

No. 680,754.

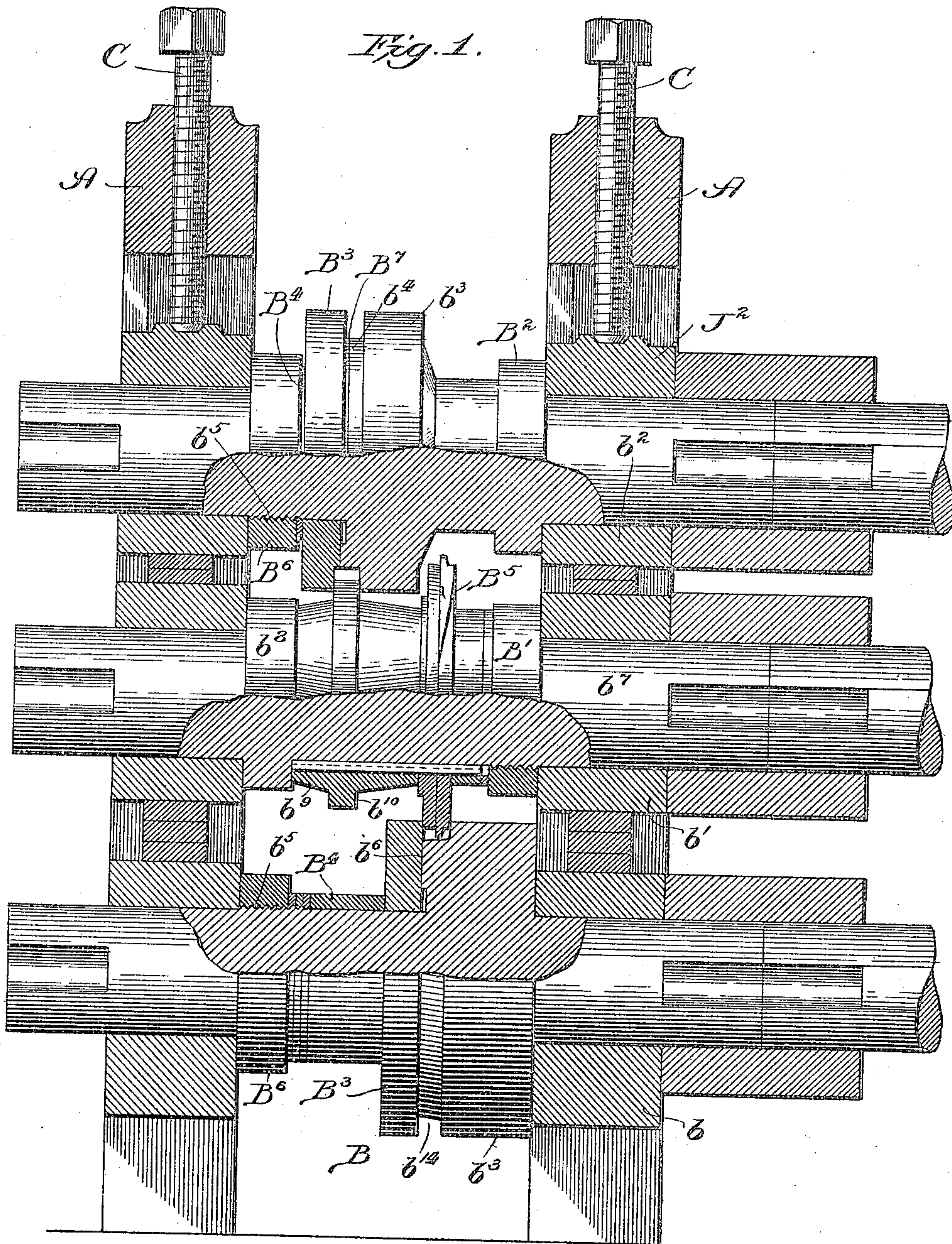
Patented Aug. 20, 1901.

G. BIRD, JR.
MACHINE FOR ROLLING HORSESHOE BLANKS.

(Application filed Dec. 8, 1900.)

(No Model.)

2 Sheets—Sheet 1.



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Fig. 5.

