

E. BOMMER.
DOUBLE ACTING SPRING HINGE.
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966,380.

Patented Aug. 2, 1910.

Fig. 1.

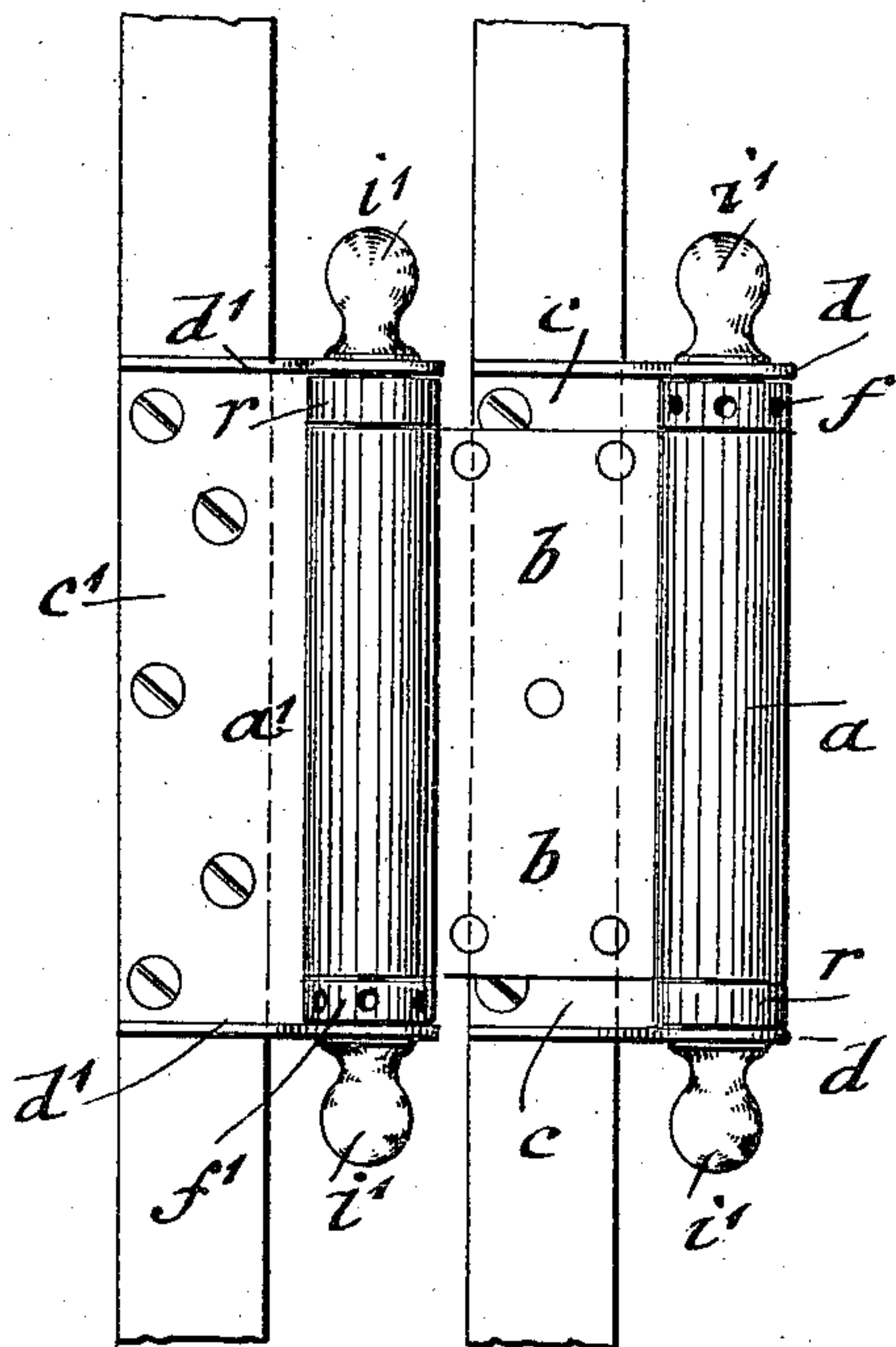


Fig. 2.

