

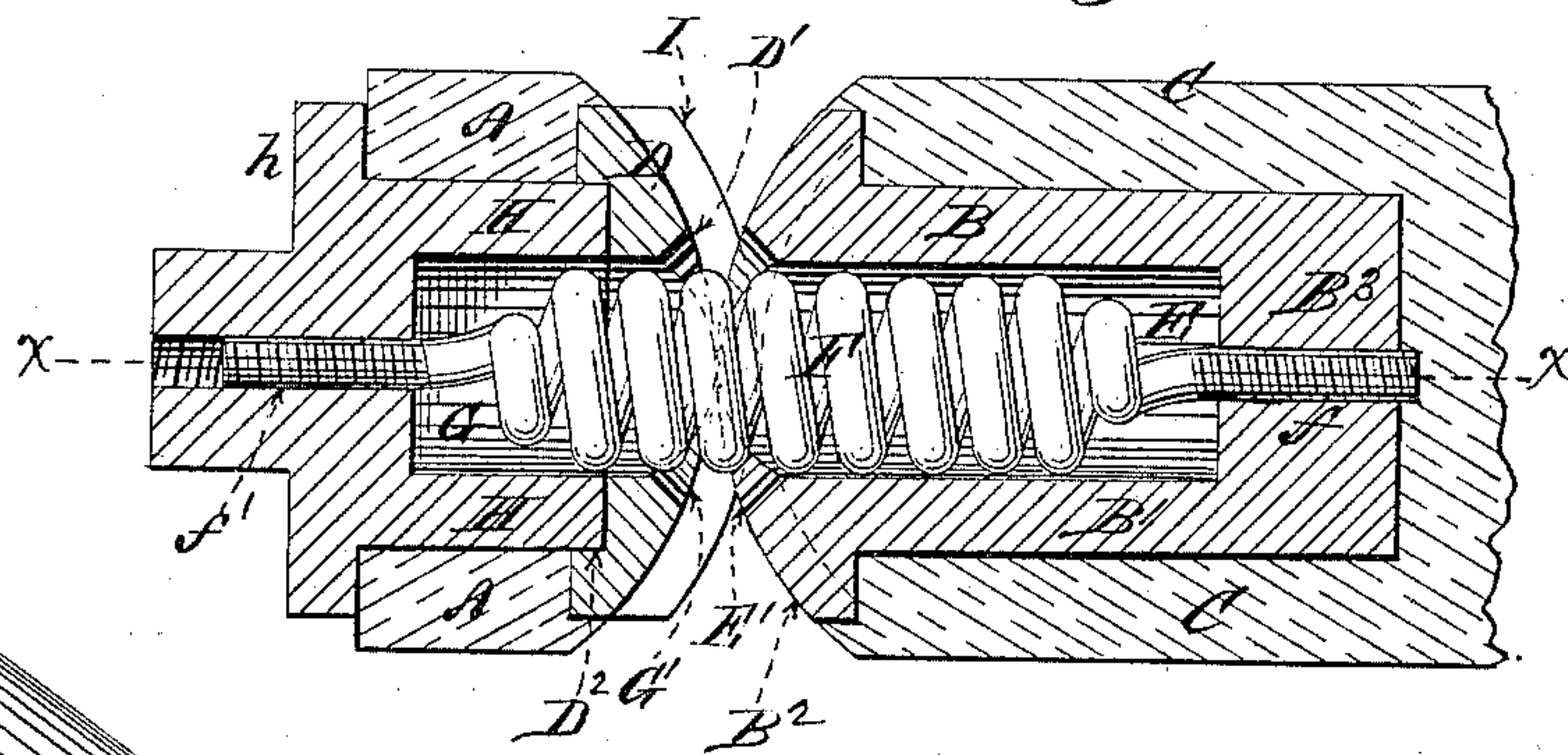
