

No. 797,992.

PATENTED AUG. 22, 1905.

C. S. VAN WAGONER.

HINGE LEAF.

APPLICATION FILED OCT. 18, 1904.

Fig. 1.

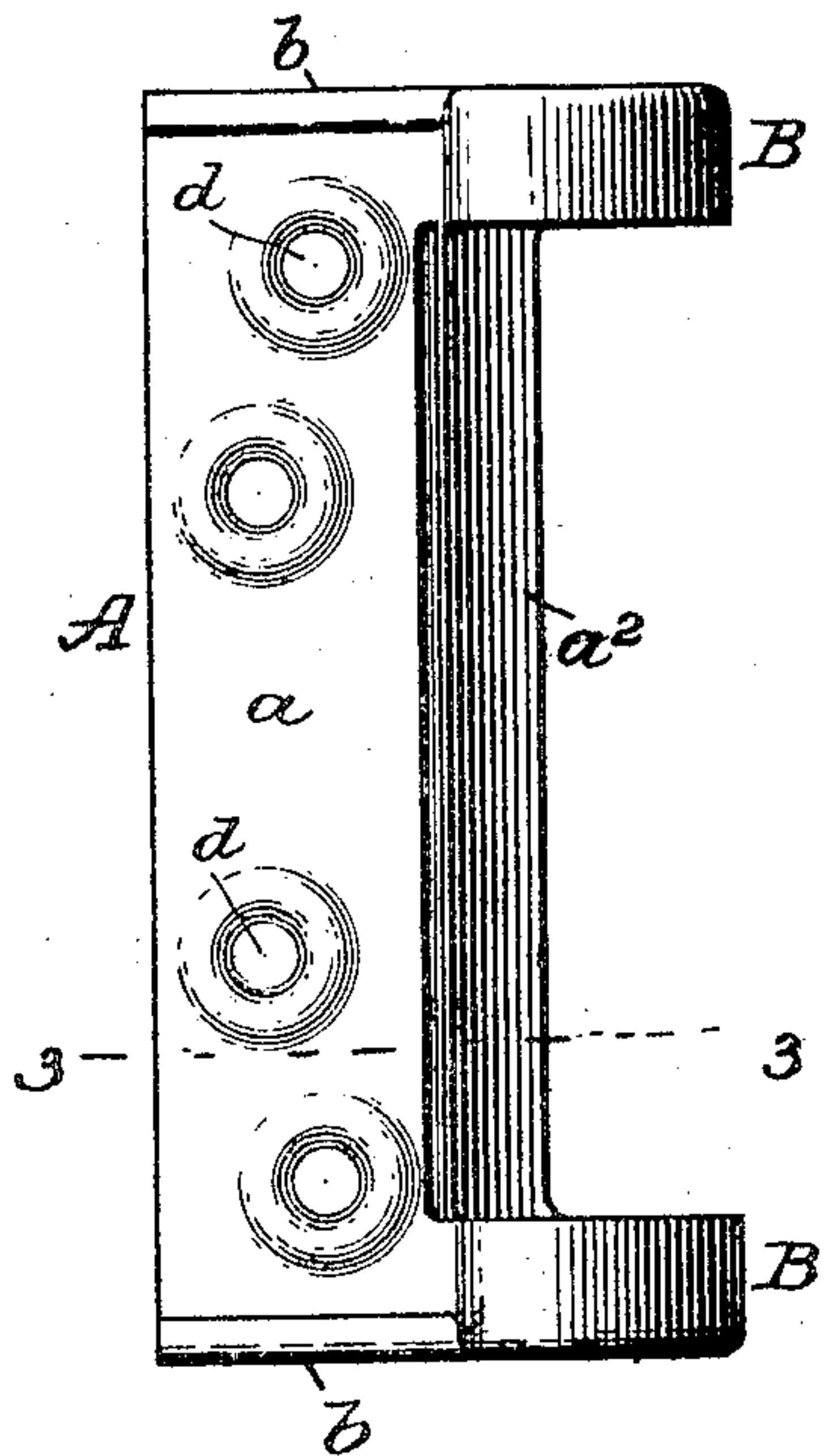


Fig. 4.

