

No. 767,229.

PATENTED AUG. 9, 1904.

H. C. HART.
METHOD OF MAKING WASHERS.

APPLICATION FILED MAR. 7, 1904.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.

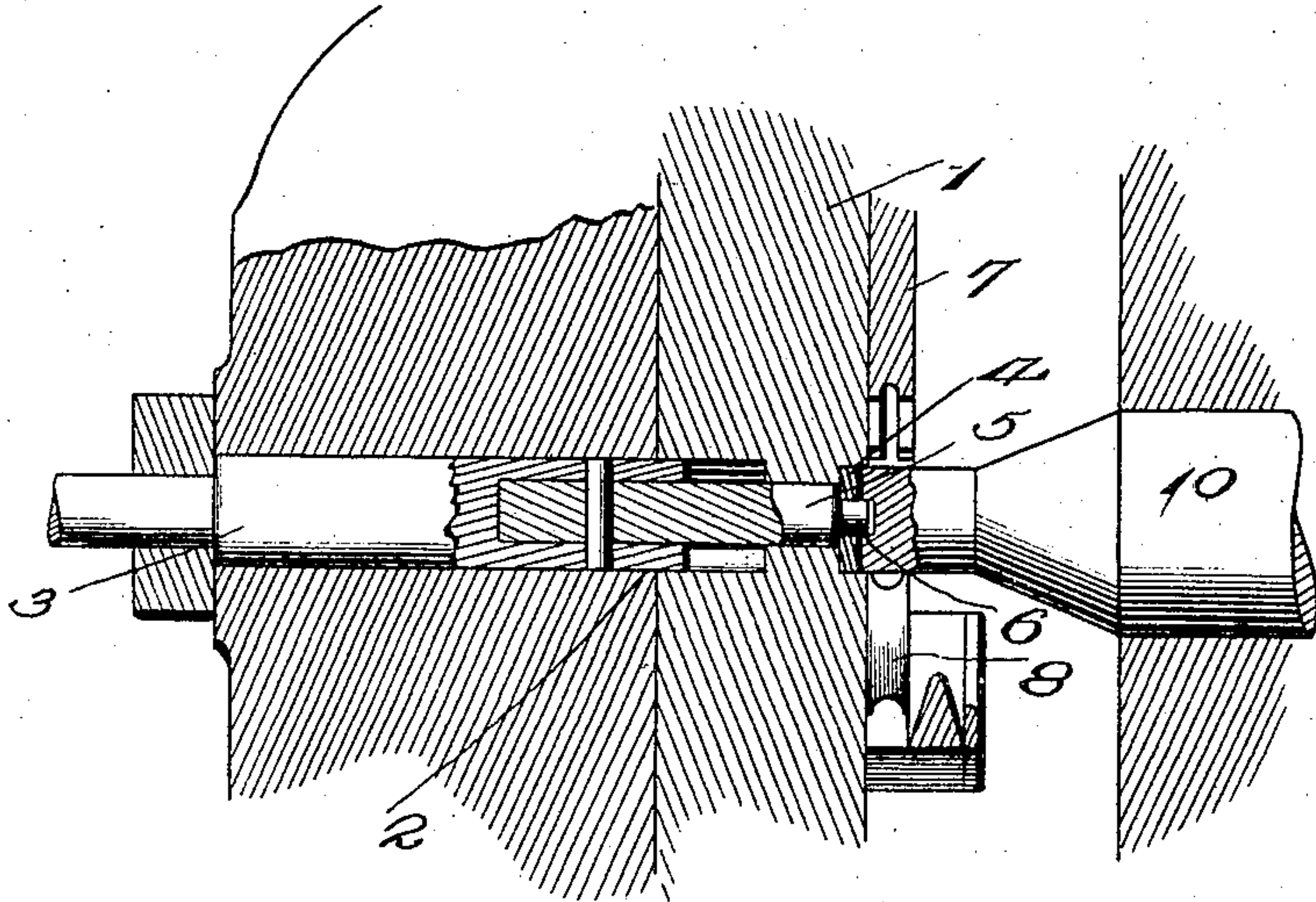
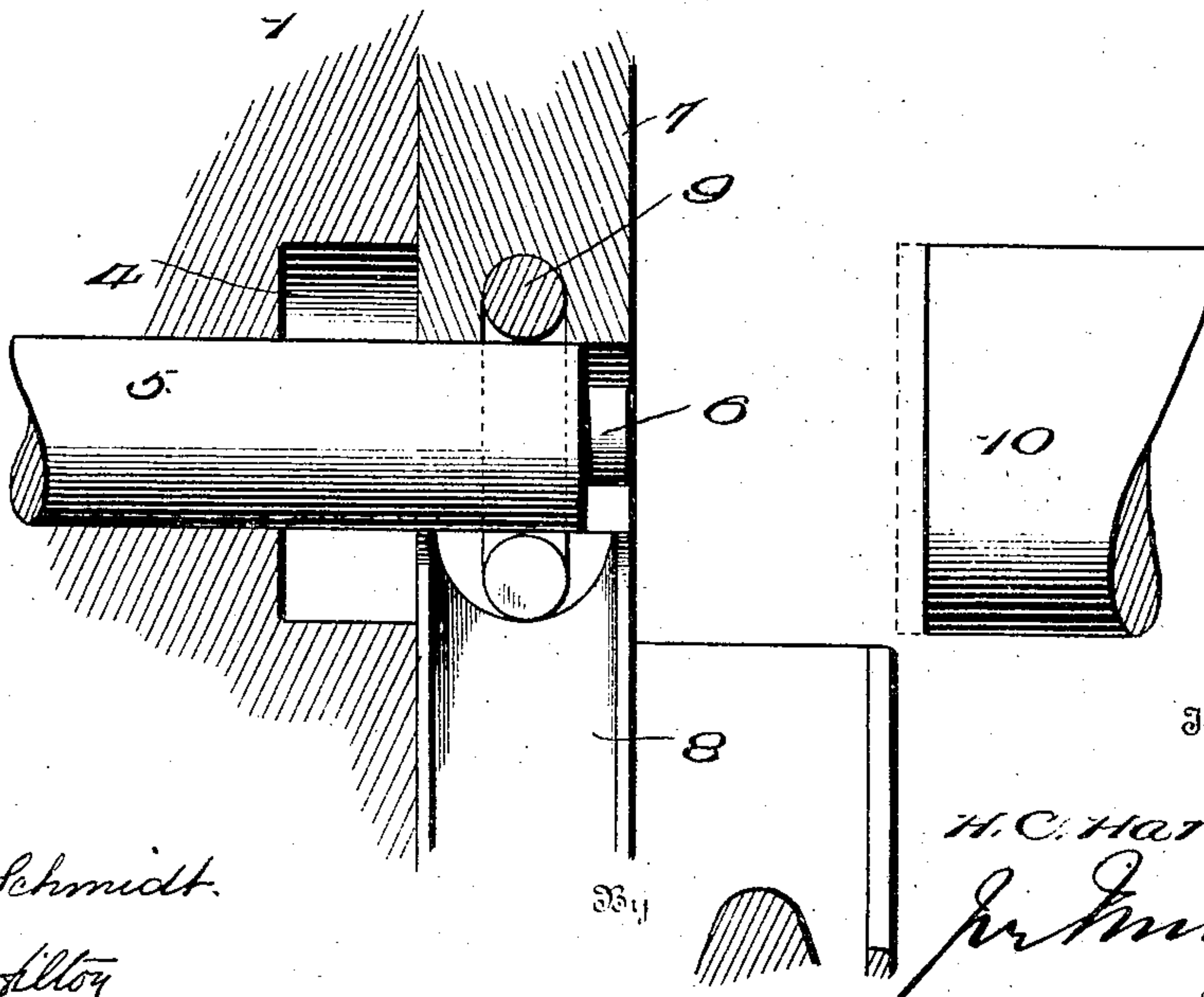