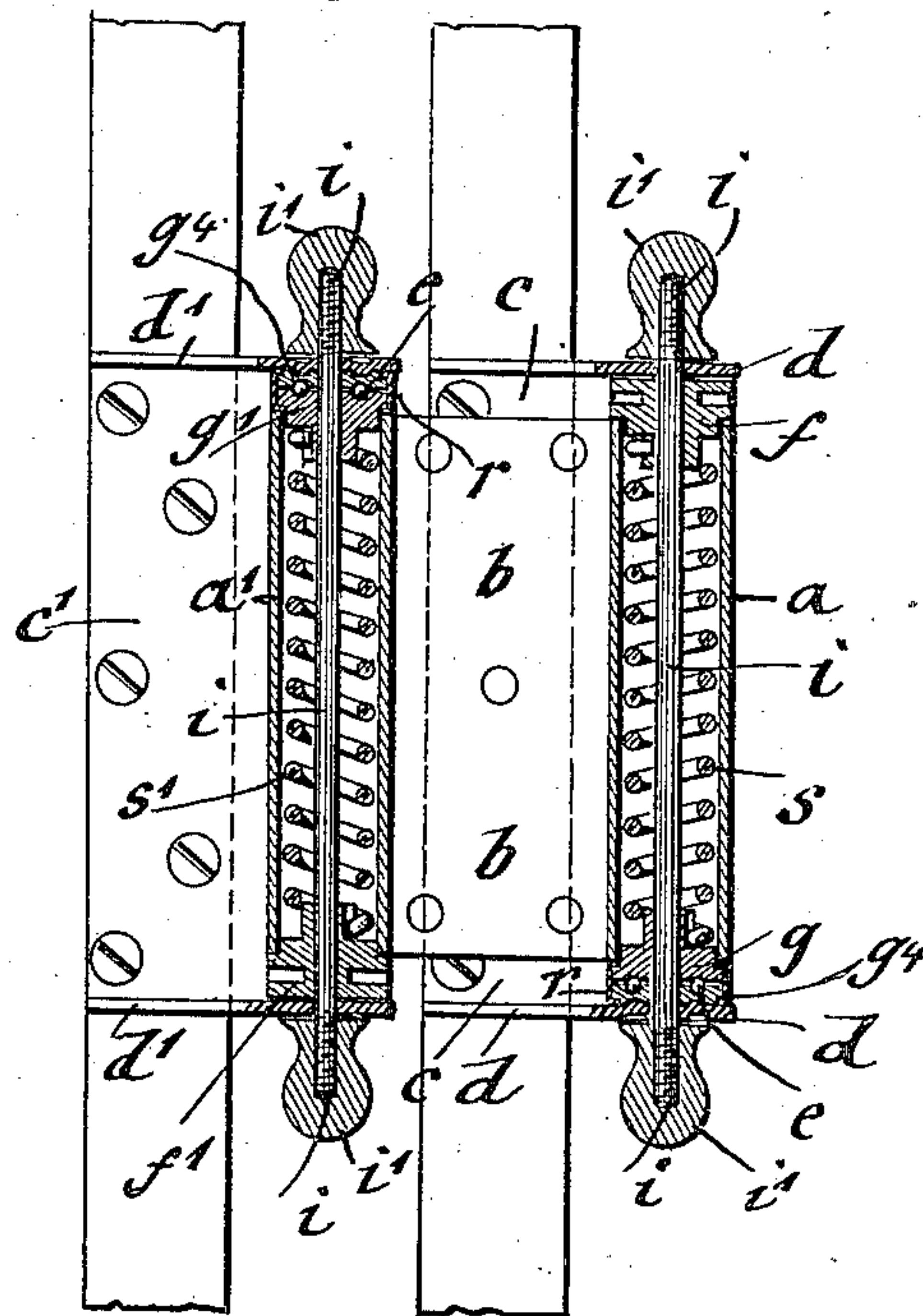
