

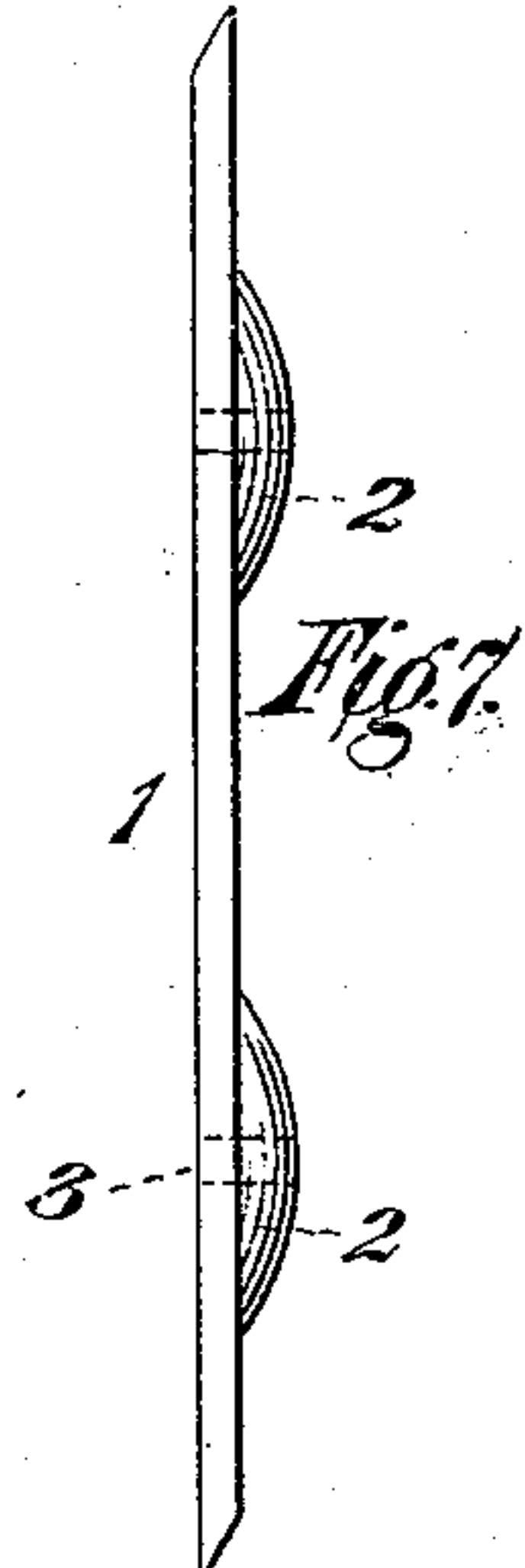
