

W. J. KEENE.

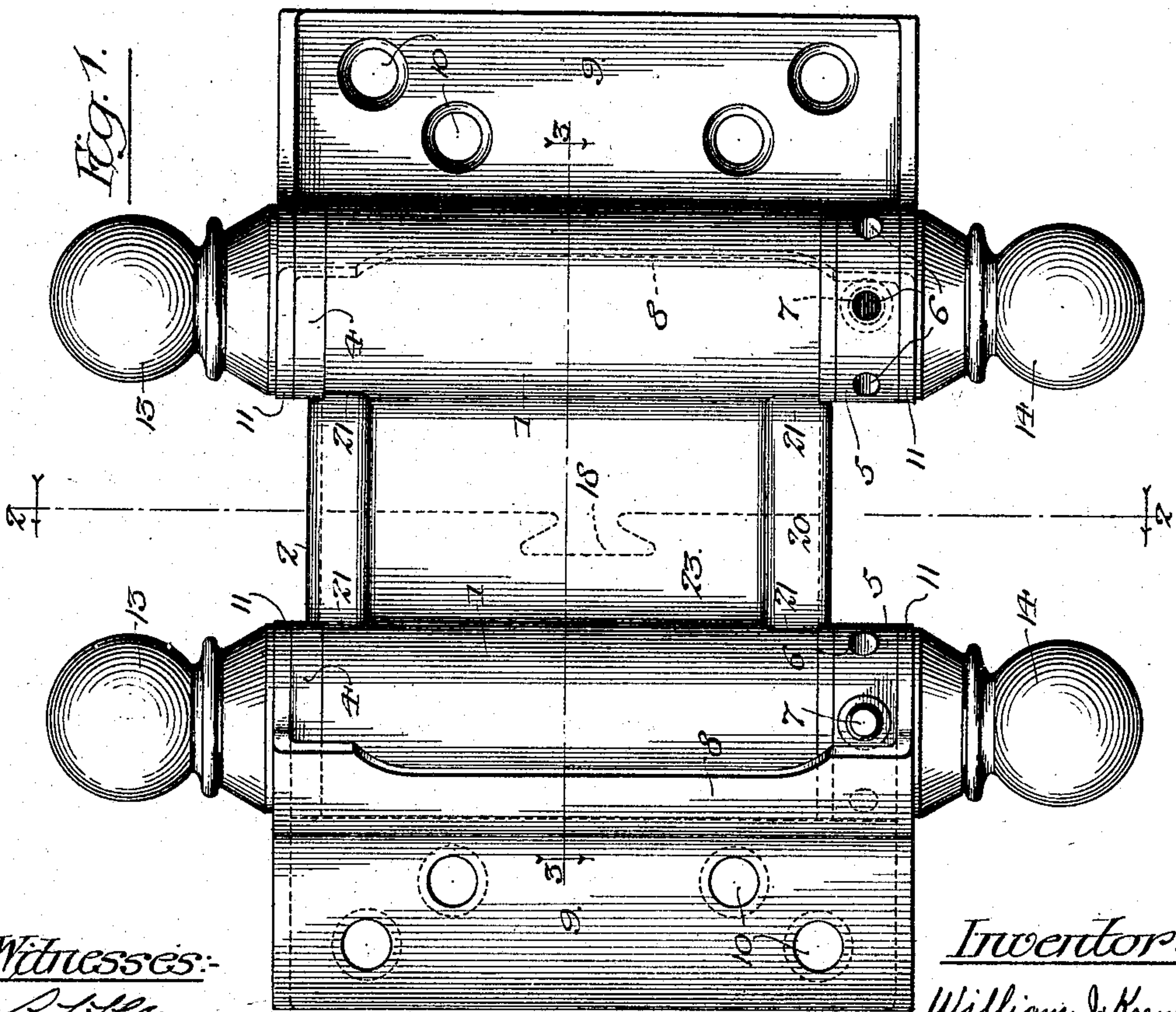
