

No. 764,785.

PATENTED JULY 12, 1904.

C. S. VAN WAGONER.
SHEET METAL HINGE.

APPLICATION FILED MAR. 13, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.

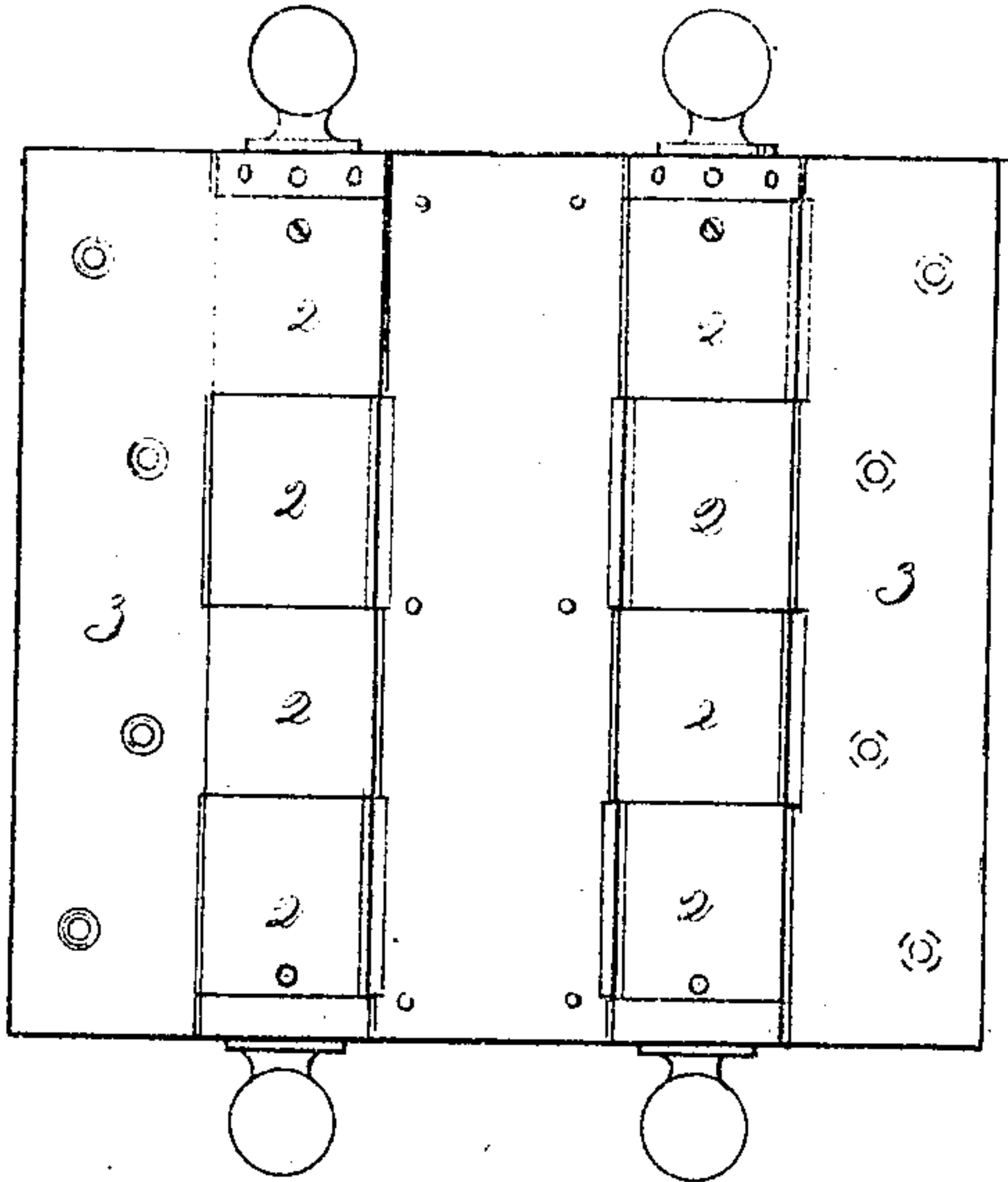


Fig. 2.