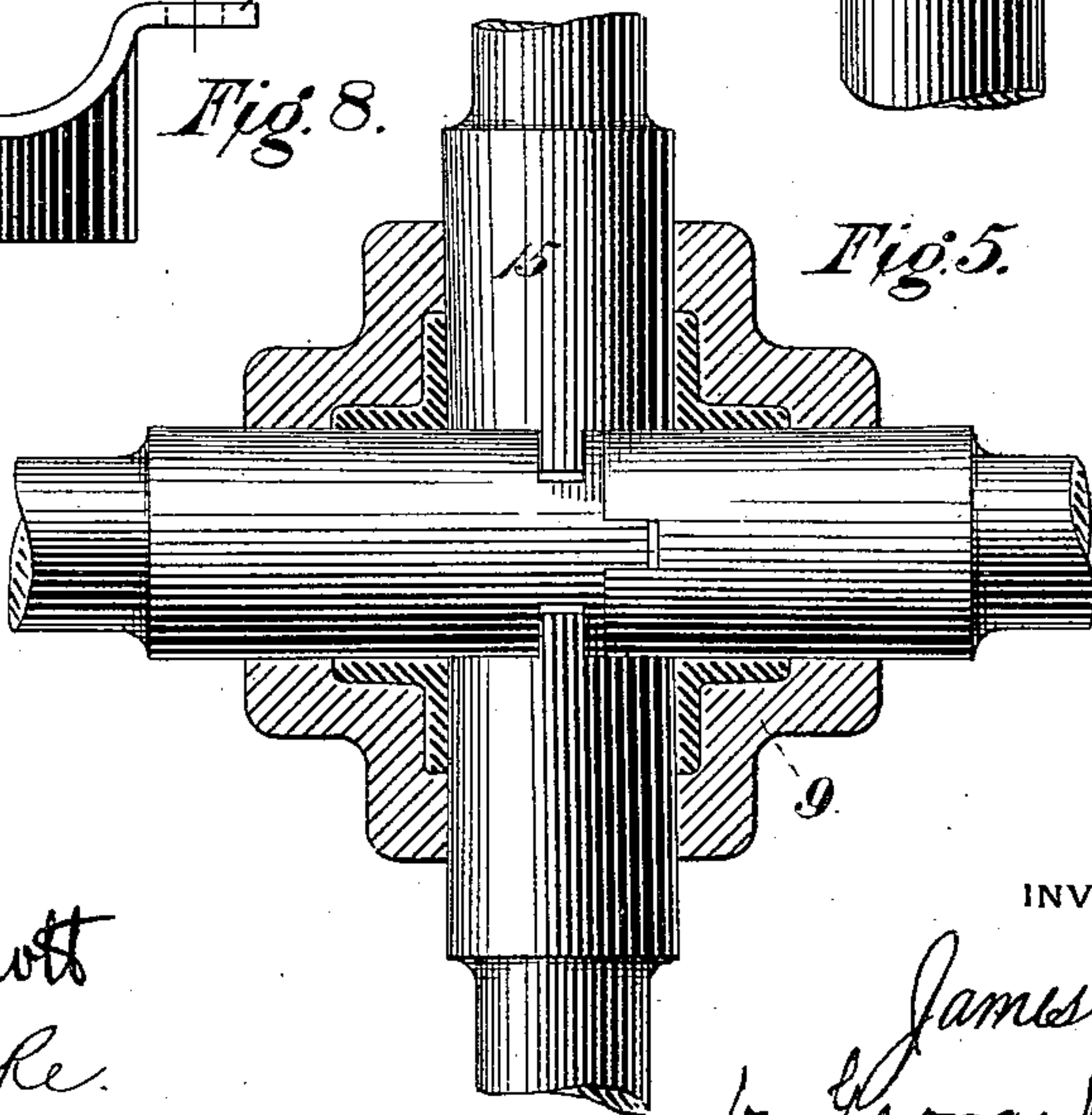
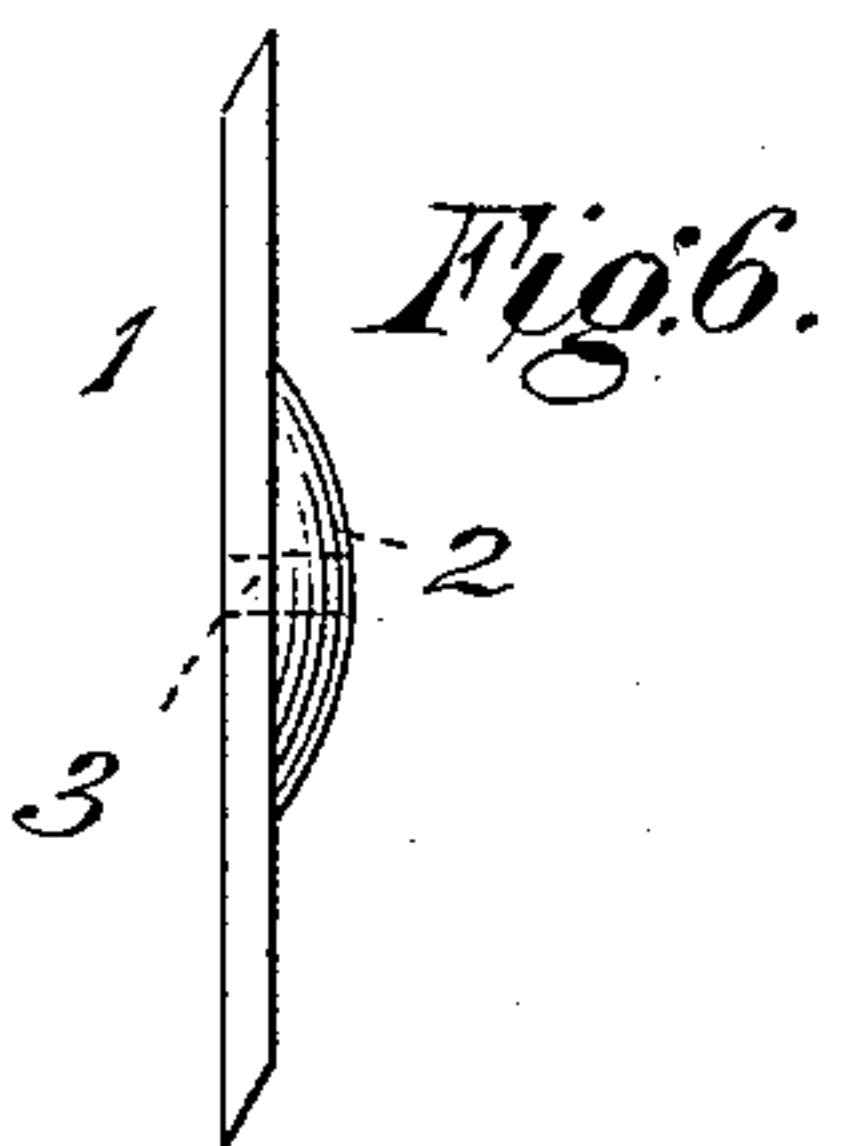