Fig. 2.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 3.

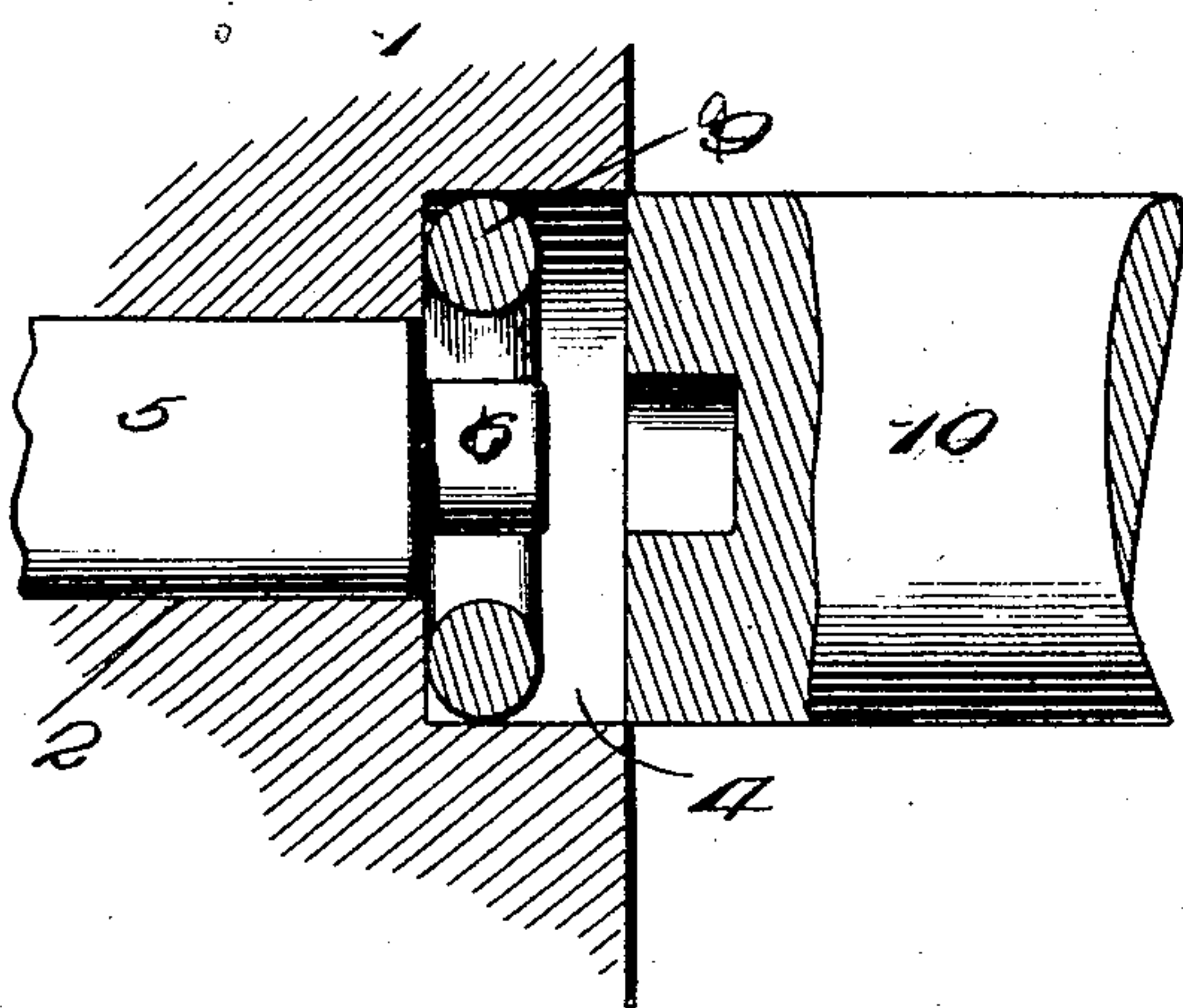


Fig. 4.

