

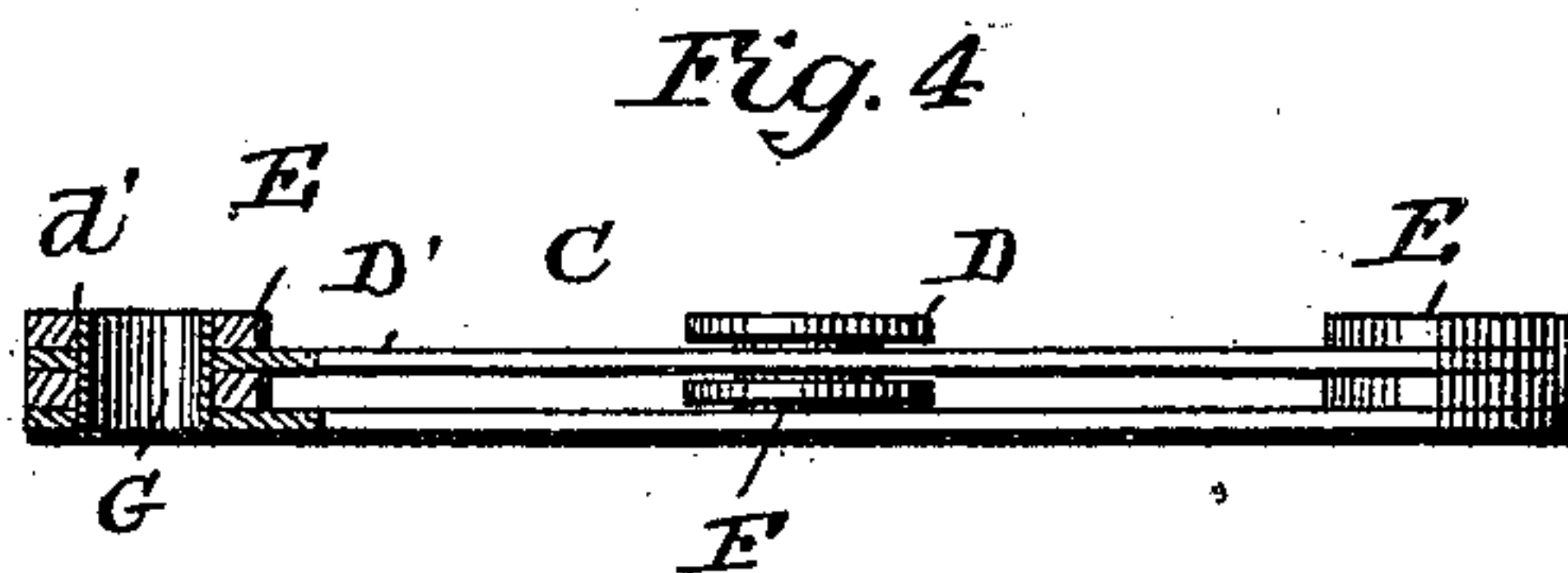