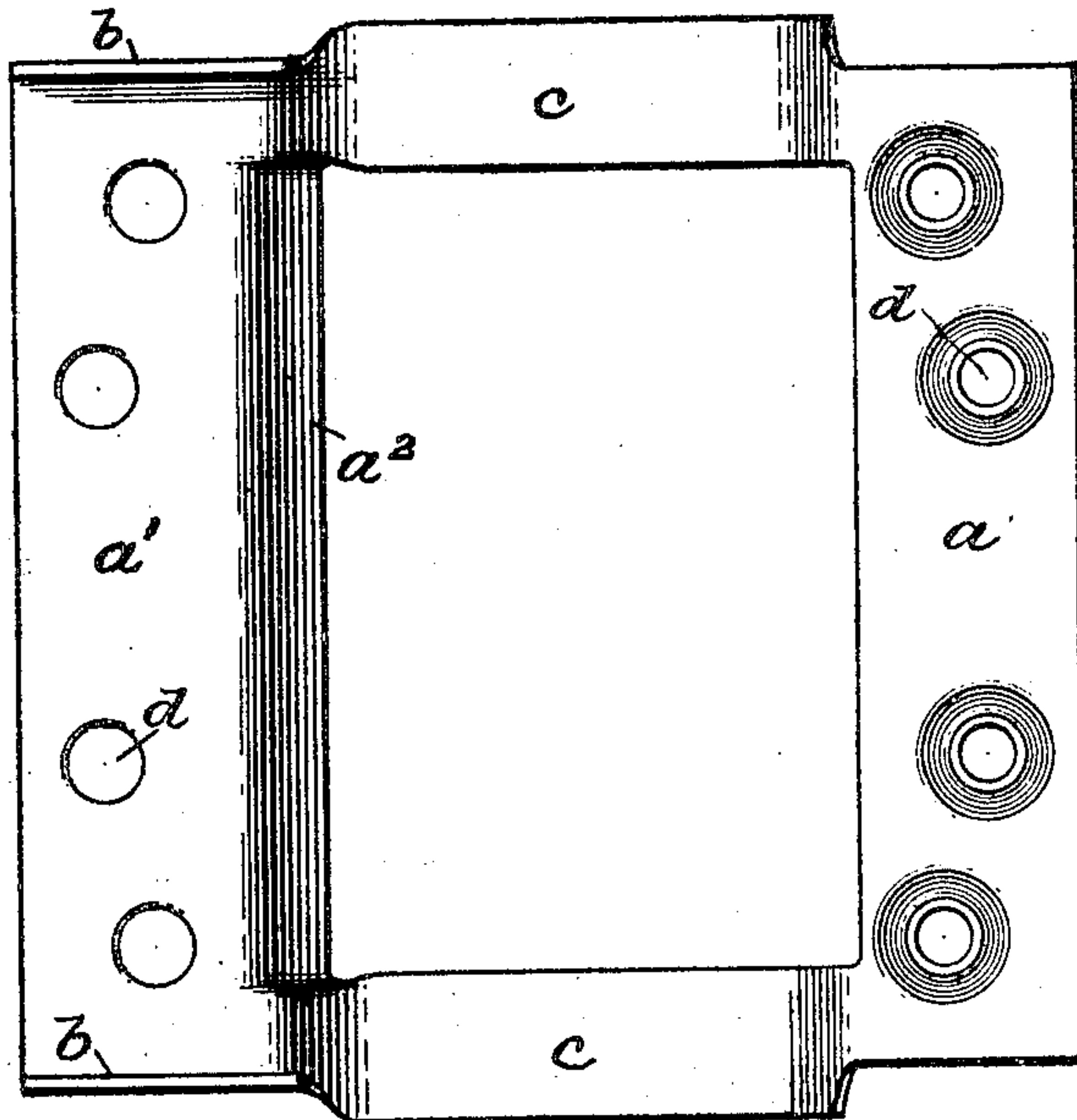


Fig. 2.

