

**No. 692,478.**

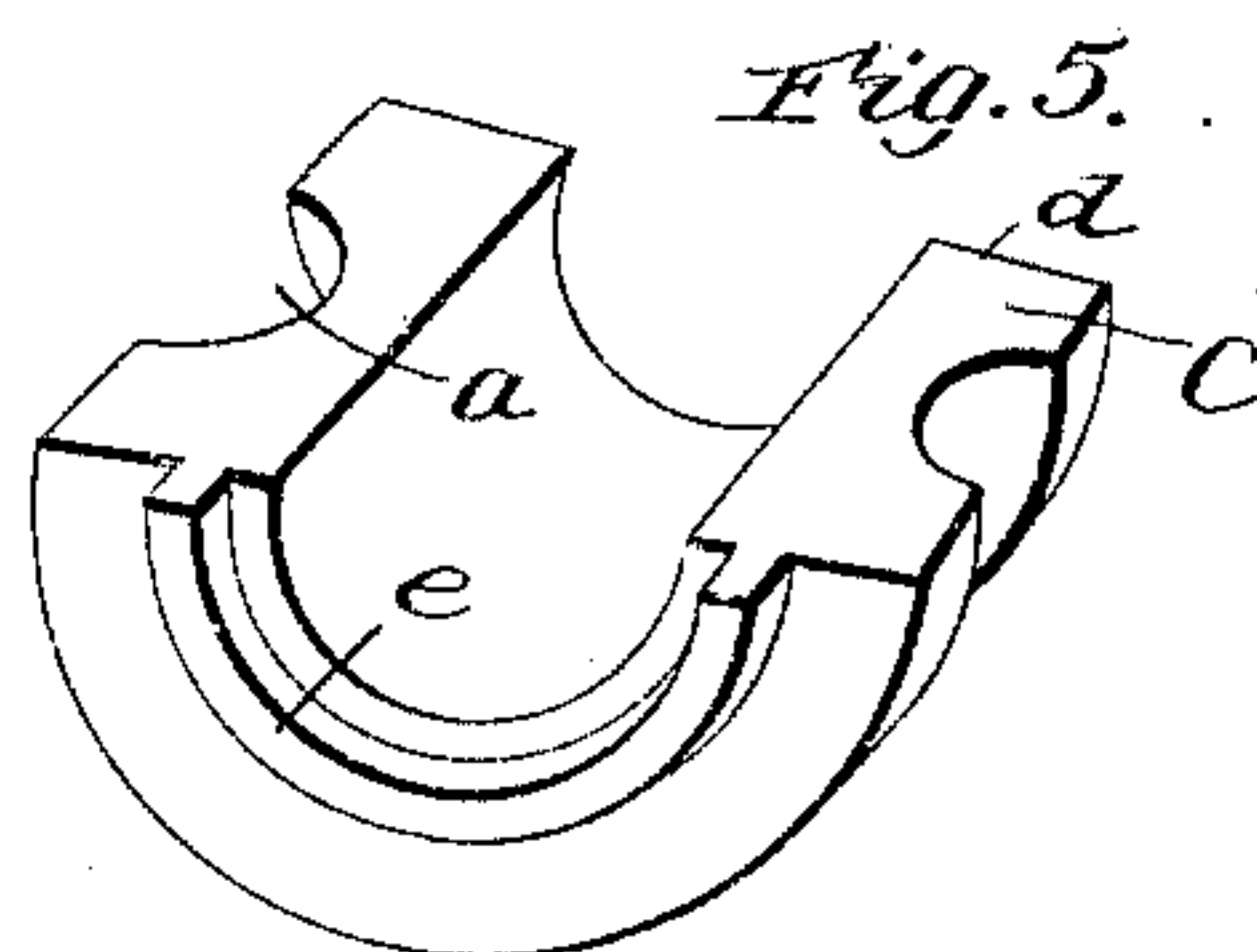