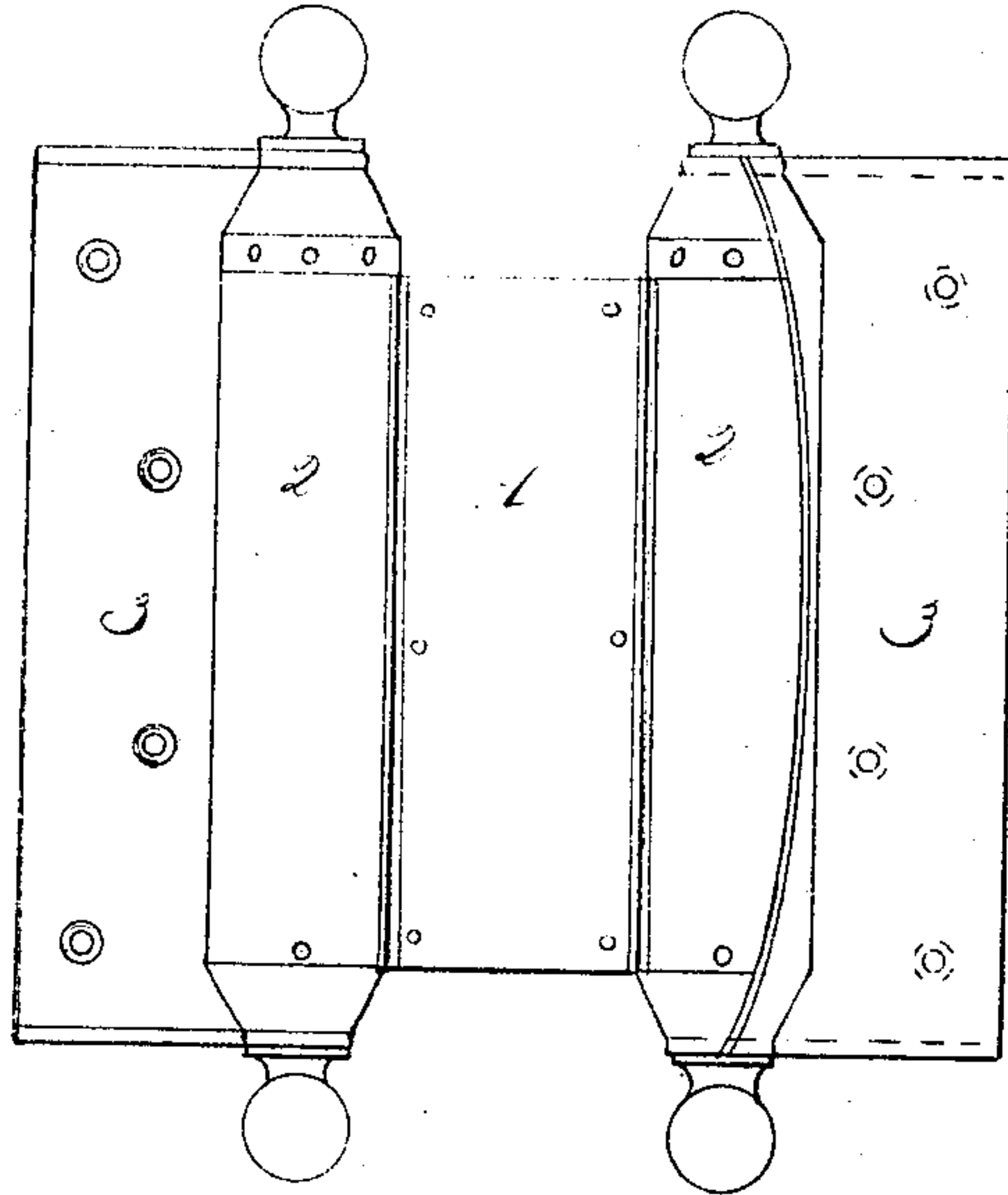


Fig. 3.

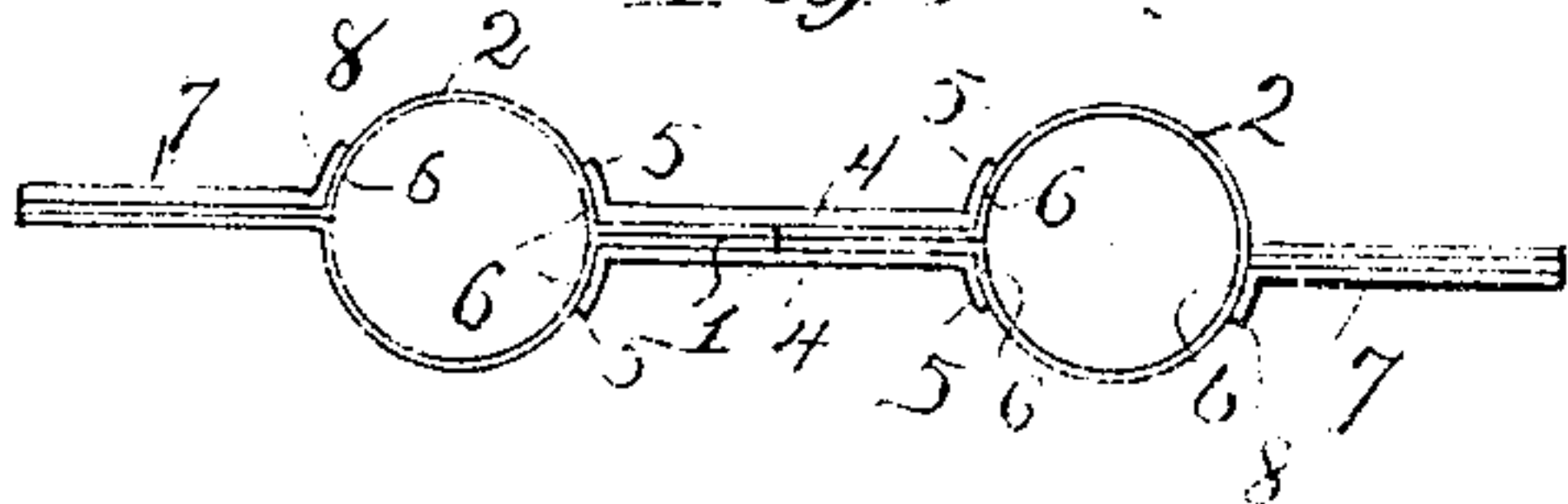


Fig. 4.

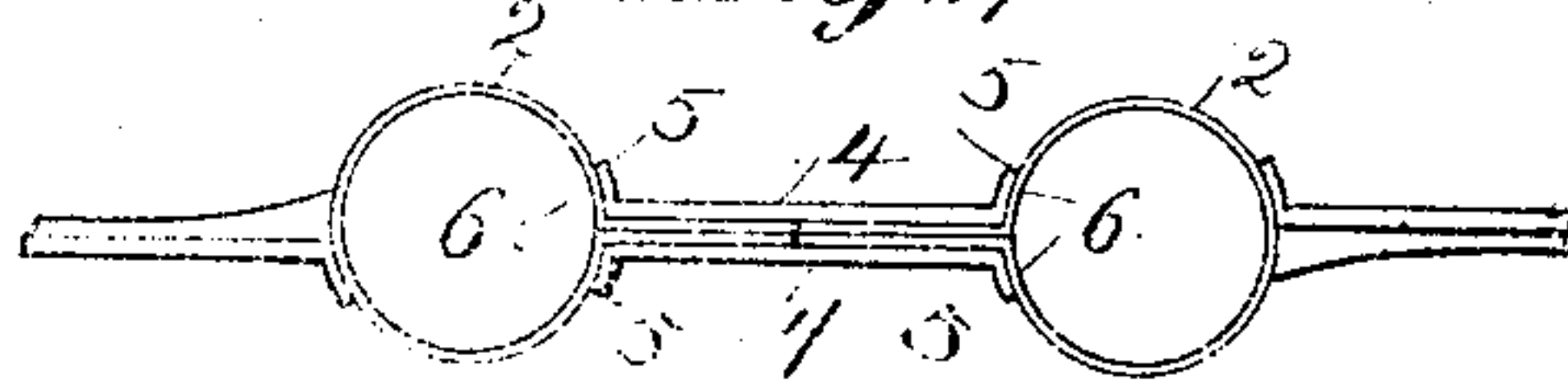


Fig. 5.

