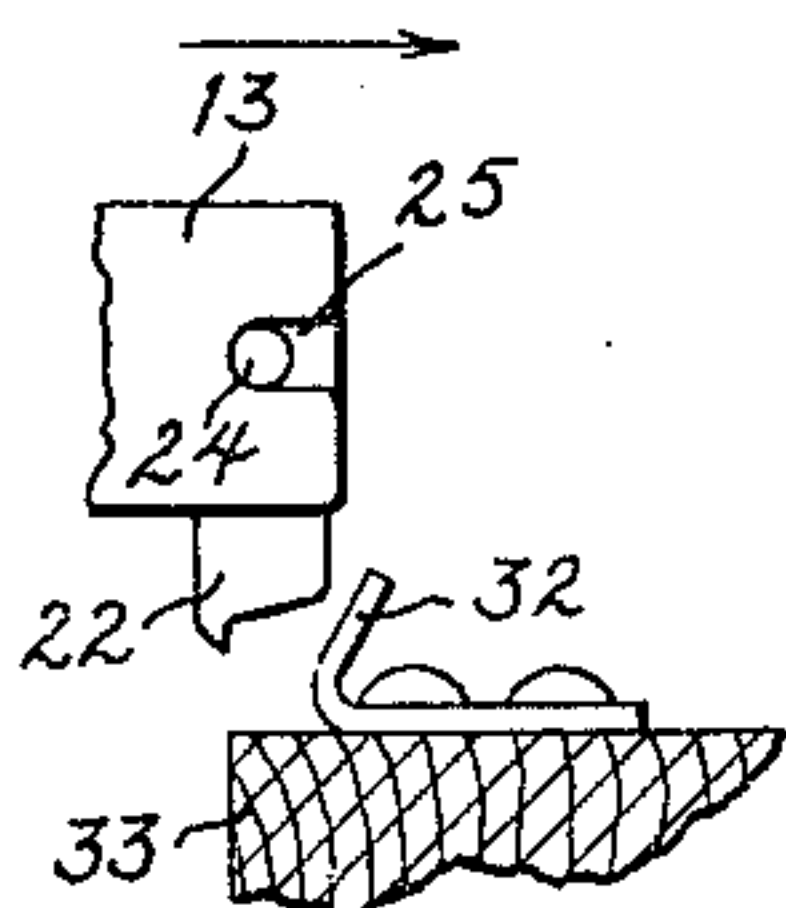


Fig. 5

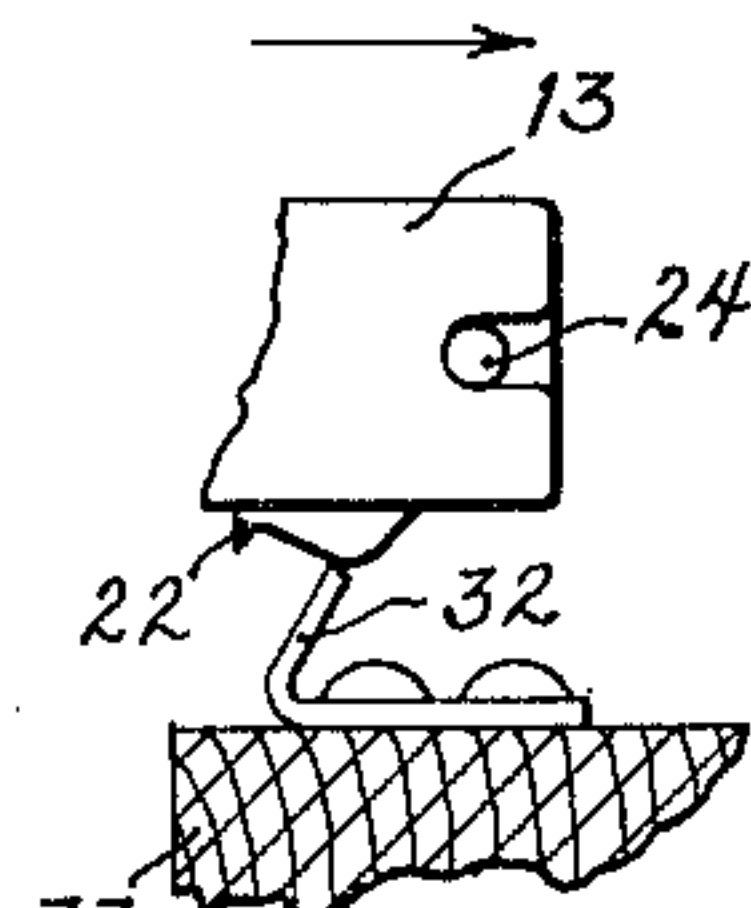


Fig. 6

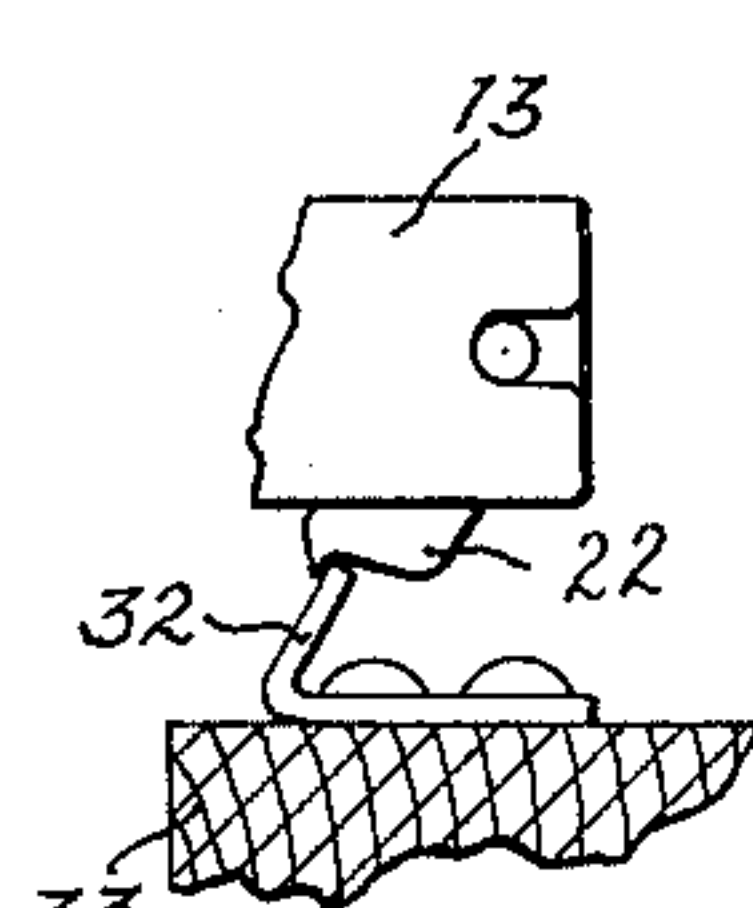


Fig. 7

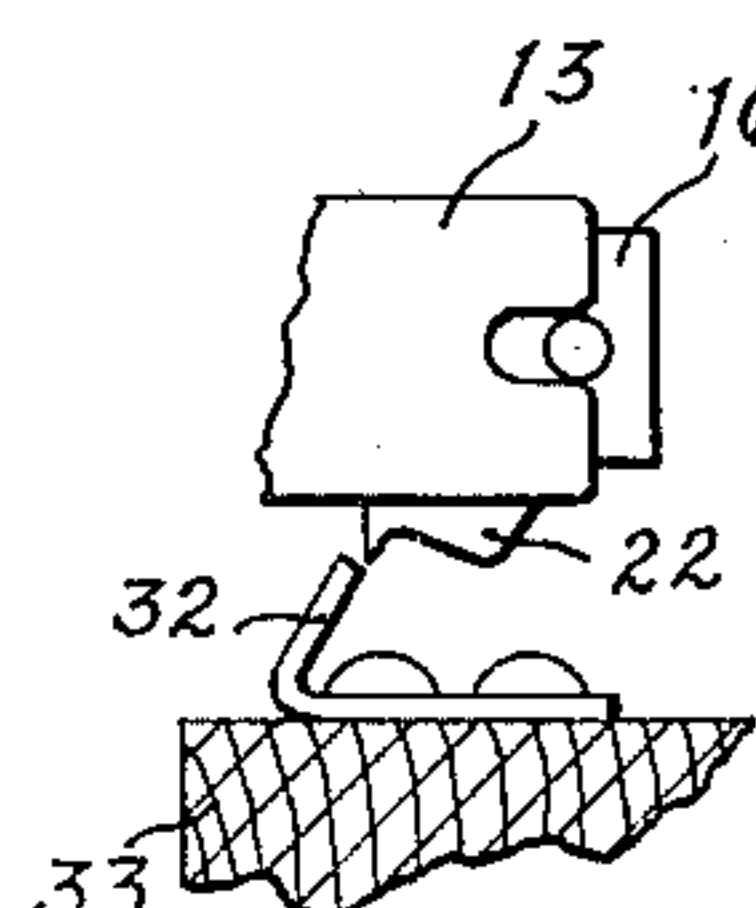


Fig. 8

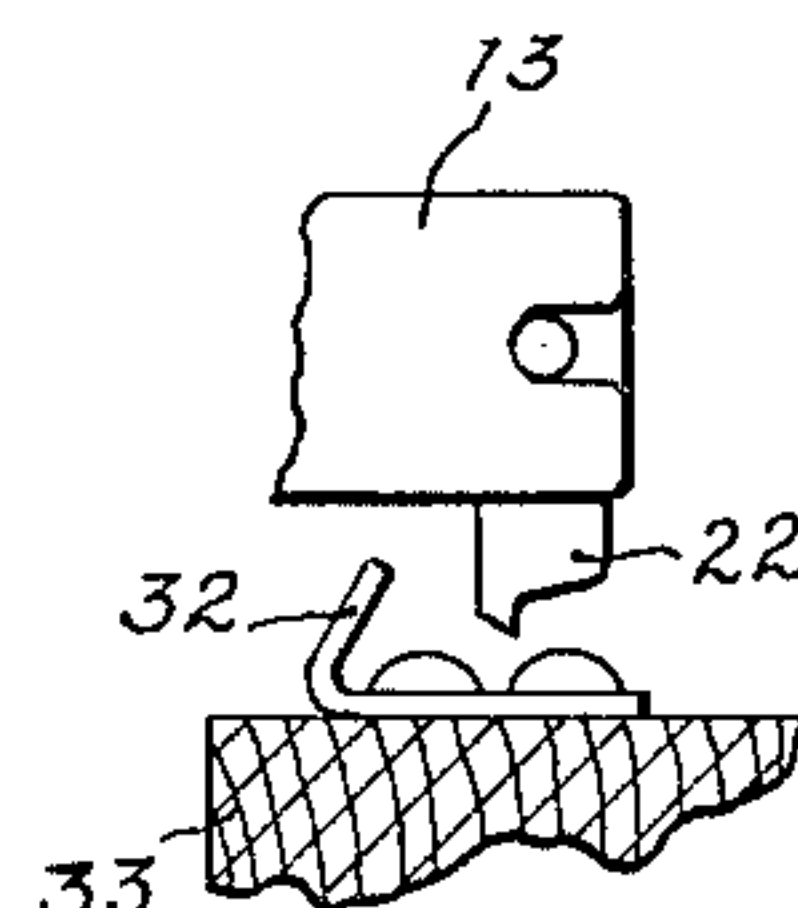


Fig. 9

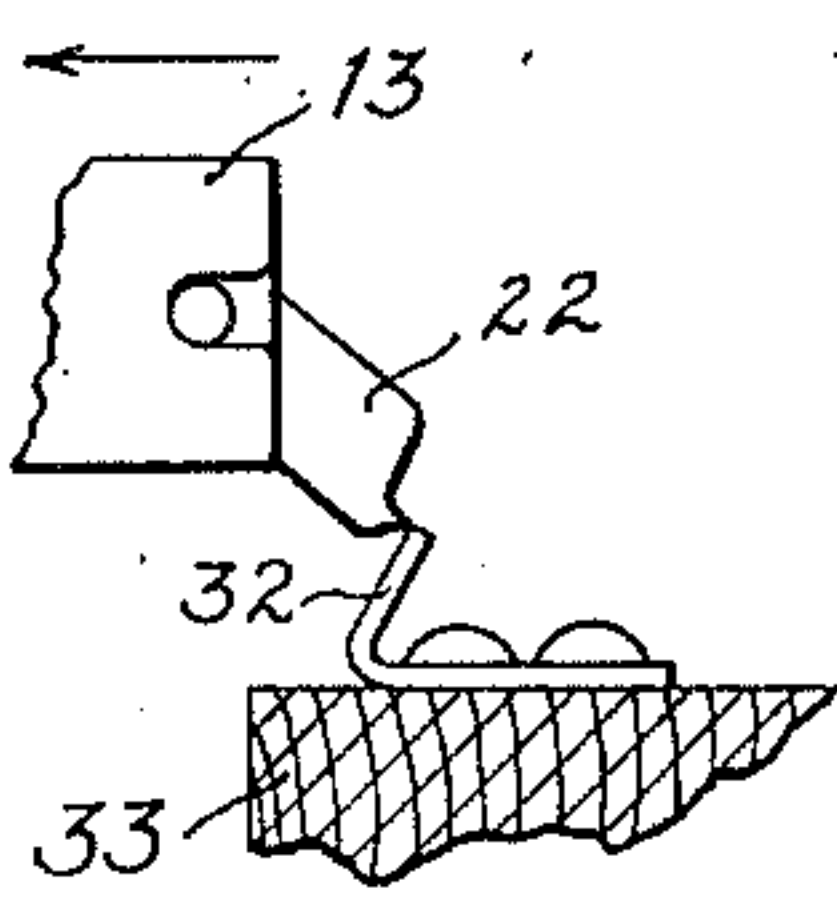


Fig. 10

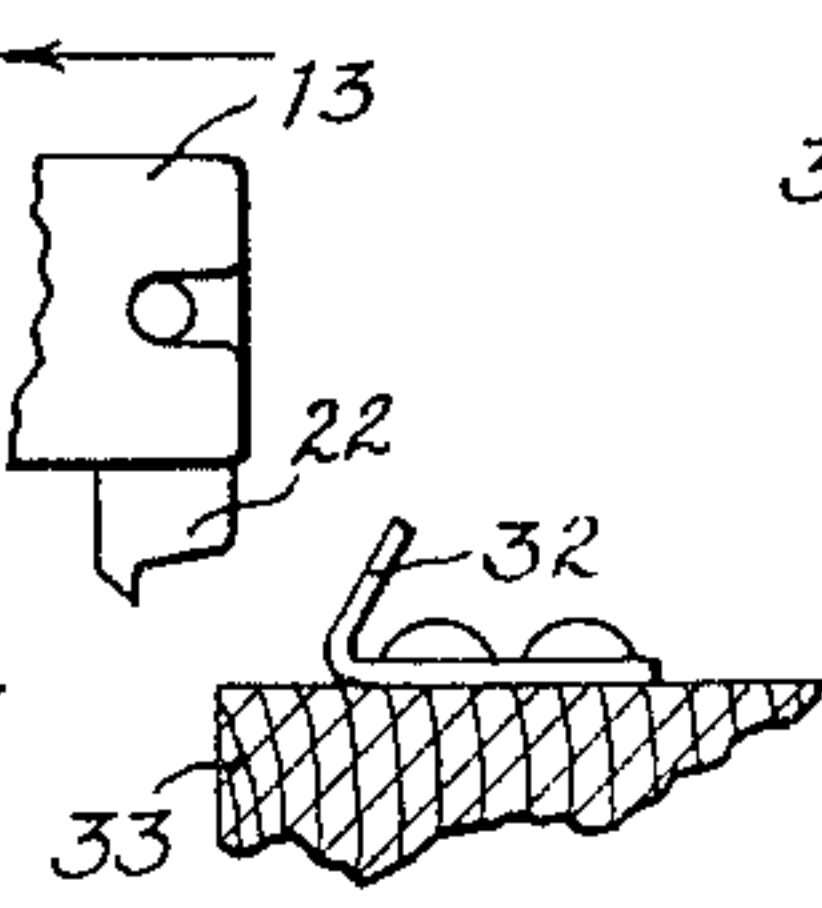


Fig. 11

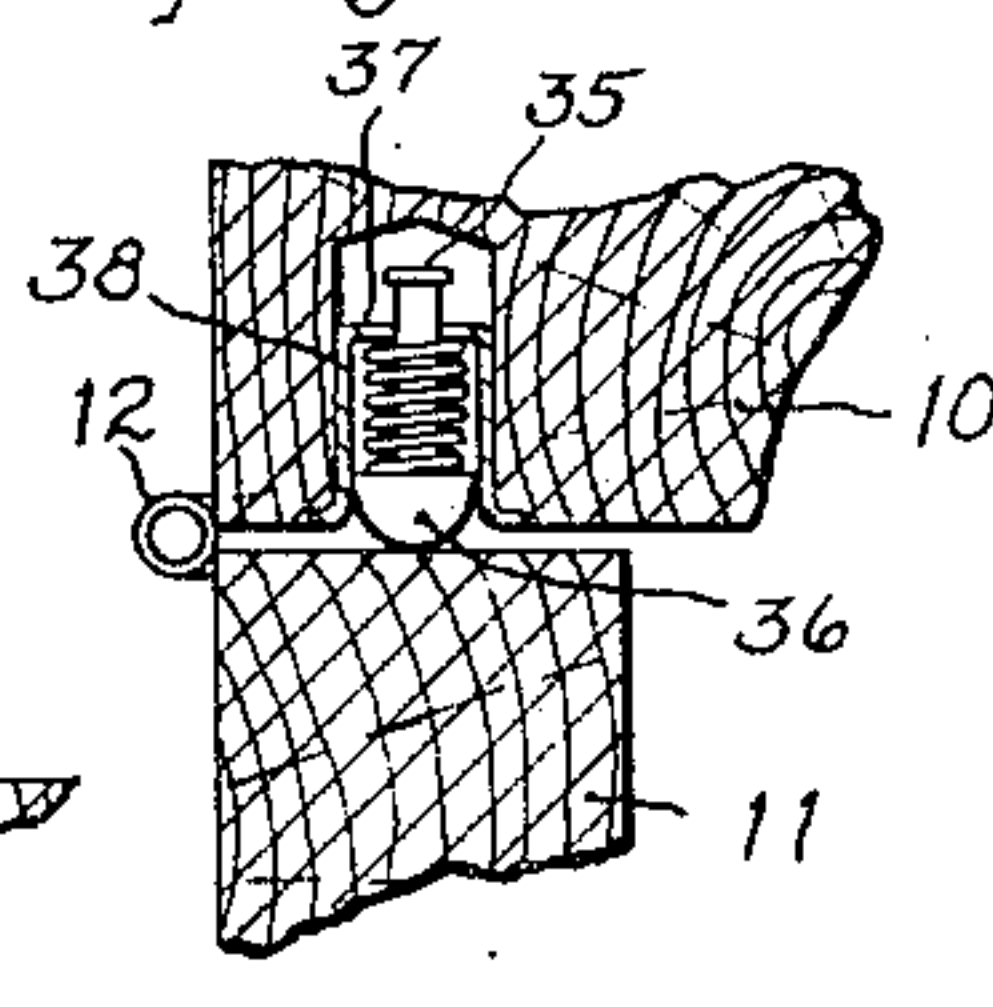


Fig. 12

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## UNITED STATES PATENT OFFICE

2,544,611

## LATCH

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9 Claims. (Cl. 292—227)

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My present invention relates to a latch such as would be employed in the latching of a door to a cabinet. The invention is not to be limited to cabinet constructions since it may be used with any two members to be latched together, such