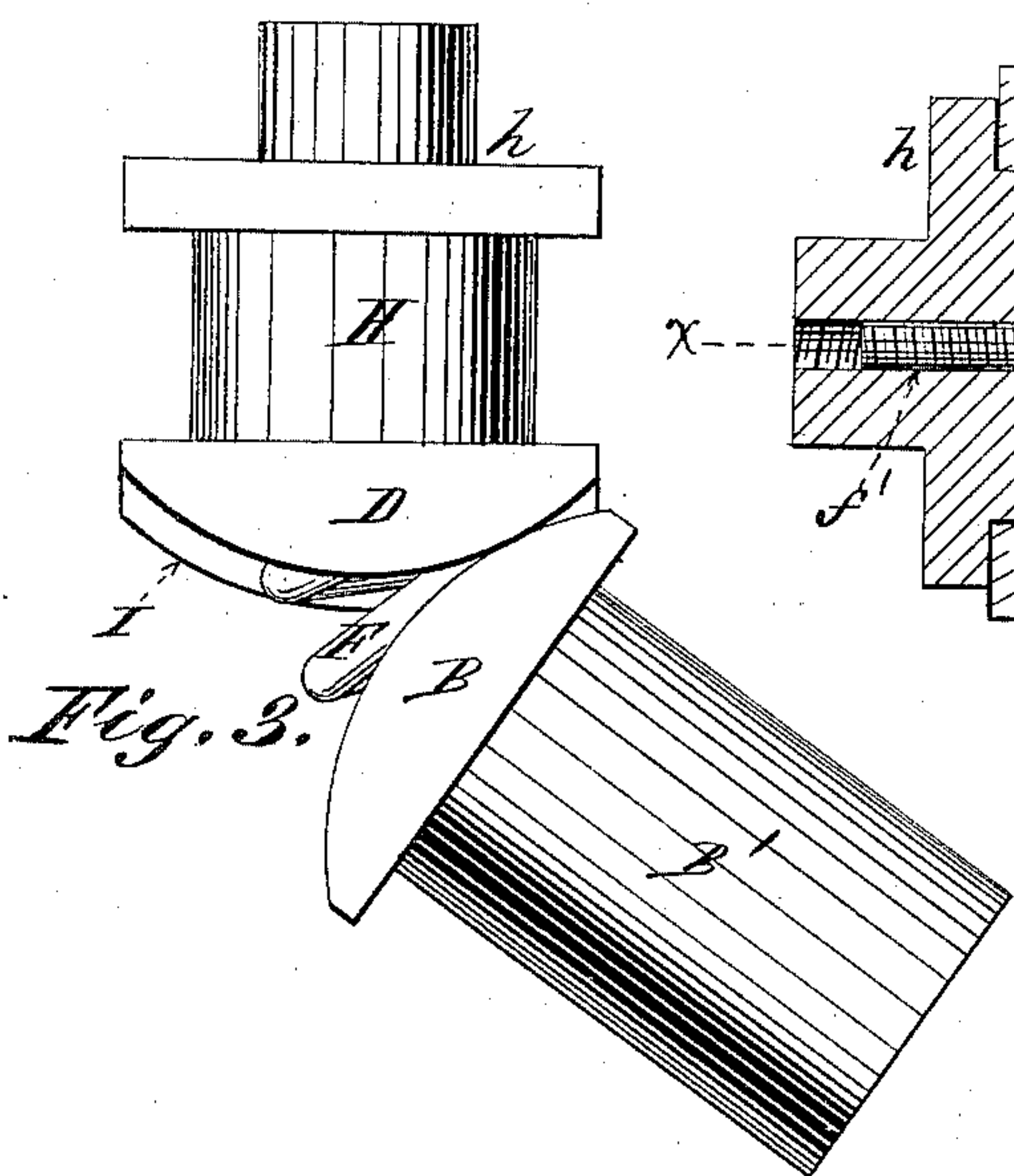
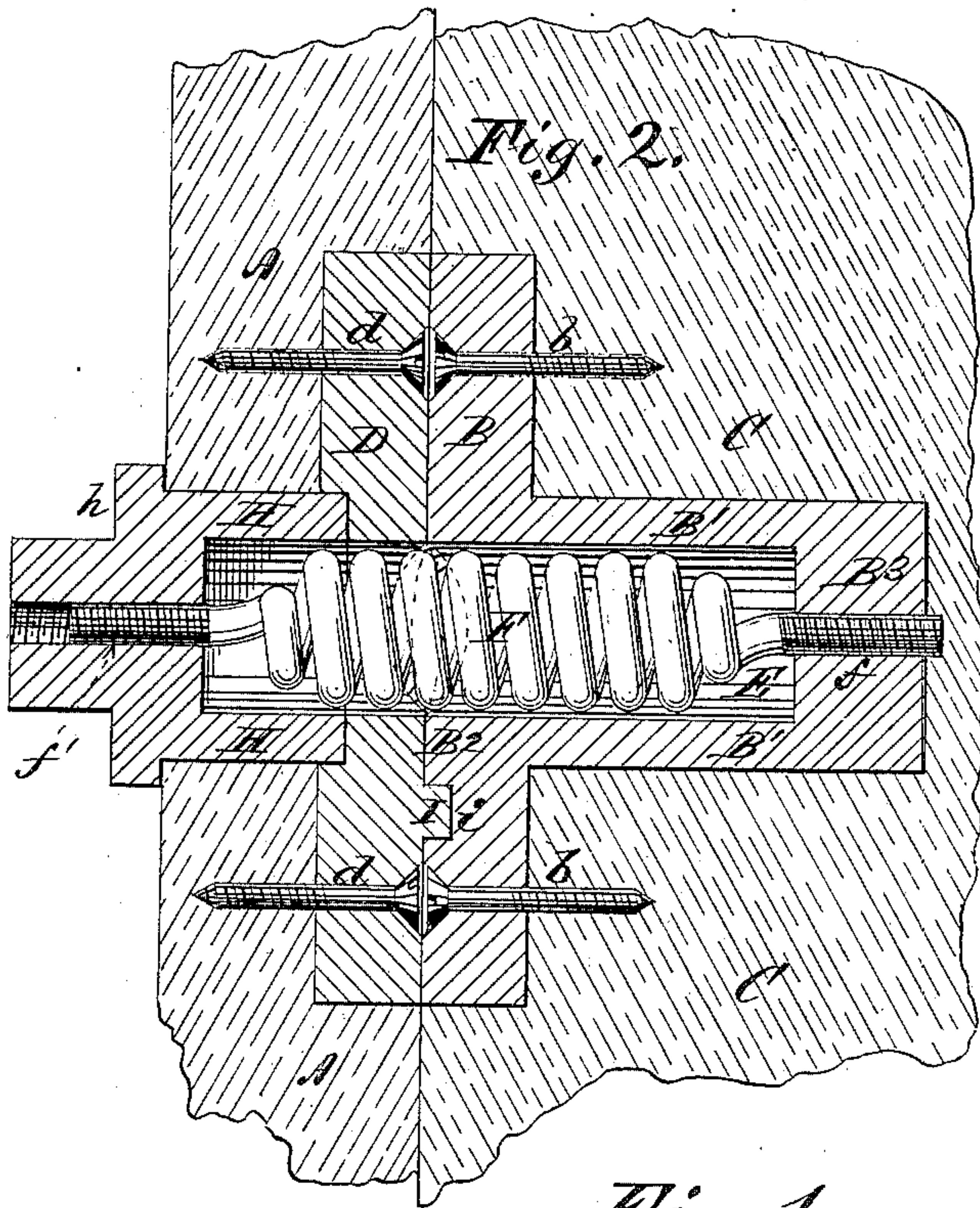
