

F. BRUCKER.
 COMBINED SPRING HINGE AND CHECK.
 APPLICATION FILED OCT. 18, 1909.

980,592.

Patented Jan. 3, 1911.

2 SHEETS—SHEET 1.

Fig. 1.

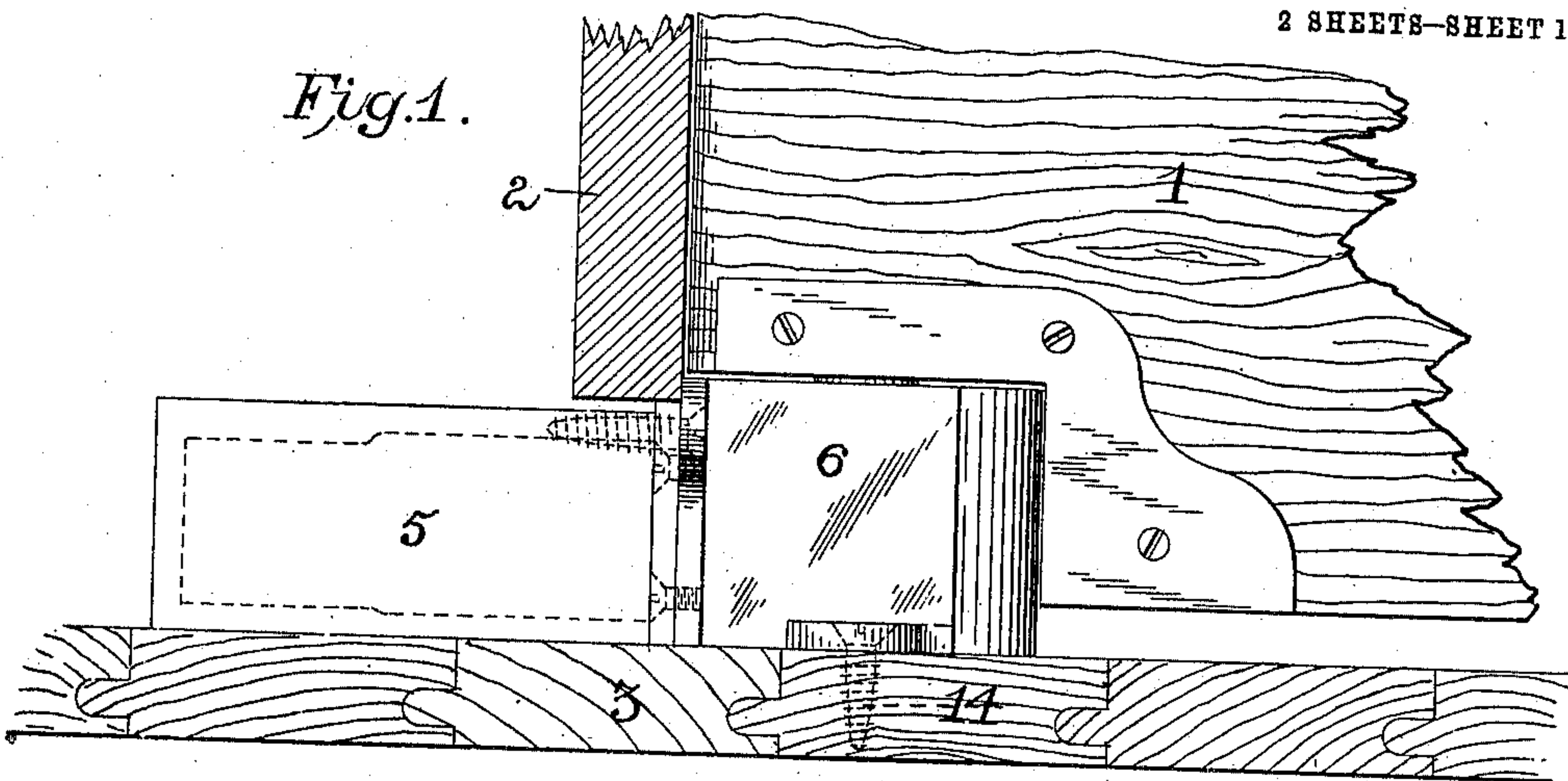


Fig. 2.