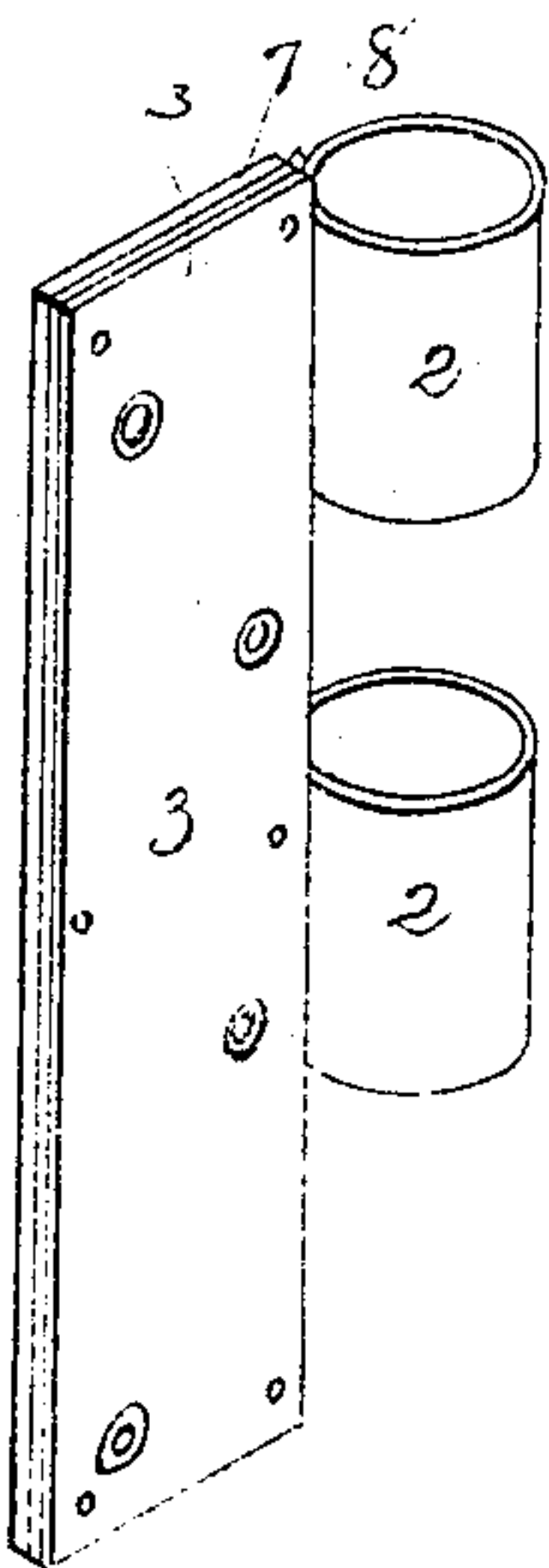


Fig. 6.

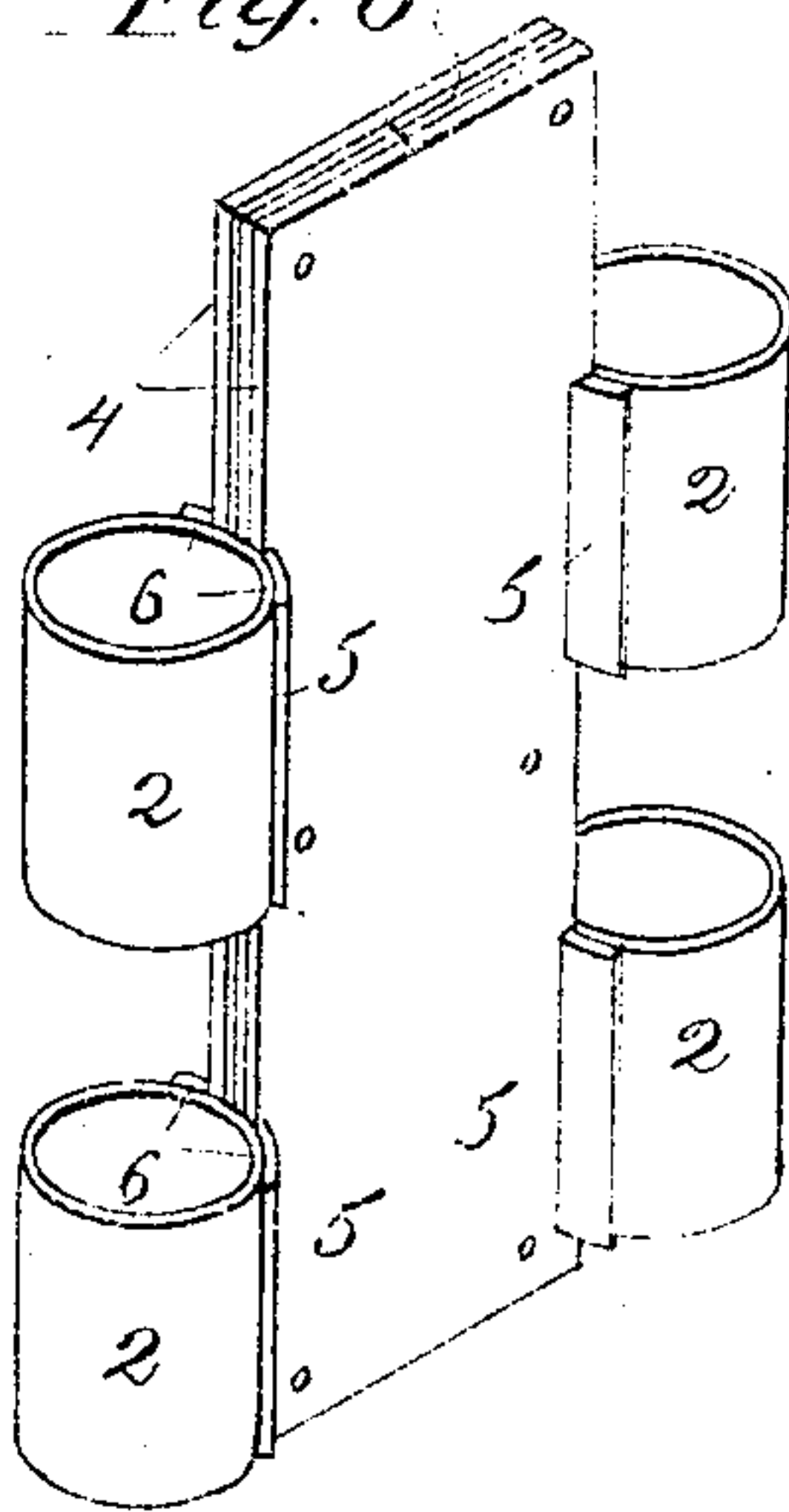


Fig. 7.