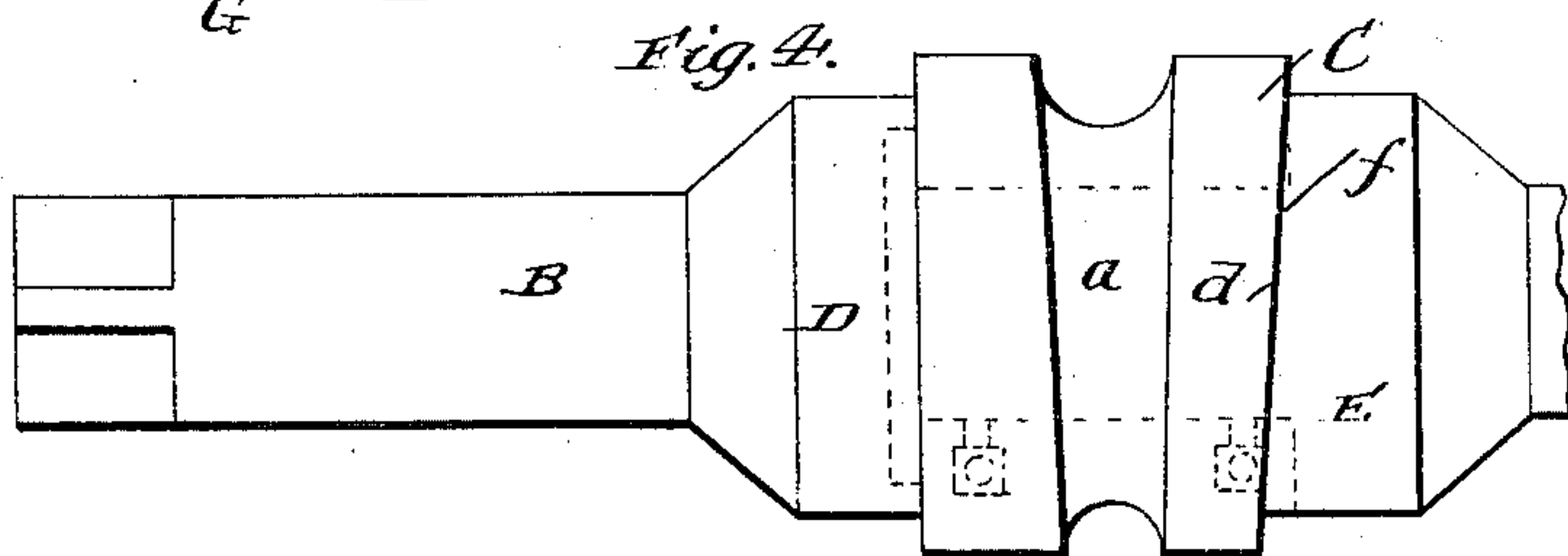
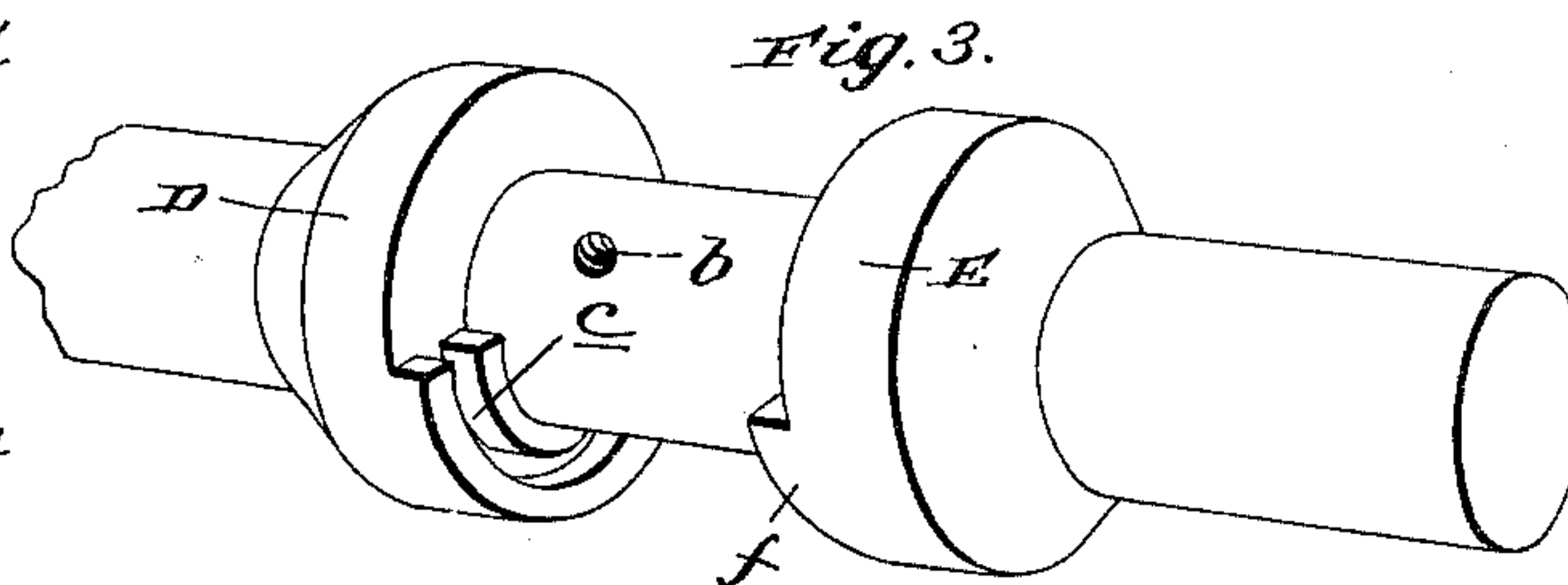