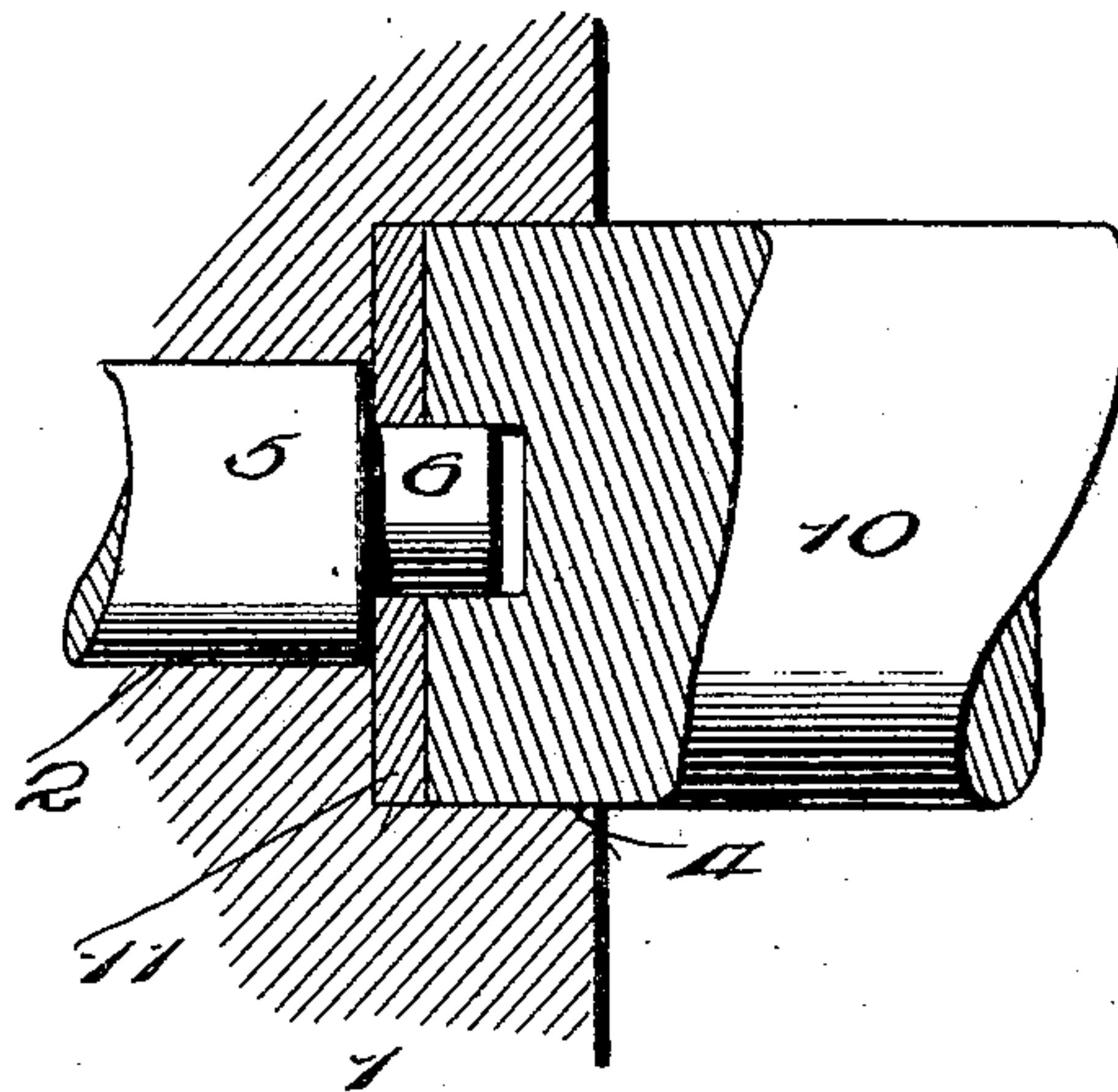


Fig. 7.