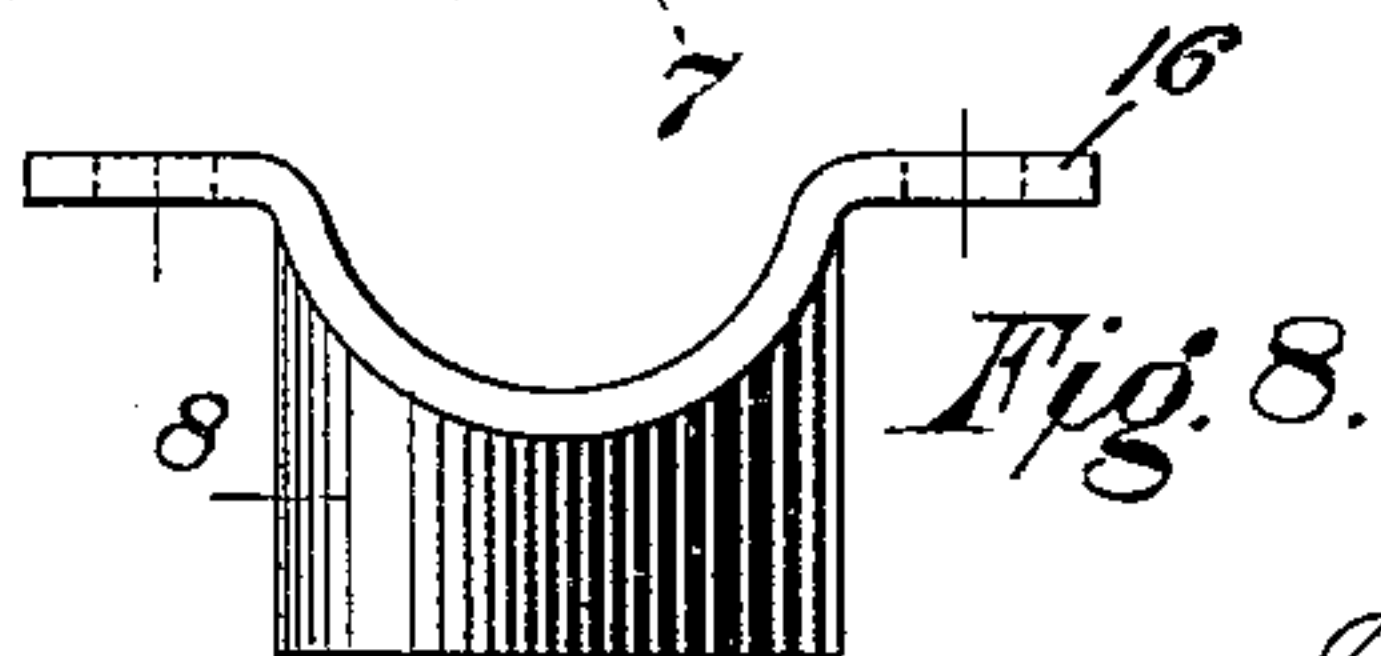