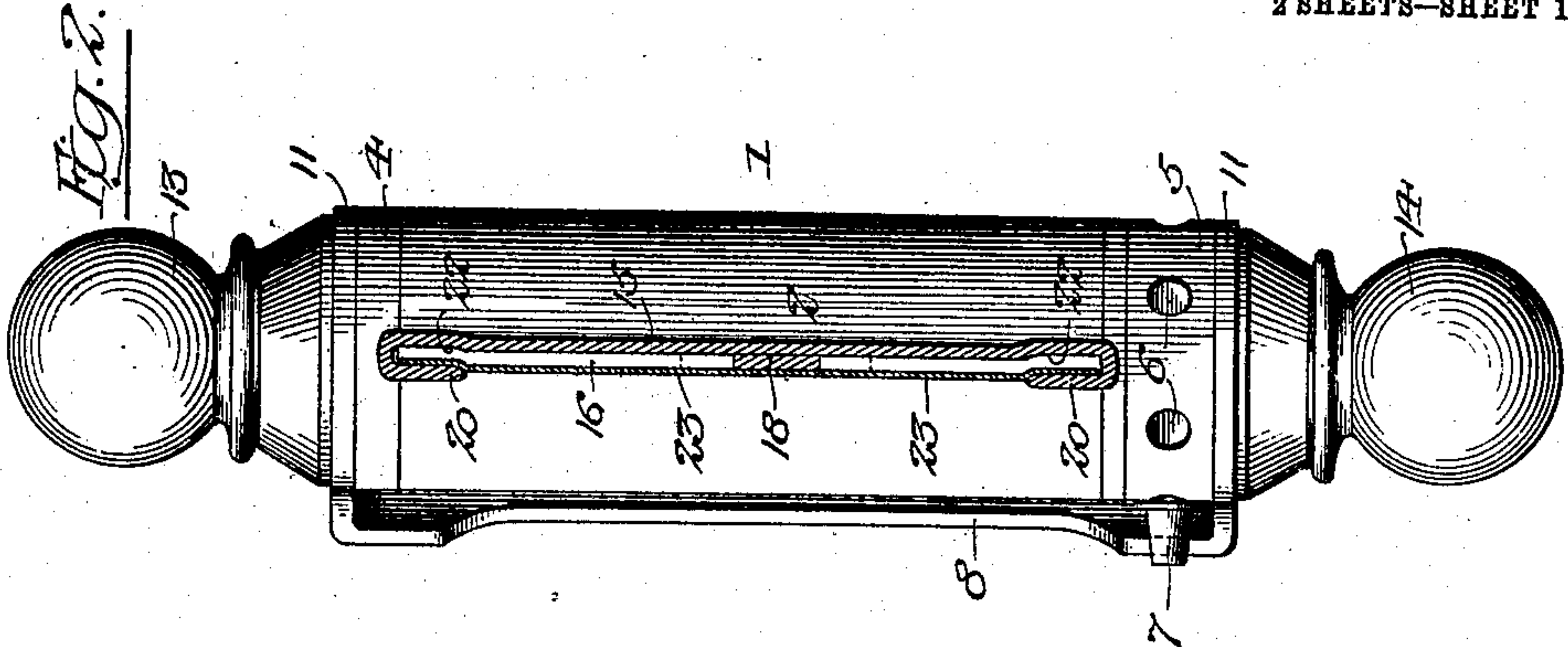
HINGE.