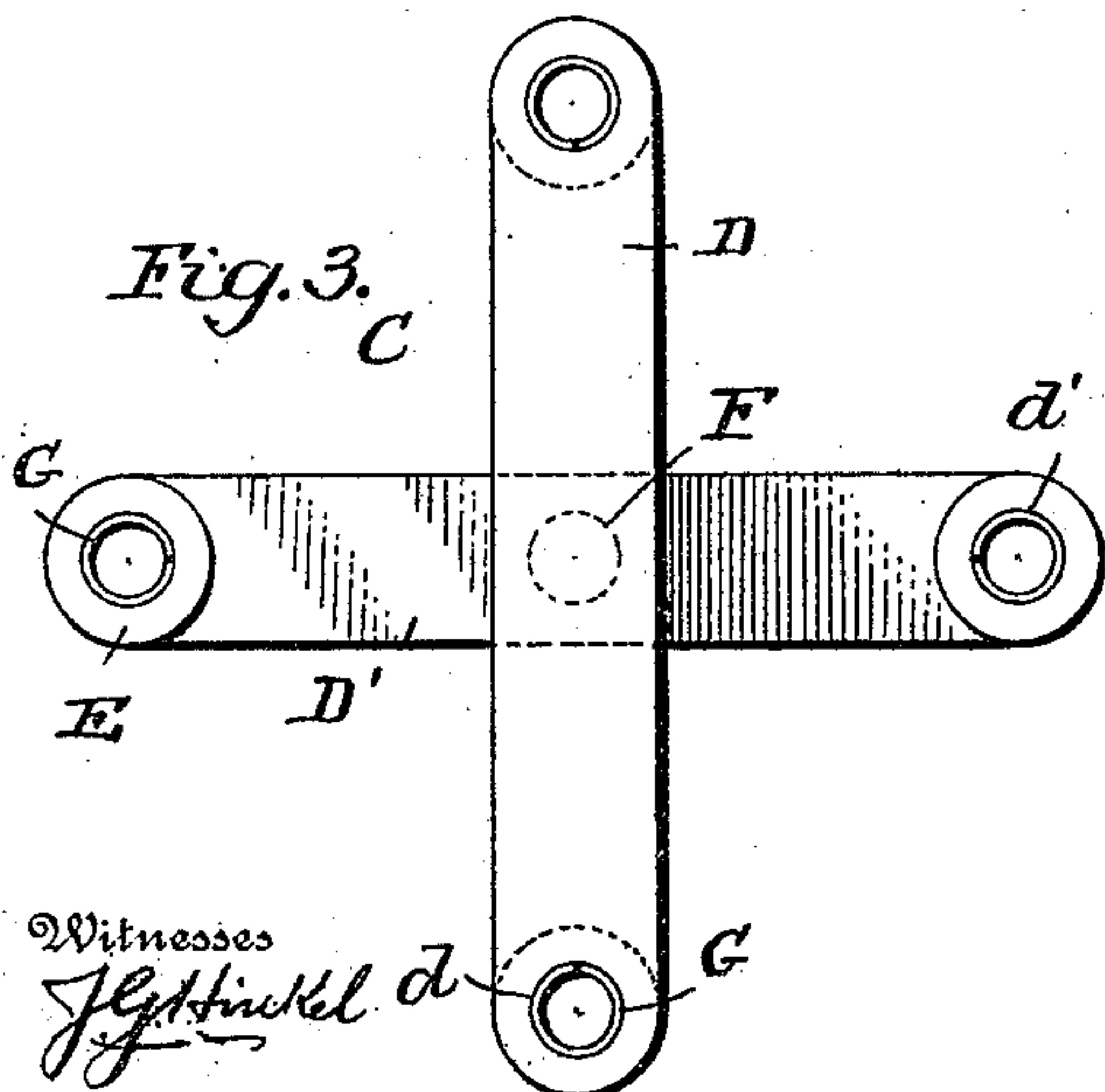
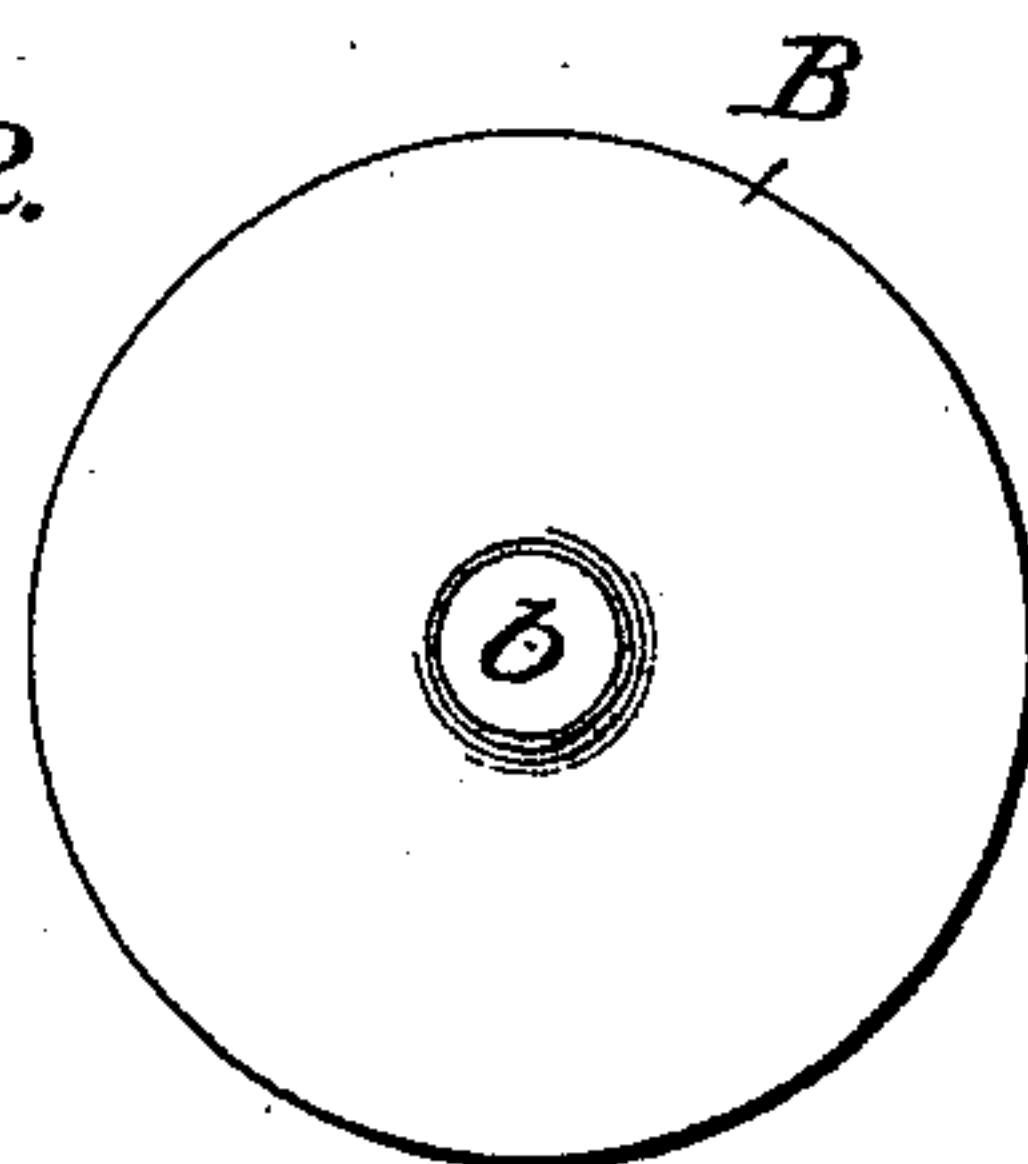