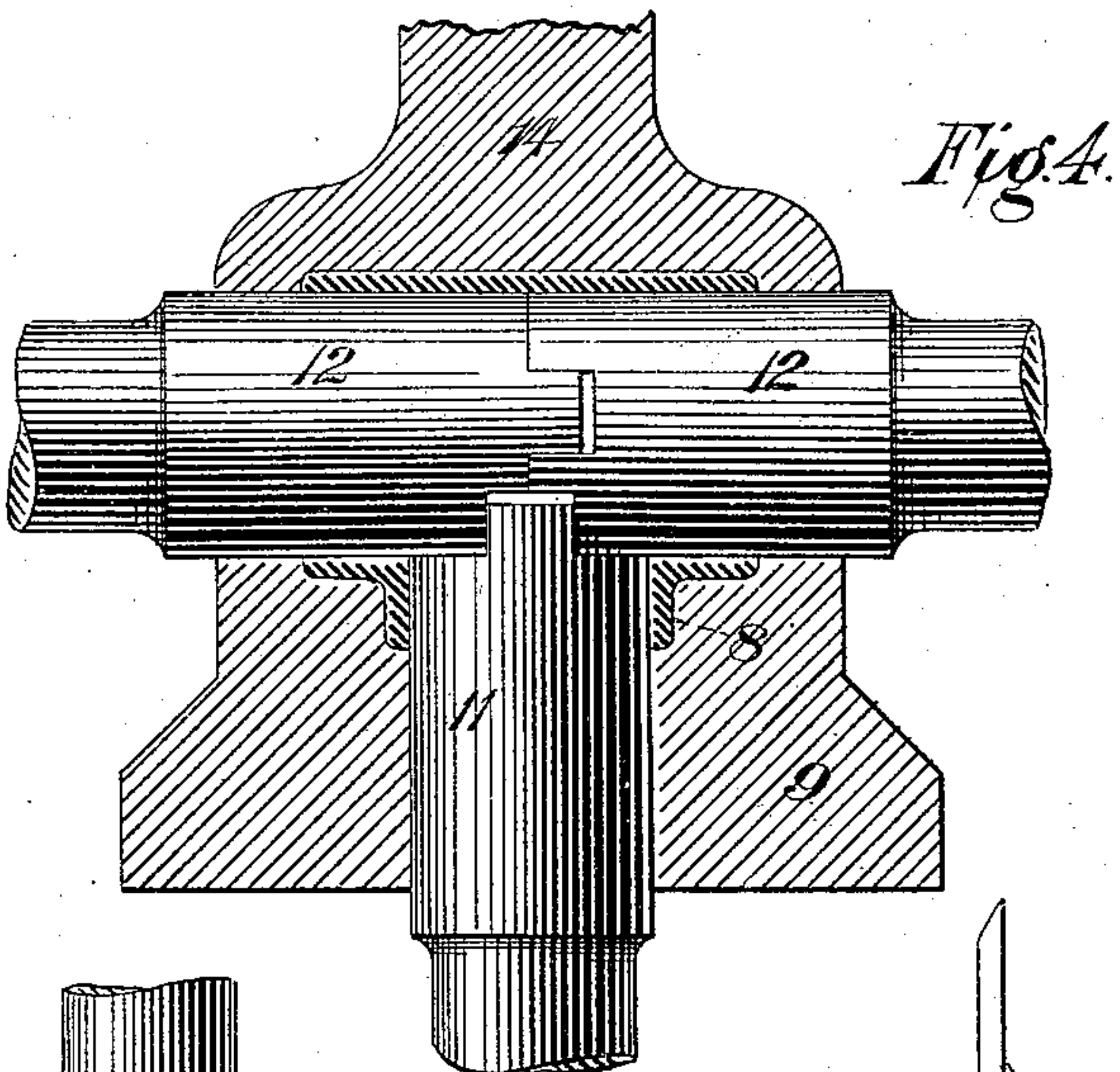
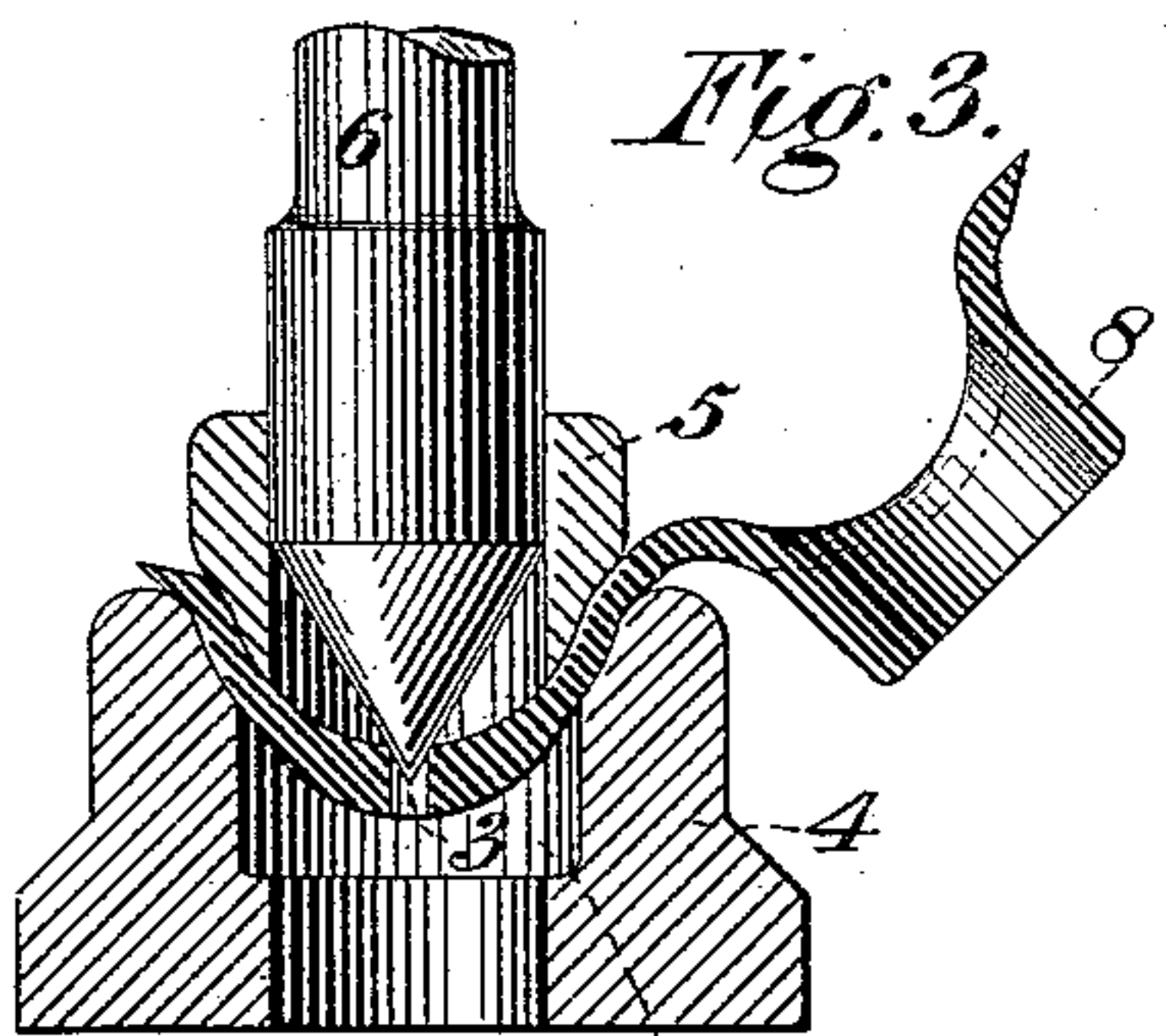
