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CYLINDER LOCK

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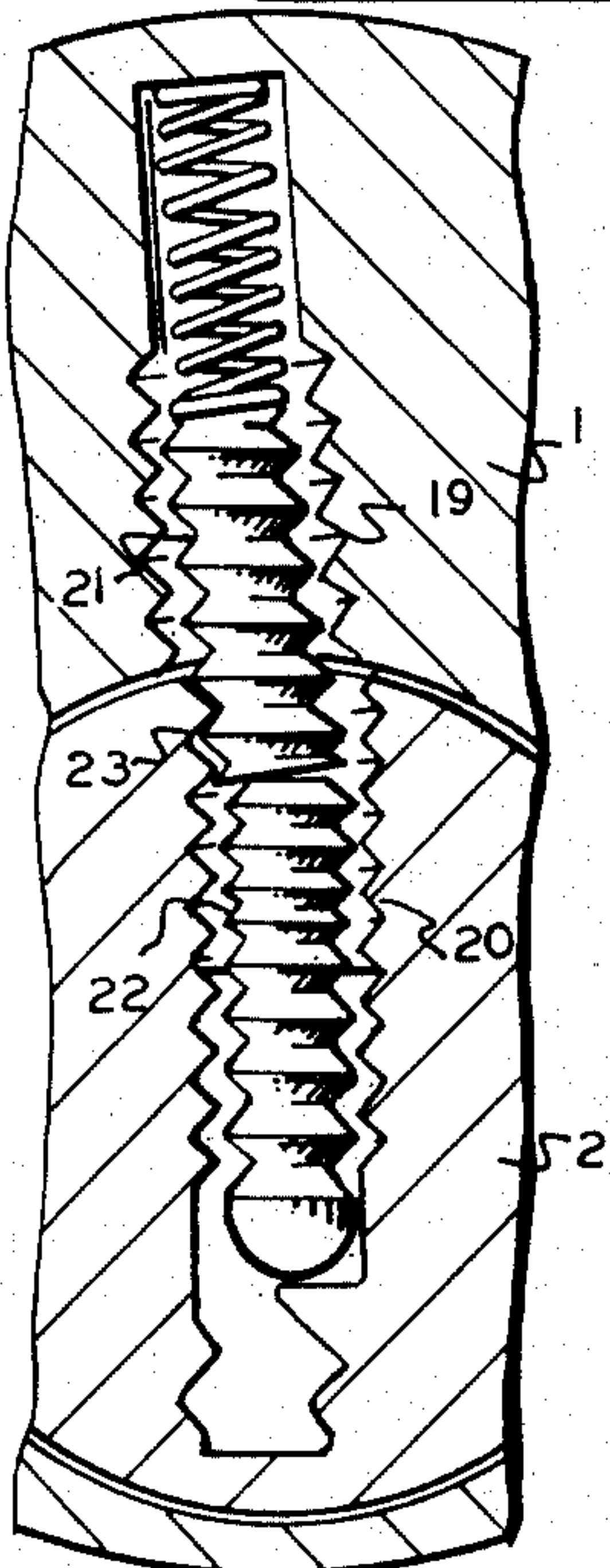
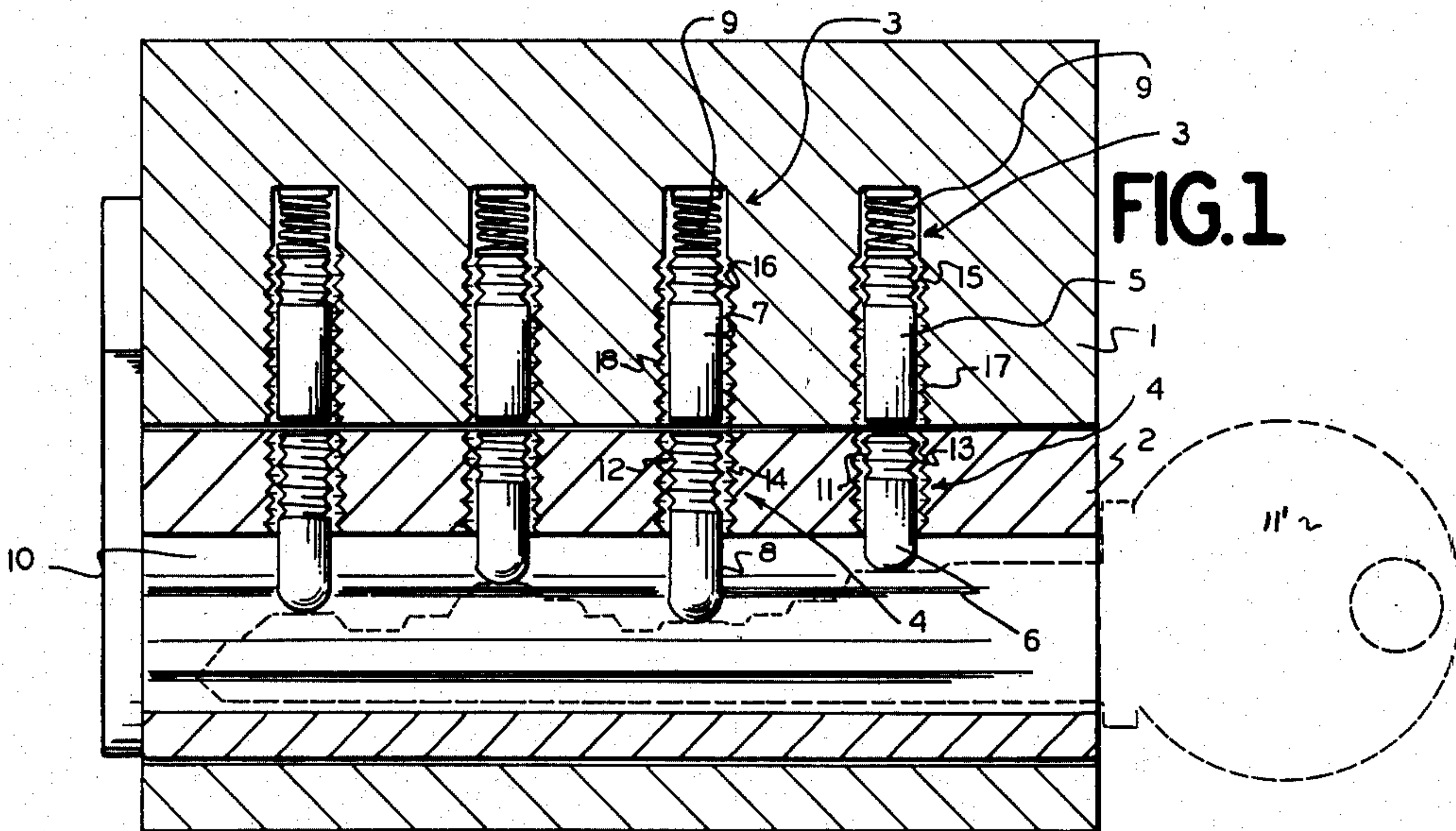