APPLICATION FILED JUNE 1, 1908.

919,882.

Patented Apr. 27, 1909.

2 SHEETS—SHEET 1.



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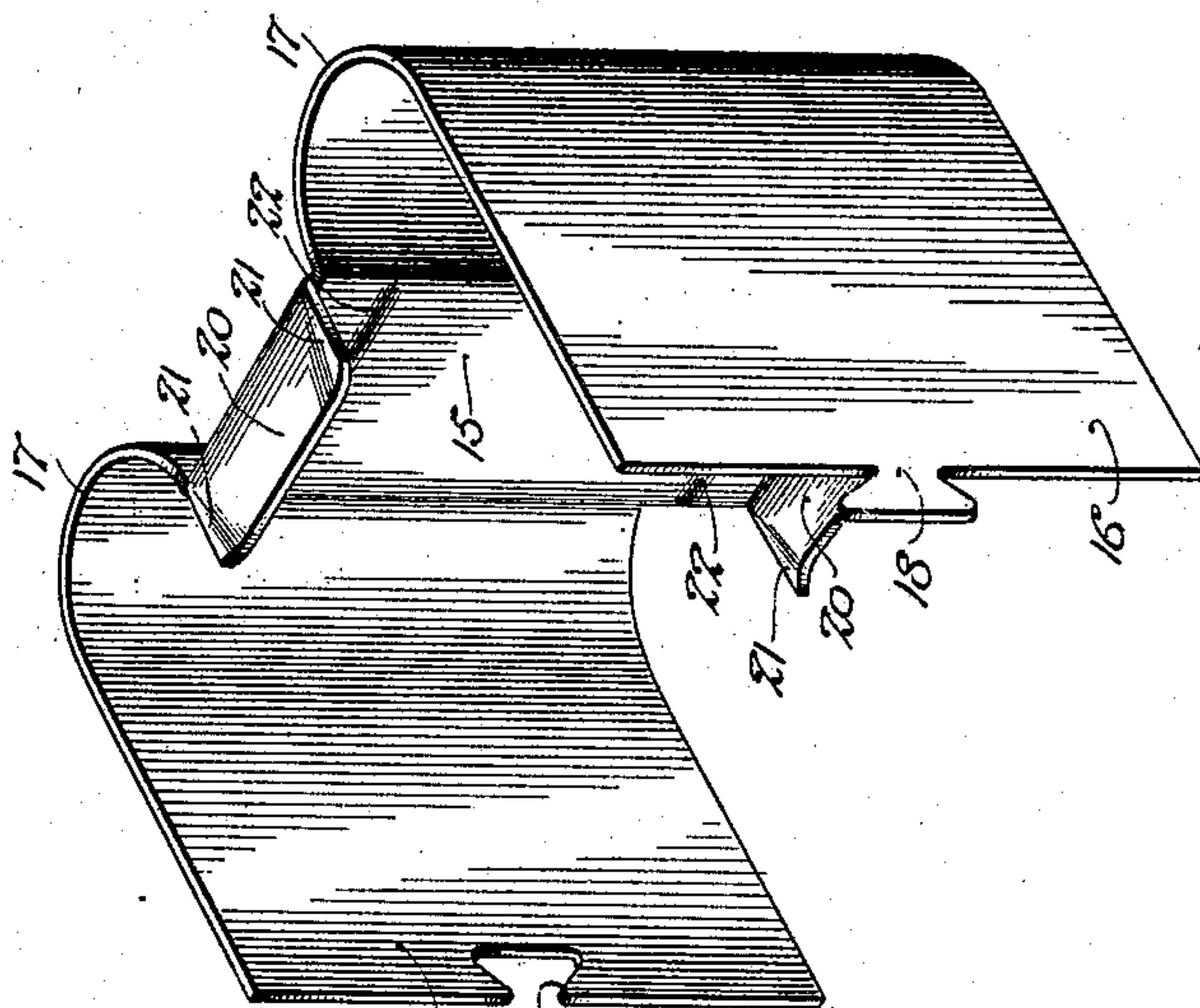
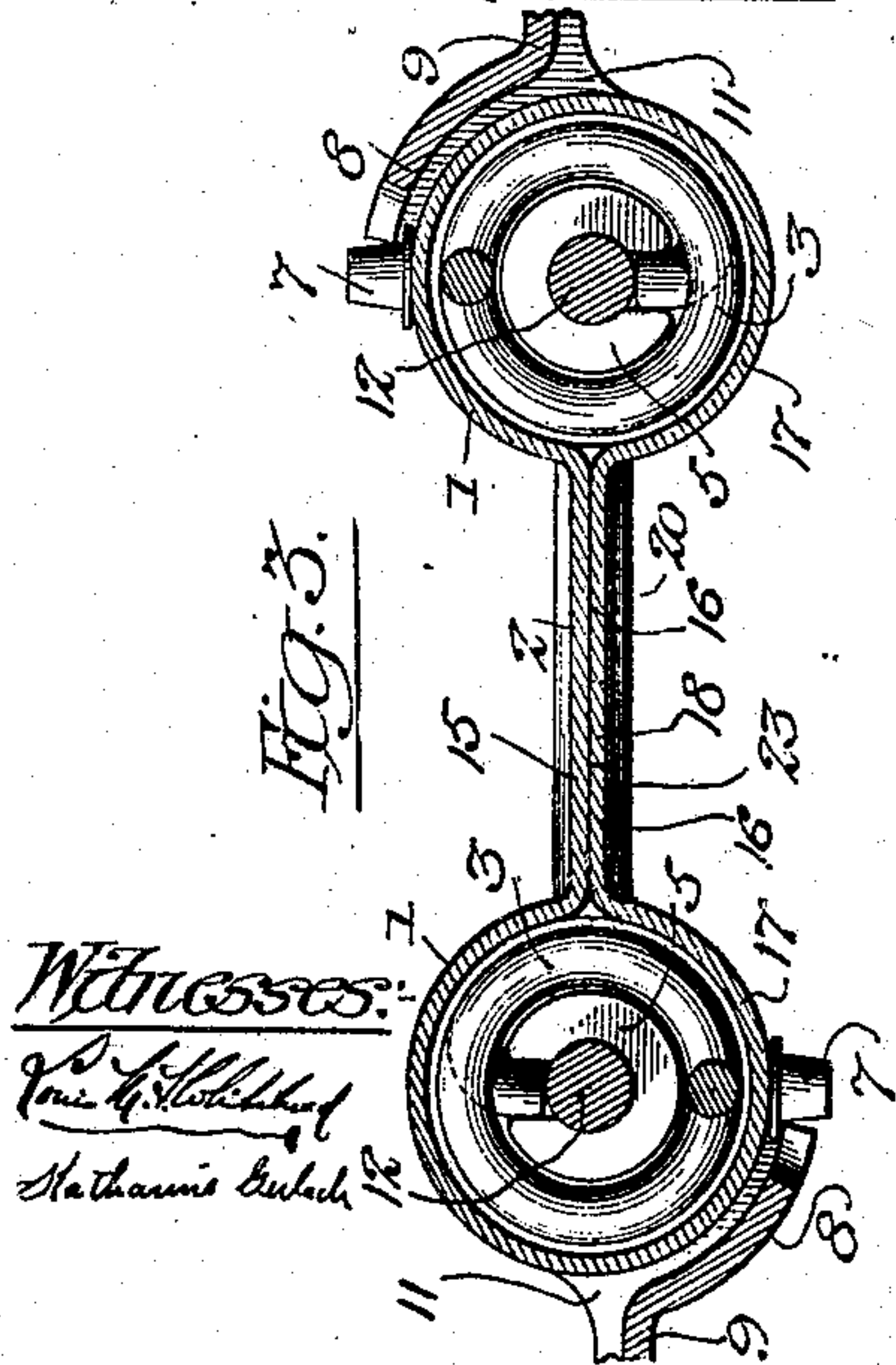
