

J. H. BURTNER.  
CHAIN PUMP BUCKET.  
APPLICATION FILED JUNE 9, 1909.

961,933.

Patented June 21, 1910.

Fig. 1.

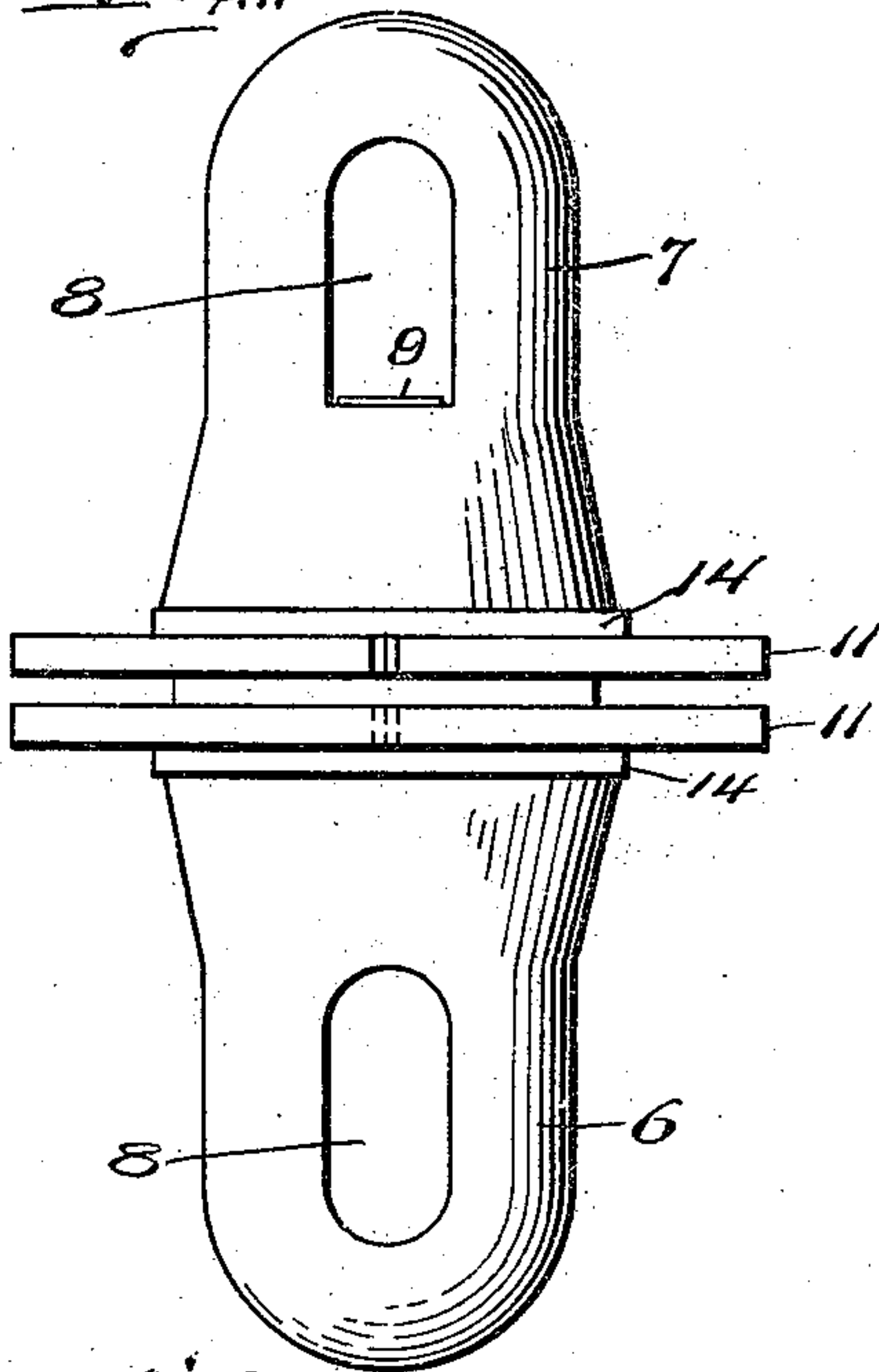


Fig. 2.