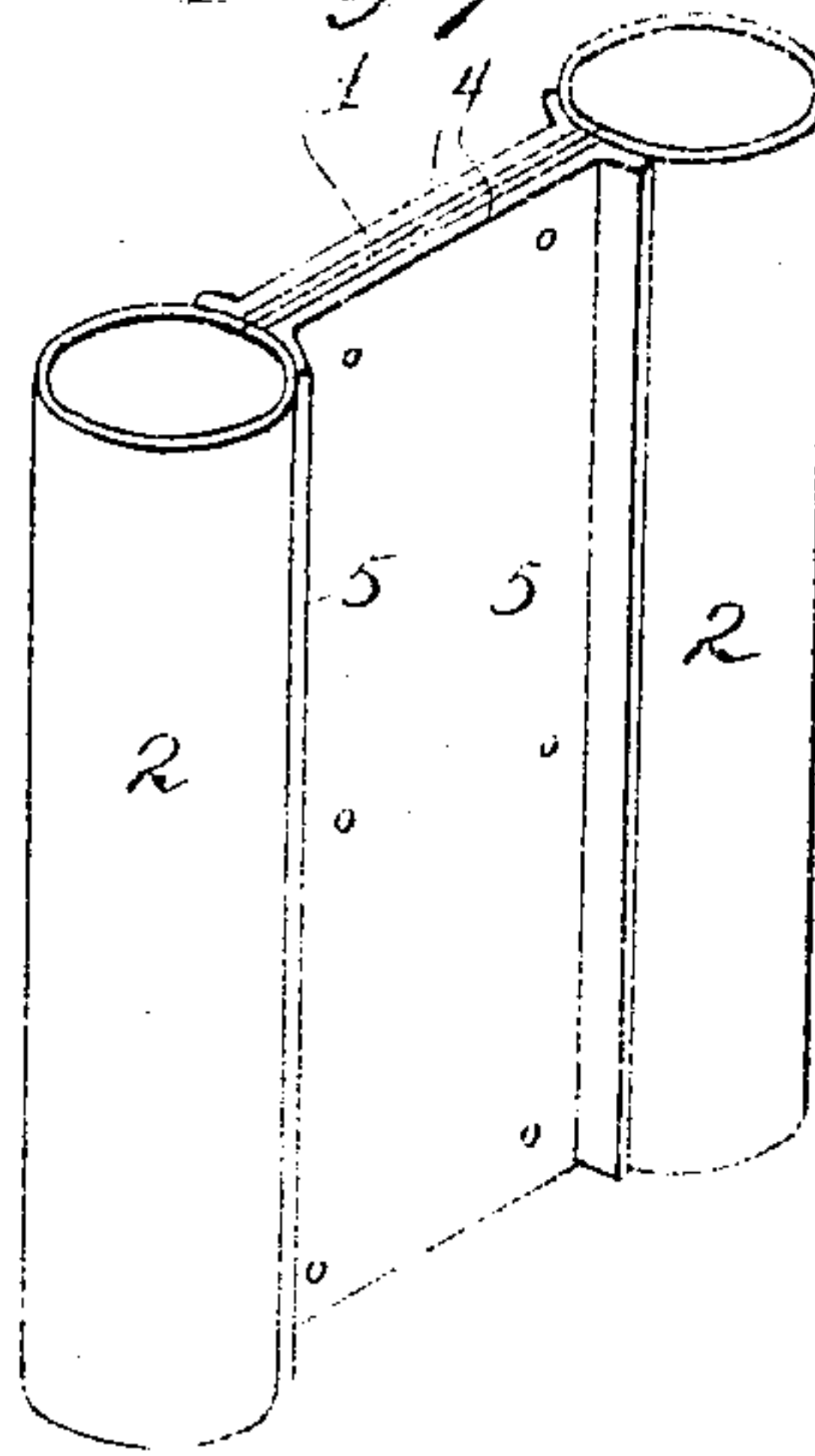


Fig. 8.

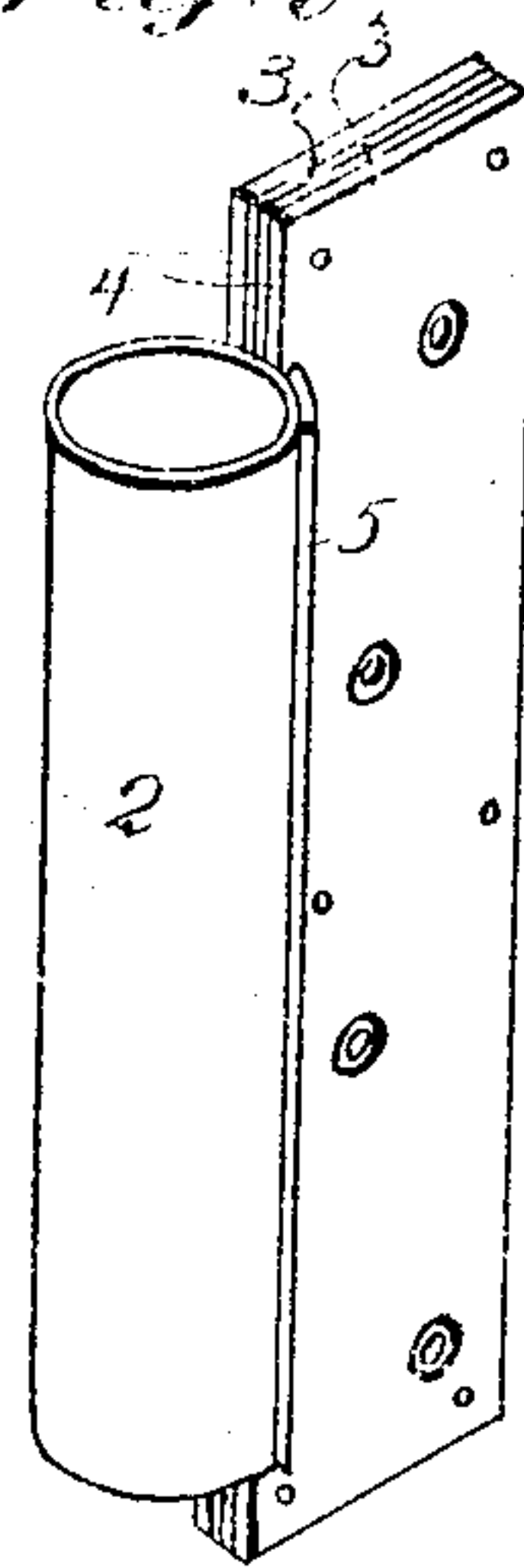
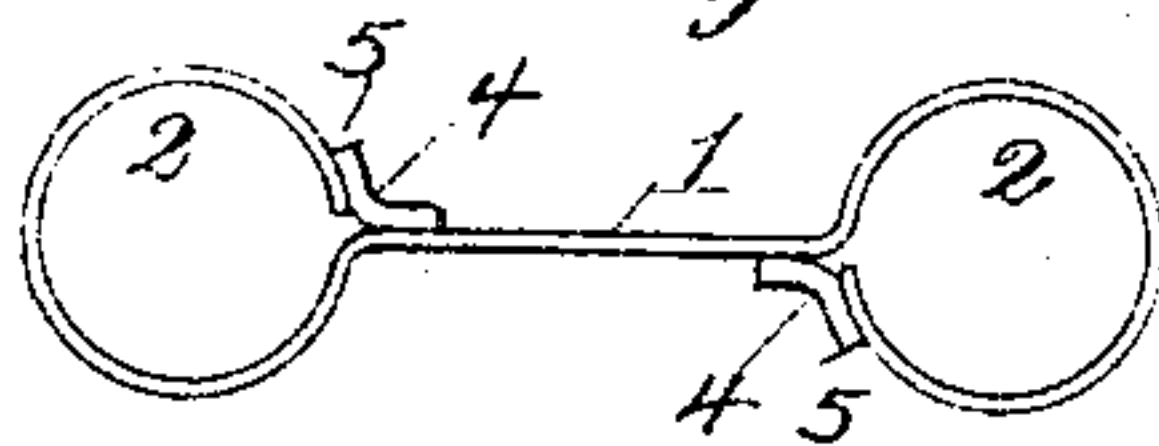


Fig. 16.