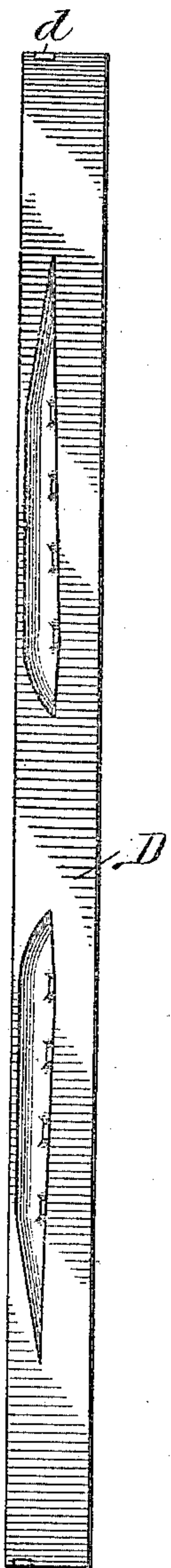


Fig. 2.

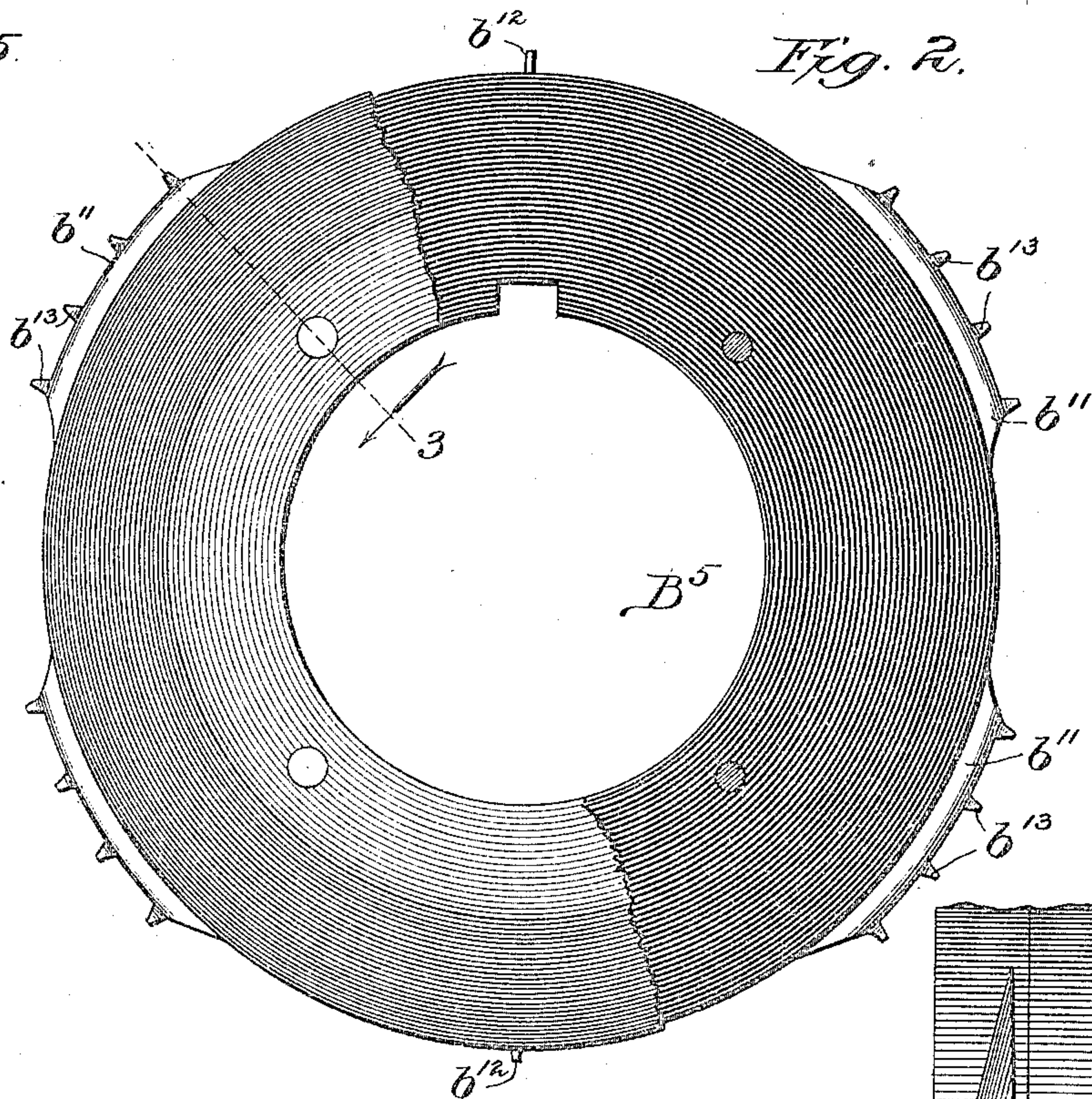


Fig. 4.