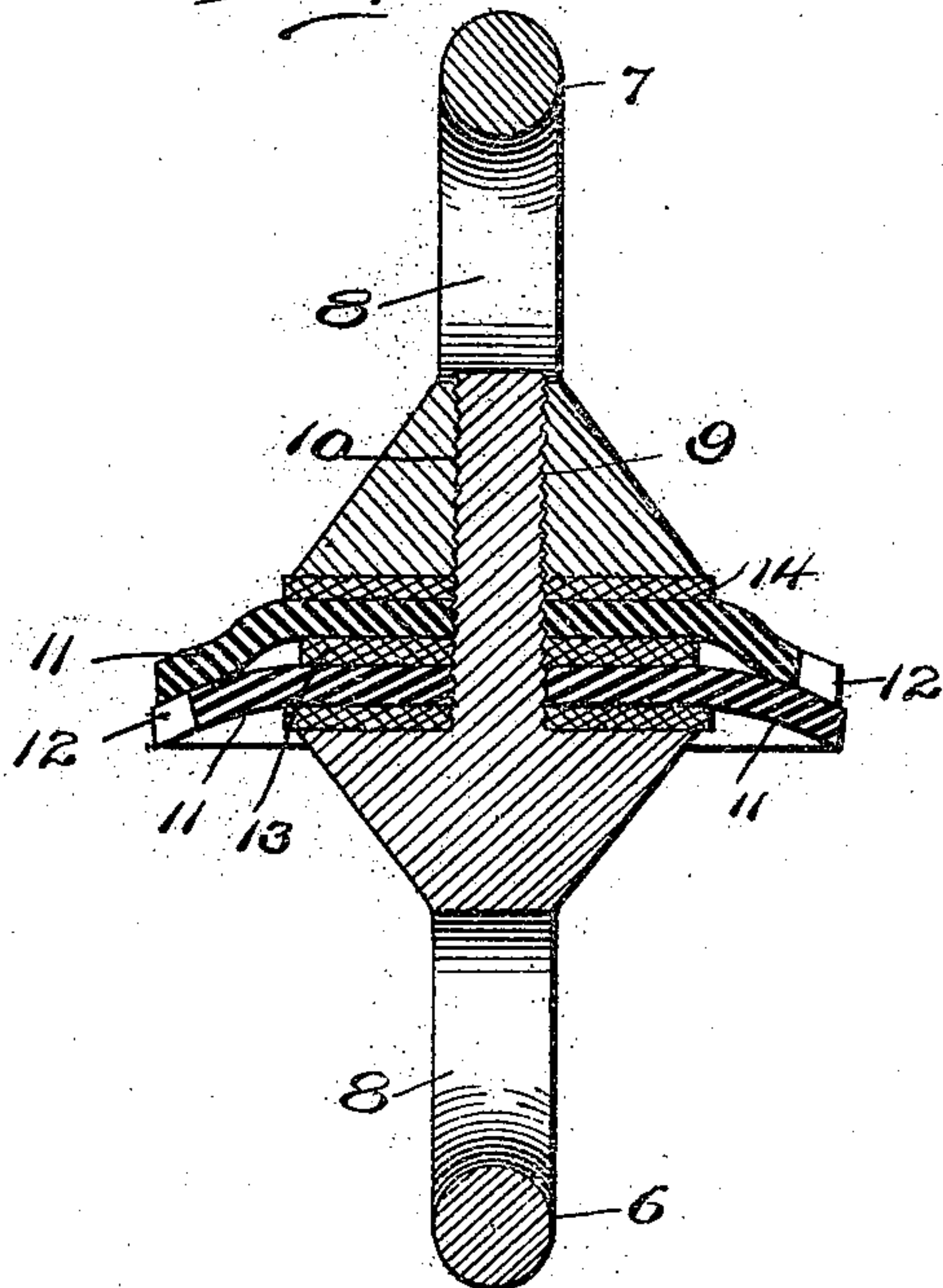


Fig. 3.