Witnesses
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2 SHEETS—SHEET 2.

Fig. 9

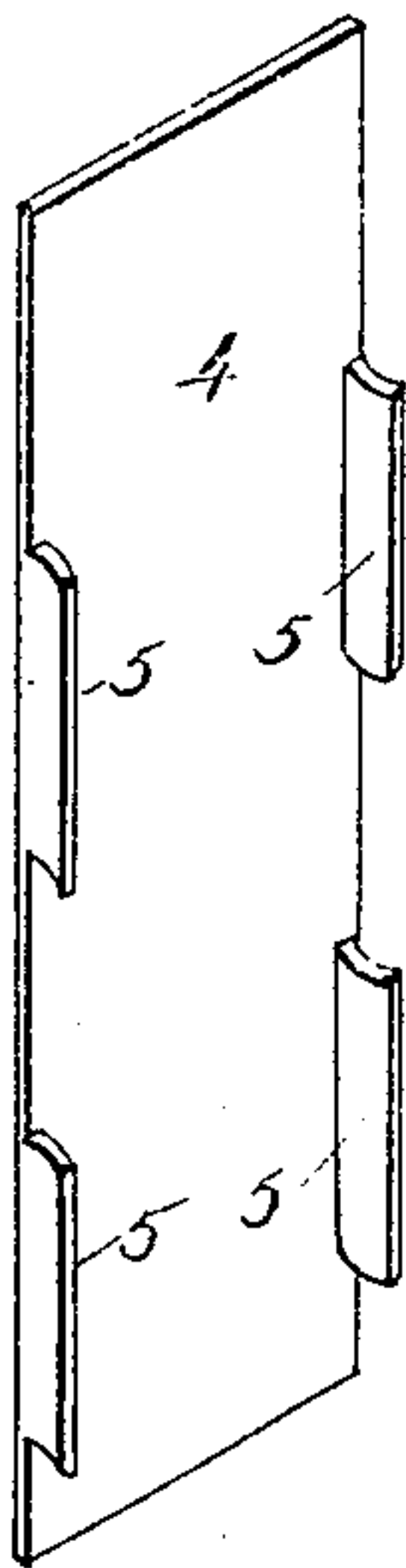


Fig. 10.

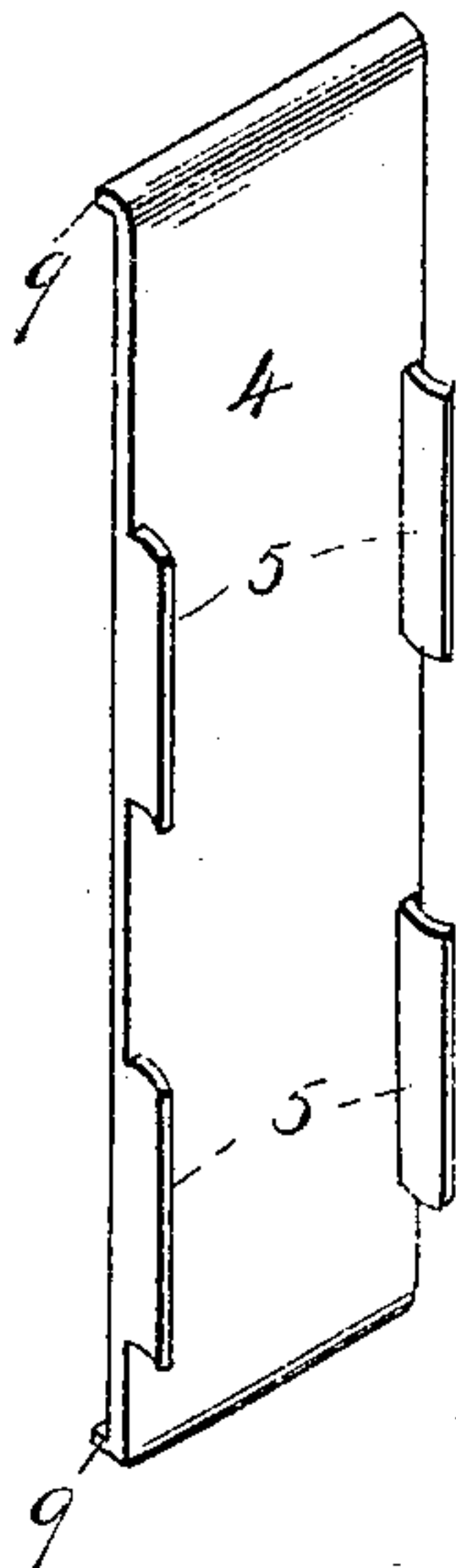


Fig. 11.

