

(No Model.)

A. S. HELD.
SPRING HINGE.

No. 515,334.

Patented Feb. 27, 1894.

Fig. 1.

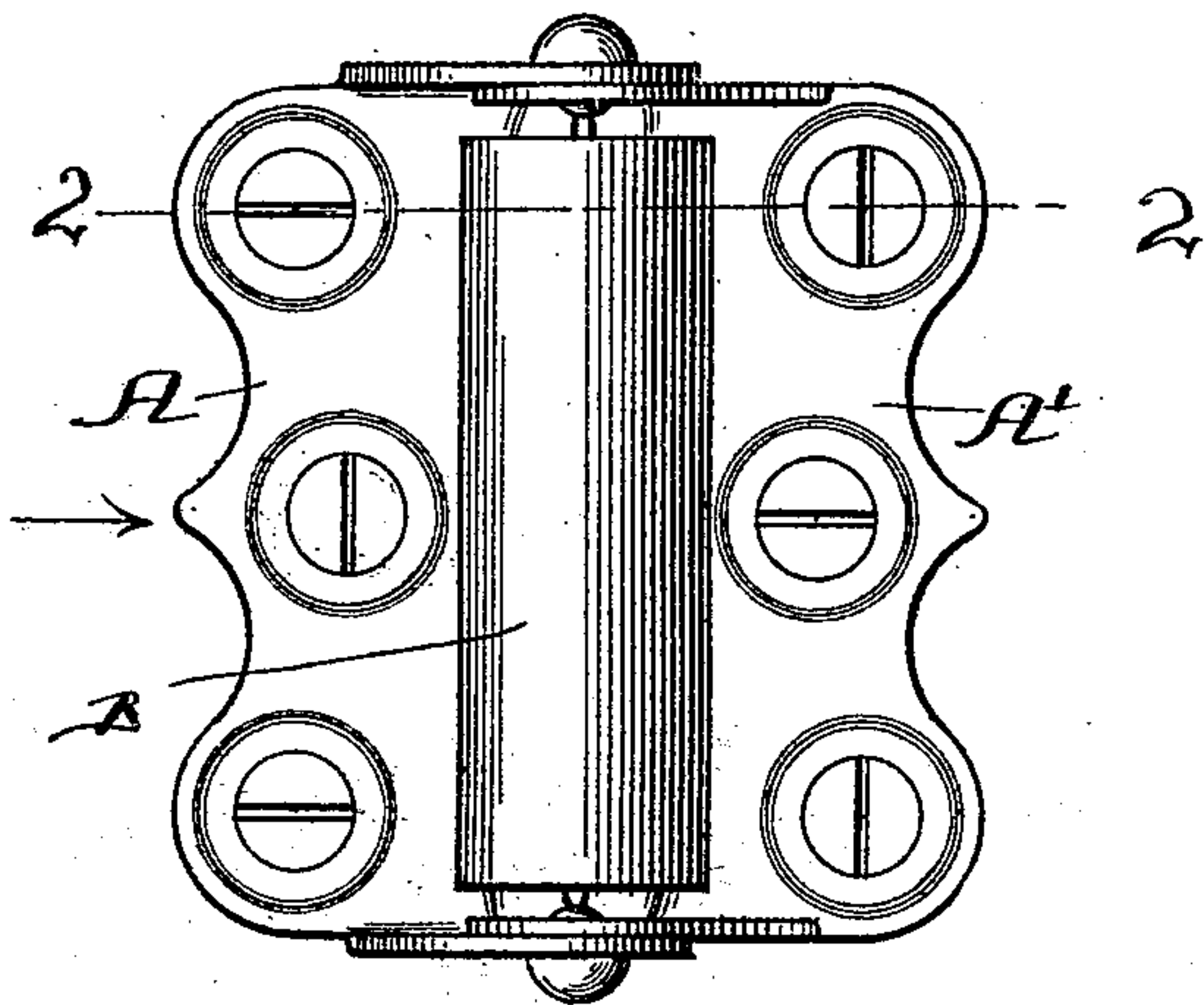


Fig. 2.