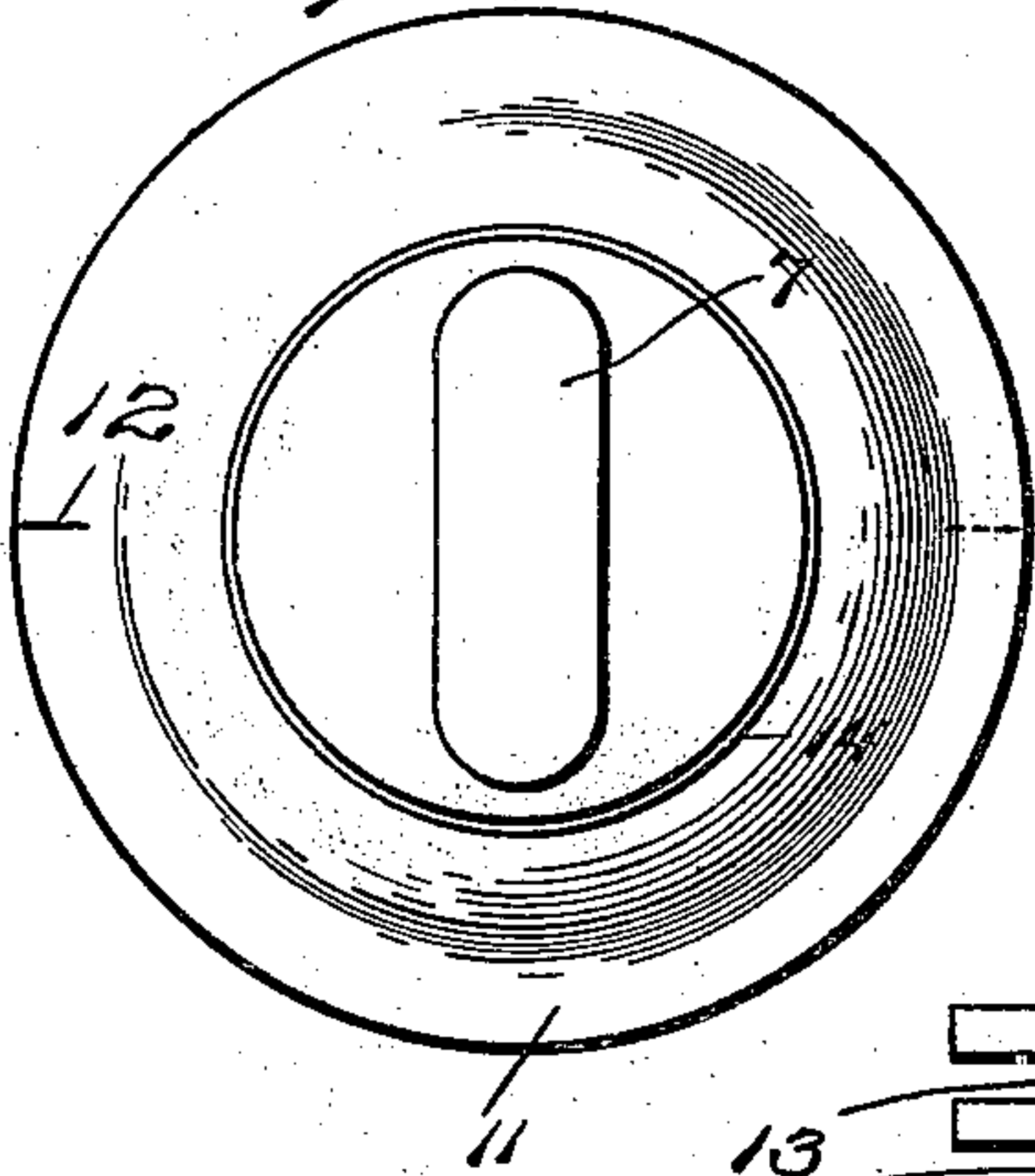


Fig. 5.