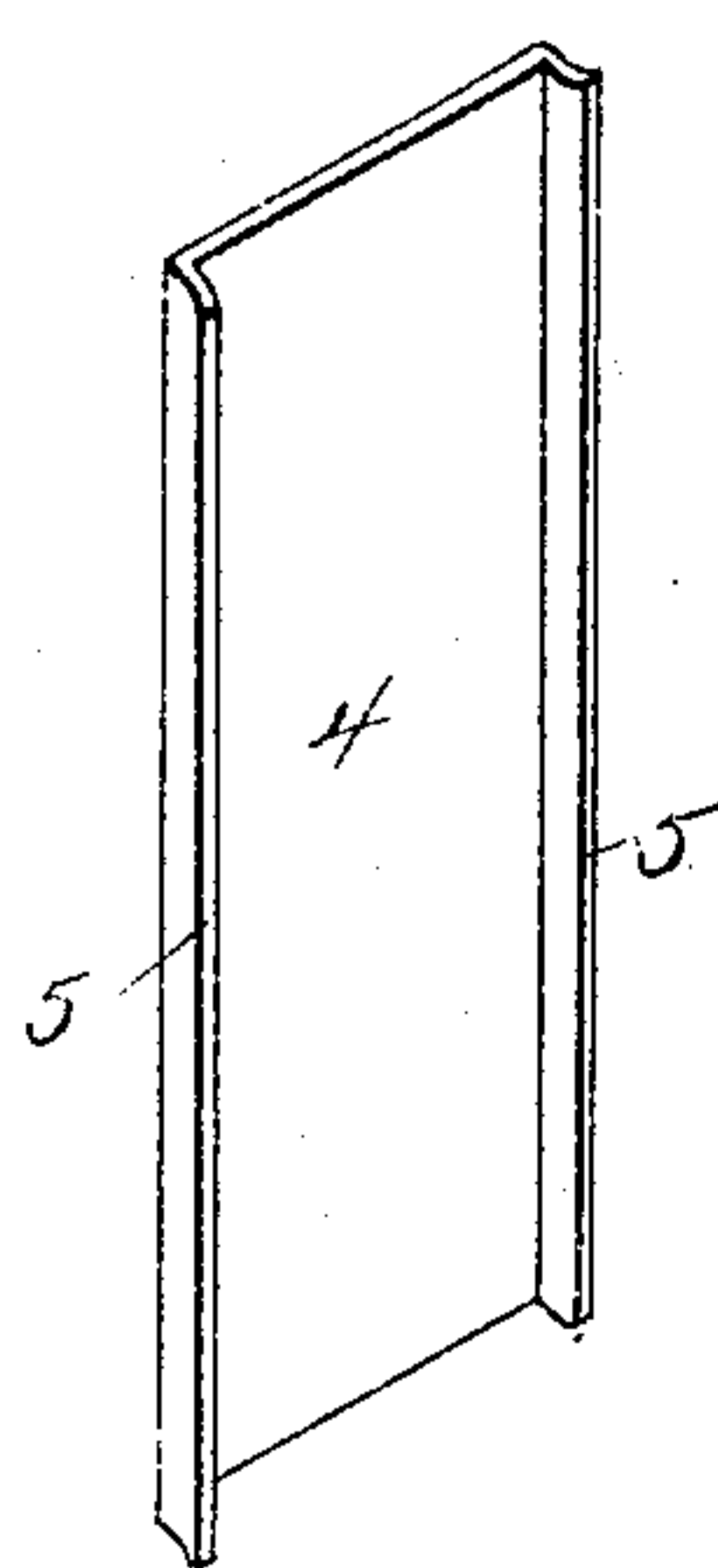


Fig. 12

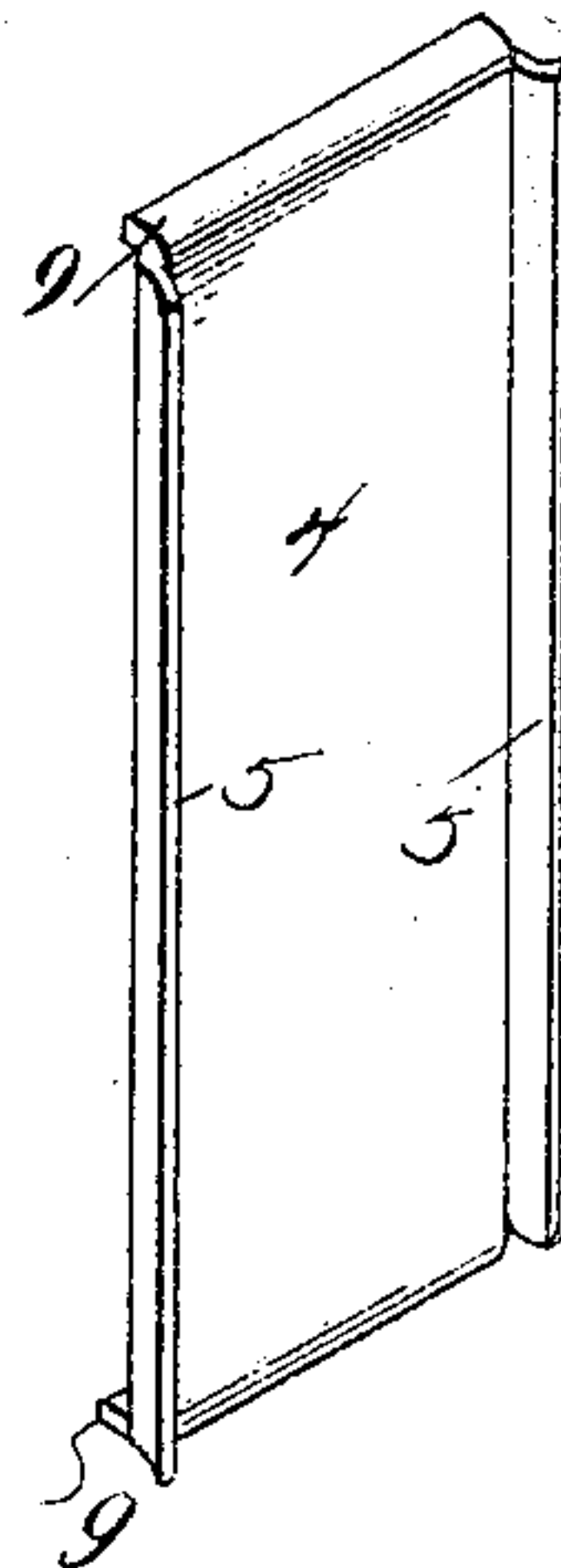


Fig. 13

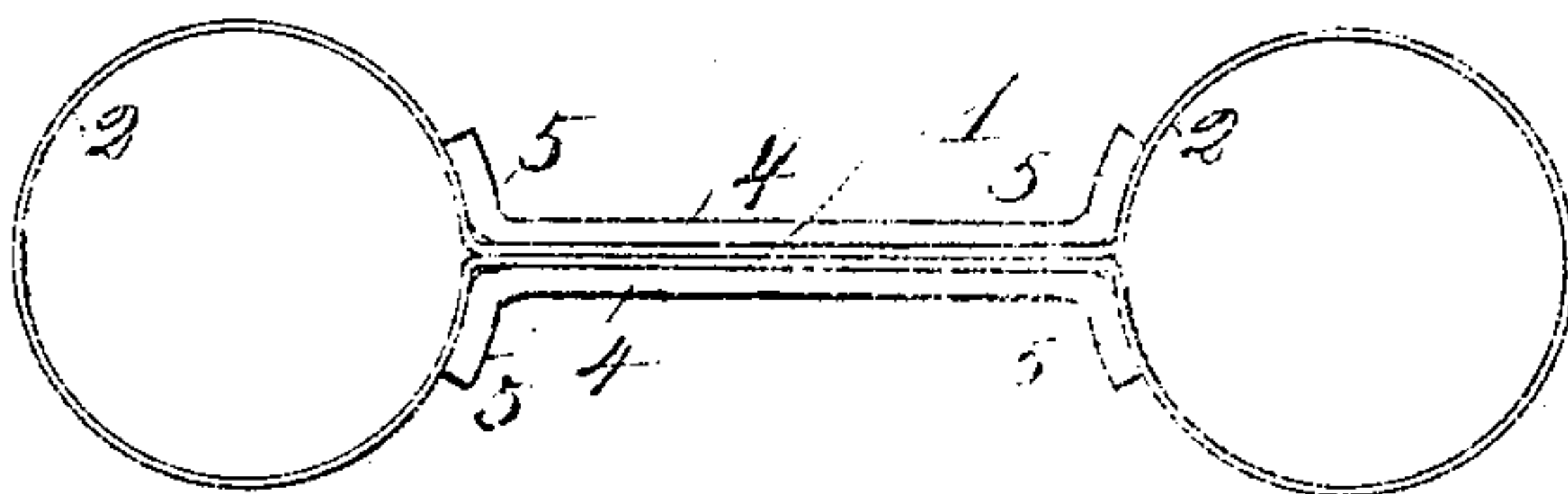


Fig. 14

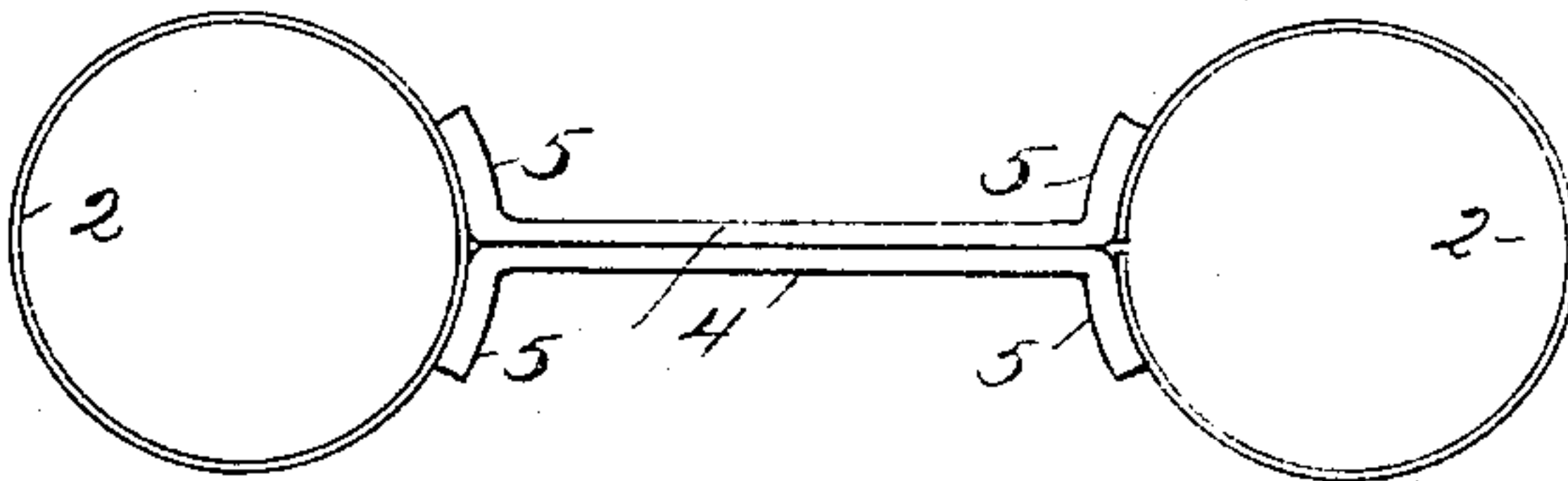
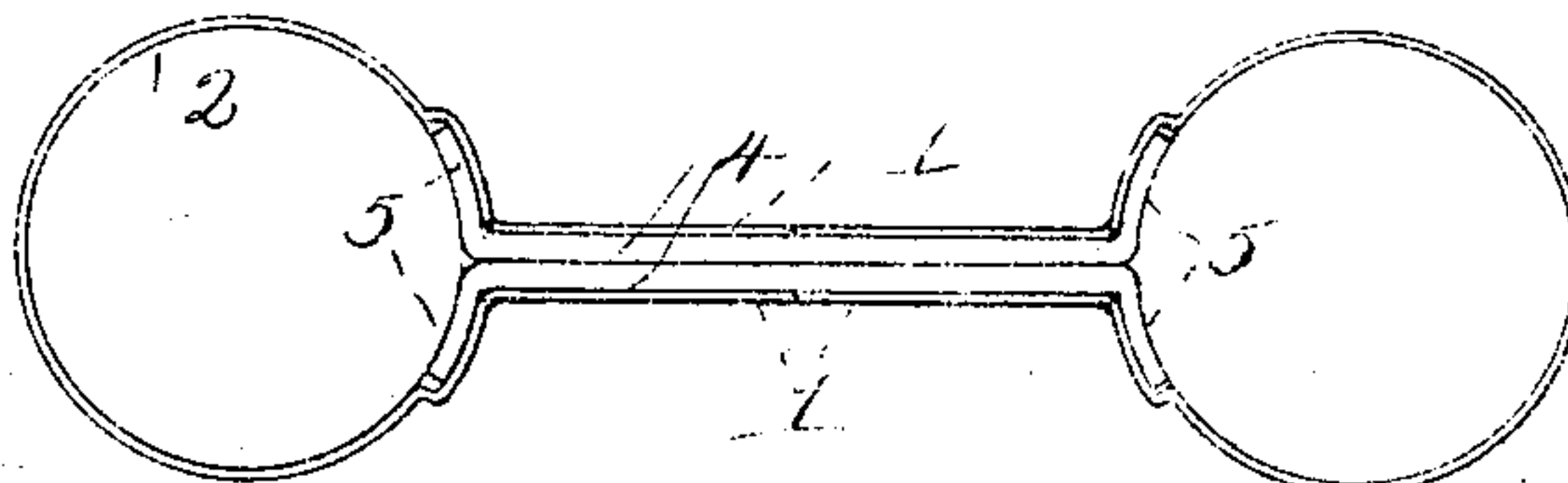


Fig. 15



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UNITED STATES PATENT OFFICE.

CORNELIUS S. VAN WAGONER, OF CLEVELAND, OHIO, ASSIGNOR, BY
MESNE ASSIGNMENTS, TO THE VAN WAGONER COMPANY, OF
CLEVELAND, OHIO, A CORPORATION OF DELAWARE.

SHEET-METAL HINGE.

SPECIFICATION forming part of Letters Patent No. 764,785, dated July 12, 1904.

Application filed March 13, 1902. Serial No. 98,030. (No model.)

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 certain new and useful Improvements in Sheet-Metal Hinges, of which the following is a specification.

My invention relates to the construction of the leaves of sheet-metal hinges provided with tubular knuckles; and its main object is to strengthen and stiffen the leaves along the line of union with the knuckles to prevent the latter from being bent out of alinement, as most frequently occurs in the center leaves of sheet-metal double-acting hinges.

Sheet-metal hinge-leaves of the character indicated are usually formed from a blank cut from metal of sufficient thickness to insure requisite strength and stiffness in the finished hinge.

By my invention I am enabled to economically produced a strong stiff sheet-metal hinge and may use thinner metal in its construction than has heretofore been employed in the manufacture of hinges of the same size and strength.

Briefly stated, my said invention consists in a sheet-metal hinge comprising in its construction a leaf having one or more tubular knuckles and a reinforcing-plate secured to the leaf proper and having one or more integral flanges partially embracing said knuckle or knuckles, as will be hereinafter more particularly described.