as a cabinet and its door, a box and its lid, an automobile glove compartment and its door, a trunk and its lid, or any other of two similar pieces of equipment.

The primary object of the present invention is to provide a latch which will be positive in action and cannot be accidentally separated, yet which will open at a slight touch of a finger, or at least by slight pressure upon a member included in the latch itself.

The present invention may be termed a touch latch in that it is designed to have an operating plunger exposed for digital engagement which will operate upon slight pressure applied by a finger.

An object of the present invention is to combine, in a structure having a closing member, a touch latch formed in accordance with the present invention and a spring loaded device causing the door or other similar member to spring open as soon as the latch is released by slight pressure of a finger. Therefore, the present invention may be used when the hands are full inasmuch as any portion of the back of the hand, such as a knuckle, may be utilized to press upon the releasing member whereupon the door will spring open.

A further object of the present invention is to devise a latching device comprising a minimum of easily manufactured and easily assembled parts.

The objects and advantages of the present invention will be more readily understood from a study of the following specification taken in connection with the accompanying drawings wherein like numerals refer to like parts throughout.

In the drawings Fig. 1 is a view in elevation of a cabinet or the like having the present invention applied thereto;

Fig. 2 is a vertical section on an enlarged scale, taken along line 2—2 of Fig. 1;

Fig. 3 is a vertical section on a further enlarged scale, taken along line 3—3 of Fig. 2;

Fig. 4 is a vertical section taken along line 4—4 of Fig. 2;

Figs. 5 to 11 inclusive are partial side views of the latch comprising the present invention in various stages of being latched and being released from latching position; and

Fig. 12 is a vertical section taken substantially along line 12—12 of Fig. 1.

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In Fig. 1 there is disclosed a cabinet 10 having a door 11 mounted thereon by means of hinges 12. The door is adapted to be latched in closed position by a latch including a sleeve 13 having a flange 14 at its outer end adapted to lie against the surface of the door 11 and to be retained in that position by a nut 15 engaging threads on the sleeve after being slipped over the inwardly projecting end of the sleeve. The latch includes a plunger 16 having its outer end 17 exposed through the open end of the sleeve adjacent the flange 14.

The plunger 16 is slidably mounted within the sleeve 13 and comprises a reduced portion adjacent the outer end about which is coiled a compression spring 18. The sleeve 13 is of larger internal diameter from the flange 14 to a point adjacent the nut 15 than its diameter from nut 15 to its inner end. Therefore the spring 18 may bear against the inner end of the larger portion and will thrust the plunger 16 outwardly to a normal position with its end 17 exposed adjacent the flange 14. The spring is preferably of relatively light construction so that a light touch or pressure against the exposed end will compress the spring and cause relative movement of the plunger inwardly within the sleeve 13 until the convolutions of the spring are brought together to limit further inward movement.