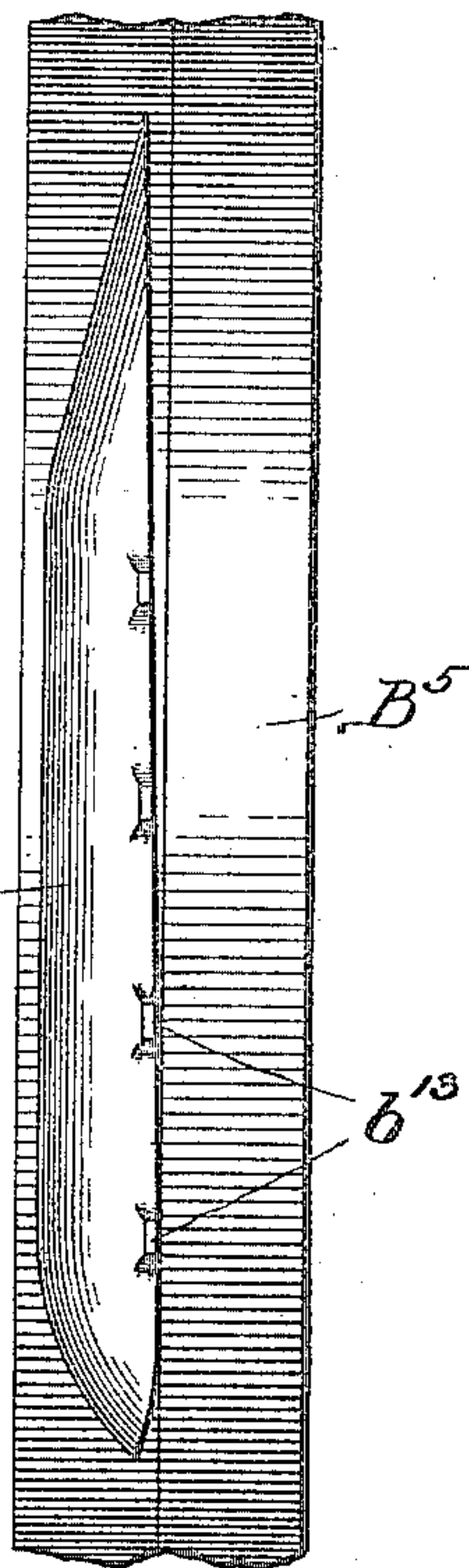
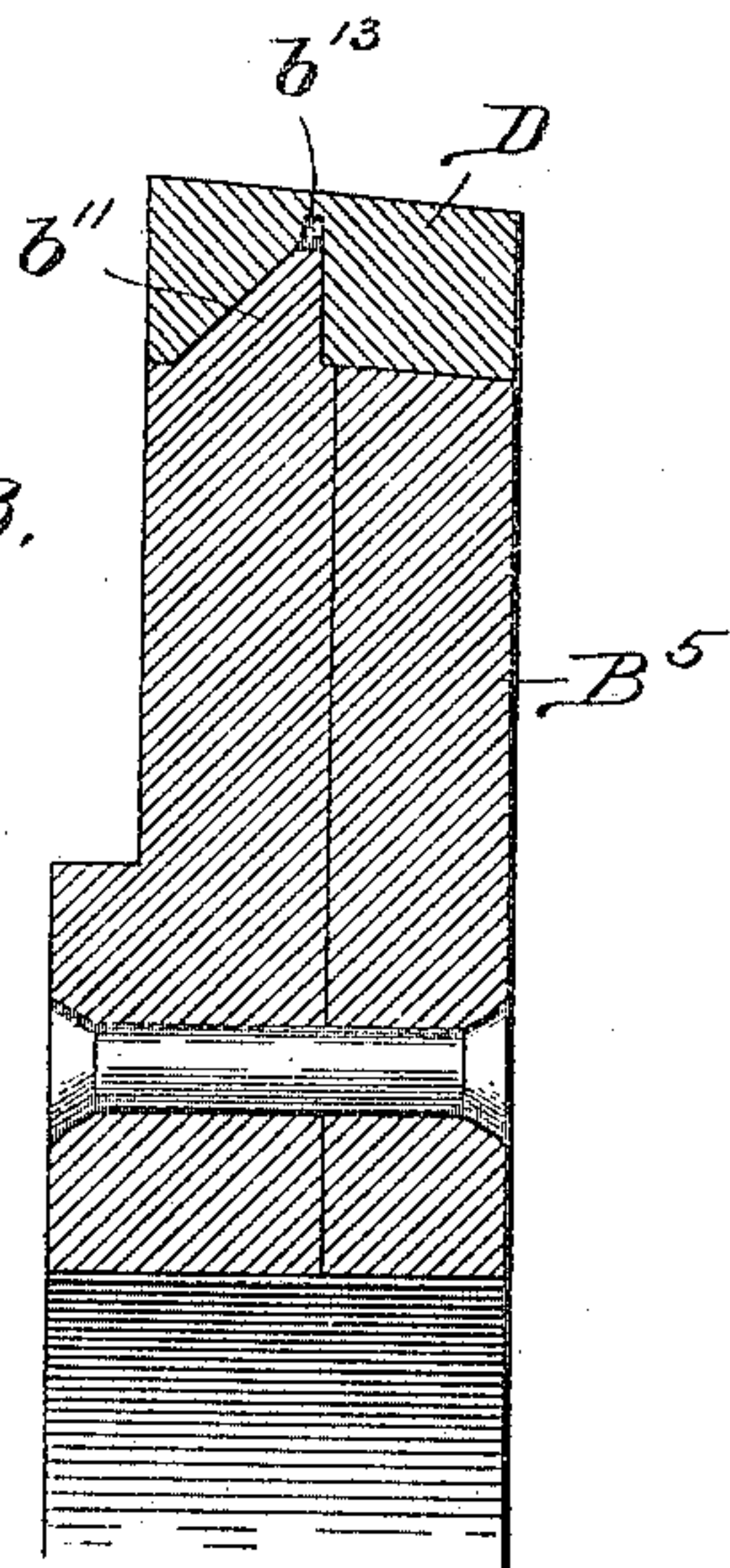