FIG. 2

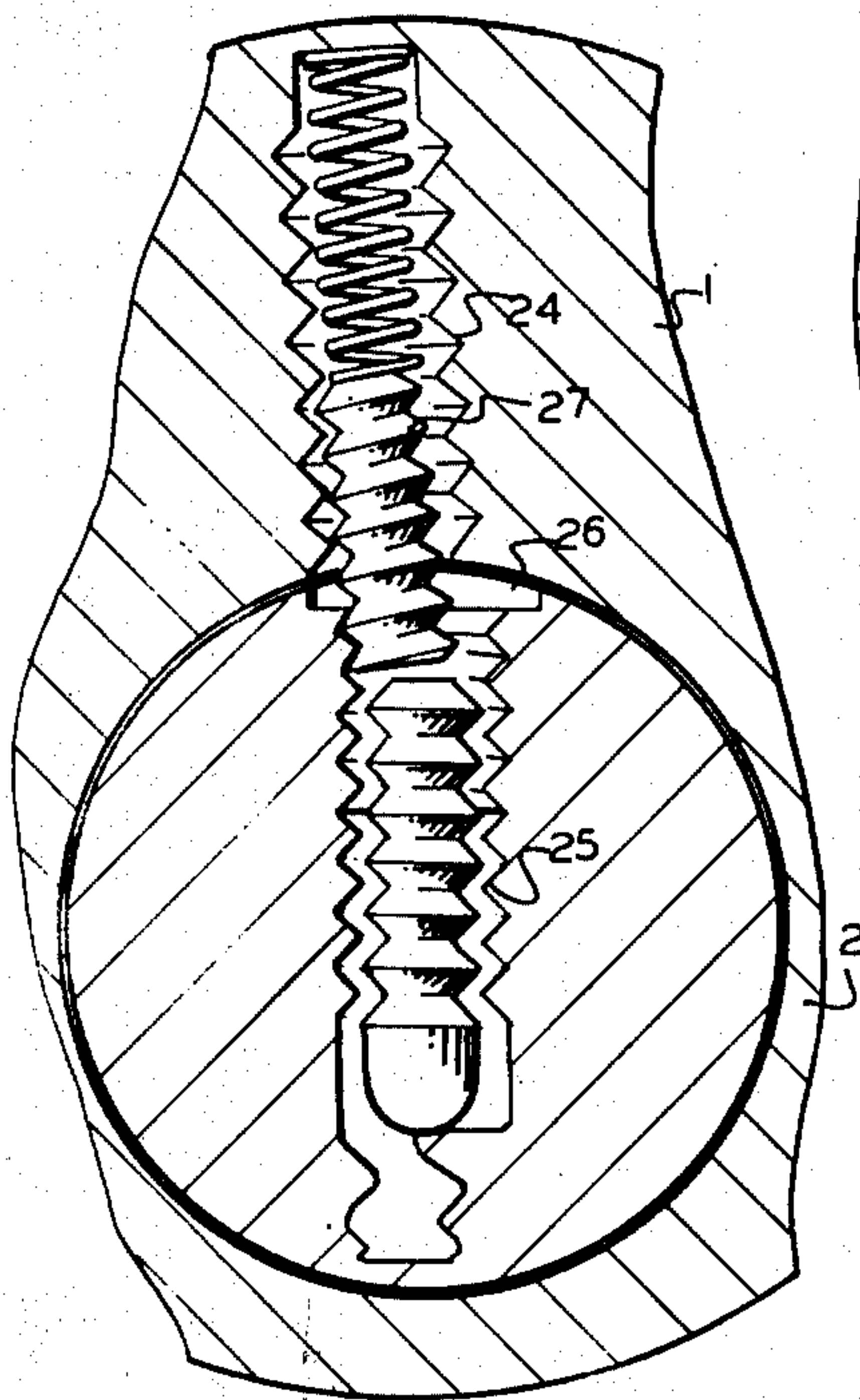


FIG. 3

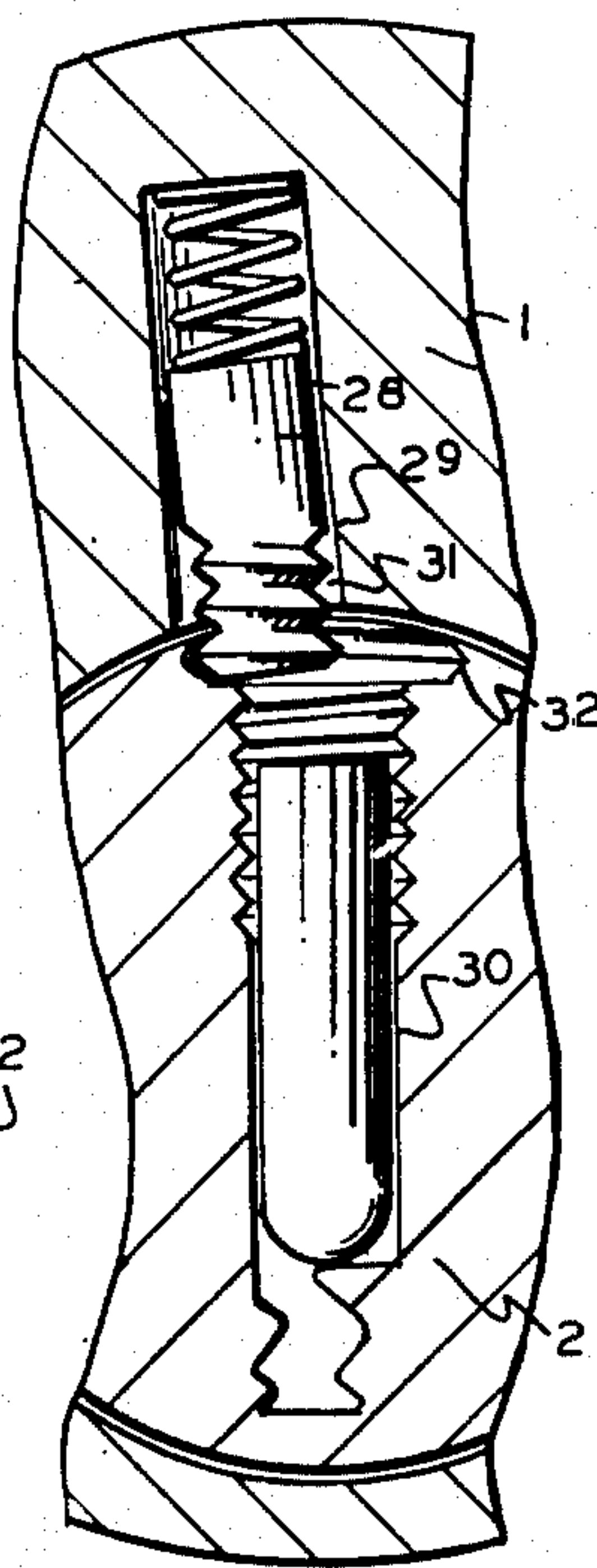


FIG.4

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CYLINDER LOCK

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1 Claim. (Cl. 70—419)

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This present invention relates to locks and more particularly to the cylinder type of lock and has principally for its purpose the construction of such a lock which cannot readily be picked or opened except by the right kind of a key. It is well known that cylinder types of locks are easily and readily opened by picking methods which consists of forcing the pins upward and catching them at the breaking point, that is the point of separation between the aligned pins at the surface of the inner cylinder in the barrel. For this purpose the inner barrel is held under a slight rotary tension while the pins are pushed up and forced down by the springs in the outer cylinder. If this is done for a little while the inner cylinder will give slightly as one or more of the pins are finally caught and held just at the surface between the outer and inner cylinders. At this point the inner cylinder will turn slightly and hold the pins in this separated position. By continuing in this fashion all of the aligned pins become separated and the lock may be turned. In the present invention advantage is taken of this initial separation not only to freeze the other pins in their holes in such a position that they cannot be moved up and down, but also the pins which have been separated will be held at such a point beyond the surface of the inner cylinder so that the inner cylinder will not be free to be turned.

These advantages which will be explained more fully in the structure as set forth in the specification make a cylinder type lock quite resistant to the usual methods of picking locks.

Other and further advantages of the present invention will be more fully understood from the description in the specification set forth below taken in connection with the drawings illustrating an embodiment of the same, in which:

Figure 1 shows in enlargement a cross sectional vertical elevation through a lock incorporating the present invention.

Figure 2 shows a modification of a section taken at right angles to the view of Figure 1 with the central cylinder slightly turned.

Figure 3 shows a further modification in substantially the same position of Figure 2, and,

Figure 4 shows another modification in substantially the same position as Figure 2.

In Figure 1 the lock comprises the outer cylinder 1 and an inner cylinder 2 which fits in a bore of Figure 1 with sufficient tolerance so that it might be turned. In the arrangement shown in Figure 1 the inner cylinder 2 is offset from

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a central position but if desired the cylinder 1 may be large enough so that the inner cylinder is centrally positioned. This is not necessary where the pins are all on one side of the lock but where the pins are on both sides of the lock the inner bore should be central.

As in the usual type of cylinder lock, the lock is provided with a number of holes 3, 3, etc., which may be aligned longitudinally in the inner and outer cylinders if desired as shown in Figure 1. They could however be in other positions in which case the key would have to be made accordingly. The holes 3 in the outer cylinder are normally aligned with corresponding holes 4, 4, etc., in the inner cylinder when the lock is locked or initially when the key is inserted before opening it. In each of these holes which may in general have almost any desired sectional shape, are pins 5, 6 in one hole, 7 and 8 in the next hole and so on for all the holes. Each hole has a pair of pins and in the outer cylinder in back of the pin therein are springs 9 bearing against the top end of the pin in the hole. These springs force the pins in the outer cylinder against the pins in the inner cylinders and hold them down in the track or channel 10 in which the key, shown in dotted lines at 11' is inserted.