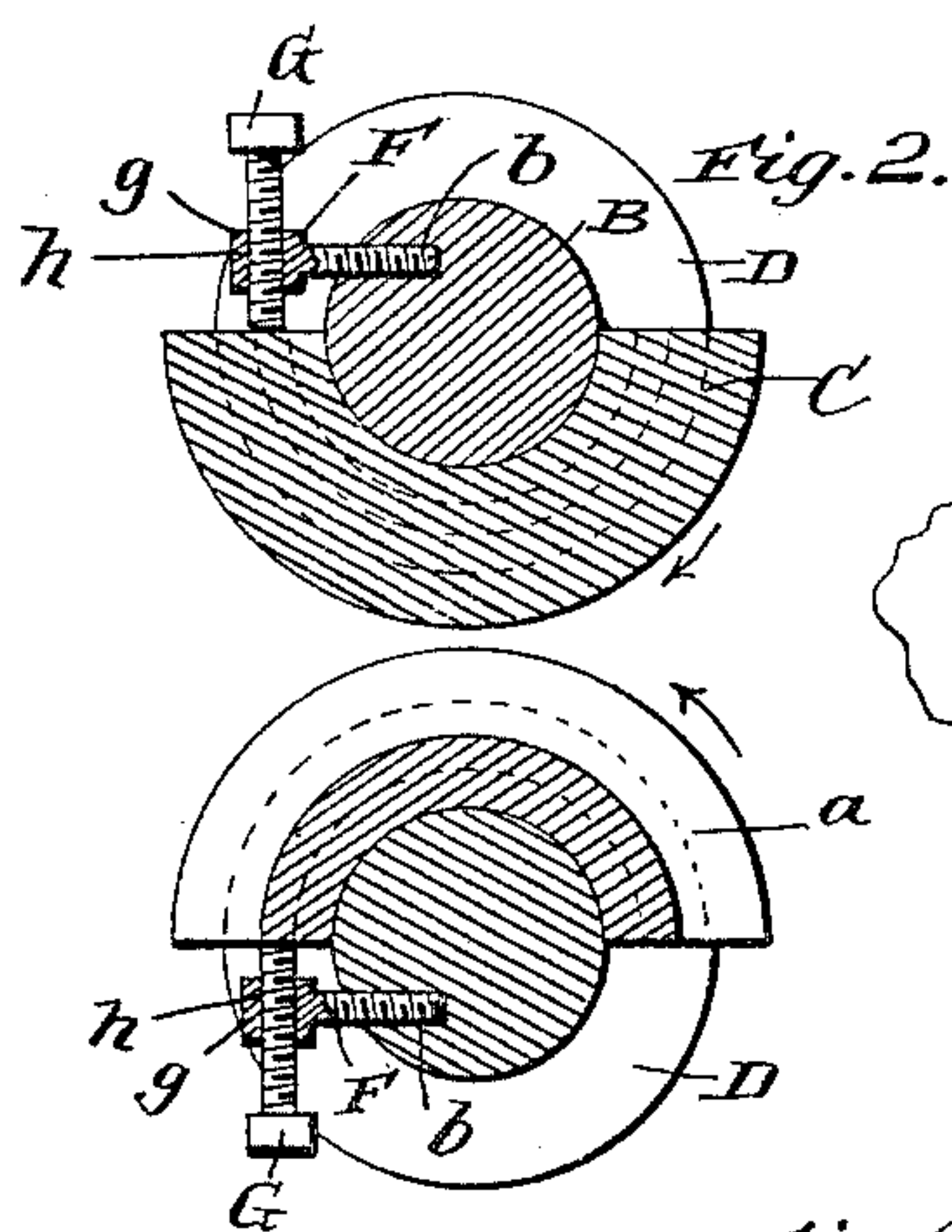