Fig. 3.



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UNITED STATES PATENT OFFICE.

GEORGE BIRD, JR., OF EAST CHICAGO, INDIANA.

MACHINE FOR ROLLING HORSESHOE-BLANKS.

SPECIFICATION forming part of Letters Patent No. 680,754, dated August 20, 1901.

Application filed December 8, 1900. Serial No. 39,219. (No model.)

To all whom it may concern:

Be it known that I, GEORGE BIRD, Jr., a citizen of the United States, residing at East Chicago, Indiana, have invented certain new and useful Improvements in Machines for Rolling Horseshoe-Blanks, of which the following is a specification.

The object of my invention is to provide a simple, economical, and efficient rolling-mill for manufacturing horseshoe-blanks; and the invention consists in the features, combinations, and details of construction hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a vertical sectional elevation of a rolling-mill constructed in accordance with my improvements; Fig. 2, a side elevation of one of the creasing-rolls constructed in accordance with my improvements with a portion broken away; Fig. 3, a full-sized sectional detail view of the creasing-roll shown in connection with a blank and taken on line 3 of Fig. 2; Fig. 4, a full-sized "developed" plan view of a portion of the creasing-roll, and Fig. 5 a plan view of a horseshoe-blank.

In the art to which this invention relates it is well known that horseshoe-blanks are produced in large quantities by means of rolling the same and that ordinarily the blanks are passed through about fourteen passes in reducing the bar to the blank necessary for forming. In the mills as now constructed and commonly used the rolls are formed of an arbor provided with a cast-iron ring driven tightly thereon, which ring contains the pass through which the blanks are run. This ring is driven tightly on the arbor and against a shoulder. In this class of mechanisms it is necessary that the pass should run true. Consequently every time the ring is driven on the pass must be trued out. In order to turn out the one hundred and twenty-five horseshoes which form the ordinary stock of commerce, it is necessary to keep on hand about four hundred and forty rolls, which entails considerable expense to keep in repair and a large initial outlay in order to construct.

The principal object of my invention, therefore, is to provide a simple, economical, and efficient roll, of such construction and arrangement that it will remove the above-

noted objections and permit a smaller number of rolls to turn out the ordinary number of sizes of blanks needed for commerce. 55

Further objects of my invention will appear from an examination of the drawings and the following description and claims.