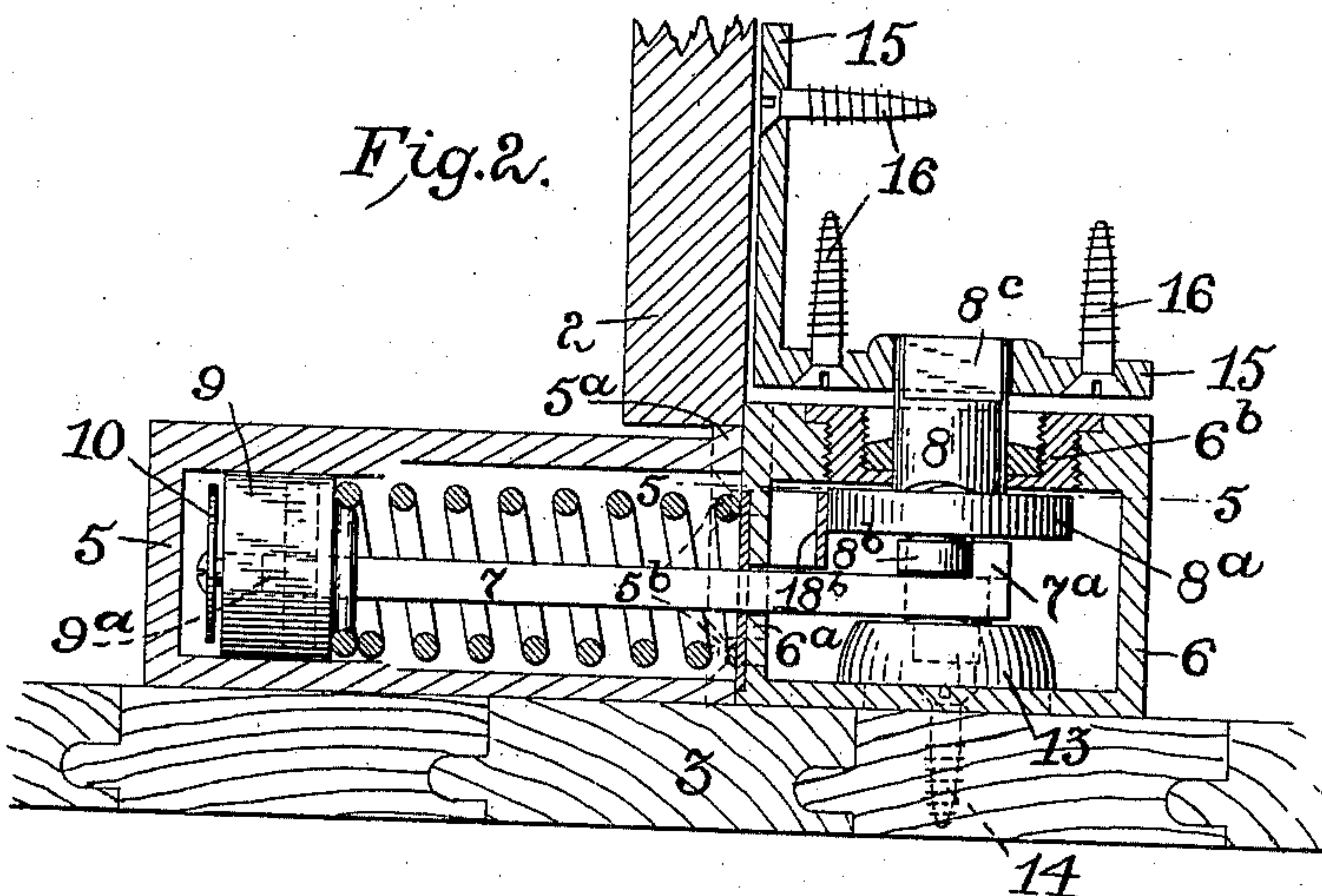


Fig. 3.