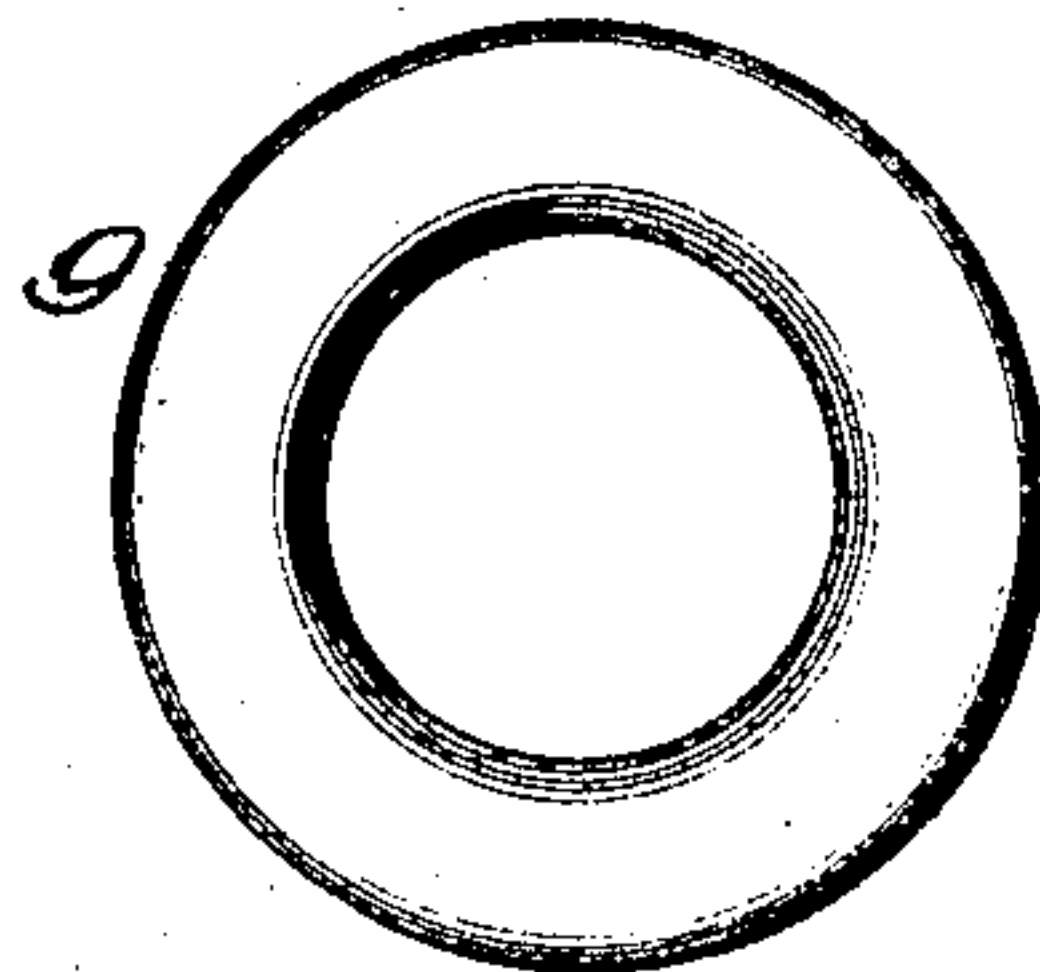


Fig. 5.