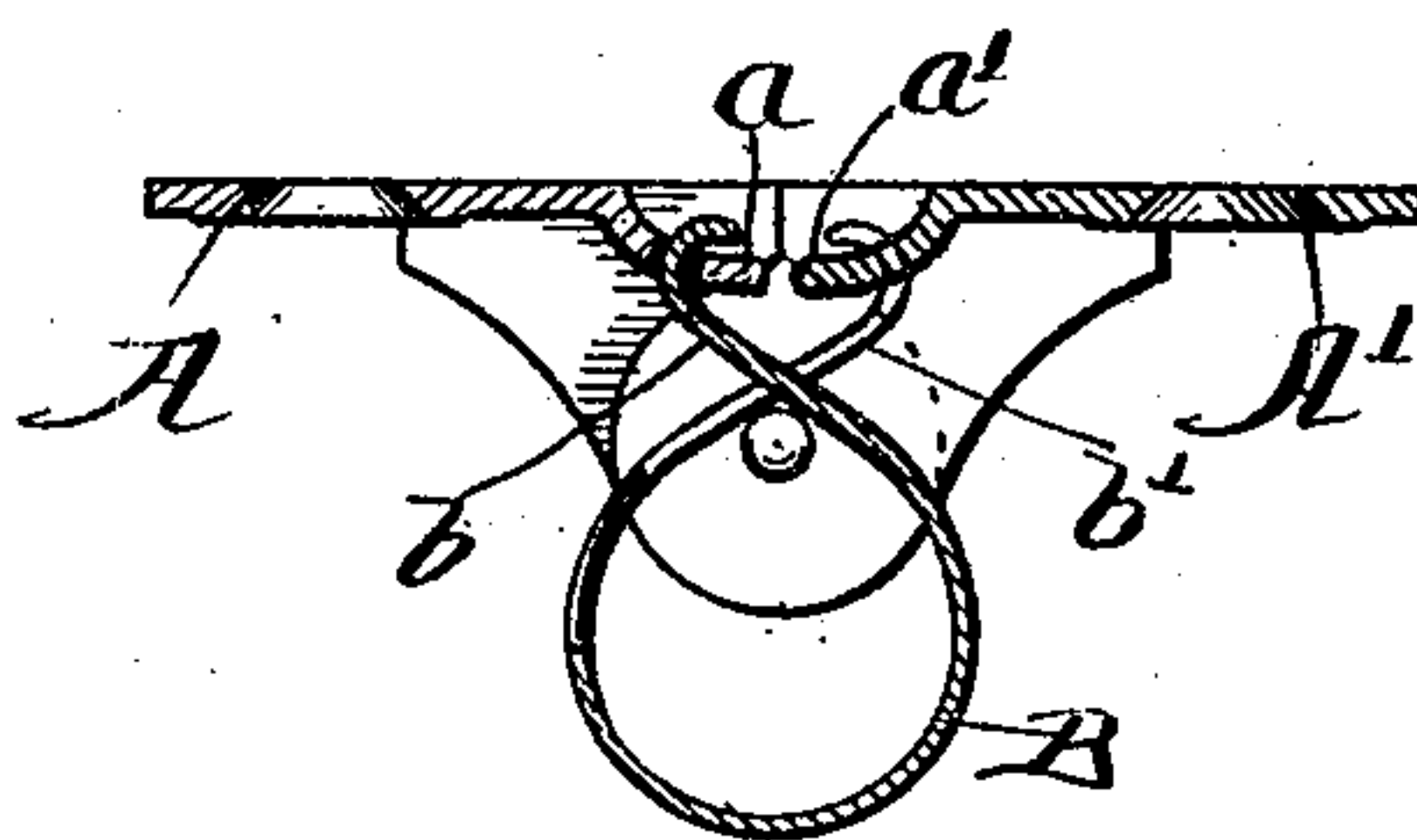


Fig. 3.

