

No. 636,335.

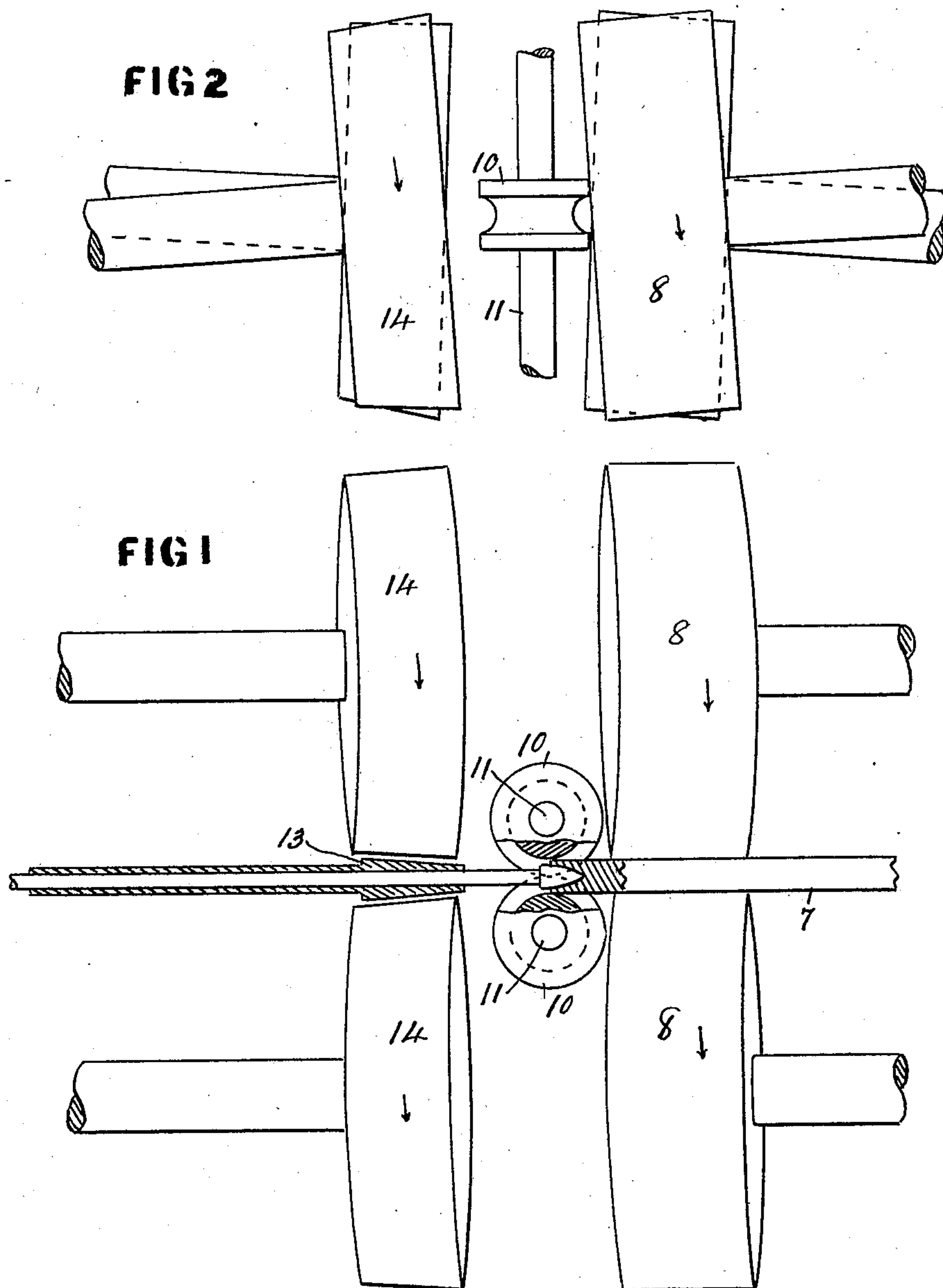
Patented Nov. 7, 1899.

J. A. HAMPTON & H. KEATES.
SEAMLESS TUBE ROLLING MILL.

(No Model.)

(Application filed Dec. 28, 1897.)