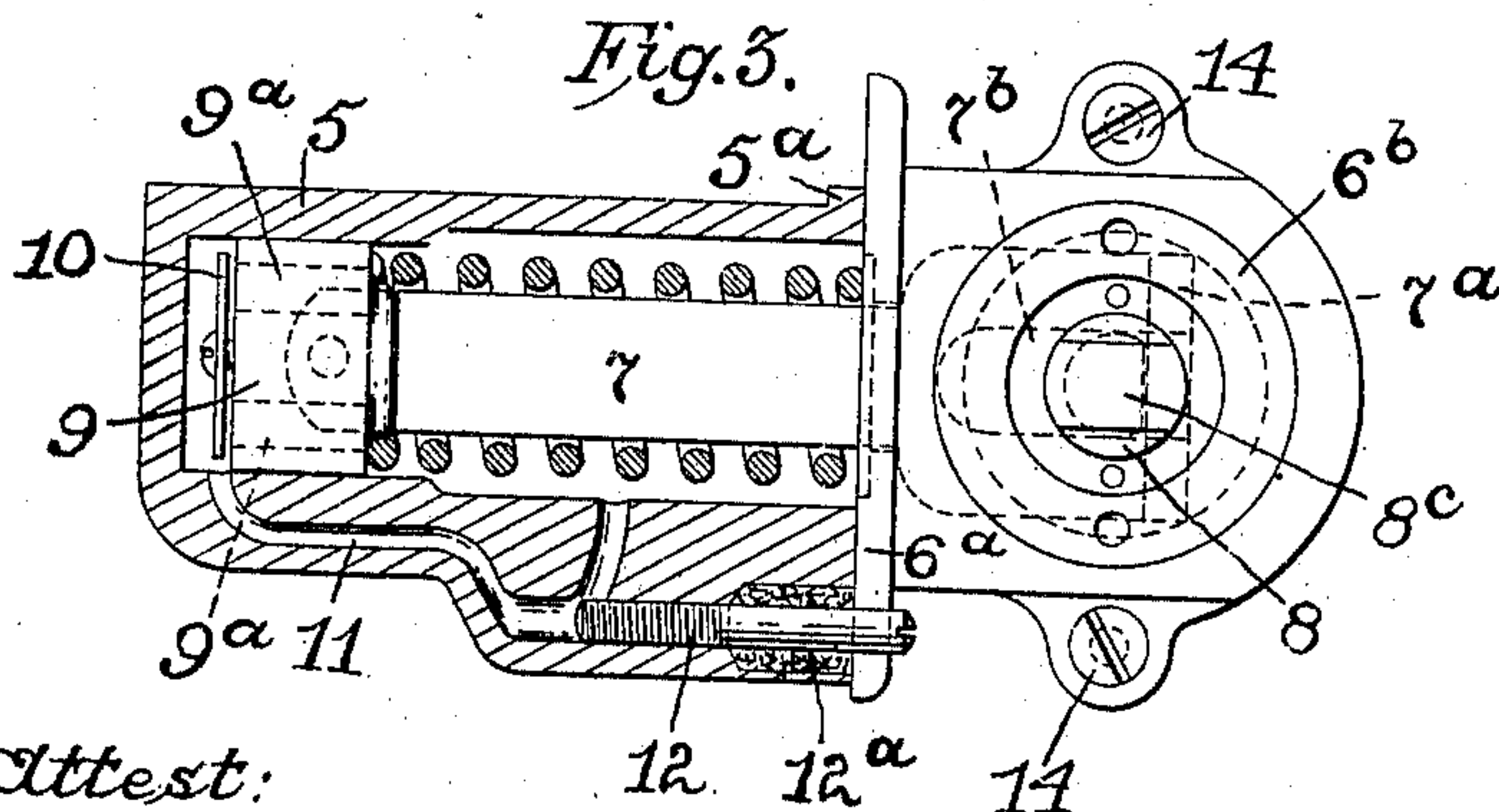


Fig. 6.