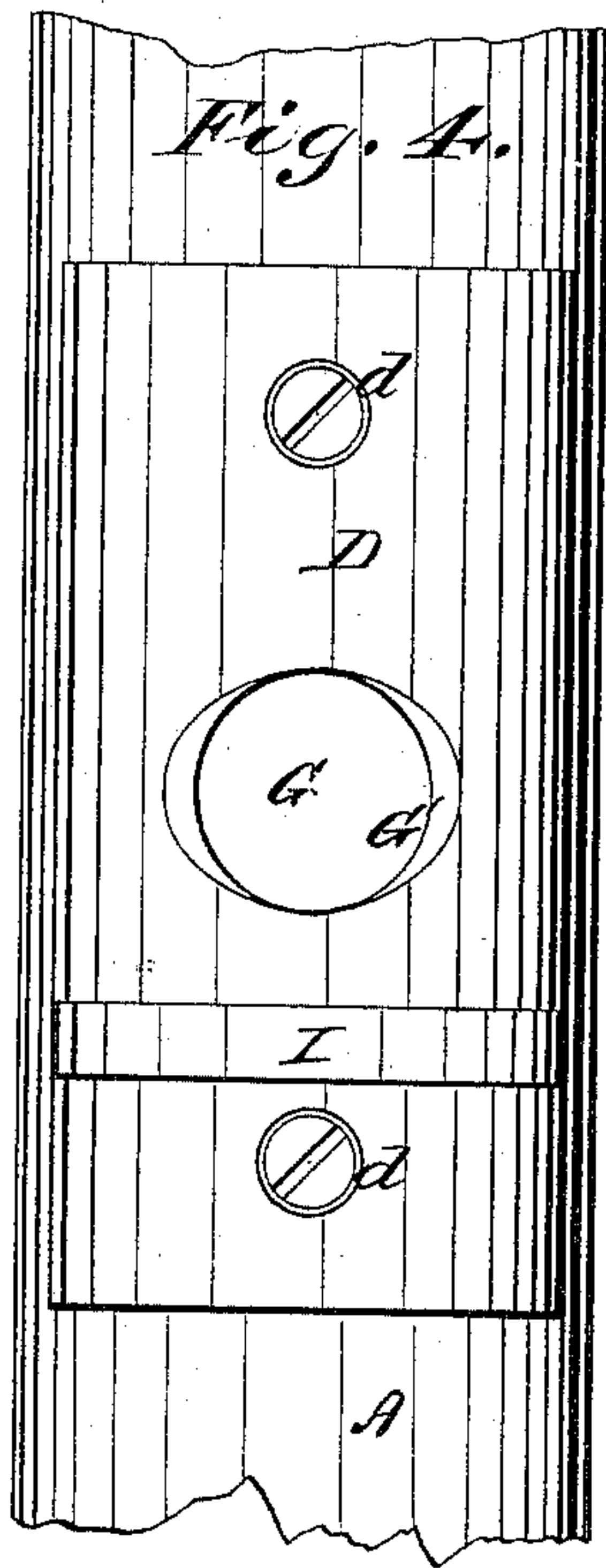
(No Model.)