2 Sheets—Sheet 1.



Witnesses

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FIG 3

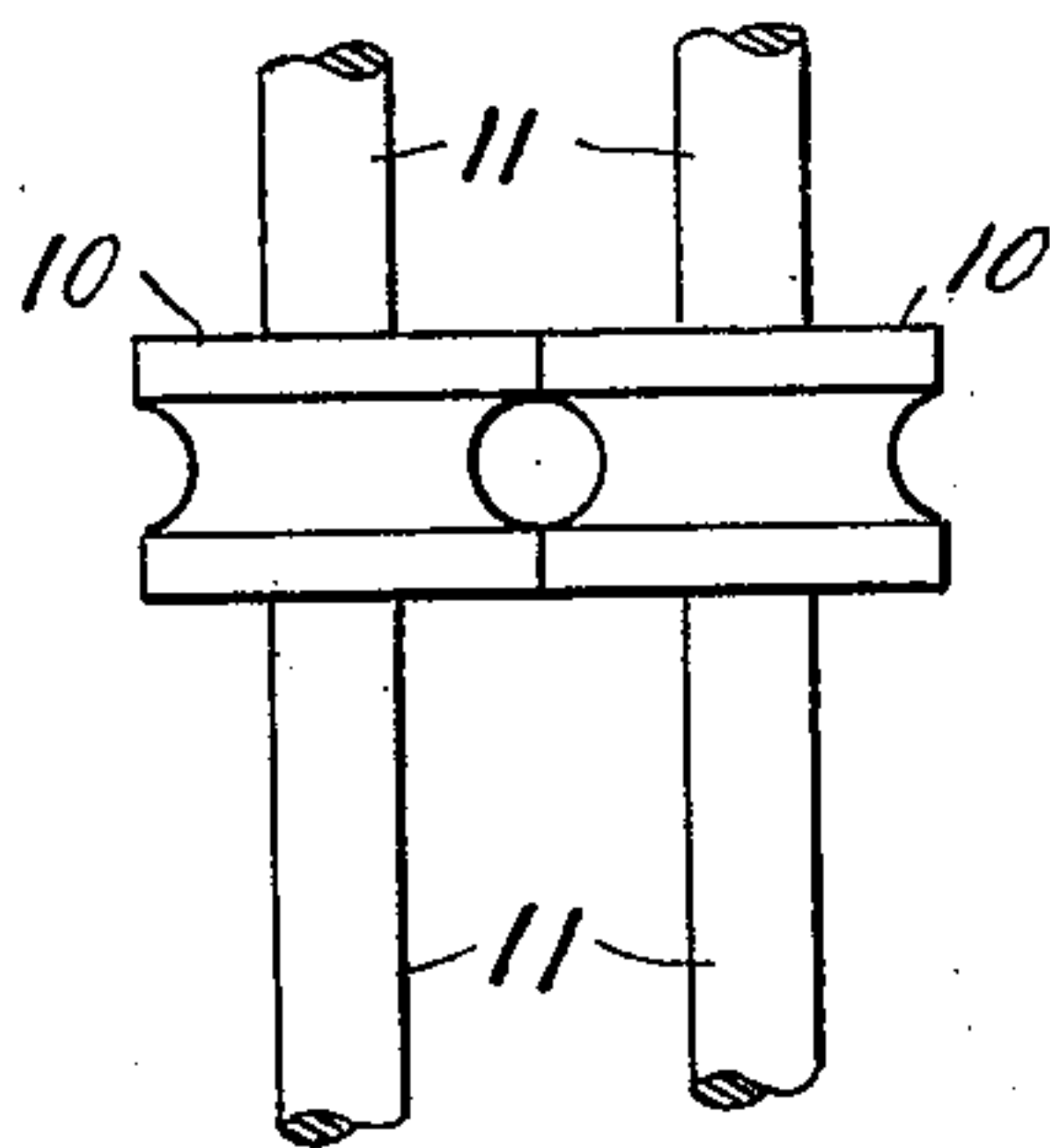
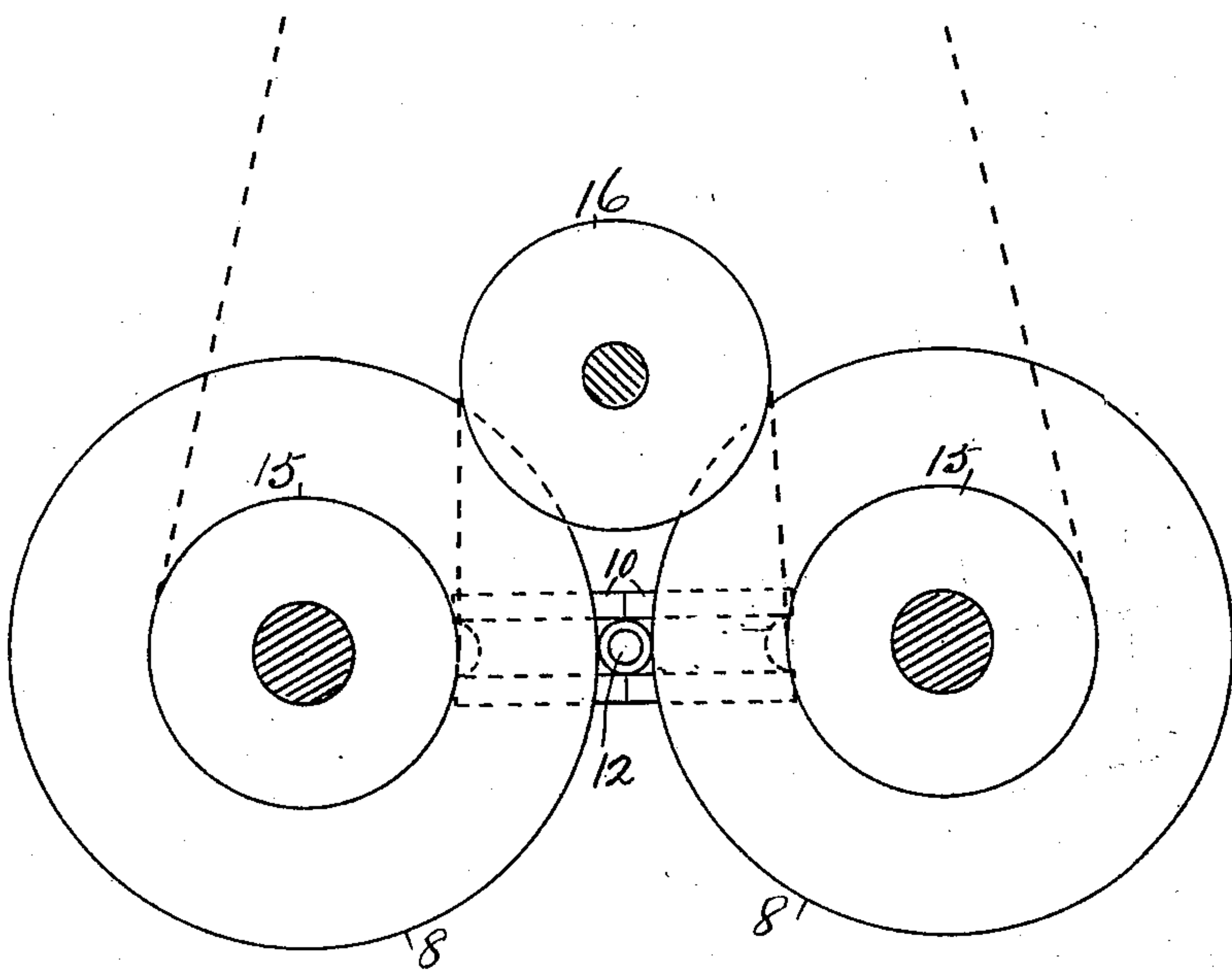