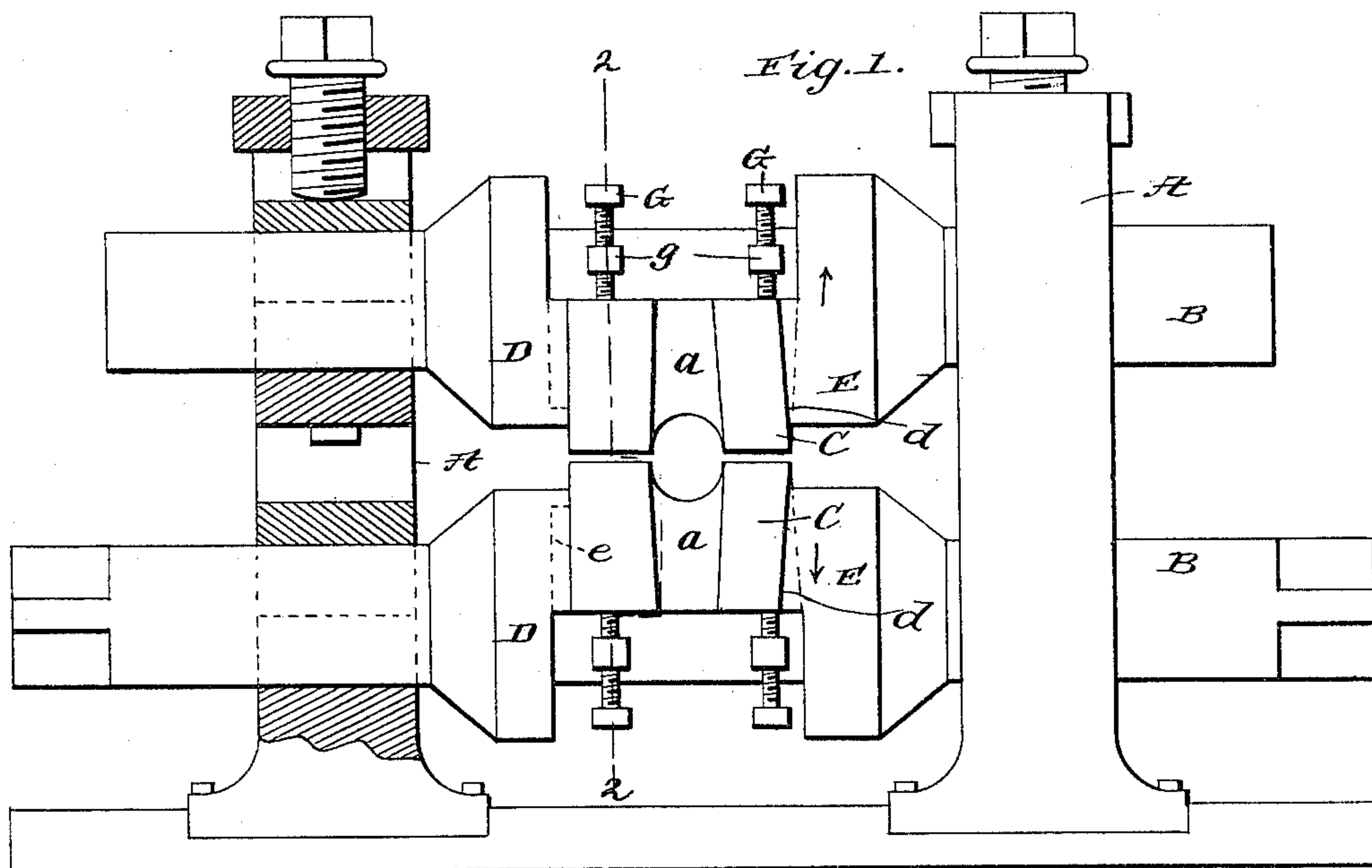
**Patented Feb. 4, 1902.**