For a detail description of my invention I will refer to the accompanying drawings, in which—

Figures 1 and 2 illustrate two well-known forms of double-acting hinges embodying my invention. Fig. 3 is an end view of the leaves of the hinge illustrated in Fig. 1. Fig. 4 is an end view of the leaves of the hinge illustrated in Fig. 2. Figs. 5 and 6 are isometric views, respectively, illustrating one of the side leaves and the center leaf of the hinge of Fig. 1. Fig. 7 is a similar view of the center leaf of the hinge illustrated in Fig. 2. Fig. 8 is a similar view of a leaf designed for a single-acting

hinge embodying my invention. Figs. 9, 10, 11, and 12 illustrate different forms of reinforcing-plates used in constructing center leaves of double-acting hinges embodying my invention. Fig. 13 is an enlarged end view of the center leaf of the hinge illustrated in Fig. 1, and Figs. 14, 15, and 16 are end views of center leaves of modified forms.

My invention has been devised more especially for strengthening the center leaf of a double-acting sheet-metal hinge and has special value in that connection but it will be obvious that a single-acting hinge may be made in accordance with my invention, and hence appropriate claims will be made to include a hinge of that character.

In Fig. 1 I have shown a well-known form of double-acting spring-hinge having all of its leaves constructed in accordance with my invention. In Fig. 2 I show another well-known form of double-acting hinge having the center leaf only constructed in accordance with my invention. In the hinge illustrated in Fig. 1 the center leaf 1 and the two side leaves 3 3 are each provided with tubular knuckles formed integrally with the leaf proper in a well-known manner. The side leaves 3 3 are formed from an appropriately-shaped sheet-metal blank, which is bent upon itself to provide a double thickness of metal in the body of the leaf and a single thickness of metal in the knuckles, the latter being formed in the bend or fold of the metal from strips which connect those portions of the blank which constitute the body portion of the finished leaf. On one side of the body portion of the leaf I attach in any suitable manner a reinforcing-plate 7, which is best shown in Fig. 3. Said plate is preferably large enough to completely cover one side of the body portion of the leaf, and adjacent to the knuckles 2 said plate is provided with integral flanges 8, which conform to the curvature of the knuckles and partially embrace the same to serve as braces against such strains as would tend to bend the metal of the leaf along the line of union with the knuckles. The metal comprising the knuckles is not required to be

as thick as the metal in the body portion of the leaf, and it will be readily seen that in the construction described comparatively thin metal may be used for the blank from which the leaf is initially formed and that sufficient strength will be afforded by the reinforcing-plate at the points where strength and stiffness are required and also that with a given thickness of metal a much stronger and stiffer leaf will result from my improved construction than is possible in the prior constructions now most commonly adopted.

The center leaf 1 of the hinge illustrated in Fig. 1 is initially formed from two sheet-metal blanks, which are shaped and bent substantially like the blank from which the side leaf 3, just described, is formed. Each of said blanks forms one-half of the center leaf, and each of the said halves is substantially like the side leaf referred to, except that the body portion thereof is only equal in width to one-half the width of the finished center leaf. These two halves of the center leaf are placed together with the inner edges abutting against each other and are secured together by means of the two reinforcing-plates 4 4, one on each side of the leaf, as shown in Figs. 3, 6, and 13. Said plates are made the exact size of the body portion of the leaf, and at their edges adjacent to the knuckles 2 said plates are provided with integral flanges 5, which partially embrace the knuckles for stiffening and strengthening the line of union between the knuckles and the leaf, as will be readily understood. One of the reinforcing-plates for this style of leaf is shown detached in Fig. 9. Said plates are secured to the two halves of the center leaf by means of rivets or in any other suitable manner, and in the manufacture of a certain class of hinges I make the reinforcing-plates slightly longer than the hinge-leaf and bend the edges over, as shown at 9 in Fig. 10, for the purpose of concealing the edges of the metal at the ends of the leaf, as will be readily understood.

The side leaves 3 3 of the hinge illustrated in Fig. 2 are as heretofore constructed. The center leaf 1 of said hinge is in all essential respects like the center leaf just described, except that its knuckles 2 2 extend the full length of the leaf and serve in the finished hinge as spring-retaining barrels. The reinforcing-plates 4 4 of this leaf (see Figs. 4, 7, and 11) are in the form of channel-beams, and consequently afford great strength and stiffness to the body portions of the leaf, besides serving, by means of the flanges 5 5, to brace the knuckles against torsional strains. The reinforcing-plates of this leaf may also have their ends bent over, as shown at 9 in Fig. 12, for the purpose of concealing the edges of the metal of the body portions of the leaf.

In Fig. 8 I have illustrated a leaf which may be used in a single-acting hinge or may serve as a side leaf for a double-acting hinge.

Its construction is substantially the same as one-half of the center leaf illustrated in Fig. 7 and will therefore require no detail description.

In Fig. 14 I have illustrated in end view a center leaf for a double-acting hinge, in which the plates 4 4 constitute the leaf proper, two of said plates being secured together back to back and the flanges 5 5 of said plates affording surfaces for brazing or otherwise securing the knuckles 2 2 thereto, as clearly shown. While I do not consider this form of construction equal in strength to the forms previously described, it may be advantageously employed in the construction of brass or bronze hinges and embodies certain features of my invention.

In the center leaf illustrated in Fig. 15 the reinforcing-plates 4 4 are placed between the two layers of metal in the leaf proper. This form of construction is also specially adapted for brass or bronze hinges.

The center leaf illustrated in Fig. 16 is formed from a single piece of sheet metal bent as shown and strengthened and stiffened along the line of union with the knuckles by reinforcing-plates 4, which are mere strips of metal bent in the form of angle-irons, as clearly shown.

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

1. A sheet-metal hinge-leaf provided with tubular knuckles comprising in its construction a plate having integral flanges which partially embrace said knuckles, substantially as described.

2. A sheet-metal hinge comprising in its construction a leaf having one or more tubular knuckles, and a reinforcing-plate secured to the body portion of the leaf and having one or more integral flanges adjacent to and partially embracing said knuckle or knuckles, substantially as described.

3. In a double-acting hinge, a sheet-metal center leaf provided with tubular knuckles, and reinforcing-plates secured to the opposite sides of the body portion of the leaf having integral flanges adjacent to and partially embracing said knuckles, substantially as described.

4. A double-acting hinge comprising in its construction a center leaf having tubular knuckles at its opposite edges, said leaf and knuckles being formed from separate sheet-metal blanks, the portions thereof projecting from the respective knuckles forming half-leaves adapted to abut each other, and reinforcing-plates secured to said leaf for uniting the half-leaves, said plates being provided with integral flanges adjacent to said knuckles and partially embracing the same, substantially as described.

5. A hinge embodying in its construction a sheet-metal leaf having tubular knuckles,

and a reinforcing-plate secured to the body
portion of said leaf having integral flanges
adjacent to and partially embracing said
knuckles, said plate being bent over the ends
5 of the leaf, substantially as and for the pur-
pose described.

In testimony whereof I have signed my name

to this specification in the presence of two sub-
scribing witnesses.

CORNELIUS S. VAN WAGONER.

Witnesses:

WM. M. MONROE,
GEORGE W. SHAW.