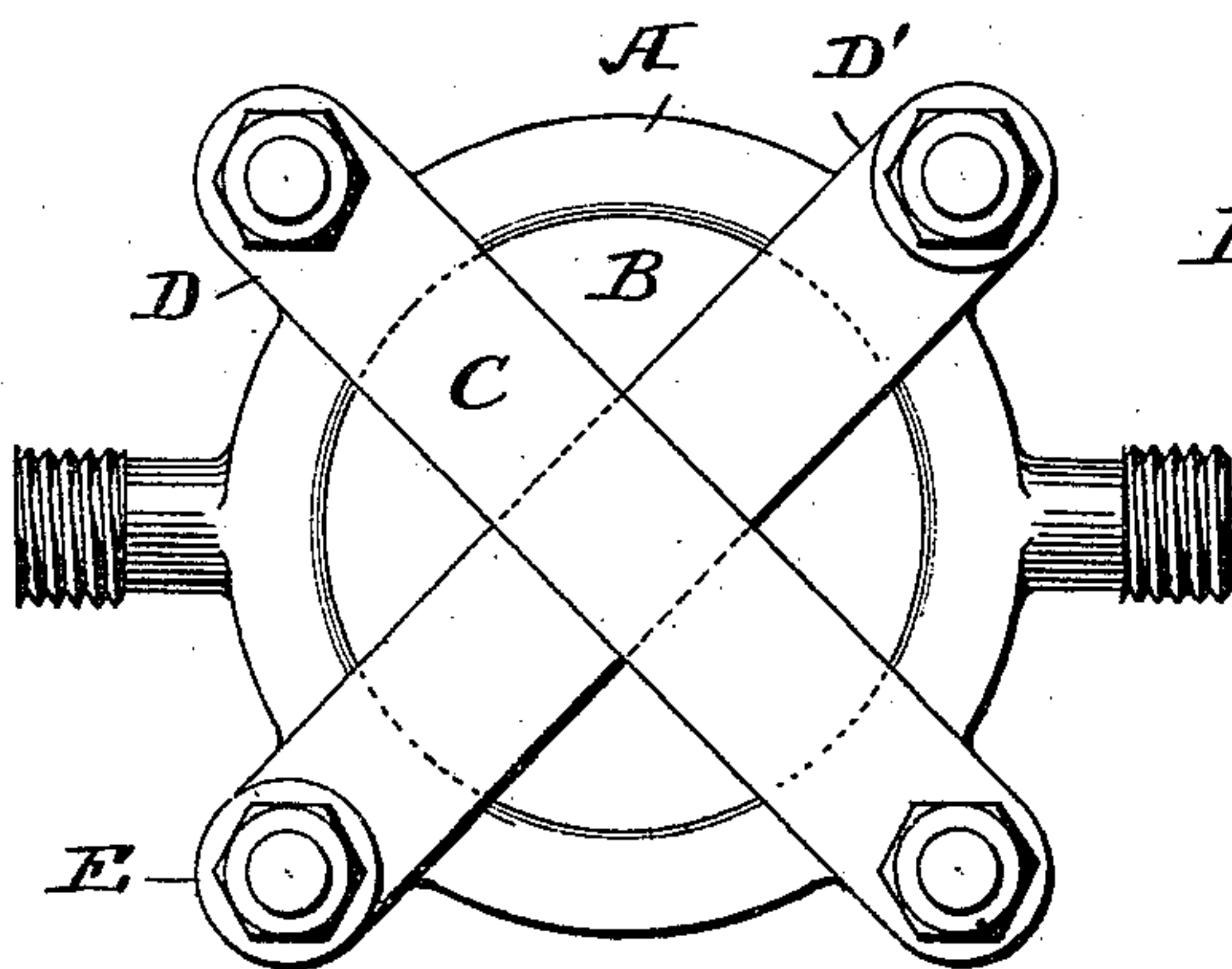