W. H. ROBBINS, J. J. BYE & A. E. JONES.

**MILL FOR ROLLING SEAMLESS TUBES.**

(Application filed May 21, 1901.)

(No Model.)



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.



# UNITED STATES PATENT OFFICE.

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## MILL FOR ROLLING SEAMLESS TUBES.

SPECIFICATION forming part of Letters Patent No. 692,478, dated February 4, 1902.

Application filed May 21, 1901. Serial No. 61,236. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM H. ROBBINS, JOHN J. BYE, and ALBERT E. JONES, citizens of the United States, residing at Ellwood City, in the county of Lawrence and State of Pennsylvania, have invented new and useful Improvements in Mills for Rolling Seamless Tubes, of which the following is a specification.

Our invention relates to mills for rolling seamless tubes, and more particularly to the means employed for securing the swages or tube-shaping dies on the rolls. It contemplates fastening the swages or dies on the rolls without the employment of keys or wedges, which are objectionable because of their liability to work loose, and this in such manner that while there is no liability of the swages or dies becoming loose in practice they may be expeditiously removed and replaced with other dies when desired.

Other advantageous features of the invention will be fully understood from the following description and claims when taken in conjunction with the accompanying drawings, in which—

Figure 1 is a front elevation of a rolling-mill embodying our invention with one of the housings in section. Fig. 2 is a transverse section taken on the line 2 2 of Fig. 1. Fig. 3 is a perspective view illustrating a portion of one of the rolls of the mill. Fig. 4 is a top plan view of the lower roll with the swage or die fastened thereon, and Fig. 5 is a perspective view of one of the dies or swages removed from its roll.