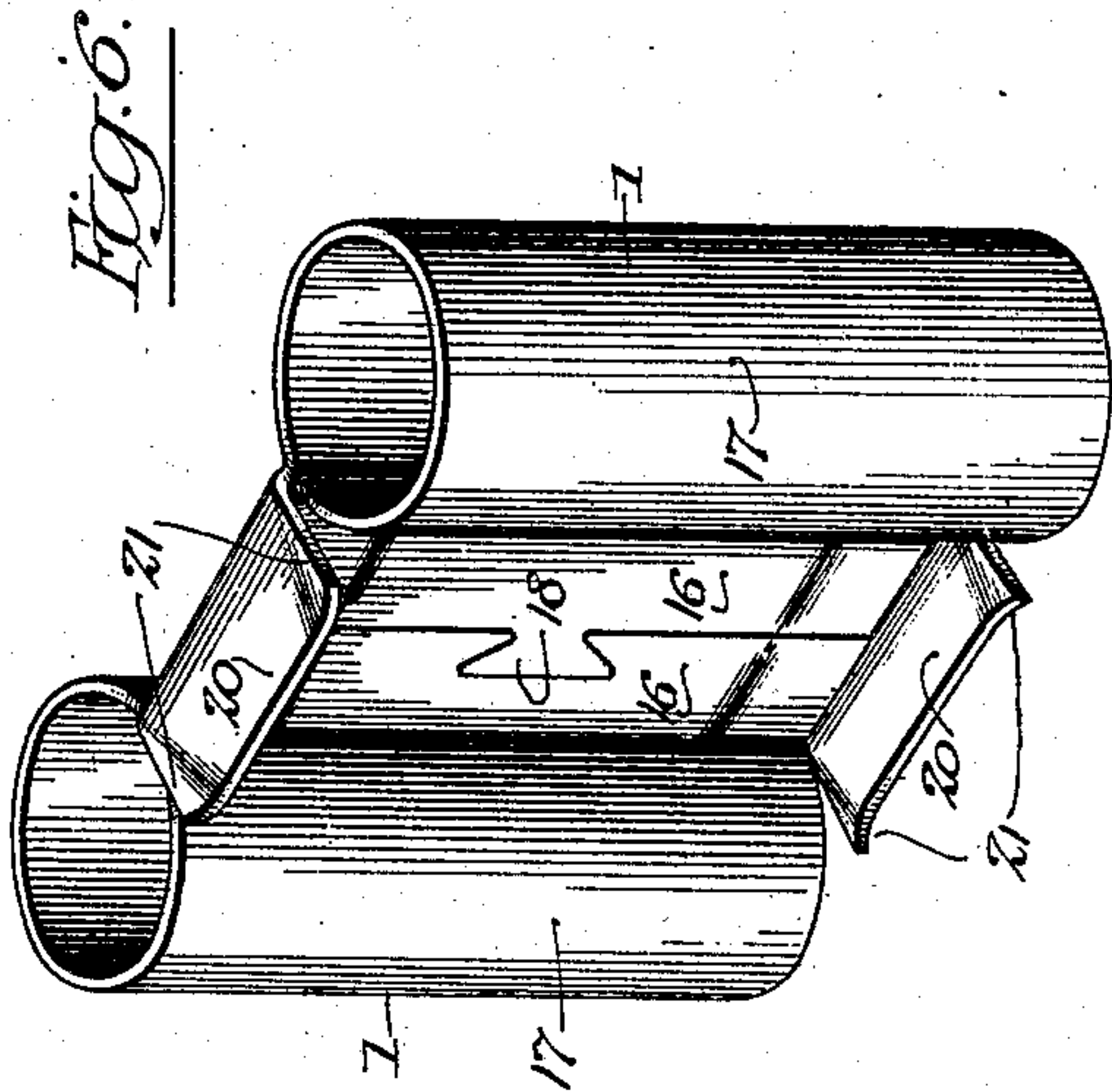
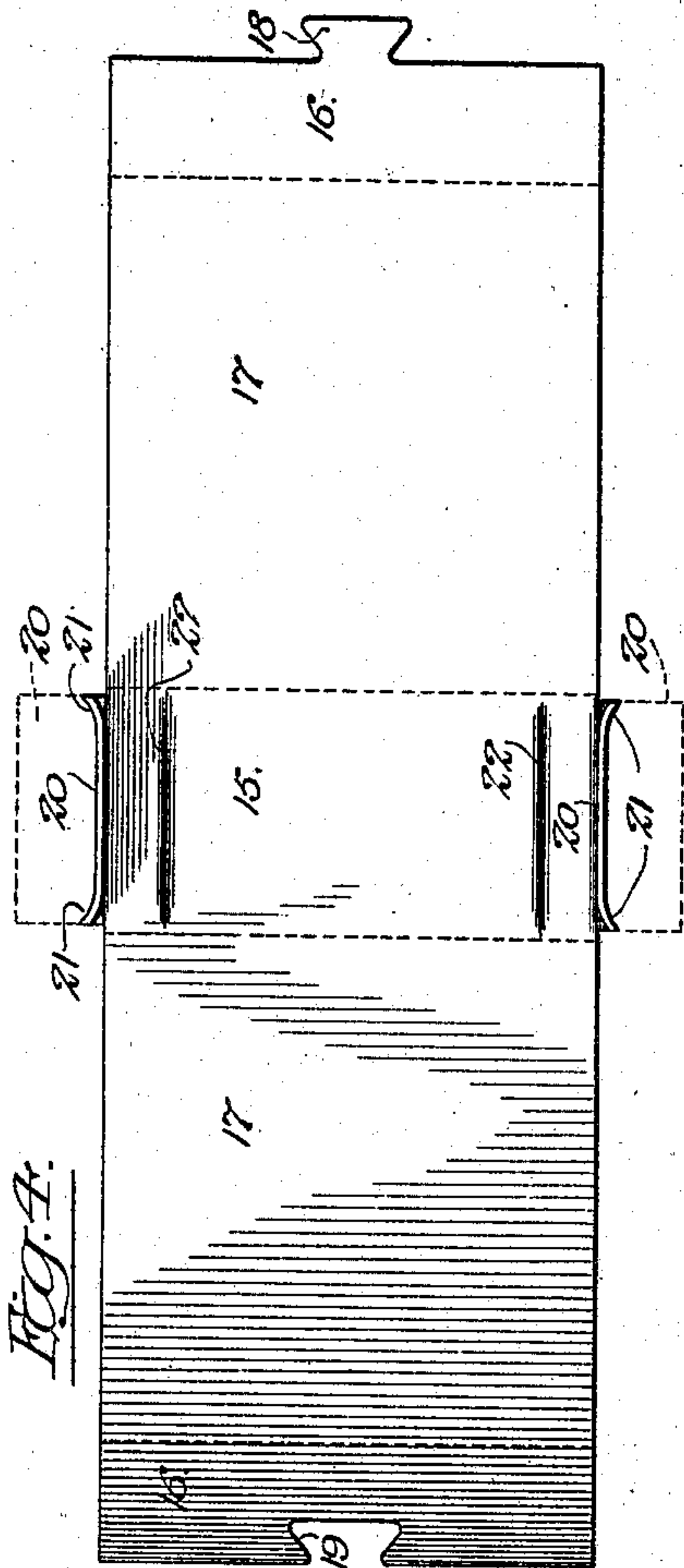
HINGE.