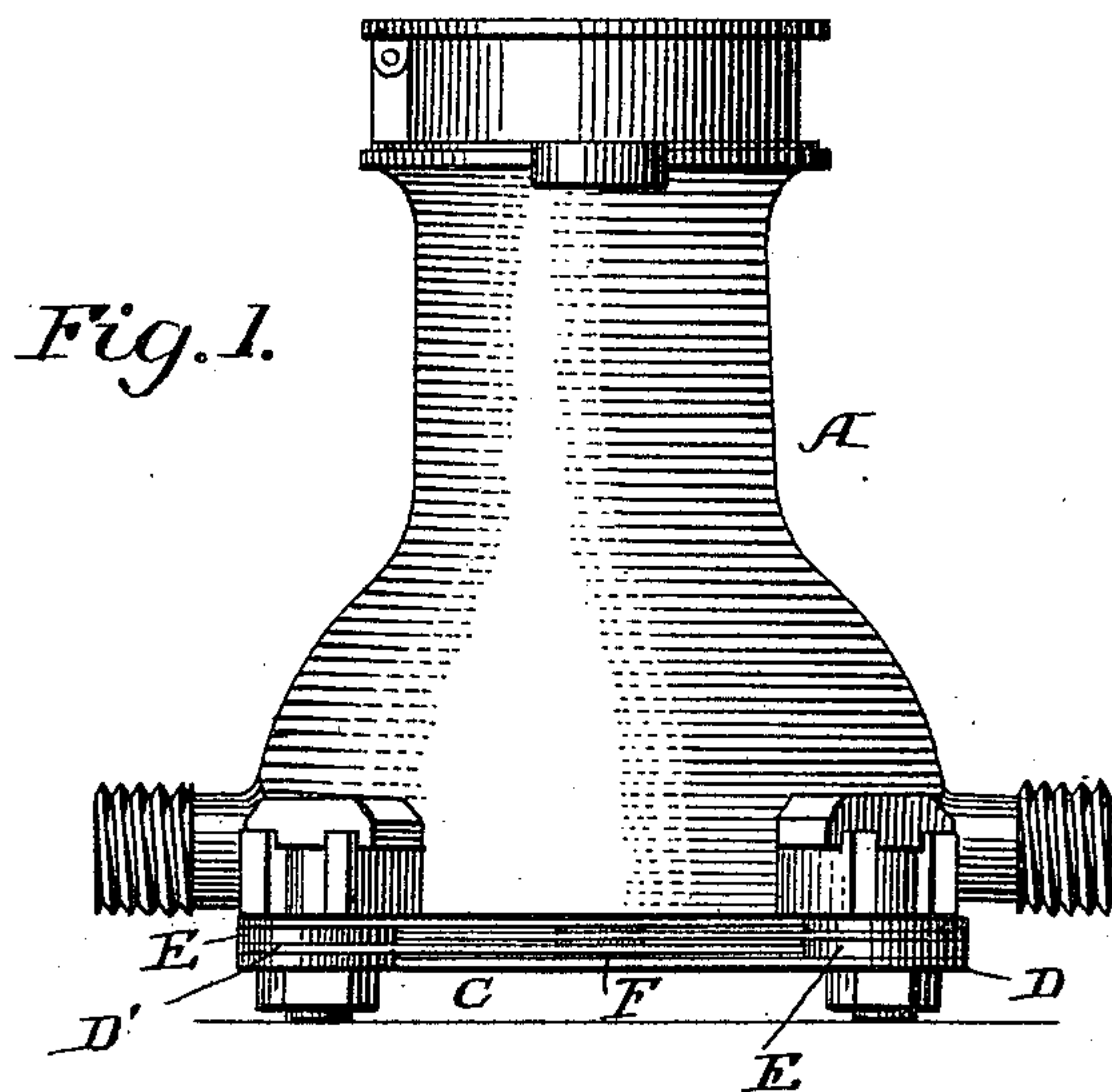
No. 642,766.