T. JOHNSTON.

SPRING HINGE.

No. 306,402.

Patented Oct. 14, 1884.



Witnesses:
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UNITED STATES PATENT OFFICE.

THEOPHILUS JOHNSTON, OF ORANGE, NEW JERSEY.

SPRING-HINGE.

SPECIFICATION forming part of Letters Patent No. 306,402, dated October 14, 1884.

Application filed May 23, 1884. (No model.)

To all whom it may concern:

Be it known that I, THEOPHILUS JOHNSTON, of Orange, New Jersey, have invented an Improvement in Double-Acting Spring-Hinges, of which the following is a specification.

This improvement relates to the class of spring-hinges which operate to close a swinging door when opened in either direction.

The invention consists in the connection of the pairs of hinge-plates with each other face to face by means of a contracting spiral spring, one end of said spiral spring being deposited in and fastened at the bottom of a cylindrical recess formed in the center of the face of one hinge-plate, while the other end of the spiral spring extends into and is fastened at the bottom of a corresponding recess having its mouth in the center of the face of the other hinge-plate. The mouths of the two cylindrical recesses are chamfered on their opposite sides, respectively, in order to allow the spiral spring to bend in a horizontal plane when the door is opened in either direction. The door is thus held against the jamb by the contractile force of the spiral spring. It is preferred to provide the hinge-plates, the one with a horizontal tongue and the other with a corresponding horizontal groove, in order that the weight of the door shall be sustained by the tongued and grooved joints instead of by the springs.

The accompanying drawings, representing a double-acting spring-hinge embodying my improvement applied to a door, are as follows:

Figure 1 is a central horizontal section. Fig. 2 is a central vertical section through the line *xx* on Fig. 1. Fig. 3 is a top view of the double-acting hinge detached from the door, showing the manner in which the spiral spring is distended and bent upon its axis by the opening of the door, and the rocking of the movable hinge upon the stationary hinge. Fig. 4 is a front elevation of one of the hinge-plates.