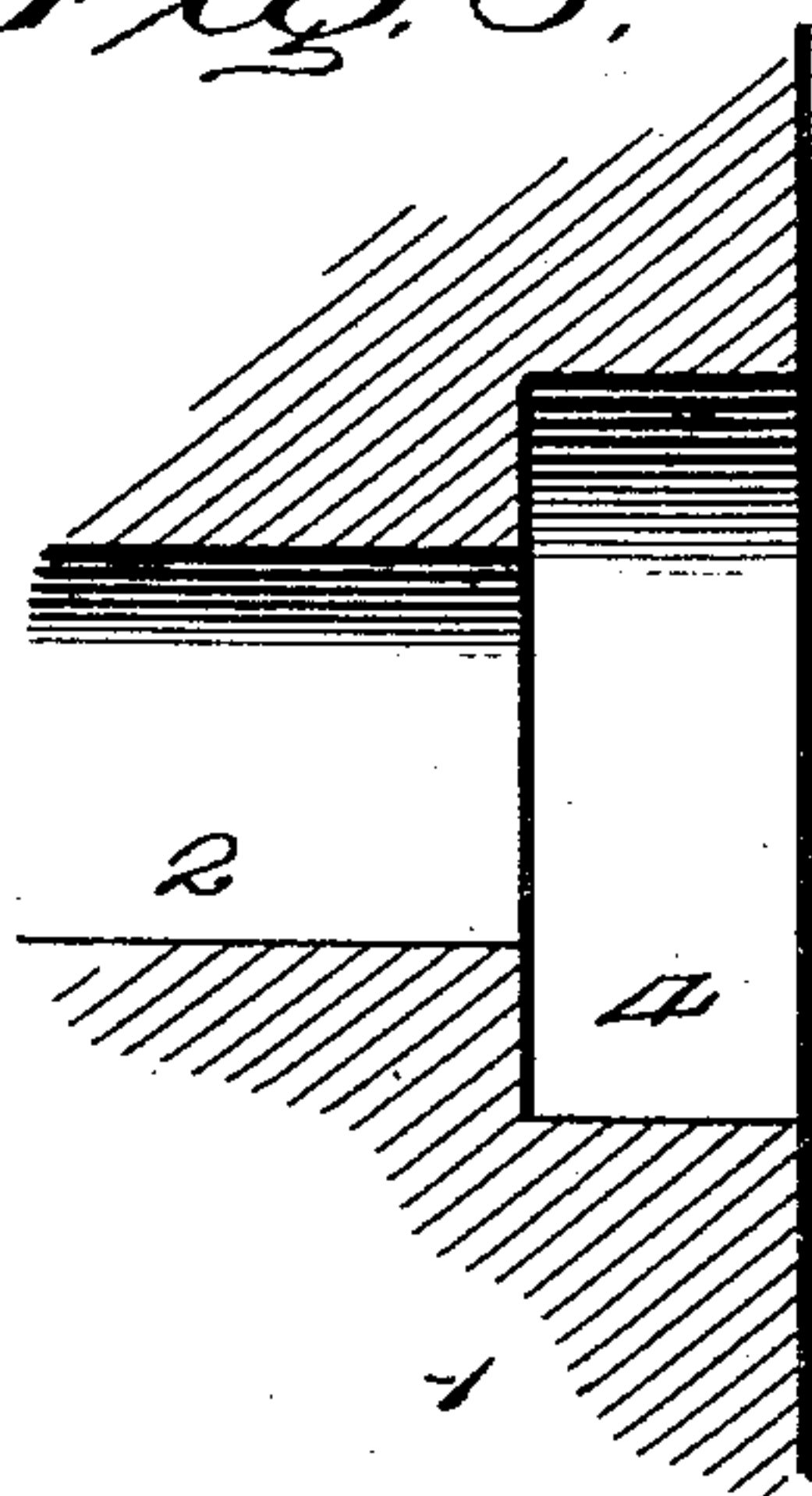


Fig. 6.