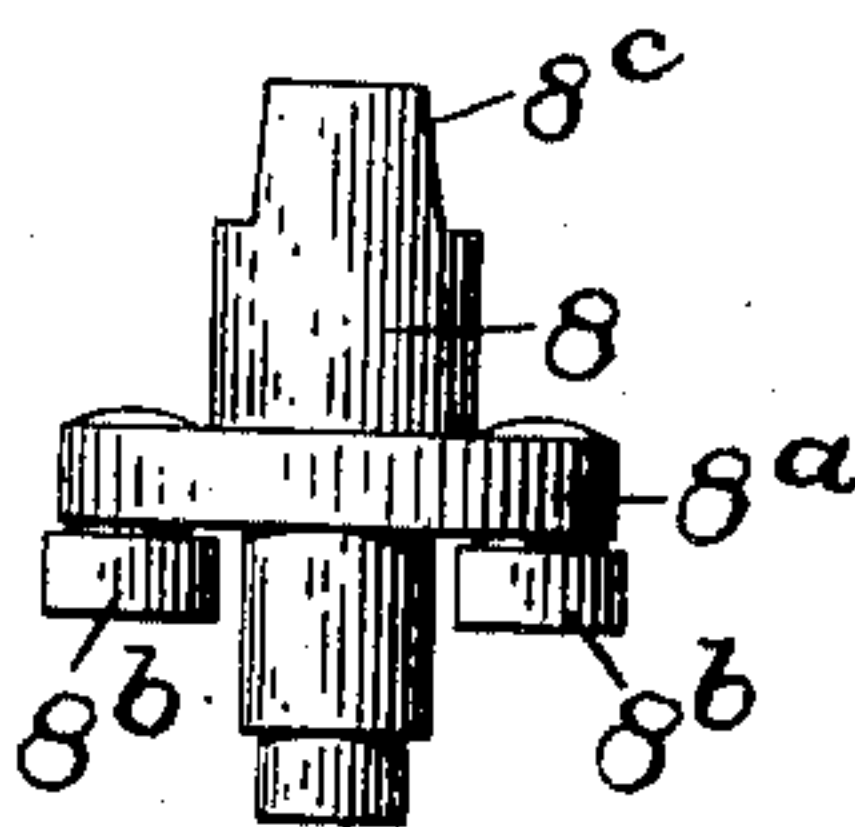


Fig. 7.

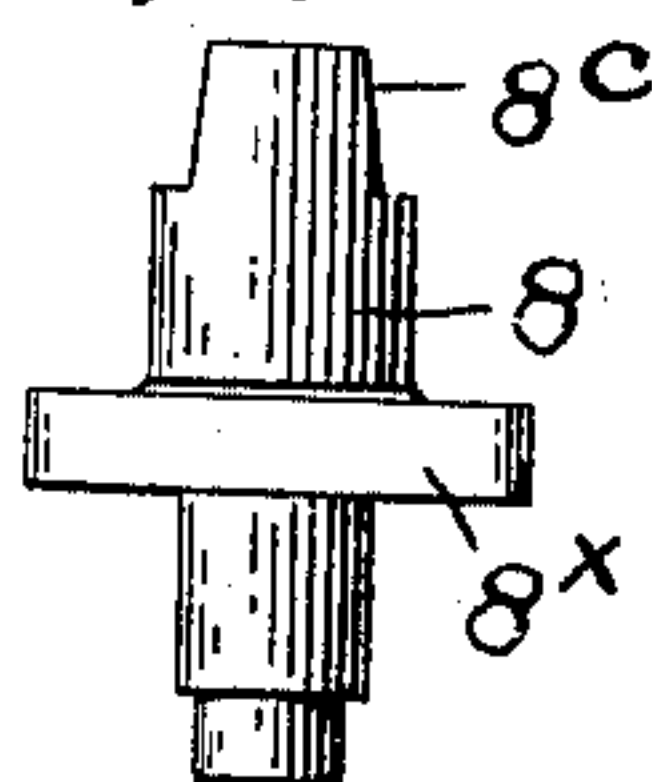
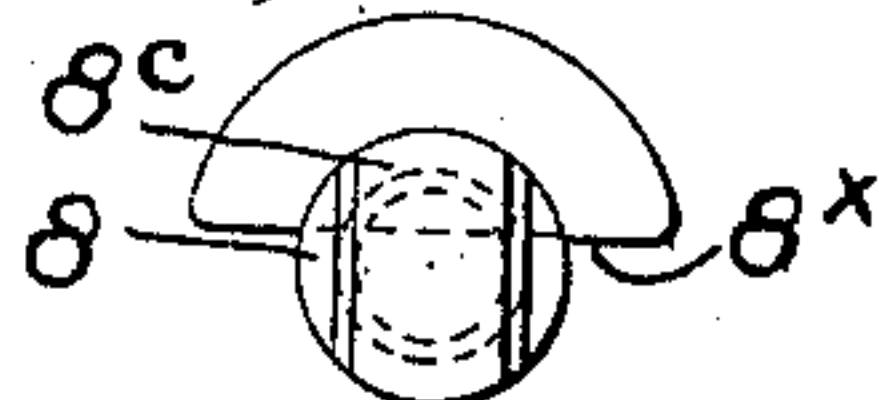


