No. 704,982.

Patented July 15, 1902.

W. H. THORP

HINGE.

(Application filed Oct. 31, 1901.)

(No Model.)

Fig. 1.

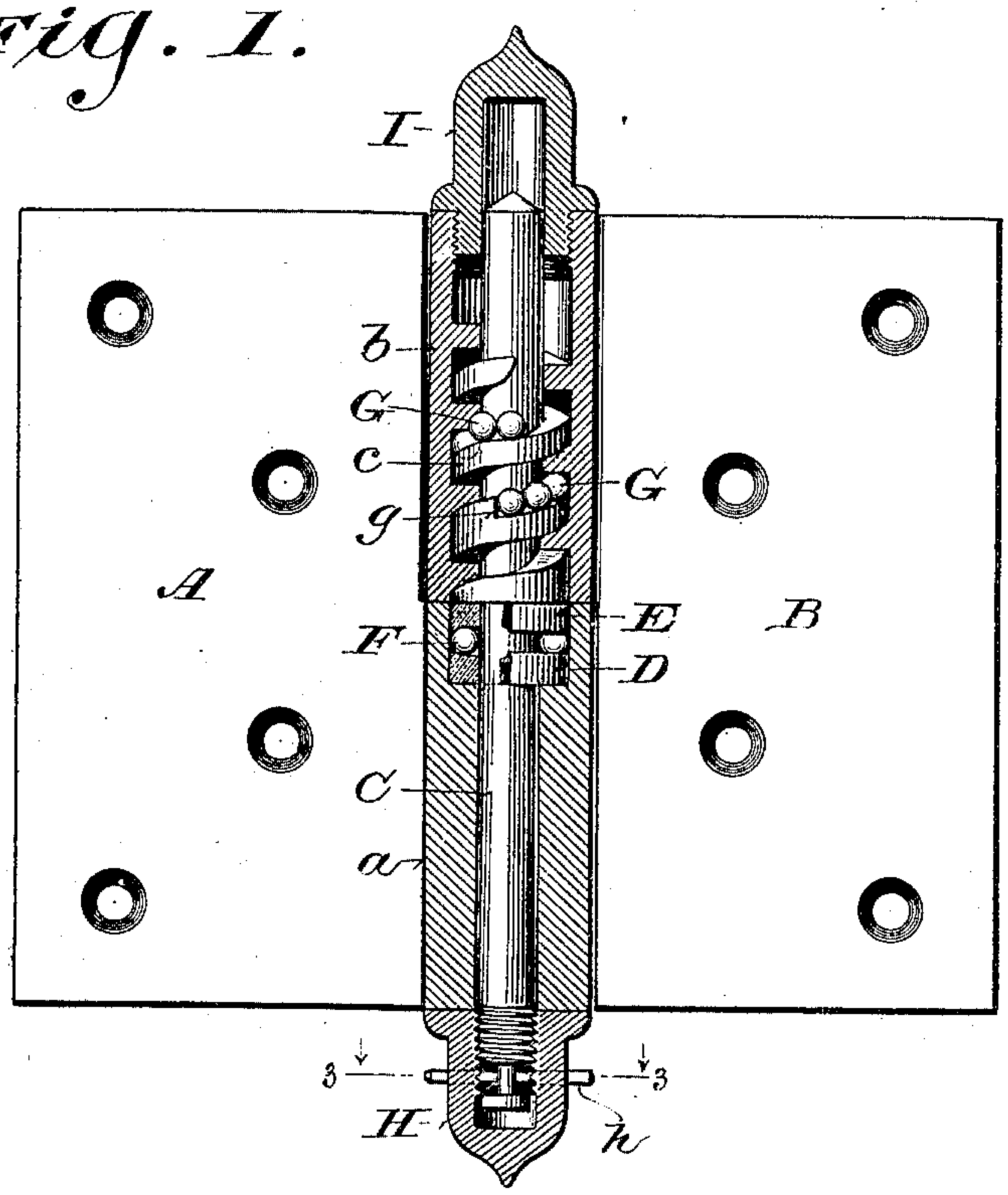
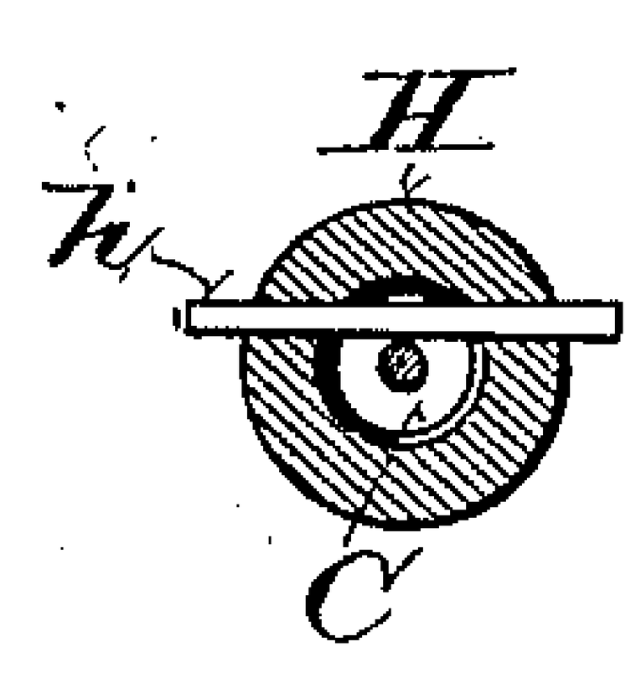