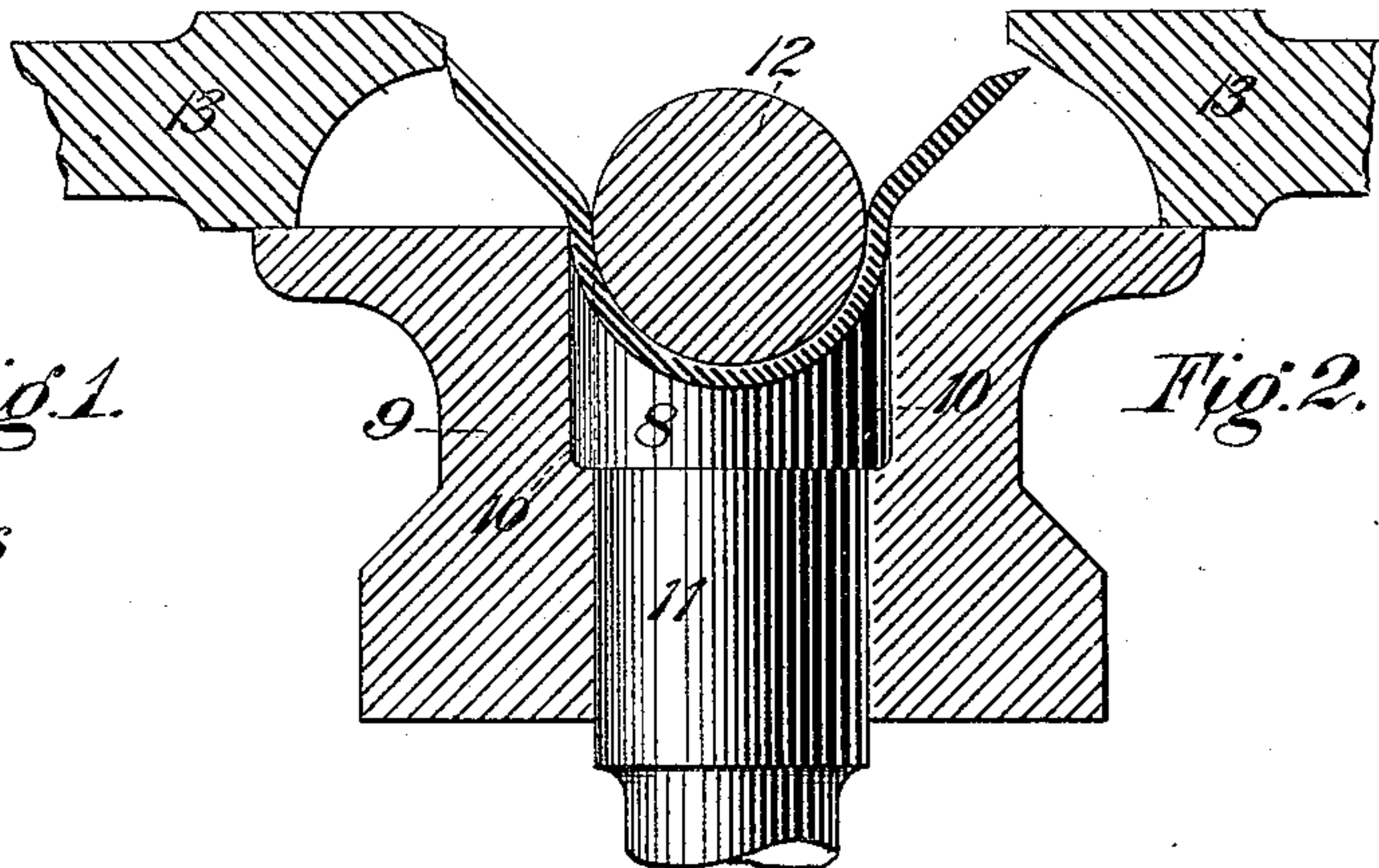