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2 SHEETS—SHEET 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

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HINGE.

No. 919,882.

Specification of Letters Patent.

Patented April 27, 1909.

Application filed June 1, 1908. Serial No. 435,856.

To all whom it may concern:

Be it known that I, WILLIAM J. KEENE, a citizen of the United States, and a resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Hinges, of which the following is a specification.

The invention relates to double-acting hinges having a body formed of two barrels connected by an intermediate web, with two flanges or wings pivotally connected by pintles to the barrels and adapted to be connected respectively to the door and door frame, and having springs arranged within the barrels to return the door automatically to closed position after it has been opened in one or the other direction.

The present invention seeks to provide an improved form of body for hinges of this type which can be economically manufactured in large numbers from flat, sheet metal blanks and which, while not cumbersome, but neat in appearance, will be rigid and strong.

The invention consists in the features of improvement hereinafter set forth, illustrated in the accompanying drawings and more particularly pointed out in the appended claims.

In the drawings Figure 1 is a side elevation of the improved hinge. Fig. 2 is a longitudinal section on line 2—2 of Fig. 1. Fig. 3 is a cross section on line 3—3 of Fig. 1. Fig. 4 is a plan view and Figs. 5 and 6 are perspective views illustrating the manner of forming the hinge body from a flat, sheet metal blank.

The hinge body comprises the two barrels 1 and the intermediate connecting web 2. Within the barrels are arranged the coiled springs 3 that are connected at their ends to the collars 4 and 5 at the opposite ends of the barrels. The collars 4 are fixed to the barrels while the collars 5 are rotatable therein and are provided with a series of radial holes or seats 6, and a pin 7 is placed in one of the holes or seats 6 of each collar and is adapted to bear upon the flange 8 of the adjacent wing or leaf 9. The wings or leaves 9 of the hinge are provided with openings 10 for the screws which fasten the wings to the door and to the door frame. These wings are formed of sheet metal and the end portions of each wing are bent over at right angles to the main portion thereof to form

the projecting ears 11 which extend over the collars 4 and 5 at the opposite ends of the spring barrel. Pintles 12 extend through the spring barrels, collars 4 and 5 and ears 11, and are provided with nuts 13 and heads 14 for securing the parts of the hinge together. Double-acting spring hinges of this type are set forth in U. S. Letters Patent No. 620,933 granted to Joseph Keene, March 14, 1899, and need not be more fully set forth here.