Fig. 7a.



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2 SHEETS—SHEET 2.

Fig. 4.

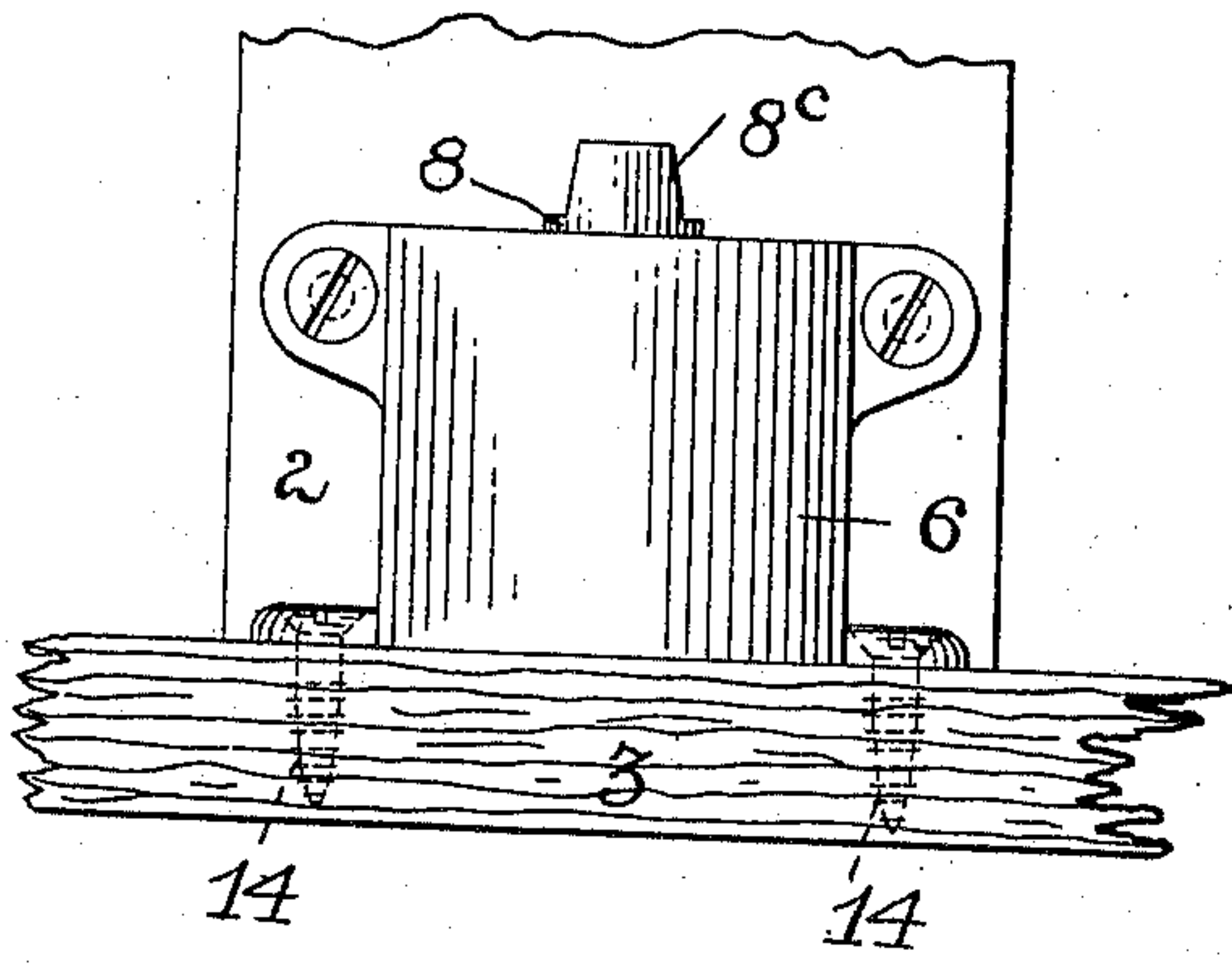
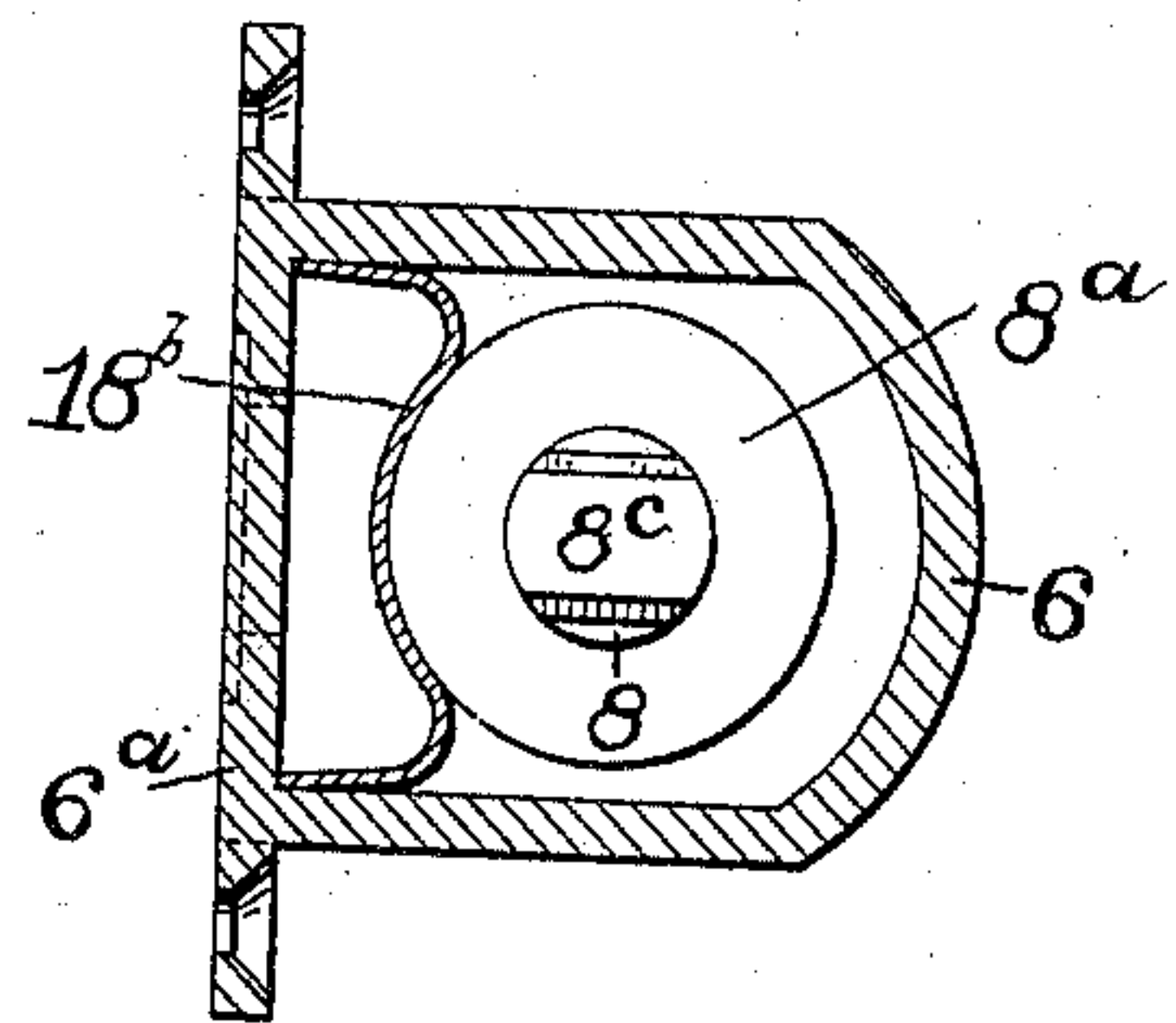


Fig. 5.