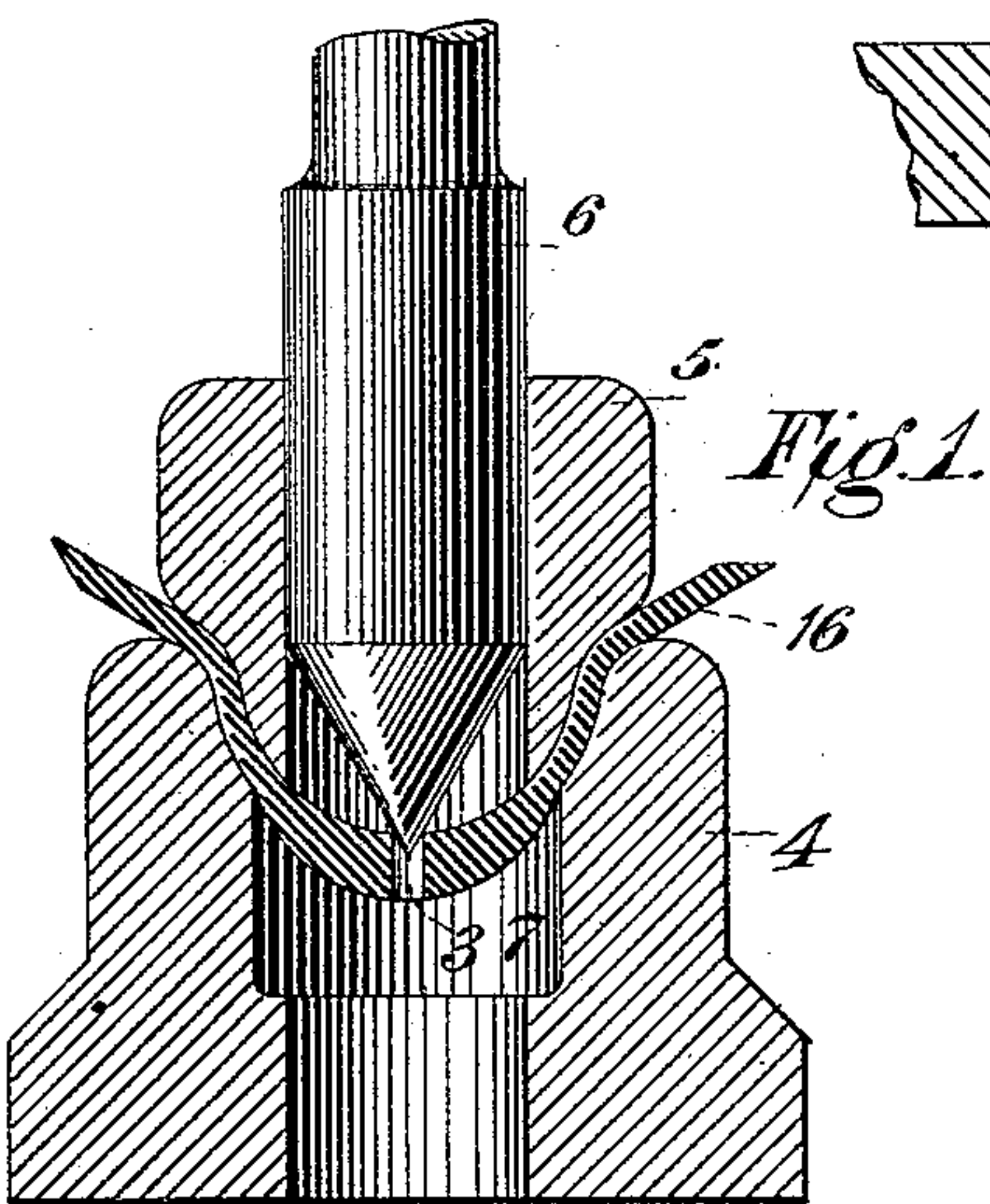
(No Model.)