The inner end of the sleeve 13 is provided with a slot 20, preferably held in its lower portion when the latch is assembled to the door. However, a feature of the present invention is that the sleeve may be mounted so that the slot 20 is exposed laterally or at the top of the sleeve rather than at the bottom of the sleeve, as long as the cooperating catch is so mounted as to engage the latch, as will presently appear.

The inner end of the plunger 13 is provided with a recess 21 which is adapted to be placed in line with the slot 20 through the wall of the sleeve 13. A dog 22 is pivotally mounted within the recess 21 and normally projects through the slot 20 beyond the outer surface of the sleeve 13. The dog is pivotally mounted upon a spring 23 coiled about a pin 24 which extends transversely of the slot 21. The pin 24 is preferably of substantially the same length as the diameter of the sleeve 13 and its projecting ends are receivable in slots 25 extending longitudinally inward a short distance from the end of the sleeve. One end 26 of the spring 23 is bent back parallel to the pin 24 to be receivable in a notch 27 extending longitudinally of the dog 22 from its pivot opening. The other end 28 of the spring 23 extends longitudinally away from the coil in the



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same direction as the end 26 but spaced therefrom substantially 180 degrees when the spring is in static condition. The end 28 normally projects beyond the face of the dog 22 and is engageable in the upper end of a slot 29 extending normal to the longitudinal axis of the plunger 16 through the center of the bore therethrough through which pin 24 passes.

Assembly of the device is achieved as follows: The spring 18 is slipped over the plunger 16 until it is entirely received within the reduced portion of the plunger. The plunger is then inserted into the sleeve from the end having the flange 14, being slidable freely until the spring 18 engages the end of the reduced portion of the inner surface of the sleeve whereupon slight pressure will cause compression of the spring until the end of the plunger projects inwardly beyond the inner end of the sleeve. The recess 21 is located in line with the recess 20 whereupon the dog 22 having the spring 23 mounted therein may be slipped into the recess 21 by compressing spring 23 and sliding the projecting end 28 through the recess 21 until it snaps into the slot 29. The pin 24 may now be inserted through the openings in plunger 16 and the interior of the coil spring 23. Upon releasing the compression of spring 18 the ends of the pin 24 will be receivable in the slots 25 and will limit outward movement of the plunger to the normal position illustrated in Fig. 2 with the ends of the pin bearing against the inner ends of the slots 25.

Due to the spring 23 having one end engaged with the plunger 16 and its other end at 180 degrees therefrom when not under tension and engaged with the dog 22, the dog 22 will normally occupy a position extending laterally from the sleeve 13 at substantially 180 degrees to the longitudinal axis of the plunger. The slot 20 and recess 21 open from the ends of their respective devices so that the dog 22 may swing inwardly to lie within the projection of the sleeve 13 in a direction away from the end 17, and are of such extent toward the end 17 that the dog may swing inwardly to lie within the plunger in the direction toward the end 17.

The outer end of the dog 22 is provided with an irregular contour defined by a forward rounded shoulder 30 and a rear pointed projection 31 defining a recess therebetween toward the central portion of the dog. A catch comprising an upstanding inwardly slanting end 32 is mounted on the cabinet, in the illustration being mounted upon a shelf 33 forming a portion of the cabinet, by means of a pair of screws 34 passing through a portion of the catch. The portion 32 projects upwardly to terminate in a plane substantially coinciding with a projection of the lowermost element of the sleeve 13 so as to present horizontal flange adjacent the slot 20 engageable by the projecting end of the dog 22. In Fig. 5 the dog is illustrated approaching the catch when the door is being brought to its closed position. In Fig. 6 is seen that the catch will engage the dog to swing it inwardly in one direction just prior to the complete closing of the door. When the door is completely closed the spring 23, which has been placed under tension by the swinging of the dog, will cause the dog to snap forward until limited by the projection 31 in which position the catch is engaged in the recess in the end of the dog. Due to the dog being canted rearwardly upon its pivot the members cannot be separated. Even though it

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were possible to separate the members slightly such as by pulling a handle provided on the door, the only result would be to slide the pin outwardly in slots 25 until the limit of compression of spring 17 is reached whereupon further movement of the door would be prevented without breaking or bending some part by the application of destructive force. The latched position is seen in Fig. 7, while in Fig. 8 the unlatching operation is illustrated at its commencement. This is accomplished by causing relative movement between the plunger 16 and sleeve 13 until pin 24 reaches the end of the slots 25, at which point the projection 31 may ride over the catch 32, being caused to do that by the tension of spring 23. This causes the dog to assume its normal position projecting laterally from the sleeve. Upon release of the plunger 16 the plunger will retract until the pin 24 strikes the ends of slots 25 as seen in Fig. 9. The dog may now swing inwardly in the opposite direction as seen in Fig. 10 when the door and cabinet are separated.