The strain upon the body of a hinge of this sort when in use, and particularly upon the connecting web between the spring barrels, is considerable. The greatest strain is brought to bear along the lines where the connecting web joins the spring barrels, and in particular at the ends of the web. It is desirable, therefore, that the web shall be formed integral with the barrels, and also that the ends of the web shall be reinforced, and while the connecting web should be rigid and strong it should not be too cumbersome.

The present invention provides a hinge body which can be economically manufactured from a flat, sheet metal blank, the barrels being of a single thickness of metal and the web of double thickness with reinforced ends, and which is rigid and strong without being cumbersome. As the web is only of two thicknesses, a heavy gage metal may be used.

The improved hinge body is formed from a flat, metal blank of rectangular form, as shown in Fig. 4. The central portion 15 of the blank and the end portions 16, when the hinge body is completed, form the integral, connecting web and the intermediate portions 17 are bent to form the cylindrical spring barrels. The end edges of the blank are provided respectively with an interlocking dove-tail or tongue 18 and a correspondingly-shaped notch 19. The side edges of the blank, opposite the central portion 15, are provided with projecting lips 20, as indicated in dotted lines in Fig. 4.

The blank is shaped by suitable tools and dies. At the first operation, the lips or projections 20 are turned up at right angles to the body of the blank with their side edge portions 21 slightly out-turned, as shown in full lines in Fig. 4, and also in Figs. 5 and 6. At the same time the ends of the central portion 15 of the blank opposite the lips 20 are

offset to form rabbets or recesses 22, as shown in Figs. 2, 4 and 5. The parts of the blank adjacent the central portion 15 are then pressed to semi-cylindrical form, as shown in Fig. 5. The blank is then further bent to complete the spring barrels 1, each of which is of a single thickness of metal, and the end portions 16 of the blank are lapped over and pressed into contact with the central portion 15 thereof to form the integral connecting web of two thicknesses of metal, as indicated in Fig. 6. The end portions 16 of the blank then lie in the same plane against the inner face of the central portion 15, with the edges of the end portions abutting, and the tongue or dovetail 18 on one edge interlocked with the correspondingly-shaped notch 19 on the other edge. The lips 20 are then pressed down upon the outer faces of the abutting end portions 16 with the outturned ends 21 of the lips engaging and bracing the ends of the barrels 1. By this operation the metal of the end portion 16 immediately below the lip 20 is forced laterally or offset into the rabbets or recesses 22, as most clearly shown in Fig. 2.

The improved hinge body may thus be easily and economically manufactured in large quantities from flat, sheet metal blanks by pressing and shaping the same with suitable dies. By interlocking the edges of the end portions 16 they are held securely against separation in lateral direction. The overlapping lips 20 which are folded over the abutting end portions 16 materially strengthen the joint between these parts, and also serve as reinforcements for the ends of the web and of the barrels which are subject to the greatest strain. The overlapping lips also prevent the interlocked end portions from lifting out of engagement with each other. The joint between the end portions 16 of the blank and the upper and lower edges of the web are further strengthened by the offsetting or corrugation of the ends of the web. Moreover, in turning down the lips 20, and in offsetting the edges of the web the metal is struck so hard with the dies that it is hardened and tempered so that these edge portions will readily resist the strain brought to bear thereon and so that there will be no tendency for the overlapped lips to lift up out of position. Moreover, with the preferred form of hinge body illustrated there is no necessity of employing rivets for connecting the sides or sections of the web, the holes for which would tend to weaken the web.

The offsetting of the edges not only strengthens the web but also gives a uniform appearance to the hinge on both sides. For the sake of appearance also, a piece of thin sheet metal 23 of substantially the same size as the web is placed over the joint between the end portions 16 and between the

barrels 1 and lips 20 before the latter are turned down from the position shown in Fig. 6. Then, when the lips are turned down, the thin piece of metal 23 will be securely held in position, as shown in Fig. 2. This thin piece gives a uniform appearance to both sides of the web but is not necessary to and adds nothing to the strength of the hinge body. While the integral, connecting web between the spring barrels is extremely rigid and strong, it is comparatively thin and neat in appearance and the flanges or wings 9 of the hinge do not have to be set very deeply into the door and door frame in order that they shall properly abut when the door is closed.