J. T. HAMBAY.

METHOD OF MAKING PIPE FITTINGS.

No. 361,507.

Patented Apr. 19, 1887.



WITNESSES:

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UNITED STATES PATENT OFFICE.

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METHOD OF MAKING PIPE-FITTINGS.

SPECIFICATION forming part of Letters Patent No. 361,507, dated April 19, 1887.

Application filed January 28, 1886. Serial No. 190,021. (No model.)

To all whom it may concern:

Be it known that I, JAMES T. HAMBAY, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, a citizen of the United States, have invented or discovered certain new and useful Improvements in the Method of Forming Wrought-Iron or Steel Pipe-Fittings, of which improvements the following is a specification.

In the accompanying drawings, which make part of this specification, Figure 1 is a sectional elevation of the dies employed in bending and nozzling the blank. Fig. 2 is a similar view of the dies employed for completing the bending operation. Fig. 3 is a view similar to Fig. 1, showing the manner of bending and flanging or nozzling a double blank for a cross. Figs. 4 and 5 are sectional elevations of the dies for welding single and double blanks, respectively. Figs. 6 and 7 are plan views of single and double blanks. Fig. 8 is a view in side elevation of a saddle-connection.

The invention herein relates to certain improvements in the method of manufacturing fittings for pipes for the conveyance of fluids. These fittings have heretofore been formed of cast metal, which is an objectionable material for many reasons—*e. g.*, the liability of the formation of sand or blow holes during casting, and their easy destruction during the formation of a joint.

The object of the invention herein is to provide for the formation of wrought-iron or steel fittings—such as T's and crosses—from a suitably-formed blank by a series of flanging, bending, and welding operations, said fittings to have when finished a wall of approximately uniform thickness throughout, and to be free from holes and other defects, and to have such elasticity as to render it capable of being somewhat stretched or strained during use without liability of cracking, and resuming its normal size when released from strain.

My improved method consists, generally stated, in forming one or more laterally-projecting collars or nozzles by a flanging operation on a rectangularly-shaped plate, bending said plate around a cylindrical mandrel, and then welding the meeting edges of said plate together. The flanging or nozzling operation is effected in a manner similar to that employed in forming flue holes or nozzles in

boiler-plates; but in thus treating a plate of uniform thickness the metal which forms the collar or nozzle will be stretched, the stretch or elongation of the metal being greatest at the outer end of the collar, and hence the sides of the collar will be made tapering, as will be clearly understood. In order to obviate this defect, the plate 1 is provided with a circular enlargement or projection, 2, at that point where the collar or nozzle is to be formed, the extra amount of metal thus incorporated in the blank being proportioned and arranged to compensate for the stretch or elongation effected by the flanging operation.