It is preferred, in order that the door may open automatically upon release of the dog, that a device such as disclosed in Fig. 12 be incorporated in the cabinet or the like. This device comprises a plunger 35 having an enlarged head 36 riding within a thimble 37 which is mounted in the cabinet 10 adjacent the edge of the door 11 on which the hinges 12 are mounted. The plunger 35 has a flange at its inner end to limit outward movement of the plunger against the tension of a compressed spring 38. When the door is closed, as seen in Fig. 12, the spring 38 is compressed and the head 36 presses against the door 11 in a direction tending to open the door. Accordingly, as soon as the finger is removed from the head 17 of the plunger 16, the door will fly open of its own accord, thus causing the dog 22 to ride over the catch 32 as seen in Fig. 10. As soon as the dog has cleared the catch it will assume its normal position, as seen in Fig. 11, due to the spring 23 seeking its untensioned state. The latch is now ready again to latch the door in closed position as soon as it is brought into that position.

Having illustrated and described a preferred embodiment of the present invention it should be apparent to those skilled in the art that the same permits of modifications in arrangement and detail. All such modifications as come within the true spirit and scope of the appended claims are considered to be a part of my invention.

I claim:

1. A latch comprising a sleeve adapted to be mounted upon one of two members to be latched together, such as a door for a cabinet, a plunger slidably mounted in said sleeve, a first spring biasing said plunger into a normal position with respect to said sleeve, a dog pivotally mounted on said plunger, said plunger being recessed to permit said dog to project laterally beyond said sleeve or to swing inwardly in either direction in line with the longitudinal axis of the sleeve, a second spring biasing said dog to rest in projecting position, and a catch adapted to be mounted on the other of the two members in position to swing the dog in one direction until it partially passes over the catch when the two members are brought together, said dog having an irregular contour on its outer end defining a recess adapted to receive said catch when the members are brought together, separation thereof being pos-



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sible only by compressing said first spring to cause the plunger to carry the dog beyond the catch, after which it may swing in the other direction and ride over the catch as the members are separated.

2. A latch comprising a sleeve adapted to be mounted upon one of two members to be latched together, such as a door for a cabinet, a plunger slidably mounted in said sleeve, a first spring surrounding said plunger and biasing said plunger into a normal position with respect to said sleeve, a dog pivotally mounted on said plunger, said plunger being recessed to permit said dog to project laterally beyond said sleeve or to swing inwardly in either direction in line with the longitudinal axis of the sleeve, and a second spring biasing said dog to rest in projecting position, said dog having an irregular contour on its outer end defining a recess adapted to receive a catch on the other of the members when the members are brought together.

3. A latch comprising a sleeve adapted to be mounted upon one of two members to be latched together, such as a door for a cabinet, said sleeve having a flange adapted to lie against the outer surface of the door, a plunger slidably mounted in said sleeve, a first spring biasing said plunger into a normal position with respect to said sleeve with its outer end adjacent said flange, a dog pivotally mounted on said plunger, said plunger being recessed to permit said dog to project laterally beyond said sleeve or to swing inwardly in either direction in line with the longitudinal axis of the sleeve, a second spring biasing said dog to rest in projecting position, and a catch adapted to be mounted on the other of the two members in position to engage the dog when the two members are brought together, said dog having an irregular contour on its outer end defining a recess adapted to receive said catch when the members are brought together, separation thereof being possible only by pushing inwardly on the outer end of said plunger to compress said first spring and cause the dog to pass beyond the catch after which the dog may ride over the catch as the members are separated.

4. A latch comprising a sleeve adapted to be mounted upon one of two members to be latched together, such as a door for a cabinet, a plunger slidably mounted in said sleeve, a first spring biasing said plunger into a normal position with respect to said sleeve, a dog pivotally mounted on said plunger, said plunger being recessed to permit said dog to project laterally beyond said sleeve or to swing inwardly in either direction in line with the longitudinal axis of the sleeve, a second spring biasing said dog to rest in projecting position, said second spring being arranged to provide the pivotal bearing surface for said dog, and a catch adapted to be mounted on the other of the two members in position to swing the dog in one direction until it partially passes over the catch when the two members are brought together, said dog having an irregular contour on its outer end defining a recess adapted to receive said catch when the members are brought together, separation thereof being possible only by compressing said first spring to cause the plunger to carry the dog beyond the catch, after which the dog may swing in the other direction and ride over the catch as the members are separated.