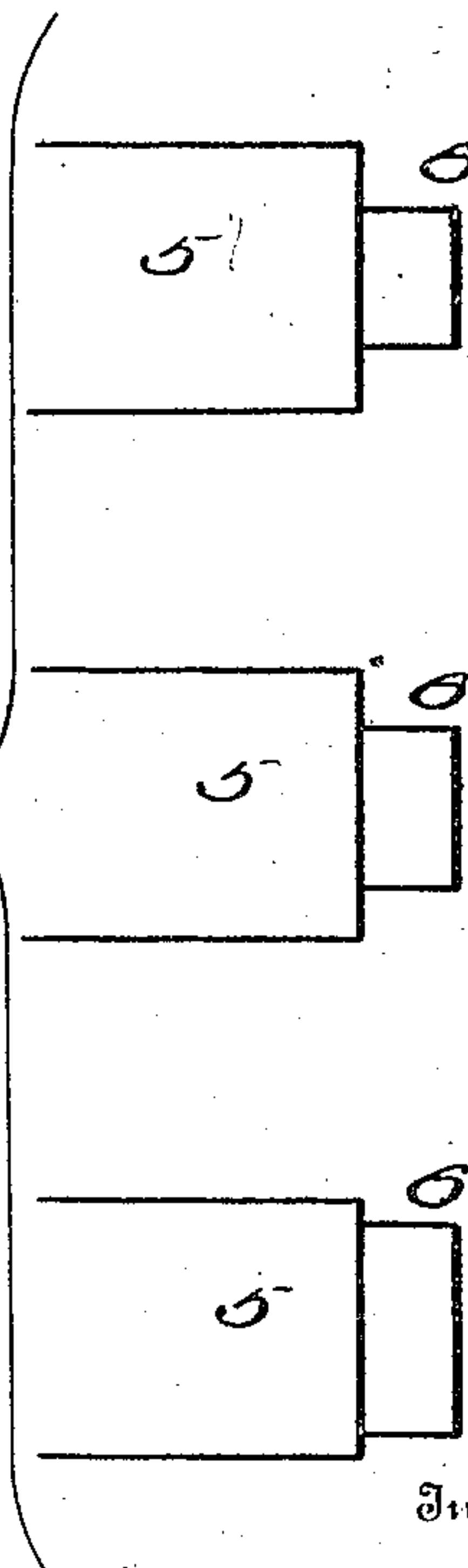
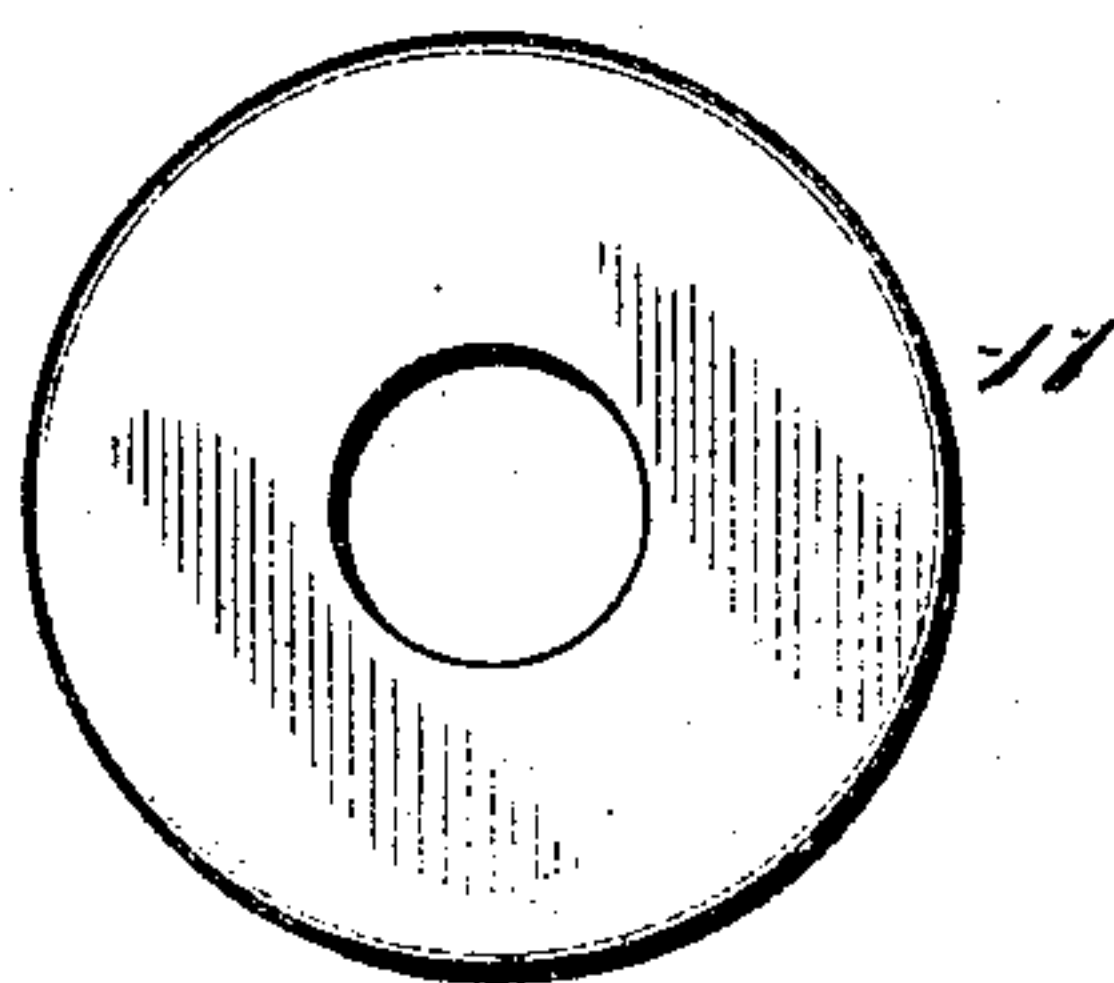


Fig. 8.



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UNITED STATES PATENT OFFICE.

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METHOD OF MAKING WASHERS.

SPECIFICATION forming part of Letters Patent No. 767,229, dated August 9, 1904.

Application filed March 7, 1904. Serial No. 196,939. (No model.)

To all whom it may concern:

Be it known that I, HUBERT C. HART, a citizen of the United States, residing at Unionville, in the county of Hartford and State of Connecticut, have invented new and useful Improvements in Methods of Making Washers, of which the following is a specification.

The invention relates to a new and useful method of making washers from formed ring-stock; and, broadly stated, it consists in confining the exterior or outer edge of the ring, inserting a size-determining core within the ring, and swaging the ring about said core, thereby producing a flat washer having an interior diameter of a definite and predetermined gage without regard to the interior diameter of the original ring-stock.