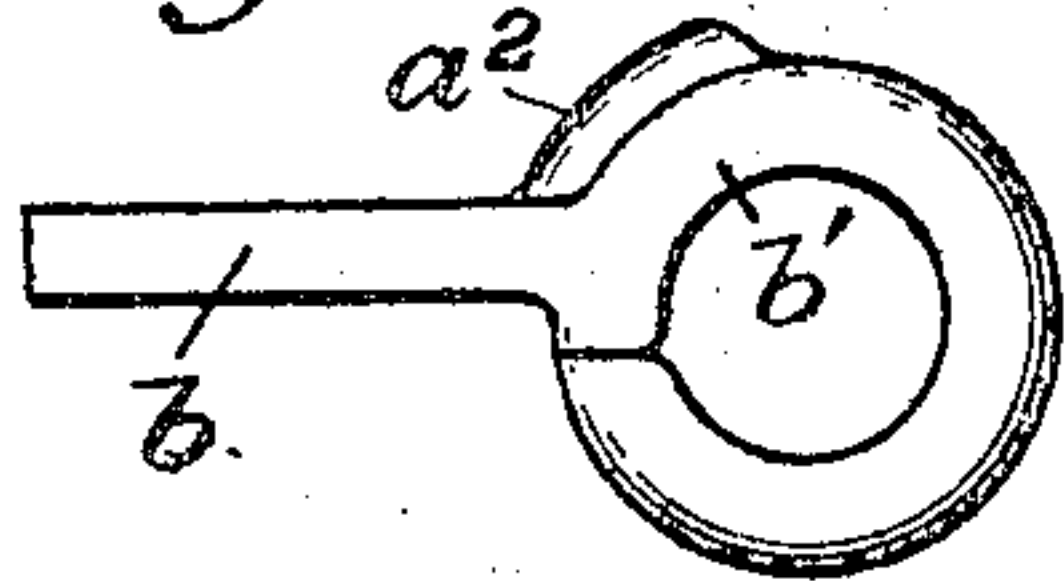


Fig. 6.