In order to connect the door with the jamb by a hinge of this character, it is necessary that access shall be had to the inner side of the jamb—that is, the side opposite to that against which the hinged edge of the door bears. Where such access cannot conveniently be had the hinge-connection is made with a vertical strip, A, which, after the hinges are attached, is fastened to the jamb. The hinge

consists of the movable hinge-plate B, secured by the screws *b b* to the edge of the door C, and of the stationary hinge-plate D, secured by the screws *d d* to the jamb or to the face of the vertical strip A. The movable hinge-plate B has cast upon its inner side the hollow boss B'. A cylindrical recess, E, extends horizontally inward from the center of the outer face, B², of the hinge-plate B. The object of the boss B' is to provide for the formation of a recess of sufficient depth to receive several convolutions of the spiral spring F, the screw-threaded end *f* of which is screwed into the centrally-tapped end B³ of the boss B'. A hole, D', bored transversely through the central part of the stationary hinge-plate D, constitutes the outer portion of the recess G, which corresponds to the recess E in the movable hinge-plate. At its inner end the hole D' is counterbored to form the shoulder D², against which abuts the end of the tube H, cast upon the face of the nut *h*. The interior of the tube H constitutes the inner portion of the recess G. The nut *h* is tapped to receive the screw-threaded end *f'* of the spiral spring. The door C has a hole bored horizontally into it to receive the boss B' of the movable hinge-plate, and similarly the vertical strip A has a hole bored horizontally through it to receive the tube H. When the nut *h*, having engaged the screw-threaded end *f'* of the spiral spring, is turned in the appropriate direction, the spiral spring is distended, and as the end of the tube H bears against the shoulder D² the door is held against the jamb or against the strip A with the elastic force of the distended spring. The mouths E' and G' of the recesses E and G are respectively chamfered on their opposite sides, to allow the spring to bend in a horizontal plane in either direction as the door is swung inward or outward. The movable hinge-plate is preferably provided with a horizontal groove, *i*, and the stationary hinge-plate with a horizontal tongue, I, for engaging the groove *i*. Thus the weight of the door is supported by the bearing of the tongue I in its groove *i*, while the door is held against the vertical strip or jamb by the tension of the spiral spring F. Preferably the faces of the hinge-plates are slightly rounded, as shown, and the hinged edge of the door, together with the edge of the strip A, to which

it is hinged, are correspondingly rounded, so that the door in swinging has a rolling motion instead of swinging upon two fixed vertical axes like doors hung with ordinary double-acting spring-hinges.

In applying my invention to a door, two of my hinges will ordinarily be employed, one above the other, in the usual manner.

The size of the hinges, particularly the size and strength of the springs, will be varied according to the weight and size of the door to which the springs are to be applied. The opening the door in either direction distends the springs and also bends them horizontally upon their axes, so that when released the door will be closed by the contractile force of the springs, by virtue of which they tend to straighten themselves axially.

I claim as my invention—

1. A double-acting spring-hinge consisting, essentially, of a movable hinge-plate adapted for fastening to the edge of a door, and provided with a recess of suitable depth extending inward from its face, and of a stationary hinge-plate adapted to be fastened to the door-frame or to a vertical strip, which is subsequently to be fastened to the door-frame, and

provided with a perforation extending inward from its outer face, a spiral spring secured at one end in the bottom of the recess formed in the movable hinge-plate and extending through the perforation formed in the stationary hinge-plate, and a tightening-nut for engaging the end of the spiral spring which extends through the hole in the stationary hinge-plate, and distending the spiral spring, and thus securing the hinge-plates together, and holding the door against the jamb by the elastic contractile force of the spring.

2. In a double-acting spring-hinge; the hinge-plates B and D, in combination with the spiral spring F and the nut h, as and for the purposes set forth.

3. In a double-acting spring-hinge, the centrally-recessed hinge-plates B and D, provided, respectively, with the tongue I and groove i, in combination with the spiral spring F and the nut h, arranged in the manner and for the purposes set forth.

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