When the proper key is inserted in such a lock the pins in each hole are separated at the surfaces of the inner and outer cylinders in the lock and as a consequence the inner cylinder may be turned to unlock the lock.

In the present invention as indicated the pins 6 and 8 in the inner cylinder are threaded in their upper section as indicated at 11 and 12 and also the holes in the inner cylinder are threaded correspondingly at 13 and 14. In the outer cylinder the upper ends of the pins 5 and 7 may also be threaded as indicated at 15 and 16 and the holes in this cylinder may also be threaded correspondingly as indicated at 17 and 18. Various types of threading of the pins and the holes in the cylinders may be used.

As indicated in Figure 2 the outer cylinder 1 may have its hole 19 threaded for a distance from its inner surface into the cylinder, while the inner cylinder 2 may have its hole threaded practically the entire way as indicated at 20. Similarly the pins 21 and 22 may be entirely threaded.

The arrangement indicated in Figure 2 shows how when the inner cylinder is slightly turned, the pin 21 is slightly tilted and the end of the pin at 23 locks in the threads of the hole 20 of the inner cylinder near the separating sur-

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faces between the inner and outer cylinder. In this figure therefore the pin 21 becomes locked and it would be difficult under such conditions to force the pin 21 upward so that the inner cylinder could be turned with reference to the outer cylinder.

In the arrangement indicated in Figure 3 the holes 24 in the outer cylinder and 25 in the inner cylinder are threaded in the same manner as shown in Figure 2. The inner cylinder however is provided with a shoulder 26 at the surface of the hole 25. This hole will permit even a more decided turn of the inner cylinder relative to the outer cylinder and will tend to tilt the pin 27 in the outer cylinder to such an extent that it will lock in the outer cylinder on the threads of the hole 24 and in the inner cylinder on the threads of the hole 25.

In the arrangement indicated in Figure 4, the pin 28 in the hole 29 of the outer cylinder is threaded only at the end which projects into the hole 30 in the inner cylinder. This threading of the end of the pin 28 is indicated at 31. The inner cylinder 2 in this modification is also provided with a shoulder 32 at its outer surface which may be threaded as shown. In this arrangement the lower pin 30 is not threaded. Figure 4 shows the inner barrel slightly turned showing the end of the pin 28 locked in the threading of the recess 32. Since in picking a lock the inner barrel is always tensioned the position shown by the pins will occur after one of the pins has been turned slightly. The first turning of the inner cylinder 2 will lock the upper pin in the position shown in Figure 4 and when this occurs it will be impossible while maintaining tension on the inner barrel to force the upper pin out of the threaded shoulder. If the tension on the inner barrel is released and it is permitted to assume a normal position where the holes in the upper pin and the lower pin are axially aligned, then of course the pins will fall back into their original position. It is clearly evident that in this way it will be impossible to pick the lock in the manner in which it is usually accomplished.

The arrangement indicated in the drawings and above described can be applied to various types of cylinder locks. The threading of the outer cylinders may be a screw thread or this

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may consist merely of successive ribs and the ribs need not extend all the way around the holes. Similarly the pins may have threads or ribs. They should however be of such a nature that they can interlock with one another. It will be noted that when the pins are in their normal central position sufficient clearance is allowed so that when the key is inserted, it is readily forced upward. If in this position the pin should not be centrally located in the hole the pressure at the bottom of the pin will push the pin out of contact with the threaded wall. It is only when the inner cylinder has been slightly turned and is held under tension thereby tilting the pin that the pin is caught and cannot readily be forced upwards.

Having now described my invention, I claim:
A cylinder lock of the type described having an inner cylinder fitting in a bore of an outer cylinder and adapted to be rotated therein, said inner cylinder and outer cylinder having aligned holes; a key slot in said inner cylinder beneath and in communication with the holes therein, a pair of pins in said holes adapted to be moved in the axial directions thereof, spring members in the back of the pins in said outer cylinder for forcing the pins in the inner cylinder against the key slot, said inner cylinder being threaded at the top of its hole and the pin extending into the outer cylinder being threaded only at its end, extending into the hole in the inner cylinder, said inner cylinder having a recess at its surface extending around the hole, said recess being threaded similarly as the hole for engagement with the end of the threaded pin.

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