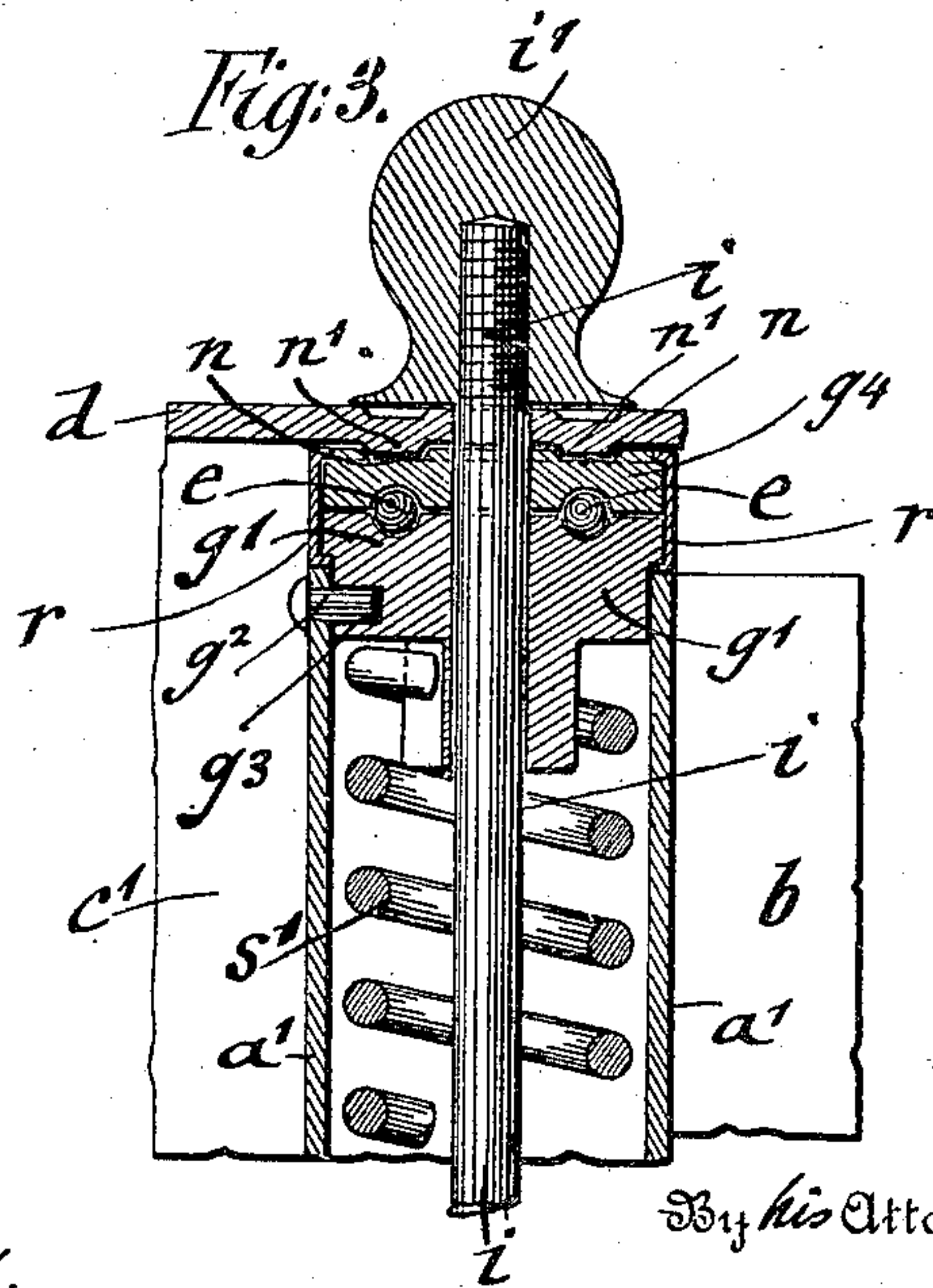