FIG 4



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UNITED STATES PATENT OFFICE.

JOHN ARTHUR HAMPTON, OF WEST BROMWICH, AND HENRY KEATES, OF MOSELEY, ENGLAND.

SEAMLESS-TUBE-ROLLING MILL.

SPECIFICATION forming part of Letters Patent No. 636,335, dated November 7, 1899.

Application filed December 28, 1897. Serial No. 670,453. (No model.)

To all whom it may concern:

Be it known that we, JOHN ARTHUR HAMPTON, a resident of 97 Birmingham road, West Bromwich, in the county of Stafford, and
5 HENRY KEATES, a resident of Eastleigh, Moseley, in the county of Worcester, England, subjects of the Queen of Great Britain, have invented new and useful Improvements in the Manufacture of Tubes, of which the following
10 is a specification.

Our invention relates to improvements in the manufacture of tubes, in which a solid billet is revolved and at the same time forced forward into a revoluble or revolving roller-die, in which is concentrically placed the
15 piercing-mandrel; also, means for simultaneous further operation upon the now-formed tube, which also continues the rotary and forward feed of the billet. We attain these
20 objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a plan view, and Fig. 2 an elevation, of this our invention. Fig. 3 is a detailed front view of the roller-die. Fig. 4 is
25 an end view showing relative positions of the friction feeding-rollers, the roller-die, and mandrel and one method by which the friction feeding-rollers may be driven.

Similar figures refer to similar parts throughout the several views.

7 is the solid billet, to which is given a rapid rotary motion, and at the same time it is also forced forward longitudinally. This may be done in various well-known ways, but that
35 shown is preferred, in which 8 8 are comparatively large friction-rollers driven at a suitable speed and which grip between their peripheries the solid billet 7. These rollers rotate in the direction indicated by the arrows
40 and with their axes inclined from each other in the horizontal plane, (see Fig. 2,) but parallel or thereabout in the vertical plane. (See Fig. 1.) By this means a very high speed of rotation to the billet may be imparted with
45 a very forcible forward movement of the billet. Near to the said rollers 8 8 are placed the two die-rollers 10 10, having semicircular grooves which combined form the die. These rollers are carried upon shafts 11 11 and
50 may be driven with a positive rotating motion, or such rotation may be merely due to the

passing therethrough of the billet. Centrally with the said die-rollers is the mandrel 12, having any desirable shaped end for piercing the billet. This mandrel is held rigidly and
55 prevented from longitudinal movement, but may or may not have a rotating movement. Thus the revolving billet is forced upon the mandrel, giving the latter the penetrating action, while at the same time the external
60 surface of the crude tube is simultaneously acted upon by the die-rollers, which elongates the tube in proportion to the reduction in area of the metal caused by the introduction of the mandrel, while the circular movement
65 of the billet and tube tends to produce an even distribution of metal in the walls of the tube and to produce a well-finished surface.

We further provide a simultaneous secondary arrangement of feeding and operating
70 mechanism which shall continue the rotating and forward motion of the billet and which also further reduces, enlarges, or otherwise alters its dimensions as follows: Upon the
75 mandrel 12 is placed a further mandrel 13, (which may, if desired, be in one with the mandrel 12,) and in conjunction with such mandrel are friction-rollers 14 14, whose peripheries are arranged to suit the said mandrel 13. These rollers 14 14 are also similarly
80 inclined, as already described for rollers 8 8, in order to obtain the necessary forward longitudinal motion of the tube passing between them upon the mandrel 13. By these means the continuation of the rotary and forward
85 movement of the billet is insured to the very end—that is, even after the rear end has left the rollers 8 8—while the thickness of the walls of the now-formed tube are reduced, &c. Further sets of rollers 14 14 and man-
90 drels 13 may be used, if desired.

We have not shown any particular method or means of driving the rollers or die or mandrel, as any convenient well-known mechanical contrivance may be adopted, except so
95 far as that suggested of imparting motion to the rollers 8 8 by means of belt running over pulleys 15 15 and idle tension-pulley 16.

What we claim, and desire to secure by Letters Patent, is—

1. The combination of a pair of idly-revoluble concave dies whose contiguous surfaces

leave a circular opening, a piercing-mandrel centrally located between said dies, and means for rapidly revolving and feeding forward a billet longitudinally against such mandrel
5 and between said dies.

2. A pair of idly-revoluble concave dies whose contiguous surfaces leave a circular opening, a piercing-mandrel centrally located between said dies, and means for rapidly re-
10 volving and feeding forward a billet longitu-

dinally against said mandrel and between said dies, in combination with a pair of pressure-rollers having located between them an enlarged portion of said mandrel.

JOHN ARTHUR HAMPTON.
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Witnesses:

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