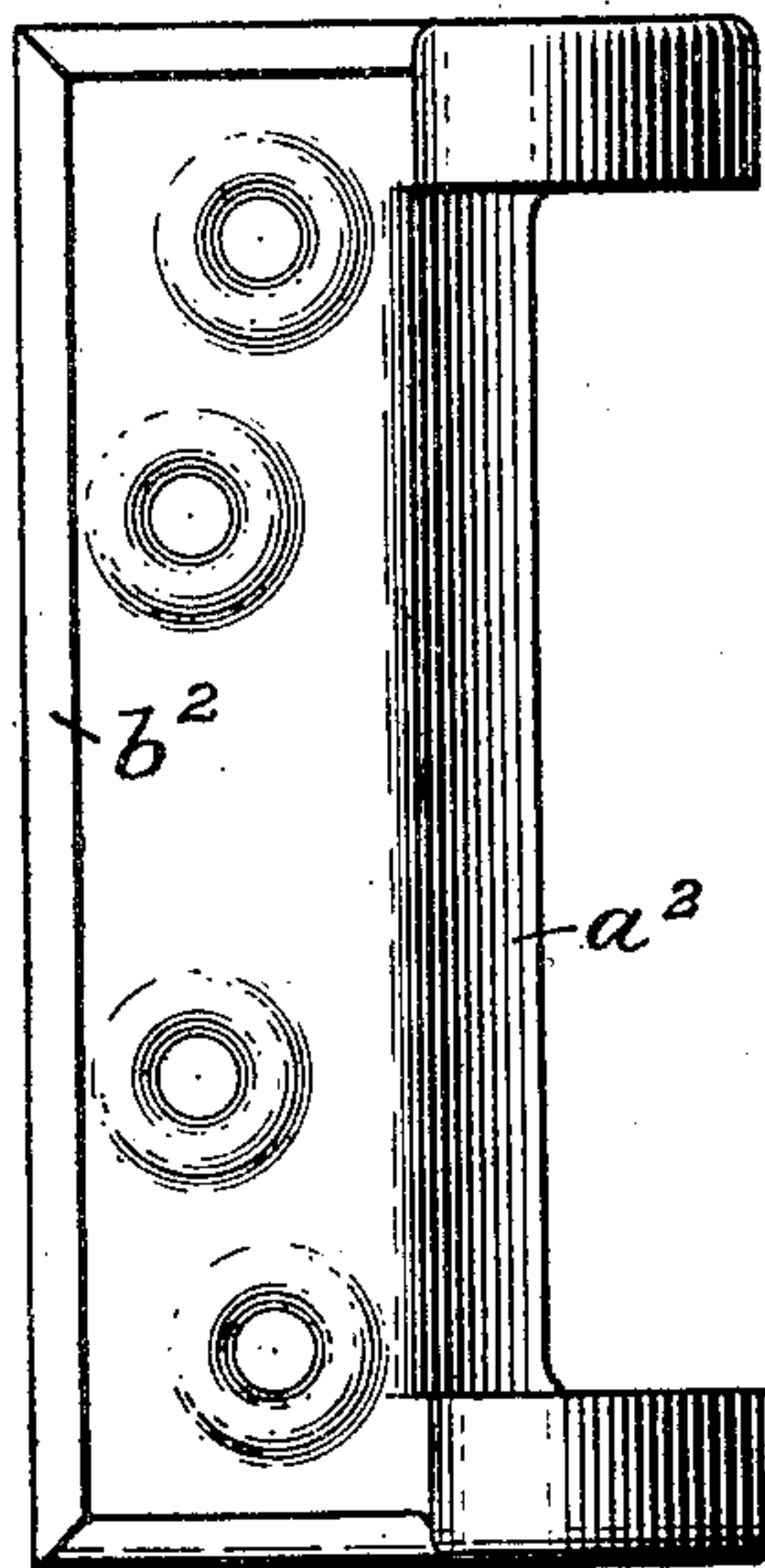


Fig. 3.

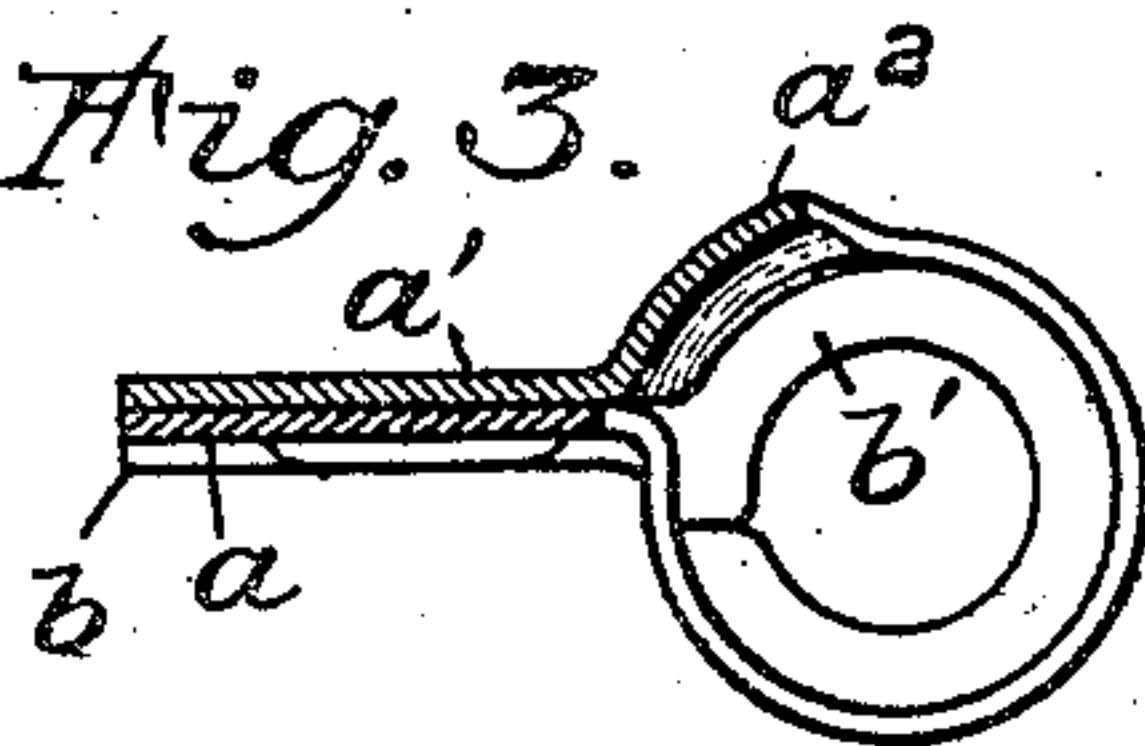
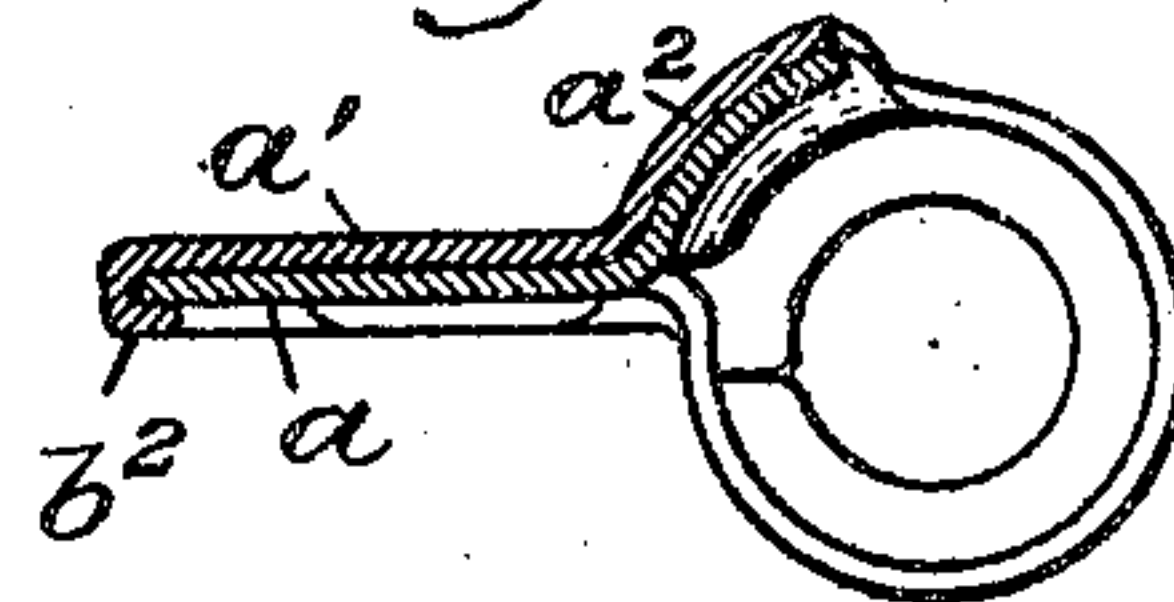