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UNITED STATES PATENT OFFICE.

FRANCIS BRUCKER, OF SHELBY, OHIO, ASSIGNOR TO STANDARD MANUFACTURING CO., OF SHELBY, OHIO.

COMBINED SPRING-HINGE AND CHECK.

980,592.

Specification of Letters Patent.

Patented Jan. 3, 1911.

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To all whom it may concern:

Be it known that I, FRANCIS BRUCKER, a citizen of the United States, residing at Shelby, Ohio, have invented certain new and useful Improvements in Combined Spring-Hinges and Checks, of which the following is a specification.

My invention relates to spring hinges and oil checks combined for use on either single or double acting doors, but more particularly on doors swinging both ways, and has for its object to provide improved means for checking the swing of the door and bringing it to its closed position quietly and to stop without swinging beyond the center, and also to provide means for holding the door open when swung to a certain distance in either direction, and further to provide a checking device for single or double acting doors that cannot be injured by suddenly forcing the door to closed position either by accident or in any other manner.

The invention includes the novel features of construction and arrangement of parts hereinafter described and particularly set forth in the appended claims.

A hinge constructed in accordance with my invention is illustrated in the accompanying drawing, in which—
Figure 1 is a side elevation partly in section, showing a portion of the door and door jamb and floor, and illustrating, for convenience, the hinge as applied to the lower corner of the door, though it will be understood that it could as well be applied to the upper corner if desired. Fig. 2 is a longitudinal sectional view. Fig. 3 is a sectional plan view. Fig. 4 is a detail end view of the hinge looking toward the jamb. Fig. 5 is a part sectional view on line 5—5 of Fig. 2. Fig. 6 is a detail view of the post, and Figs. 7 and 7^a are views of a modified form of post.

Referring by reference characters to this drawing, the numeral 1 designates the door, 2 the door jamb or frame, and 3 the floor. Within a recess formed in the door frame or jamb and above the level of the floor is located a barrel or case 5 for containing the spring and oil check. This barrel, being concealed from sight, may be made of cast metal, and being open at the end toward the door, is easily machined out. It is provided with a lateral flange 5^a which is secured, by means of screws 5^b, to the flange 6^a of the

case 6 containing the hinge pin and cooperating parts, hereinafter more fully described.

Within the barrel 5 is located a plunger comprising a piston 9 and piston rod 7, which extends through an opening in the wall of the case, and has, at that end, an upwardly turned flange or rib 7^a designed to cooperate with a cam device on the hinge pin 8, as hereinafter explained, said rod having an elongated opening 7^b through which the hinge pin passes, while the piston 9 has longitudinal openings 9^a therethrough to permit the passage of oil from the spring containing portion of the barrel to the space behind the piston when the piston is moved to the right, these openings or passages being closed by a check valve 10 when the piston moves to the left. When the piston is so moved, under the action of the spring in closing the door, the oil is forced through a by-pass 11 which is controlled by an adjustable set screw 12, the head of which passes through the flange 6^a of the case 6. The shank of the set screw is packed, as indicated at 12^a to prevent any liability of leakage.

The hinge pin 8, before referred to, has its lower end seated in a suitable step bearing 13 on the bottom of the case 6, which may be secured to the floor in any suitable manner as by one or more screws 14. A disk 8^a is carried by or formed integral with the pin and carries rollers 8^b which cooperate with the flange or rib 7^a of the plunger and constitute the cam device hereinbefore referred to, so that, as the hinge pin is turned in either direction, one or the other of the rollers acting on the rib of the rod 7 will move the piston to the right, compressing the spring. The upper end of the hinge pin passes through a packed bearing in the removable cover 6^b of the case, and is provided with a tapered end of non-circular cross section, as indicated at 8^c. This tapered end enters a correspondingly shaped socket in an L shaped plate 15 which is secured to the lower corner of the door by means of screws 16. Thus the weight of the door coupled with the tapered construction described, tends to insure a tight engagement between the hinge pin and its socket, and cause the door and pin to move in unison and without any lost motion whatever, while disengagement is easily effected by simply lifting the door.