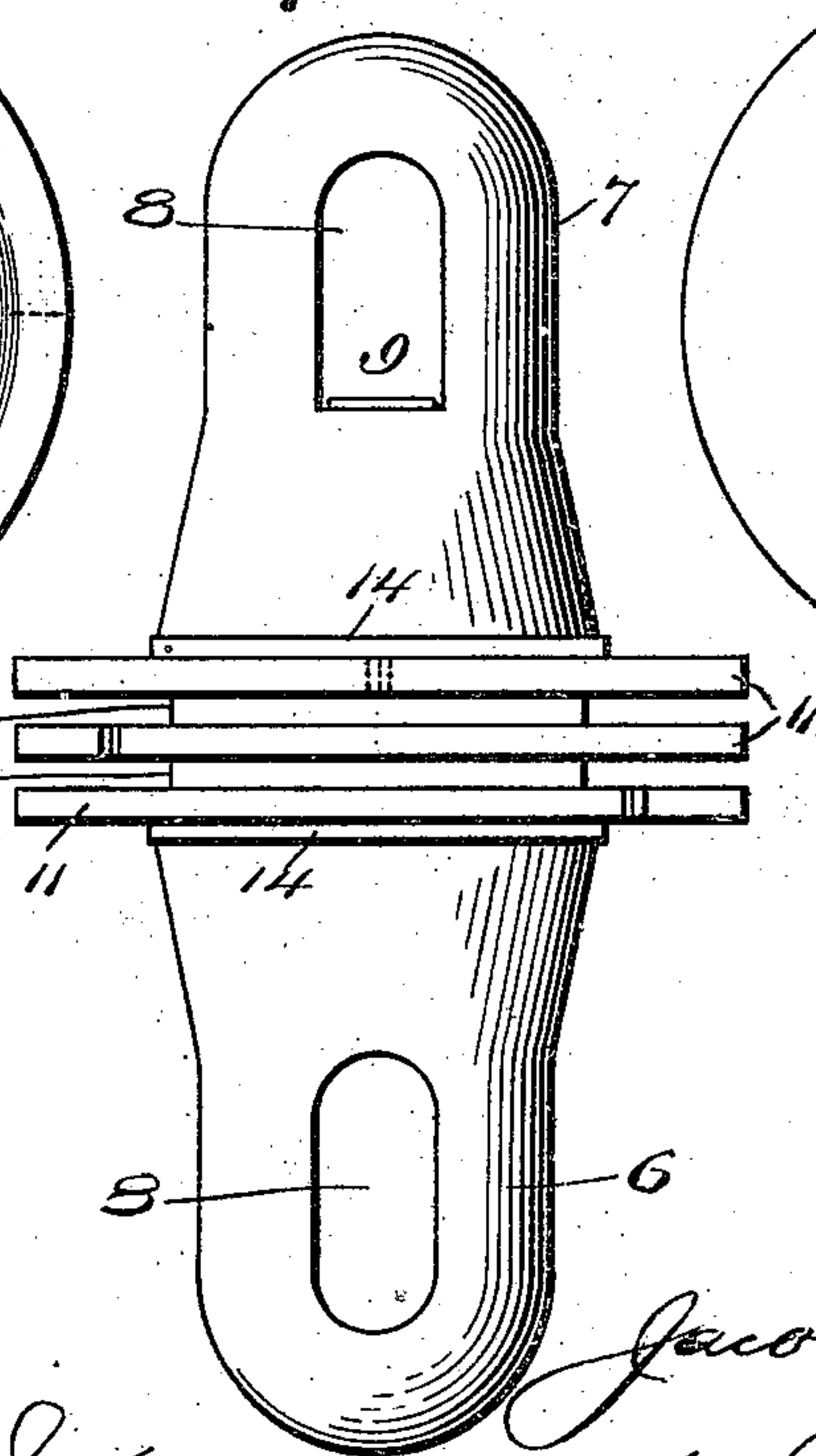
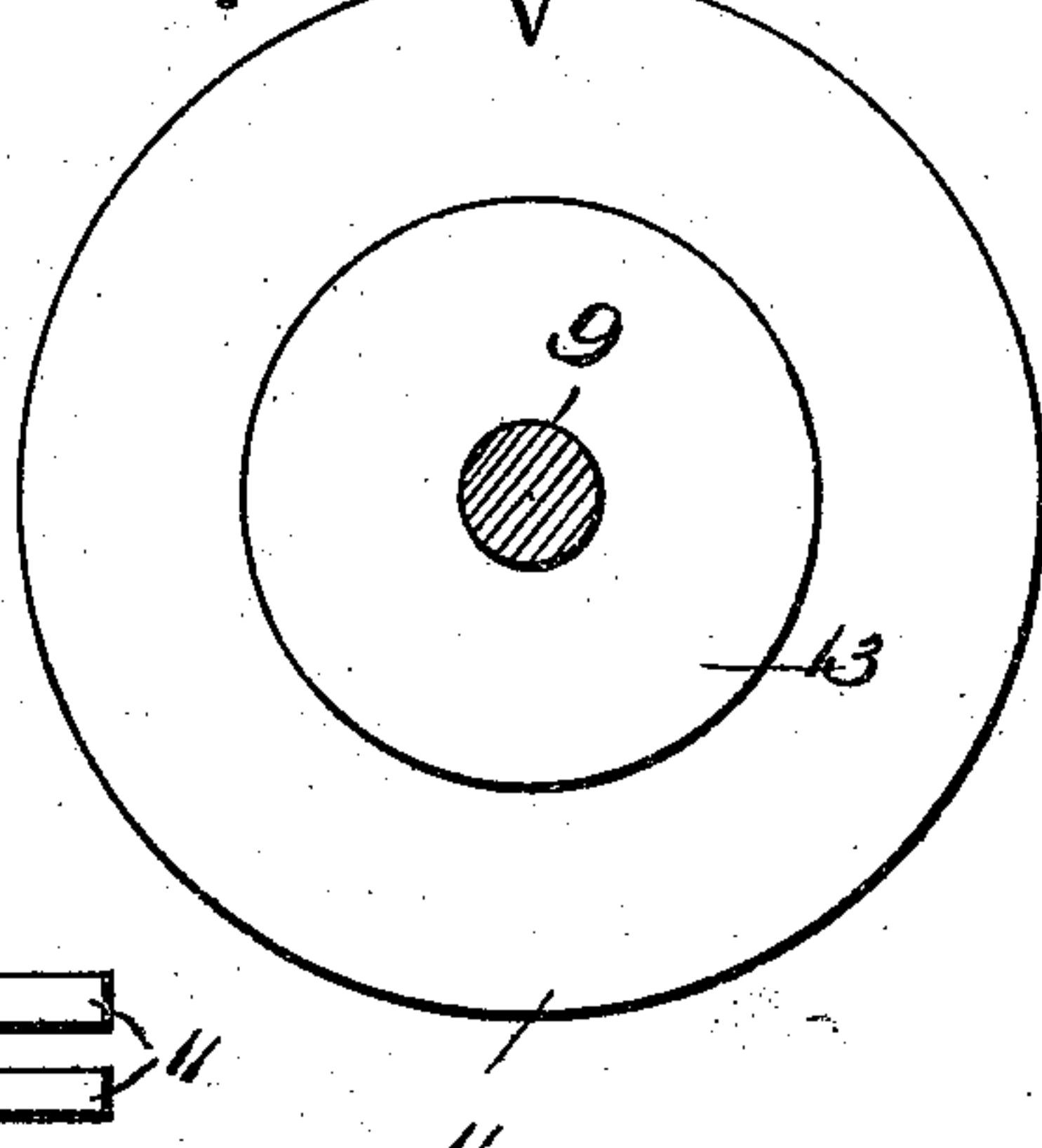