The blanks with the enlargements are preferably formed by rolling between suitably-constructed rolls, although they may be formed by forging in continuous lengths, the enlargements being formed at suitable distances apart, such distance being proportional to the size of the pipe for which the T's are intended. The blanks for crosses are provided with two enlargements or projections, 2, formed at a distance from each other equal to one-half of the circumference of the pipe, measuring from center to center, with which they are to be used. The next step in the operation of forming either T's or crosses is to drill a hole, 3, through the center of the enlargements 2, said holes serving as a guide for the punch or flanging-tool during subsequent operations, and to facilitate the opening out of the enlargement under the action of the punch. The holes 3 may, if desired, be formed during the rolling operation, the rolls being provided with projecting pins and corresponding sockets. The blanks thus prepared are placed on the female die 4, Fig. 1, the hole 3 being arranged in the axial line of said die, which is attached to the anvil of a suitable press. The forming and clamping die 5 is then forced down, imparting to the body of the blank its initial trough-like form. While this die 5 holds the blank against the die 4, as shown, the punch 6 is caused to descend through the circular opening in the die. The point of the punch enters the hole 3, and passing down through the hole will spread the same and force the metal of the enlargement 2 back into the recess 7 of the die 4, thus forming the collar or nozzle 8. It will be observed that the dies 4 and 5 grasp the blank around the edges of the projection 2, so

that all the swaging action of the punch operates on the metal of the projection, and that the enlargement is thickest or has the greatest body of metal at the point where the greatest stretch or elongation is effected—*i. e.*, around the hole 3.

In making crosses or double T's, the above preliminary bending and the flanging or nozzling operation is duplicated, as shown in Fig. 3. The blank is next placed on the die 9, the collar or nozzle 8 being located in the recess 10 of said die, the mandrels 11 and 12 are then moved up. The mandrels 12 serving as a former around which to bend the blank, and the mandrel 11 entering the collar or nozzle, thus serving to prevent any distortion thereof. The bending-dies 13 are then moved forward to wrap the blank around the mandrels 12. After the retraction of the bending-dies 13, the welding-die 14 is forced down to weld the overlapping scarfed edges of the blank. This welding operation completes the T with the exception of the internal threading of the same, which can be effected in a suitable machine. In making crosses or double T's a fourth mandrel, 15, is inserted into the other nozzle after the bending-dies have operated, so as to preserve the shape of the second nozzle.

It will be understood that the blank is heated and reheated during the above operations as often as necessary to keep the metal in the proper plastic condition.

It is frequently necessary to make branch connections in pipe-lines at points where no provision was made for such connection during the laying of the pipe-line. To make such branch connection, a "saddle," as it is termed, is clamped around the pipe at the point where the connection is to be made. This saddle consists of a metal plate curved to fit the curvature of the pipe, and provided with a nozzle for connection with the branch line and laterally-extending flanges, through which the clamping-bolts are passed. I propose to make these saddles, which are usually of cast metal, of wrought-iron or steel. In making these saddles a blank similar to the T-blanks, above

described, is employed. This blank is given the proper contour and nozzled in the same manner, and with dies essentially similar to those employed in making the preliminary bend and nozzling the T-blanks. After bending and nozzling the blank, the edges 16 of the blank are bent out at about right angles to the nozzle. The nozzle is then threaded and the flanges drilled for the reception of the clamping-bolts. A completed saddle for a branch connection is clearly shown in Fig. 8.

When a small nozzle or collar is formed on a large T—*i. e.*, one with thick walls—a re-enforcement or enlargement of the plate is not necessary, as there will be sufficient metal in the thick walls. A plain plate can therefore be used.

No claim is made herein for any of the apparatus employed in carrying out my improved method, as such apparatus will form the subject of other applications to be filed in due time.

I claim herein as my invention—

1. As an improvement in the art of manufacturing wrought-iron or steel T's, crosses, and like fittings for pipes for the conveyance of fluids, the herein-described method, which consists in re-enforcing a portion of a suitably-shaped blank, nozzling or flanging the re-enforced portion, and then imparting the desired shape to the body portion of said blank, substantially as set forth.

2. As an improvement in the art of manufacturing T's, crosses, and like fittings for pipes for the conveyance of fluid, the herein-described method, which consists in re-enforcing a portion of a suitably-shaped blank, nozzling or flanging the blank at re-enforced portion, imparting a circular form to the body portion of the blank, and finally welding together the adjacent edges of said blank, substantially as set forth.

In testimony whereof I have hereunto set my hand.

JAMES T. HAMBAY.

Witnesses:

DARWIN S. WOLCOTT,
R. H. WHITTLESEY.