Fig. 7.



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HINGE-LEAF.

No. 797,992.

Specification of Letters Patent.

Patented Aug. 22, 1905.

Original application filed September 30, 1903, Serial No. 175,157. Divided and this application filed October 18, 1904. Serial No. 229,014.

To all whom it may concern:

Be it known that I, CORNELIUS S. VAN WAGONER, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented new and useful Improvements in Hinge-Leaves, of which the following is a specification.

In an application for United States Letters Patent filed by me September 30, 1903, Serial No. 175,157, of which my present application is a division, I show and describe a ball-bearing spring-hinge which in its preferred form involves the use of a hinge-leaf having cup-shaped knuckles in which the ball-bearings are housed and supported.

My present invention relates to a sheet-metal hinge-leaf adapted for use in a hinge such as is described in the aforesaid application for Letters Patent; and said invention consists in the features hereinafter described, and particularly pointed out in the claims hereunto annexed.

Referring to the drawings furnished and forming a part of this specification, Figure 1 is a front elevation of one of my novel hinge-leaves. Fig. 2 is a top view, and Fig. 3 is a sectional view, of said leaf, the sectional view being taken on line 3 3 of Fig. 1. Figs. 4 and 5 are plan and edge views, respectively, of a sheet-metal blank from which the leaf of Fig. 1 is formed; and Figs. 6 and 7 are front and cross-sectional views, respectively, of a hinge-leaf of modified construction embodying my invention.

My novel hinge-leaf is designed for use in connection with a companion hinge-leaf having a tubular knuckle adapted to be inserted between and to be embraced by the knuckles at the opposite ends of the leaf and is more especially intended for a ball-bearing spring-hinge in which the spring and ball-bearings are housed within the hinge-knuckles.

The main object of my invention is the production of a sheet-metal hinge-leaf which shall possess the strength and rigidity requisite for hinges designed for heavy or moderately heavy supporting duty.

The leaf illustrated in Figs. 1, 2, and 3 is formed from a sheet-metal blank, such as shown in Figs. 4 and 5, the body portion A of the leaf being composed of a double thickness and the knuckles B B of a single thickness of the metal of the blank. The tubular walls of the knuckles B B are integrally

united to the inner edges of the two layers of metal a and a' , which constitute the body portion of the leaf, and the latter is provided with strengthening and stiffening flanges $b b$ at its opposite ends, which are continued around the knuckles B B to form inwardly-projecting flanges $b' b'$, which may be utilized as raceways for antifriction-balls or serve as supports for raceways inserted in the knuckles. The flanges b and the flanges b' are integrally united, so that there will be little or no liability of the leaf being bent along the line of union of the knuckles with the body of the leaf.