It is old in the art to swage a formed ring to produce a flat washer; but so far as I am aware no person has ever contemplated regulating or changing the interior diameter of the ring during swaging by a method which permits varying-gage washers to be made from the same ring-stock.

In carrying out my method I take a ring of the washer-stock, which has been made up in any approved manner, and confine its outer edge, then insert a size-determining core of the desired gage within the ring and swage the ring about the core, producing a flat washer of a gage equal to the size of the core and without changing the exterior diameter of the ring-stock.

Washers are generally known to the trade by the gage—that is, the size of the interior opening—and it is in enabling the operator to produce varying and regulatable gages of washers from a single-size ring-stock that my method has its important advantage, as simply inserting a core of the gage desired will produce washers of that gage without regard to the original stock. Thus by the use of varying-sized cores washers of varying gages may be produced at will from the original one-size ring-stock.

In order to more fully present my method, I have illustrated certain parts of a machine for carrying out the method, which machine forms no part of the present invention, being described and claimed in an application filed

by me in the United States Patent Office on the 19th day of June, 1903. I have illustrated only sufficient of said machine, however, to indicate a way of carrying out the method herein described.

In the accompanying drawings, Figure 1 is a sectional view illustrating sufficient of the operating parts to carry out the method. Fig. 2 is an enlarged detail section showing position of the parts after formation of the ring-stock. Fig. 3 is a similar view showing position of parts after withdrawal of the mandrel. Fig. 4 is a similar view showing position of the parts after swaging of the ring. Fig. 5 illustrates a section of the bed-plate, showing the ring-holding recess and the mandrel-opening. Fig. 6 is a view in elevation, showing a plurality of mandrels carrying different-sized cores. Fig. 7 is an elevation of the original ring-stock. Fig. 8 is a similar view showing the completed washer.

As the accompanying illustration is merely to show a means for mechanically carrying out the method, no specifically-detailed description of the parts will be given herein, particularly as the identical machine is fully described and claimed in the copending application hereinbefore referred to.

1 represents the bed-plate, having an opening 2, in which a member 3 is adapted to reciprocate. The remote or washer-receiving end of the opening 2 is enlarged to form a washer-retaining recess 4. A mandrel 5, carrying at its free end a size-determining core 6, is secured as desired to the member 3. A vertical plunger 7 and a slide 8 operate to bend the original round stock into a ring 9 about the mandrel when the reciprocating member has been moved to project the free end of the mandrel beyond the face of the bed-plate, as illustrated in Fig. 2. After withdrawal of the ring-forming means the member 3 is drawn back into opening 2, carrying with it the mandrel 5 and the formed ring until the latter is seated in the recess and the mandrel has been entirely withdrawn from the ring, leaving the size-determining core 6 within the ring, all as clearly shown in Fig. 3. A hammer or plunger 10, arranged to properly coact with the parts, is brought into operation to swage the ring 9,

and as the exterior diameter of the ring is confined by the wall of the recess 4 the flattening causes the metal of the ring to approach and embrace the core 6, thus producing a flat washer 11, having an interior gage of the diameter of the core.

The mandrel is removably secured in the member 3, and if a different-gage washer is desired such mandrel is removed and another carrying a different-sized core 6 is inserted, the consequent operation producing a washer of a different gage from that resulting from the use of the original mandrel, as will be evident.

While a simple machine has been illustrated specifically adapted for carrying out the method, it is evident that such may be completely practiced by hand, the only requisite being means for confining the exterior edge of the ring and a plurality of size-determining cores to control the gage of the washer.

The method described contemplates the formation of the ring-stock in quantities by any desired mechanism or means and the produc-

tion of flat finished washers having one or more interior gages without other change in the ring-stock, thus enabling the operator to produce the same or different gage flat washers from one-size original ring-stock by a quick and simple method.

What I claim as new is—

1. The herein-described process which consists in swaging a ring about an interior core of less diameter than the original interior of the ring to force the metal to embrace the core.

2. The herein-described process which consists in confining the exterior edge of a washer ring-stock, inserting a size-determining core within the ring, and swaging the ring about the core.

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

HUBERT C. HART.

Witnesses:

CARL J. HART,
W. O. HART.