Fig. 3



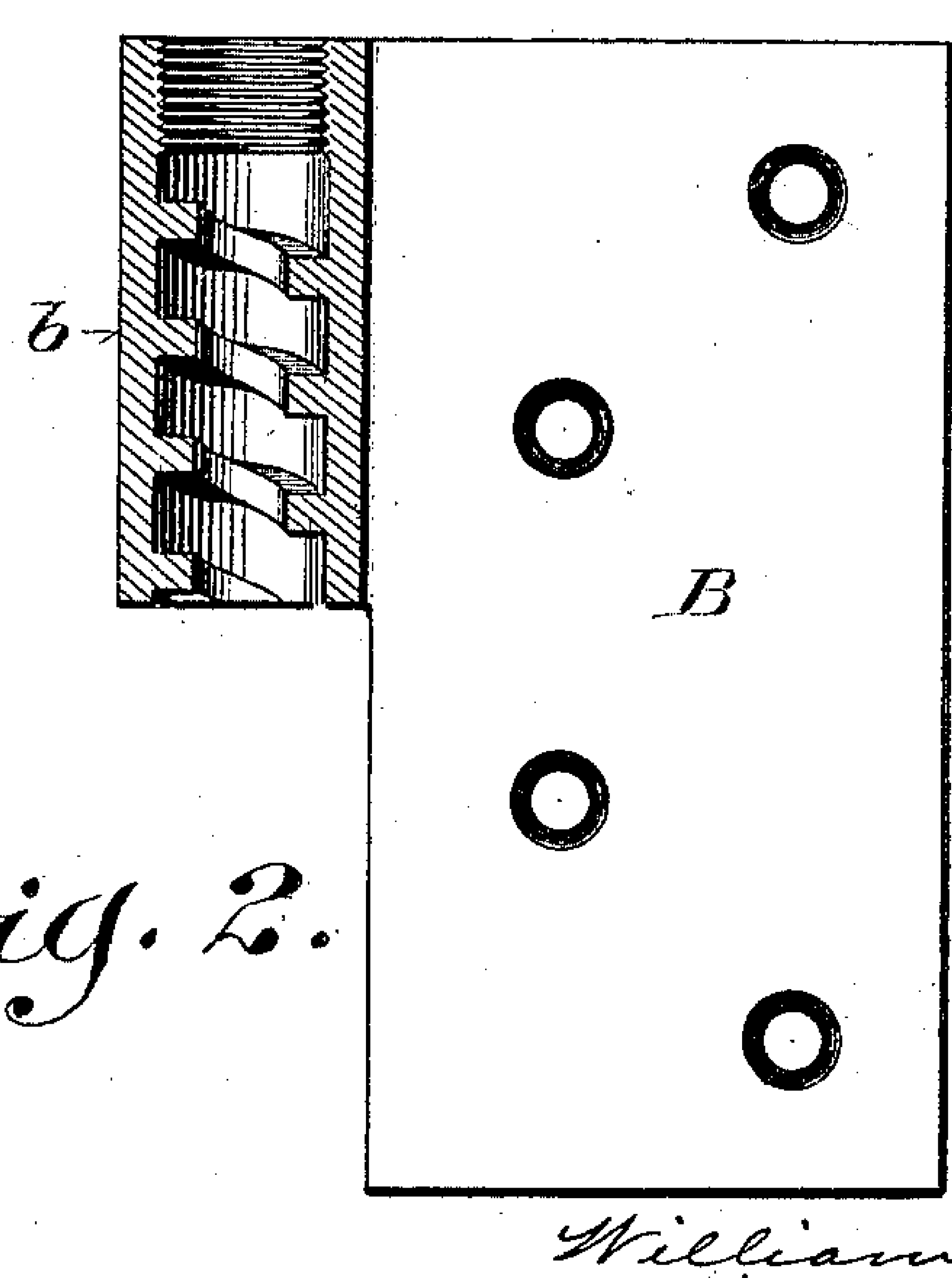


Fig. 2.

Witnesses:
Geo. W. Young,
Chas. L. Goss.

Inventor:
William H. Thorp.
By Winkler Flanders Smith Bottum & Vilas
Attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM H. THORP, OF BEAVERDAM, WISCONSIN.

HINGE.

SPECIFICATION forming part of Letters Patent No. 704,982, dated July 15, 1902.

Application filed October 31, 1901. Serial No. 80,581. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. THORP, a citizen of the United States, residing at Beaverdam, in the county of Dodge and State of Wisconsin, have invented certain new and useful Improvements in Hinges, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The main objects of my invention are to produce a hinge that may be readily made self-closing or not and that may be locked open, and generally to improve the construction and operation of hinges of this class.

It consists in certain novel features of construction and in the arrangement and combinations of parts hereinafter particularly described, and pointed out in the claims.

In the accompanying drawings like letters designate the same parts in the several figures.

Figure 1 is a face view of the hinge when opened, the barrels of the leaves being shown in vertical medial section. Fig. 2 is a face view of the movable leaf of the hinge, its barrel being shown in vertical medial section; and Fig. 3 is a horizontal section on the line 3 3, Fig. 1, of the lock-nut at the lower end of the hinge-pin.

The hinge is composed, as usual, of two leaves A and B and a pin C. The fixed leaf A is formed on the lower part of one of its vertical edges with a sleeve or barrel *a*, having a plain or smooth cylindrical bore. The upper part of this bore is countersunk or enlarged to receive roller-bearing rings D and E or to form a shoulder or roller-bearing in place of the ring