Fig. 4.



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# UNITED STATES PATENT OFFICE.

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## CHAIN-PUMP BUCKET.

961,933.

Specification of Letters Patent. Patented June 21, 1910.

Application filed June 9, 1909. Serial No. 501,169.

*To all whom it may concern:*

Be it known that I, JACOB H. BURTNER, a citizen of the United States, residing at Keedysville, in the county of Washington and State of Maryland, have invented certain new and useful Improvements in Chain-Pump Buckets, of which the following is a specification.

This invention relates to that class of water elevators which are known as chain pumps and which embody in their construction a suitably supported endless chain equipped with links having flexible diaphragms adapted to operate through a pump tube the lower end of which is immersed in the well and the upper end of which is connected with a discharge spout.

The present invention has particular reference to an improved construction of such of the chain links as are generally known as chain pump buckets; one object of the invention being to provide a reversible link or bucket of simple and improved construction.

A further object of the invention is to provide the bucket with a plurality of flexible diaphragms spaced slightly apart and provided with non-alining apertures adjacent to their edges so that, when the diaphragms are forced together by the weight superimposed water when the pump is in operation, the several apertures shall be closed, thus presenting virtually an integral and non-leaking diaphragm for engagement with the walls of the pump tube while, when the pump is at rest, the resiliency of the diaphragms will spread them apart, thus opening the several apertures to the leakage of water which will thus be free to return to the well, and avoiding danger to the pump tube resulting from the freezing of water left standing.

Still further objects of the invention are to simplify and improve the construction and operation of this class of devices.

With these and other ends in view which will readily appear as the nature of the invention is better understood, the same consists in the improved construction and novel arrangement and combination of parts which will be fully described and particularly pointed out in the claim.

In the accompanying drawing has been illustrated a simple and preferred form of the invention; it being, however, understood that no limitation is necessarily made to the precise structural details therein exhib-

ited, but that changes, alterations and modifications within the scope of the invention may be resorted to when desired.

In the drawing—Figure 1 is a side elevation of a chain pump bucket constructed in accordance with the invention. Fig. 2 is a vertical sectional view of the same, showing the flexible diaphragms in the position assumed under the weight of superimposed water when the pump is in operation. Fig. 3 is a plan view of the device as seen in Fig. 2. Fig. 4 is a horizontal sectional view of the device as seen in Fig. 1. Fig. 5 is a side view showing a pump bucket equipped with an additional diaphragm.