In the said drawings similar letters of reference designate corresponding parts in all of the several views, referring to which—

A A are the housings of a rolling-mill, B B are rolls journaled in suitable bearings in the housings, and C C are swages or dies provided with grooves *a* for giving shape to seamless tubes. The rolls B are respectively provided with two enlargements D E, arranged about the distance illustrated apart, so as to receive between them the swages or shaping-dies, and said rolls are also provided at points intermediate of the enlargements D E with threaded sockets *b*, disposed as best shown in Fig. 2 for a purpose presently

pointed out. The enlargements D are provided in their inner faces with simicircular grooves *c*, while the enlargements E are provided at their inner sides with inclined faces *d*, disposed obliquely with respect to the longitudinal centers of the rolls, as best shown in Figs. 1 and 4. The swages or dies, which are semicircular in shape, are provided with square ends to meet the square faces of the enlargements D and semicircular lugs *e* on said ends to enter the grooves *c* of the enlargements, and said swages or dies are also provided with ends *f*, inclined in conformity to the inclined faces *d* of the enlargements E, whereby it will be seen that they may be wedged between the enlargements D E.

F F are bolts arranged in the threaded sockets *b* of the rolls B and provided with heads *g*, having threaded apertures *h*, and G G are bolts bearing in the said apertures *h* of the bolts F and arranged to engage the inner reduced ends of the swages or dies C after the manner illustrated in Figs. 1 and 2.

In the practice of our invention it will be observed that when the swages or dies are interposed between the enlargements D E of the rolls B, with their semicircular lugs *e* arranged in the complementary grooves *c* of the enlargements D and their inclined ends *f* bearing against the inclined faces *d* of the enlargements E, they will be securely wedged between and held to the enlargements and the rolls B and in consequence will not be liable to become loose in practice. It will also be observed that the bolts G serve as stops for the swages or dies and are also adapted to be used to advantage in starting the swages or dies when it is desired to remove the same to give place to other swages or dies.

The grooves *a* of the swages or dies have a radius of from four and one-half to eight inches and extend throughout the length of the swages or dies, as shown.

It will be appreciated from the foregoing that by virtue of the inclined ends *f* of the swages or dies and the complementary inclined faces *d* of the enlargements E the swages or dies are secured between the enlargements D E in a wedge-like manner, and in consequence the necessity of employing



keys, wedges, or other auxiliary appurtenances for fastening the swages or dies is obviated, which is a highly important advantage.

5 We have entered into a detail description of the construction and relative arrangement of parts embraced in the present and preferred embodiment of our invention in order to impart a full, clear, and exact understanding of the same. We do not desire, however, to be understood as confining ourselves to such specific construction and arrangement of parts, as such changes or modifications may be made in practice as fairly fall within  
10 the scope of our claims.

15 Having described our invention, what we claim, and desire to secure by Letters Patent, is—

1. The combination with a roll having an enlargement provided in its inner side with a groove, and another enlargement provided with an inclined inner face; of a swage or die adapted to be interposed between the enlargements of the roll, and having a lug or  
20 tongue at one end to enter the groove in one enlargement, and also having its opposite end inclined in conformity to the inclined inner face of the other enlargement.

2. The combination with a roll having an enlargement provided with an inclined inner face, and also having another enlargement; and a projection interposed between the enlargements; of a swage or die adapted to be interposed between the enlargements of

the roll, and having one of its ends inclined in conformity to the inclined inner face of one enlargement, coacting means on the other enlargement and the swage, whereby the latter is held to the former, and an adjustable device bearing in the projection of the roll and adapted to engage the inner edge of the swage.

3. The combination with a roll having an enlargement provided in its inner side with a groove, and another enlargement provided with an inclined inner face, and also having a threaded socket arranged intermediate of the enlargements; of a swage or die adapted to be interposed between the enlargements of the roll and having a lug or tongue at one end to enter the groove in one enlargement, and its opposite end inclined in conformity to the inclined inner face of the other enlargement, a bolt arranged in the threaded socket of the roll and having a head provided with a threaded aperture, and a bolt bearing in said aperture and arranged to engage the inner end of the swage.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

WILLIAM H. ROBBINS.  
JOHN J. BYE.  
ALBERT E. JONES.

Witnesses:

U. S. SMILEY,  
BEN L. JONES.