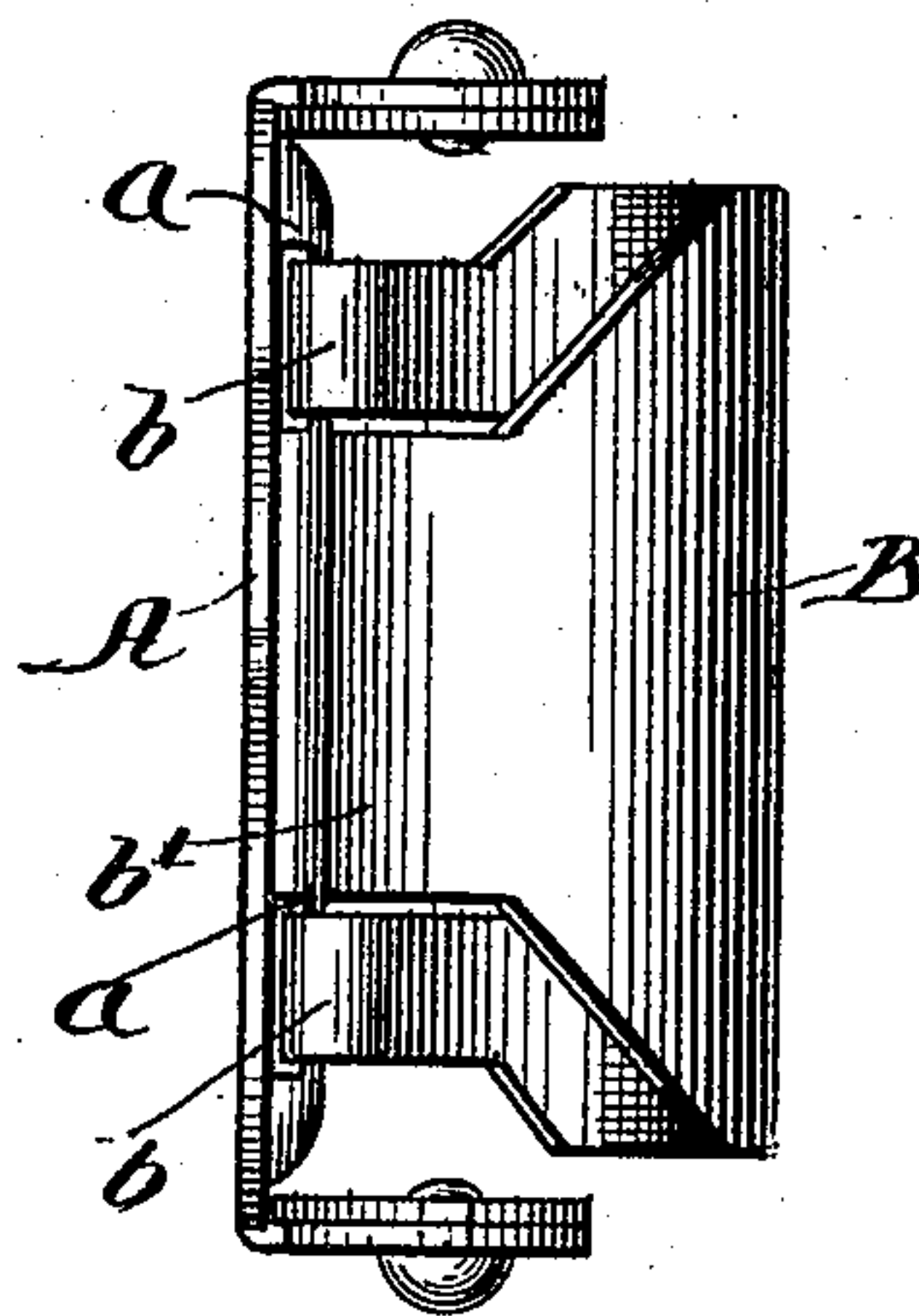


Fig. 4.