It is obvious that the details set forth may be varied without departure from the essentials of the invention as defined in the claims.

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

1. A hinge body comprising a sheet metal blank shaped to form two spring barrels, each of a single thickness of metal, with the end portions of the blank overlapping the central portion thereof to form an integral connecting web of double thickness, the edges of said end portions abutting and provided with interlocking parts, substantially as described.

2. A hinge body comprising a sheet metal blank shaped to form two spring barrels, each of a single thickness of metal, with the end portions of the blank overlapping the central portion thereof to form an integral connecting web of double thickness, the edges of said end portions abutting and provided respectively with an interlocking dovetailed tongue and notch, and means for securing said end portions to said central portion, substantially as described.

3. A hinge body comprising a sheet metal blank shaped to form two spring barrels, each of a single thickness of metal, with the end portions of the blank overlapping the central portion thereof and having their edges abutting to form an integral connecting web of double thickness, said central portion having lips at its side edges folded over the side edges of said abutting end portions, substantially as described.

4. A hinge body comprising a sheet metal blank shaped to form two spring barrels, each of a single thickness of metal, with the end portions of the blank overlapping the central portion thereof to form an integral connecting web of double thickness, said central portion having integral lips at its side edges folded over the side edges of said end portions and engaging the outer faces thereof, said folded lips extending between and bearing upon the ends of said barrels, substantially as described.

5. A hinge body comprising a sheet metal

blank shaped to form two spring barrels, each of a single thickness of metal, with the end portions of the blank overlapping the central portion thereof to form an integral connecting web of double thickness, the edges of said end portions abutting and provided with interlocking parts and said central portion having lips at its side edges folded over said abutting, interlocked end portions, substantially as described.

6. A hinge body comprising a sheet metal blank shaped to form two spring barrels, each of a single thickness of metal, with the end portions of the blank overlapping the central portion thereof to form an integral connecting web of double thickness, the sections of said web being united by overlapping lips, each of which is integral with one section and folded over and interlocked with the edge of the other section, and the folded edges of said web being laterally offset, substantially as described.

7. A hinge body comprising a sheet metal blank shaped to form two spring barrels, each of a single thickness of metal, with the end portions of the blank overlapping the central portion thereof to form an integral connecting web of double thickness, the edges of said end portions abutting and provided with interlocking parts and said central portion having lips at its side edges folded over the edges of said abutting, interlocked end portions and engaging the outer faces thereof, the folded lips or edge portions of said web being laterally offset, substantially as described.

8. A hinge body comprising a sheet metal blank shaped to form two spring barrels, each of a single thickness of metal, with the end portions of the blank overlapping the central portion thereof to form an integral connecting web of double thickness, the edges of said end portions abutting and provided respectively with an interlocking dove-tailed tongue and notch, and the sections of said web being united by overlapping flanges, each of which is integral with one section and folded over and interlocked with the edge of the other section, substantially as described.

9. A hinge body comprising a sheet metal blank shaped to form two spring barrels, each of a single thickness of metal, with the end portions of the blank overlapping the central portion thereof to form an integral connecting web of double thickness, the edges of said end portions abutting and provided with interlocking parts and said central portion having lips at its side edges folded over the side edges of said abutting interlocked end portions, said folded lips extending for the full width of said web and bearing upon the ends of said barrels, substantially as described.

10. A hinge body comprising a sheet metal blank shaped to form two spring barrels, each of a single thickness of metal, with the end portions of the blank overlapping the central portion thereof to form an integral connecting web of double thickness, the edges of said end portions abutting and provided respectively with an interlocking dove-tailed tongue and notch, said central portion having lips at its side edges folded over the side edges of said abutting interlocked end portions, the folded lips or edge portions of said web being laterally offset and extending between and bearing upon the ends of said barrels, substantially as described.

11. A hinge body comprising a sheet metal blank shaped to form two spring barrels, each of a single thickness of metal, with the end portions of the blank overlapping the central portion thereof to form an integral connecting web of double thickness, the edges of said end portions abutting and provided with interlocking parts, and said central portion having lips at its side edges folded over the edges of said abutting, interlocked end portions, and a piece of thin sheet metal covering the joint between said abutting end portions and secured in position by said overlapping lips, substantially as described.

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Witnesses:

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