Fig. 3.



Witnesses:
Fannus Fiske
H. J. Suberbie.

Inventor
E. Bommer
By his Attorney
James G. Coyle.

UNITED STATES PATENT OFFICE.

EMIL BOMMER, OF NEW YORK, N. Y.

DOUBLE-ACTING SPRING-HINGE.

966,380.

Specification of Letters Patent.

Patented Aug. 2, 1910.

Application filed December 1, 1908. Serial No. 465,572.

To all whom it may concern:

Be it known that I, EMIL BOMMER, a citizen of the United States of America, residing in New York, in the borough of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Double-Acting Spring-Hinges, of which the following is a specification.

10 This invention relates to certain improvements in the double-acting spring-hinge for which Letters Patent No. 898,031 were granted to me on September 8, 1908, the improvements being designed with a view of simplifying the construction of the double-acting spring-hinge and reducing the cost of the same, they being also applicable to single-acting spring-hinges for the same reasons.

20 In practically testing the improved double-acting spring-hinge referred to, it was found that the use of independent ball-bearings, interposed between the pintle-sockets and the upper edge of one spring-barrel and the lower edge of the other spring-barrel, was connected with considerable expense, for the reason that it required four ball-bearings for each door and eight ball-bearings for a pair of doors. While the former construction is preferable for use with large and heavy doors, there is also a demand for double-acting spring-hinges of a lighter and cheaper construction in which the ball-bearings, instead of being arranged independently of the pintle-sockets and fixed spring-holders, are combined directly with the latter, that is to say, one member of the ball-bearings having an annular groove on its face is non-rotatably coupled by suitable means with the ear of one flange adjacent to the fixed spring-holder, which is rigidly attached to the spring-barrel and which has a corresponding annular groove on the face of its exterior portion outside of the upper end of one spring-barrel, said spring-holder forming the second member of the ball-bearings and inclosing with the first member the antifric-
40 tion balls interposed between the annular grooves of the two members, while a retaining ring, which is bent over the edges of the two members, holds the antifric-
50 tion balls in place for the convenient assembling and disconnecting of the parts of the spring-hinge. This arrangement eliminates the separate ball-bearings in single- and double-acting spring-hinges and substitutes for them ball-

bearings which are combined with the upper face of the fixed spring-holder, so as to permit the use of longer springs in the spring-barrels, give an additional support to the pintles, and dispense with the pintle-sockets.

For these purposes the invention consists of a double-acting spring-hinge the construction of which will be fully described hereinafter and finally pointed out in the claim.

In the accompanying drawings, Figure 1 represents a side-elevation of my improved double-acting spring-hinge, Fig. 2 is a vertical section through the same, and Fig. 3 is a section through the ball-bearing spring-holder interposed between the bent-up ears of the flange and the spring-barrel, drawn on a larger scale.

Similar letters of reference indicate corresponding parts throughout the figures.

The general construction of my improved double-acting spring-hinge is the same as that shown and described in the prior patent referred to. The spring-hinge consists of two spring-barrels a, a^1 , which are connected by a web b that extends between the two spring-barrels. The spring-barrels are provided with flanges c, c^1 which are provided at their upper and lower ends with perforated ears d, d^1 which serve for supporting the pintles i of the spring-barrels. Adjustable tension-collars f, f^1 are located at diagonally opposite ends of the spring-barrels and provided at the inside of the spring-barrels with seats or lugs for receiving one end of the springs s, s^1 located in the spring-barrels, while the opposite ends of the springs are engaged by the interior seats or lugs of two fixed spring-holders g, g^1 , which latter are rigidly attached to the ends of the spring-barrels, preferably by suitable pins g^2 which pass through the spring-barrels into sockets g^3 in the fixed spring-holders. The fixed spring-holders have exterior portions which extend outside of and abut upon the ends of the spring-barrels, said exterior portions having an annular groove concentric with the pintles and forming one member of a ball-bearing. Antifric-
100 tion balls e are interposed between the groove of the fixed spring-holder and the groove of a second or additional member g^4 of the ball-bearing and held in position by a retaining ring r , which holds all the members of the ball-bearing from separating, said retaining ring being bent over the edges of the grooved