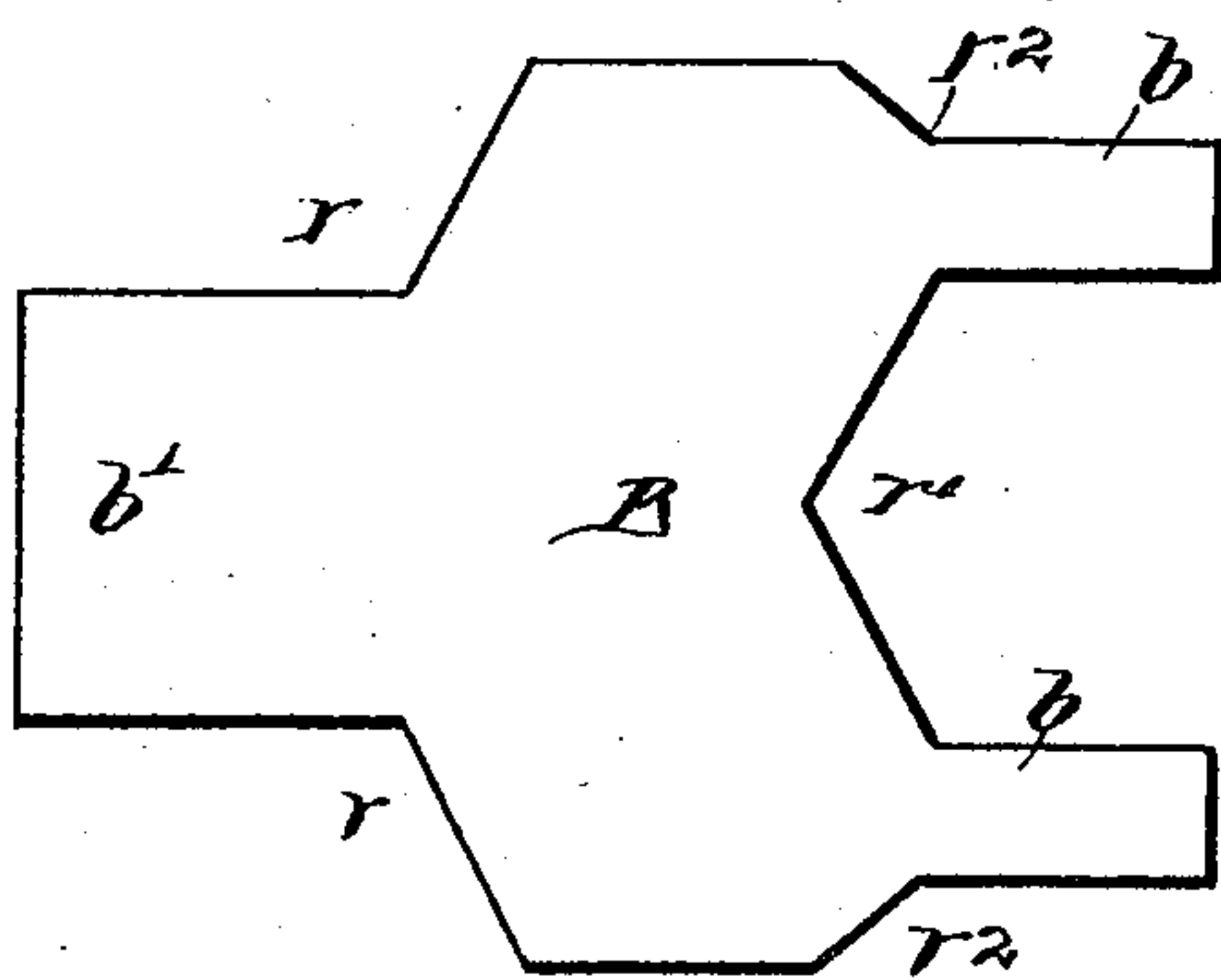
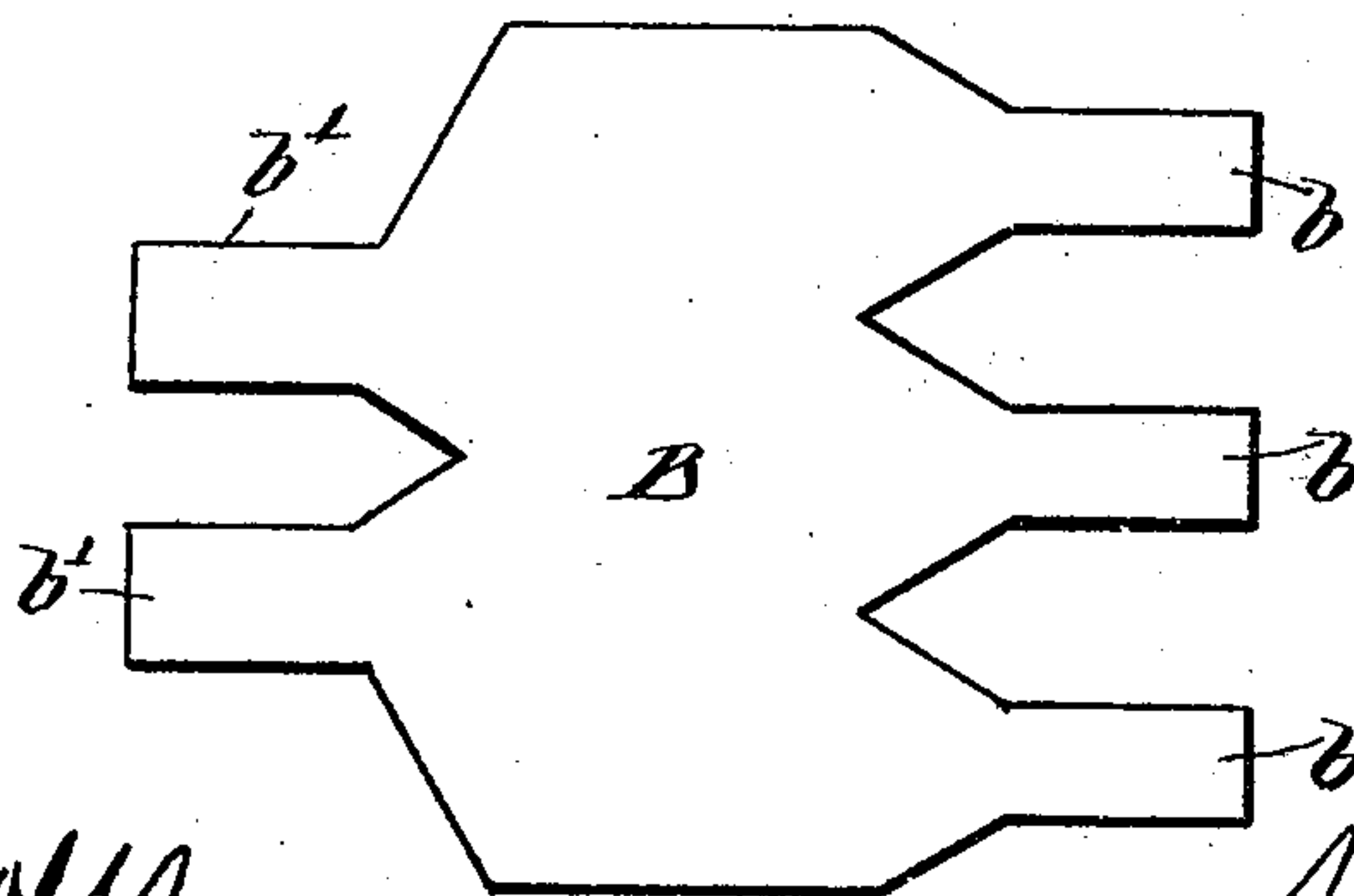