D and to receive balls or rollers F and an upper roller-bearing on the pin C. The movable leaf is formed on the upper part of one of its vertical edges with a sleeve or barrel *b*, having an internal spiral groove, preferably of square or rectangular shape in cross-section. The lower part of the pin C is made of cylindrical form and fitted to turn in the plain bore of the barrel *a*. The upper part is formed with a square or rectangular spiral *c*, corresponding with but narrower in an axial direction than the spiral groove in the barrel *b*. Between the upper face of the spiral *c* and the upper opposing face of the groove in the barrel *b* are interposed balls or rollers G, the depth of said groove being nearly equal to the diameter of said balls, so as to avoid a shearing strain that would tend to split or cut the balls. The spiral *c* is made wider in an axial direction at its lower end to form a shoulder *g*, or the pin C is provided with an abutment for holding the balls G in place in the spiral groove of the barrel *b*.

H is a cap-nut threaded on the lower end of the pin C and adapted to be screwed up against the lower end of the barrel *a*, so as to lock said pin and prevent it from turning in said barrel when it is desired to make the hinge self-closing or to lock it in an open position. A cross-pin *h*, passing eccentrically through said nut and a circumferential groove in the lower end of the hinge-pin, prevents the separation of said nut when loosened from the hinge-pin and affords convenient means for screwing the nut against the barrel *a* to lock the hinge-pin therein.

I is a flanged cap-nut threaded in the upper end of the barrel *b* and corresponding in external shape and appearance with the nut H. It is formed with an axial socket, in which the upper end of the hinge-pin is fitted to turn, as shown in Fig. 1.