Corresponding parts in the several figures are denoted by like characters of reference.

The improved chain pump link or bucket is composed of two clamping members 6 and 7, each having a terminal eye 8 by means of which connection may be made with adjacent links. One of the members, 6, is provided with an axial externally threaded stem 9 extending in the direction of the opposite member 7 and engaging an axial screw-threaded bore 10 in the latter; the two members 6 and 7 being in this manner separably connected.

The stem 9 carries a plurality of disks or diaphragms 11 made of any suitable flexible and resilient material such as rubber, leather or the like, said disks or diaphragms being provided adjacent to their edges with notches or apertures 12. In the example illustrated in Figs. 1 to 4 inclusive, two such disks or diaphragms have been shown, and the notches or apertures 12 of the said disks are disposed barely at diametrically opposite sides so as to be absolutely out of alinement. These notches or apertures may be of any suitable appropriate shape although usually notches or incisions of approximate V-shape will answer the purpose. The disks or diaphragms 11 are spaced slightly apart by an interposed washer 13 which may be made of any suitable material, although it is preferably made of leather or some similar material which will not injure the disks or diaphragms. Thin protective washers 14 are interposed between the disks or diaphragms 11 and the end members. These washers, as will be observed by reference to Fig. 2, are of greater diameter than the opposed faces of the frusto-conical body portions of the clamping members, the object of this arrangement being to protect



the disks 11 from cutting action when flexed in being drawn through the well tube.

It will be readily seen from the foregoing description that when the parts are assembled, the disks 11 as well as the washer or washers will be firmly clamped and held between the end members 6, 7 which latter have screw-threaded connection with each other, as shown. When the pump equipped with the improved links or buckets is in operation, the weight of the water resting upon the upper disk or diaphragm 11 will force the latter downwardly upon the lower disk or diaphragm, thus closing or obstructing the apertures 12, as will be best seen in Fig. 2. The disks or diaphragms being but slightly spaced apart, the apertures 12 may thus be obstructed without interfering with the effective engagement of the disks or diaphragms with the pump tube. When the pump is at rest, the natural resiliency of the disks or diaphragms will cause them to assume the spaced relation illustrated in Fig. 1, and any water above the disks will thus be free to return to the well.

One of the essential features of the invention is to prevent any impact between the buckets and the tube when the former enter the latter in the operation of the pump. To secure this result, all of the exterior surfaces of the eyes are formed on curved lines, and merge into the body portion of the clamping members, which latter are cone frustums. It will be seen that by this arrangement should the eye of the ascending bucket strike the end of the tube it will merely slip past the same without any jar, the same being true with regard to the frusto-conical body portion. This feature is of great importance, inasmuch as it will insure the smooth running of the pump, and prevent any damage to the buckets.

In Fig. 5 of the drawing has been illustrated a slight modification under which the link or bucket is equipped with three spaced disks or diaphragms instead of only the two such disks, as shown in the remaining

figures, each of said diaphragms being provided with a notch or aperture 12, and said apertures in the several disks being disposed out of alinement with each other. The construction in other respects is identical with that hereinbefore described, and the operation and advantages of this invention will be readily understood.

It will be seen that the improved link or bucket is reversible, and may be used with either end uppermost; it may also be stated that when the disks or diaphragms become partly worn, they may be reversed or inverted, thus presenting a fresh wear surface as will be readily understood.

The construction is simple and inexpensive, and disks or diaphragms that have been worn out may be readily replaced by new ones, and such disks or diaphragms may be cut from a piece of leather or other suitable material without resorting to the use of skilled labor.

Having thus described the invention, what is claimed is:

A chain-pump bucket comprising two clamping-members each embodying an eye and a frusto-conical body-portion, the opposed faces of the body-portions being flat, the exterior surfaces of the eyes being rounded to prevent impact with the well-tube, and the frusto-conical body-portions serving as guides to direct the bucket into the tube, means for connecting the two body-portions, spaced resilient disks clamped between the body-portions, and protective disks disposed between the opposed faces of the body-portions and the disks, and being of somewhat greater diameter than said faces to protect the disks from cutting action when flexed.

In testimony whereof I affix my signature in presence of two witnesses.

JACOB H. BURTNER.

Witnesses:

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