Fig. 5.



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SPRING-HINGE.

SPECIFICATION forming part of Letters Patent No. 515,334, dated February 27, 1894.

Application filed March 23, 1893. Serial No. 467,286. (No model.)

To all whom it may concern:

Be it known that I, AUGUST S. HELD, a citizen of the United States of America, residing at Freeport, in the county of Stephenson and State of Illinois, have invented certain new and useful Improvements in Spring-Hinges, of which the following is a specification.

My invention relates to improvements in spring hinges of that class in which two leaves of suitable form provided with pivotally connected ears are combined with a sheet metal spring placed between the ears and having its ends fastened to the leaves. In hinges of this kind the spring has usually been bent into the form of an incomplete cylinder open at the side next the leaves and having each of its ends fastened to the corresponding leaf in such a way that the ends were nearest together and the cylinder was of least diameter when the hinge was in its closed position, the ends being drawn apart and the cylinder being expanded by the opening of the hinge. It is evident that a spring thus constructed and operated must work at a great disadvantage, since at every opening of the hinge, it must be bent in a reverse direction to that by which it was given its cylindrical form, and that the constant tendency must be to destroy the elasticity of the spring and thus impair its value. This is not only a theoretical conclusion, but it is borne out by the results of actual and repeated tests and may be taken as a settled fact. In order to overcome this difficulty I have simply changed the general form of my sheet metal spring by crossing its ends and making it a completely closed cylinder, the relation of the ends of the spring to the two leaves being reversed as compared with the hinge having the ordinary construction above referred to. The result of this change of construction is that the opening of the hinge increases the distance to which the ends are crossed and contracts the diameter of the cylinder made up of the spring, the flexure of the spring as the hinge is open being thus in the same direction as that applied to the spring in forming it into a cylinder.