At the inner edge of the leaf there is a web or flange a^2 , which connects the two knuckles, said flange being integrally connected to the body of the leaf and to the knuckles for strengthening the leaf longitudinally and bracing the knuckles against the weight to be carried by the hinge. Said flange a^2 conforms to the curvature of the cylindrical walls of the knuckles, but is slightly offset with respect thereto to afford clearance for the knuckle of the companion leaf of the hinge.

Referring to the sheet-metal blank illustrated in Figs. 4 and 5, that portion a' thereof which forms the rear of the leaf is cut as wide as the desired leaf plus the width of the flange a^2 , the latter being bent to proper form in the finished blank. Said portion a' is cut slightly longer than the desired leaf to afford sufficient metal for the end flanges $b b$, the metal for said flanges being bent at right angles to the body portion of the blank, as clearly shown. That portion a of the blank which is to form the front of the hinge is cut the proper length to fit between the flange portions $b b$ at the ends of the rear portion a' and is approximately as wide as the desired leaf.

The two portions a and a' of the blank are connected together by integral strips of metal $c c$, from which the knuckles of the leaf are formed, the space between said strips being equal to the space between the knuckles of the finished leaf. Said strips are equal in length to the circumference of the desired knuckles and are as wide as the length of the knuckles plus the width of the inwardly-projecting flange b' , the metal for the latter projecting beyond the ends of the body portions of the blank.

In the finished blank the body portions a and a' are bent at right angles to the connect-

ing-strips *c c*, and the latter are bent to bring the body portions in parallel planes, the bends in the connecting-strips conforming to the curvature of the desired knuckles, as clearly shown in Fig. 5.

By means of suitable dies the connecting-strips *c c* are bent into cylindrical form to form the knuckles, the body portion *a* being at the same time folded over upon the body portion *a'* and secured thereto by turning down the metal at the edge of the flange *b*, as clearly shown in Fig. 1. The metal around the outer edge of the knuckles is then turned down to form the flanges *b'*, as will be readily understood.

The screw-holes *d* are cut in the body portions of the blank before the latter is bent to final shape, as shown in Fig. 4.

In Figs. 6 and 7 I show a leaf which is in all respects similar to the leaf already described, except that the rear layer of metal *a'* is bent over the outer edge of the front layer *a*, as shown at *b²*, and the metal of the front layer is extended to form a double thickness of metal in the web or flange *a²*. The bending of the rear layer of metal over the front layer at the outer edge of the leaf serves to more securely bind the two layers together and also adds strength and stiffness to the finished leaf.

By forming the flange *a²* of a double thickness of metal, as best shown in Fig. 7, additional strength is afforded; but this is only necessary in hinge-leaves of extra large size.

It will be readily seen that a hinge-leaf constructed in accordance with my invention possesses great strength where strength is most needed and that it may be made from thinner metal than has heretofore been used in the manufacture of sheet-metal hinge-leaves of given size and strength.

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

1. A hinge-leaf provided at opposite ends

with tubular-shaped knuckles, said knuckles being provided with inwardly - projecting flanges around their outer edges, said leaf, knuckles and flanges being formed from an appropriately-shaped sheet-metal blank.

2. A hinge-leaf formed from an appropriately-shaped sheet-metal blank and having integral tubular knuckles at opposite ends, the metal at each end of said leaf being turned down to form continuous or unbroken flanges extending along the ends of the body portion of the leaf and around said knuckles.

3. A hinge-leaf having tubular knuckles at opposite ends thereof, said knuckles being provided with inwardly - projecting flanges around their outer edges, and a flange extending along the inner edge of the body portion of the leaf and integrally connecting said knuckles, the whole being formed from an appropriately-shaped sheet-metal blank.

4. A hinge-leaf having tubular knuckles at opposite ends thereof, a continuous flange extending along the ends of the body portion of the leaf and around the outer edges of said knuckles, and a flange extending along the inner edge of the body of the leaf and integrally connecting said knuckles, the whole being formed from an appropriately-shaped sheet-metal blank.

5. A hinge-leaf formed from an appropriately-shaped sheet-metal blank, having tubular-shaped knuckles at opposite ends thereof, said knuckles being provided with inwardly-projecting flanges at their outer edges, and the body portion of said leaf being composed of two layers of sheet metal, one of said layers having a portion turned over and upon the other.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

CORNELIUS S. VAN WAGONER.

Witnesses:

C. A. WESBECHER,
ALS FORSCH.