It will be noticed that the centers of the

rollers 8^b, or the straight bearing face of the form shown in Figs. 7 and 7^a is back of the center of the hinge pin. This construction insures the door hinge being held open when it is swung a little more than 90° in either direction as when the parts are in such position the point of application of the power of the spring is on the opposite side of the dead center and the spring, instead of tending to close the door, tends to hold it open.

Instead of using rollers for the cam device, as shown in Fig. 6, I may use a construction such as shown in Figs. 7 and 7^a, in which the post is provided with a straight faced portion 8^x cooperating with the flange 7^a. While the spring, restrained by the action of the oil, will gradually bring the door back to closed position, it will be seen that by reason of the particular connection between the hinge pin and the plunger rod the door may be suddenly closed by hand without affecting the movement of the plunger, and thus all danger of injury to the hinge or check by careless or violent handling is avoided. To prevent too free closing of the door, as, for instance, its being blown closed ahead of the action of the spring, by the wind, I provide a spring brake 18^b bearing against the periphery of the disk 8^a, as shown.

In operating the door, it will be seen that when the door is swung either way, the rollers 8^b or straight cam face 8^x will pull against the spring actuated plunger rod 7, compressing the spring and pulling the piston 9 forward or to the right, allowing the oil or other liquid in the barrel or cylinder to pass through the holes to the rear end of the cylinder, or in other words, filling the space between the rear end of the cylinder and the piston so that when the spring acts upon the plunger and piston to bring the door back to its closed position, the compression of the oil or liquid will not allow it to come back any faster than the oil or liquid can escape from the rear end of the cylinder, and this is regulated fast or slow by the regulating screw closing or opening the bypass, leakage around the regulating screw being prevented by the packing. The joint between the barrel or cylinder part and the exposed part or case of the hinge is also packed with any suitable packing to prevent any leak at that point. The same is true with reference to packing around the hinge pin 8 as will be seen from Fig. 2.

Attention is called to the fact that there is no packed joint of any kind at any place where the oil or liquid is under pressure. The few joints are made where there is no

compression of the liquid or oil. It will also be noticed that the spring actuated plunger is open at the center through which opening the rotatable hinge pin operates or turns, and this causes the spring plunger to be guided by the post on either side to prevent any side motion. It will also be noted that in assembling these parts the spring plunger is put in place, and the hinge pin put in from the top and the screw-cap and stuffing box put in place afterward. Further, that with this construction it is impossible to injure the mechanism of the hinge by any careless handling of the door and, at the same time, with the spring brake the door is always under perfect control of spring and check.

Having thus described my invention what I claim is:—

1. The combination with a door and its frame, of a barrel having a fluid checked spring actuated plunger carried by one of said parts, a hinge pin connected to the other part, said plunger rod having an elongated opening or recess through which the pin passes, for guiding the plunger, and said plunger rod and said pin having the one a rib and the other cam devices coacting with said rib, substantially as described.

2. The combination with a door and its frame, of a barrel seated in a recess in the side of the frame, a casing at the end of the barrel, a hinge pin rotatably mounted in the casing, a plunger rod extending from the barrel into the casing and having an elongated opening through which the pin passes, said plunger rod having a transverse rib, cam devices on said pin cooperating therewith, a spring in the barrel acting on the plunger, and a plate carried by the door and engaging the end of the post, substantially as described.

3. The combination with a door and its frame, of a barrel seated in a recess in the side of the frame, a casing at the end of the barrel, a hinge pin rotatably mounted in the casing, a plunger extending from the barrel into the casing and having an elongated opening through which the pin passes, said plunger having a transverse rib, cam devices on said pin cooperating therewith, a spring in the barrel acting on the plunger, a plate carried by the door and engaging the hinge pin, and a friction brake for said pin, substantially as described.

In testimony whereof, I affix my signature in presence of two witnesses.

FRANCIS BRUCKER.

Witnesses:

ESTELLA CLOWES,
NELLIE STROCK.