The invention is fully described and ex-

plained in this specification and shown in the accompanying drawings, in which—

Figure 1 is a front elevation of a complete hinge in working position. Fig. 2 is a horizontal section through the line 2—2, Fig. 1, the view being downward. Fig. 3 is a side elevation of a hinge, the view being in the direction indicated by the arrow in Fig. 1. Fig. 4 is a plan of the blank from which the spring is formed; and Fig. 5 is a plan of a modified form of blank.

In Figs. 1 to 4, A, A' are two leaves of suitable form provided at their ends with ears pivoted together in the usual manner to form hinge joints. The inner edges of the leaves are formed with loops, *a, a'*, respectively, adapted to receive and retain the hooked ends of a spring of suitable form and in the space between the ears is placed a cylindrical sheet metal spring, B, formed on one of its edges with a single central leg, *b'*, and on its opposite edge with two symmetrically placed legs, *b, b*, separated by a space slightly wider than the leg, *b'*. The legs, *b, b, b'*, are crossed as shown in the drawings and their ends are formed into hooks, the hooks on the outer legs, *b, b*, being in engagement with the loops, *a*, on the leaf, A, and the hook on the central leg, *b'*, being in engagement with the loop, *a'*, on the leaf, A'. It is evident that the opening of the hinge from the closed position shown in Fig. 2 must not only separate the hooks, *b, b'*, but must increase the distance to which they are crossed and contract the cylinder into which the body of the spring is formed. In this operation the spring is bent in the same direction as that required in forming it originally, and there is no reason why a spring properly tempered should not stand the strain of such use for an indefinite period.

The outer edges of the legs, *b, b*, may evidently be straight lines continuous with the ends of the blank from which the spring is formed, but I prefer to form them with recesses, *r²*, Fig. 4, the re-entrant angles of these recesses being obtuse as shown, or being curved lines. It is also preferable to make the recesses, *r, r*, on opposite side of

the central leg, b' , in substantially the same form as the shallower recesses, r^2 , and I prefer also to make the opening, r' , between the legs, b, b , in substantially the form shown in Fig. 4.

Fig. 5 shows a blank in which one of the edges is formed with three legs, b, b, b , and the opposite edge with two legs, b', b' , adapted to pass through spaces between the legs, b, b, b . Whatever may be the form of the blank or the number of legs, it is desirable that the legs be so symmetrically placed that the spring may be balanced when in working position.

The hinge shown in the drawings is what is known as a hold-back hinge, that is, a hinge in which the force of the spring tends equally to close or open the hinge from a certain neutral position between its limit of motion, this neutral position being known as the dead point and being reached when the hinge pivot and the points of connection of the spring with the two leaves are all in the same plane. I do not, however, intend to limit the use of this form of spring to a hold-back hinge, since it may be so applied to a hinge as to tend to close it from any position which its leaves may assume. As shown in the drawings, the spring, B, is very nearly in the form of a perfect cylinder and in the following claims, it is spoken of as approximately cylindrical. I do not, however, intend to limit my invention in this respect to this specific cross-section, though the cylindrical form is probably preferable to any other.

Having now described and explained my

invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a spring hinge, the combination with two leaves of suitable form, of a sheet metal spring formed into approximately cylindrical form and having its ends crossed and attached to the leaves respectively, whereby the opening of the hinge from its closed position increases the distance to which the ends are crossed and decreases the diameter of the cylinder; substantially as shown and described.

2. In a spring hinge, the combination with two leaves of suitable form having ears pivoted together to form knuckle joints, of the sheet metal spring bent into approximately cylindrical form, the opposite edges of the spring being formed with legs crossing each other and fastened to the leaves of the hinge respectively; substantially as shown and described.

3. In a spring hinge the combination with two leaves suitably pivoted together, of a sheet metal spring bent into approximately cylindrical form and having on one of its edges two legs separated by a suitable space and on its opposite edge a leg adapted to pass through said space, the legs on the opposite edges of the spring being crossed and fastened to the leaves respectively; substantially as shown and described.

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Witnesses.

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