Patented Feb. 6, 1900.

J. THOMSON.  
WATER METER.

(Application filed Sept. 18, 1899.)

(No Model.)



Witnesses  
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# UNITED STATES PATENT OFFICE.

JOHN THOMSON, OF NEW YORK, N. Y.

## WATER-METER.

SPECIFICATION forming part of Letters Patent No. 642,766, dated February 6, 1900.

Application filed September 18, 1899. Serial No. 730,929. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN THOMSON, a citizen of the United States, residing at New York, (Brooklyn,) in the county of Kings and State of New York, have invented certain new and useful Improvements in Water-Meters, of which the following is a specification.

My invention relates to water-meters, and more particularly to the means for securing the closing cap or head of the casing, the object being to improve the construction and increase the durability of such meters; and it consists in the features of construction and arrangements of parts substantially as hereinafter set forth.

In the accompanying drawings, Figure 1 is a side elevation of a meter, showing my improvement in place. Fig. 2 is a bottom plan of the same, also showing the head separately. Fig. 3 is an enlarged plan view of the resilient retainer, and Fig. 4 is a side view.

The advantages arising from the use of resilient retainers for the cap or closing end or bottoms of water-meters have been fully recognized and their operation is fully understood by those skilled in the art; and my present invention has for its object to provide a cheap, durable, and effective retainer which shall be automatic and certain in its operation under all conditions of abnormal pressure, whether from freezing of the water, water-ramming, or otherwise.

In the example illustrated in the drawings, A is the main casing of the meter, having a closing-head B, fitting loosely in the recessed end of the casing and forming a water-tight closure, under all normal conditions. The head is held in position under pressure by the resilient retainer C, suitably secured to the casing and bearing upon the head, which in the present instance is provided with a central projection *b*. The resilient retainer is made up of a series of strips *D D'* of resilient metal, which may be made from a rolled strip of metal or otherwise formed without waste. A number of these strips are stacked crosswise one upon the other, and spacing-washers E, whose thickness is equal to that of the strips, are placed between the strips at or near

their ends, so that the strips are maintained practically parallel to each other and are in two piles, preferably at right angles to each other.

There may be any desired number of strips used, and each strip is subjected to precisely the same strain as the others wherever located, as at the top, bottom, or middle portion of the pile, and together they constitute what may be termed a "leaf-spring."

In some instances I have found it desirable to place thin washers F between the intersecting surfaces of the strips to prevent contact between the edges of the strips, and this has the effect of increasing the resiliency of the springs.

To maintain the strips of the piles in proper and convenient positions, they may be bound or held together in different ways, and I have shown tubes G, fitting the bolt-holes *d d'* in the ends of the strips. These tubes may fit tightly in the holes or they may be riveted or swaged at the edges. They are most conveniently and inexpensively formed by curving the tubes from strips of metal and inserting them in the holes without joining their edges, when they hold the strips by friction, due to their tendency to expand.

It will thus be seen that the resilient retainer is cheaply made, is convenient to handle, and that any desired degree of resiliency may be attained by combining the desired number of strips in the manner set forth. Each strip has a resiliency of its own, and this is not affected by the others, and if one or more strips break or is inefficient from any cause it does not destroy or injure the effect of the others.

What I claim is—

1. The combination with the casing and head therefor, of a resilient retainer for the head comprising strips of resilient metal stacked crosswise, substantially as described.

2. The combination with the casing and head therefor of a resilient retainer for the head comprising strips of resilient metal stacked crosswise and having spacing-washers, substantially as described.

3. The combination with the casing and



head therefor, of a resilient retainer for the head comprising strips of resilient metal stacked crosswise, having spacing-washers and means for holding the strips together, 5 substantially as described.

4. A resilient retainer comprising strips of resilient metal stacked crosswise and provided with holes, spacing-washers between the strips and tubing arranged in the holes

of the strips for securing them together, substantially as described. 10

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN THOMSON.

Witnesses:

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