5. A latch comprising a sleeve adapted to be mounted upon one of two members to be latched together, such as a door for a cabinet, a plunger

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slidably mounted in said sleeve, a first spring biasing said plunger into a normal position with respect to said sleeve, a dog pivotally mounted on said plunger, said plunger being recessed to permit said dog to project laterally beyond said sleeve or to swing inwardly in either direction in line with the longitudinal axis of the sleeve, a second spring biasing said dog to rest in projecting position, a pin passing laterally through said plunger and providing pivotal support for said dog, slots extending longitudinally of said sleeve for reception of the ends of said pin, said second spring being coiled about said pin to form a bearing surface for said dog, and a catch adapted to be mounted on the other of the two members in position to swing the dog in one direction until it partially passes over the catch when the two members are brought together, said dog having an irregular contour on its outer end defining a recess adapted to receive said catch when the members are brought together, separation thereof being possible only by compressing said first spring to cause the plunger to carry the dog beyond the catch, after which the dog may swing in the other direction and ride over the catch as the members are separated.

6. A latch comprising a sleeve adapted to be mounted upon one of two members to be latched together, such as a door for a cabinet, a plunger slidably mounted in said sleeve, a first spring biasing said plunger into a normal position with respect to said sleeve, a dog pivotally mounted on said plunger, said plunger and said sleeve being recessed to permit said dog to project laterally beyond said sleeve or to swing inwardly in either direction in line with the longitudinal axis of the sleeve, a second spring biasing said dog to rest in projecting position, a pin passing laterally through said plunger and providing the pivotal support for said dog, slots extending longitudinally of said sleeve for reception of the ends of said pin, said second spring being coiled about said pin to form a bearing surface for said dog, one end of said second spring being anchored in a slot in said dog and the other end thereof anchored in a slot in said plunger, and a catch adapted to be mounted on the other of the two members in position to swing the dog in one direction until it partially passes over the catch when the two members are brought together, said dog having an irregular contour on its outer end defining a recess adapted to receive said catch when the members are brought together, separation thereof being possible only by compressing said first spring to cause the plunger to carry the dog beyond the catch, after which the dog may swing in the other direction and ride over the catch as the members are separated.

7. A latch comprising a sleeve adapted to be mounted upon one of two members to be latched together, such as a door for a cabinet, a plunger slidably mounted in said sleeve with its outer end normally exposed, a first spring biasing said plunger into normal position with respect to said sleeve, a dog pivotally mounted on said plunger, said plunger being recessed to permit the outer end of said dog to project laterally beyond said sleeve or to swing inwardly at least partially into said plunger in either direction in line with the longitudinal axis of said plunger, and a second spring normally biasing said dog to rest in an intermediate, laterally projecting position, said second spring being arranged to provide a bearing surface upon which said dog is supported.



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8. A latch comprising a sleeve adapted to be mounted upon one of two members to be latched together, such as a door for a cabinet, a plunger slidably mounted in said sleeve with its outer end normally exposed, a first spring biasing said plunger into normal position with respect to said sleeve, a dog pivotally mounted on said plunger, said plunger and said sleeve being recessed to permit the outer end of said dog to project laterally beyond said sleeve or to swing inwardly at least partially into said plunger in either direction in line with the longitudinal axis of said plunger, a second spring normally biasing said dog to rest in an intermediate, laterally projecting position, and a pin passing laterally through said plunger upon which said dog is pivotally mounted, said sleeve having longitudinally extending slots for reception of the ends of said pin, and said second spring being coiled about said pin to form the pivotal bearing surface for said dog.

9. A latch comprising a sleeve adapted to be mounted upon one of two members to be latched together, such as a door for a cabinet, a plunger slidably mounted in said sleeve with its outer end normally exposed, a first spring biasing said plunger into normal position with respect to said sleeve, a dog pivotally mounted on said plunger, said plunger being recessed to permit the outer end of said dog to project laterally beyond said

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sleeve or to swing inwardly at least partially into said plunger in either direction in line with the longitudinal axis of said plunger, a second spring normally biasing said dog to rest in an intermediate, laterally projecting position, and a pin passing laterally through said plunger upon which said dog is pivotally mounted, said second spring being coiled about said pin to provide the pivotal bearing surface for said dog and a part of said second spring being anchored in said dog and another part thereof being anchored in said plunger.

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