members. The adjustable tension-collars with their spring-holding lugs are located diagonally opposite to each other, one at the lower end of one spring-barrel and the other at the upper end of the other spring-barrel, while the fixed spring-holders with their ball-bearings are respectively located diagonally opposite to each other at the upper and lower ends of the spring-barrels. The pintles i pass contrally through the perforations of the ears of the flanges, ball-bearing, fixed spring-holder, tension-collar and spring of each barrel, and are provided at their upper and lower ends with ball-shaped tips or terminals i^1 which are screwed to the threaded ends of the pintles or otherwise attached thereto. The spring-holder g with its ball-bearing is located at the lower end of the barrel a , and the other spring-holder g^1 with its ball-bearing at the upper end of the other spring-barrel a^1 adjacent to the ears of the flanges, as shown in Fig. 2. The face of the additional member g^4 of each ball-bearing, adjacent to the perforated ear of the flange, is preferably provided with indentations or depressions n , which register with raised portions n^1 punched into the adjacent ear, as shown in Fig. 3, so as to interlock with the same when the assembled parts of the ball-bearing spring-holder are placed in position, the adjacent ear yielding sufficiently for permitting the springing in of the combined barrel, spring-holder and ball-bearing, and adjustable tension-collar, as the retaining ring r holds the members of the ball-bearing, including the antifriction balls e , in position for assembling or detaching the parts of the spring-hinge, or other means can be used for connecting the parts with the ears of the spring-hinge. When the spring-hinge is in use, the ball-bearing member g^4 of the fixed spring-holder adjacent to the ear turns with the same, while the fixed spring-holder turns with the spring-barrel. The adjustable tension-collars f, f^1 are located respectively at the upper and lower ends of the spring-barrels a, a^1 and between the same and the adjacent perforated ears of the flanges. The adjustable tension-collars f, f^1 are provided in the usual manner with radial holes and locked in position after the tension of the springs is adjusted by means of set-pins. The coiled springs s, s^1 are located in the spring-barrels

and coiled in opposite direction to each other, that is to say, the spring in one barrel is coiled in the right-hand direction and the spring in the other barrel in the left-hand direction. The four pintle-sockets heretofore in use are entirely dispensed with, so that by the construction described the expense of double-acting ball-bearing spring-hinges for a pair of doors is considerably reduced, while still all the advantages of the ball-bearings at diagonally opposite points of the spring-barrels are obtained. The improved double-acting spring-hinges are equally useful and effective for many purposes, as the appearance of the spring-hinges and the symmetrical hanging of a pair of doors with the same is accomplished in the same manner as when four pintle-sockets and independent ball-bearings are employed. As springs of greater length can be used in the spring-barrels, greater power is imparted to this style of spring-hinges, but at considerably smaller cost than with the double-acting ball-bearing spring-hinges heretofore in use.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

In a spring-hinge, the combination of a spring-barrel, a flange jointed thereto and provided with perforated ears, a fixed spring-holder inserted into the barrel and having an exterior portion extending outside of and abutting upon the end of the barrel, said exterior portion having an annular groove in its face, a ball-bearing member having an annular groove in its face adjacent the spring-holder, antifriction balls interposed between the grooves of the spring-holder and ball-bearing member, a retaining ring bent over the edges of the exterior portion of the spring-holder and ball-bearing member, and means for locking together the adjacent faces of one of the ears on the flange and the ball-bearing member.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

EMIL BOMMER.

Witnesses:

PAUL GOEPEL,
HENRY J. SUHRBIER.