My improved hinge operates as follows: When it is desired to make the hinge self-closing, the nut H is screwed tightly against the barrel *a* of the fixed leaf A, when the movable leaf B is closed against it and the lower end of its barrel *b* rests against the upper end of the barrel *a*. If now the leaf B is opened or turned away from the leaf A, the pin C being held stationary, the upper face of the spiral groove in barrel *b* will run up on the balls G and lift the movable leaf B and the door to which it is attached, so that when the door is released its weight will tend to turn it back upon the inclined bearing of the hinge, and thus close it. If it is desired to make the hinge operate without closing the door to which it is attached, the nut H is loosened, so that the pin C will turn freely in the barrel *a*. Under this condition when the leaf B is turned on the leaf A the pin C will turn in the barrel *a*, this operation being facilitated by the balls F without lifting the barrel *b* out of contact with the barrel *a*. If it is desired to fasten the door open, the nut H, which has been unscrewed to release the

pin C when the hinge was closed, is screwed up against the barrel *a* when the hinge is open and the barrel *b* rests upon the barrel *a*. The door and hinge will thus be prevented from closing, because the pin C being prevented from turning in the barrel *a* while the barrel *b* rests on the barrel *a* the leaf B cannot descend on its spiral bearing, and therefore cannot turn toward the leaf A.

Various changes in minor details of construction and arrangement of parts may be made within the spirit and intended scope of my invention. For example, cylindrical rollers may be used in place of the balls F and G, and by journaling such rollers on spirally-arranged pins around the pin C the spiral *c* may be dispensed with.

I claim—

1. A hinge composed of two leaves, one having a barrel with a plain bore and the other having a barrel with an internal spiral groove, a pin fitted to turn in both barrels and provided with spirally-arranged antifriction-rollers adapted to engage with said spiral groove, and means for locking at will said pin from turning in the barrel having a plain bore, substantially as described.

2. A hinge composed of two leaves, one having a barrel with a plain cylindrical bore and the other having an internal spiral groove in the bore of its barrel, a pin having a cylindrical portion fitted to turn in said plain bore in one leaf and spirally-arranged antifriction-rollers adapted to engage said spiral groove in the other leaf, a nut threaded on the lower end of said pin and adapted when screwed up against the lower end of the barrel of the fixed leaf to prevent said pin from turning therein, substantially as described.

3. In a hinge the combination of a fixed leaf having a barrel with a plain cylindrical bore and roller-bearing, a movable leaf having a barrel with an internal spiral groove, a pin having a cylindrical lower portion fitted to turn in the barrel of the fixed leaf, spirally-arranged rollers adapted to engage the spiral groove in the movable leaf and an intermediate roller-bearing opposed to the roller-bearing in the barrel of the fixed leaf, rollers interposed between said bearings and means for locking said pin at will from turning in the barrel of the fixed leaf, substantially as described.

4. In a hinge the combination of a fixed leaf having a barrel with a plain cylindrical bore, a movable leaf having a barrel with an internal square spiral groove, a pin having a cylindrical part fitted to turn in the plain bore of the fixed leaf and provided with a square spiral corresponding with but narrower axially than said groove, and balls interposed between the upper face of the spiral on the pin and the upper opposing face of said groove, substantially as described.

5. In a hinge the combination of a fixed leaf having a barrel with a plain bore, a movable leaf having a barrel with an internal spiral groove, a pin having a cylindrical part fitted to turn in the plain bore of the fixed leaf, and a spiral adapted to engage the spiral groove in the movable leaf, rollers interposed between opposing bearings in the barrel of the fixed leaf and on the hinge-pin, and means for locking at will said hinge-pin in said fixed leaf, substantially as described.

6. In a hinge the combination of a fixed leaf having a barrel with a plain bore, a movable leaf having a barrel with an internal spiral groove, a pin having a cylindrical part fitted to turn in the plain bore of the fixed leaf, and a spiral adapted to engage with the spiral groove in the movable leaf, a nut threaded on the lower end of said pin, and a pin passing transversely through said nut and a circumferential groove in the hinge-pin, substantially as described.

7. In a hinge the combination of a fixed leaf having a barrel with a plain bore, a movable leaf having a barrel with an internal spiral groove, a pin having a cylindrical part fitted to turn in the plain bore of the fixed leaf, and a spiral adapted to engage with the spiral groove in the movable leaf, a nut threaded on the lower end of said pin and adapted to lock the same in the fixed leaf, and a nut threaded in the upper end of the barrel of the movable leaf and having an axial socket in which the upper end of the hinge-pin has a bearing, substantially as described.

In witness whereof I hereto affix my signature in presence of two witnesses.

WILLIAM H. THORP.

Witnesses:
CHAS. L. GOSS,
ELINOR V. WRIGHT.