In constructing a mill in accordance with my improvements I provide a frame portion A A, of a desired size and shape to contain and hold the operating mechanisms. This frame portion is provided, preferably, with a set of three rolls B, B', and B², arranged in vertical relation one above the other and so meshing with each other as to form the desired passes, through which the blanks are run, as hereinafter described. These rolls are journaled in bearing portions b, b', and b², which are slidingly mounted in the standards in the frame portion and adjusted by means of set-screws C, as occasion requires—all in the usual manner. 60 65 70

In the ordinary rolls of commerce every time a roll is used it is necessary to true up the same. In order to provide a female roll which will not have to be trued up every time it is necessary to use the same, I provide each of the rolls B and B² with an enlargement or annular projecting shoulder b³, formed integral therewith, and which is so turned that it forms a portion of the pass b⁴ and b¹⁴, respectively. This enlargement or shoulder portion forms what might be termed the "roll proper," and in order to complete the "pass" I provide a ring portion B³, preferably formed of hardened steel, which is passed over the roll-arbor, so that its face, which is "squared," contacts the face of the shoulder and completes the pass. The rings B³ used upon the female rolls, as shown on roll B² in Fig. 1, form one of the side walls of the pass. These rings also form a portion B⁷ of the bottom of the pass. This pass-bottom portion of the rings is wide on some and narrow on others. The pass-bottom portion integral with the roll is also wide on some rolls and narrow on others. The pass-bottom portion integral with a given roll may be used with any one of several rings, each ring having a different width of pass-bottom, thus making as many different widths of pass upon the same roll without the necessity of turning it out. These same rings may be used with another roll hav- 75 80 85 90 95 100

ing a pass-bottom portion of a different width, and when so used will produce as many more sizes of pass. As will be readily seen, this construction and arrangement makes it possible to make a given number of sizes of pass by the use of a much smaller number of rings and rolls, affording great economy, durability, and speed of manipulation and operation.

The roll proper is chilled, so that the material or metal may be passed through the same without causing any great amount of wear, and by means of the adjacent male roll the bar of metal is formed into the desired shape. In order to hold the steel ring which completes the female roll in operative engagement with the roll, I provide the roll with a threaded portion b^5 and place a ring-nut b^6 in engagement therewith. Between this ring-nut and the steel ring is placed one or more cylindrical washers B^4 , so that the difference in size or shape of the steel ring may be compensated for and the parts held securely together. By this construction and arrangement it will be seen that one roll may be used to form a variety of sizes of blanks, for the reason that only a portion of the pass is formed by the integral portion of the roll, while the steel ring shown in the upper roll of Fig. 1 may be replaced by a new one or turned out, so as to complete the pass for another size of blank. In other words, a number of removable steel roll-rings may be used in connection with one roll and form a variety of sizes of blanks, and as the face of the roll and ring at b^6 are kept "true" or "square" there is no necessity for truing the roll every time it is used, taken out of, or placed in the machine. Inspecting the lower roll in Fig. 1 it will be seen that the bottom portion of the pass is arranged at an incline, so that when it is necessary to turn the pass out for the same or another size the bottom as well as the side portion of the pass can be trued up, and consequently the roll can be used over and over again.

To form the male roll for the mill and also to crease the horseshoe-blanks, I provide the arbor portion b^7 with a shoulder b^8 (see roll B' in Fig. 1) and provide a sleeve portion b^9 , which fits against the shoulder b^8 and has an outer projecting annular rib b^{10} , arranged so as to engage with the pass b^4 in the upper roll. The creasing ring or roll B^5 is made in two parts, riveted together, as shown in Figs. 2 and 3, one part having a series of projections b^{11} and b^{12} . The projections b^{11} , as shown in Fig. 4, have sharp-pointed edges, so that they enter the metal readily, and their radial projections b^{13} press into the same, so as to form the nail-holes. The projections b^{12} are merely for the purpose of marking the length of the blank D , as shown at d in Fig. 5. As shown in Fig. 2, the creasing-roll is of such a size as to form two blanks at every revolution. Consequently the roll has four creasing projections and two marking projections. This creasing-roll, as shown in

Figs. 1 and 2, is made in two parts and riveted together, so that the creasing portion can be made of a high-grade steel and hardened. The particular advantage obtained is that the creasing portion which does the most work can be easily replaced, while the other and old portion can be retained, thus reducing the cost of maintenance.

In operation the bar has been run through twelve passes, and is then run through the pass b^{14} in order to perform the creasing operation. It is next run through the pass b^4 , between the rolls B' and B^2 , which completes the forming of the blank.

The principal advantages incident to a rolling-mill constructed in accordance with my improvements are, first, the rolls are economical to build; second, they produce rolls absolutely uniform and true; third, I have found in practice that the rolls as ordinarily constructed would only make about thirty tons of blanks before they were used up, while from experimental tests I have found that rolls constructed in accordance with my improvements have made over three hundred tons of blanks without being trued up or retued, and, fourth, the rolls are economical in operation, in that but twenty-four rolls are needed to turn out the sizes and save an enormous initial expense and considerably reduce the cost of truing and re-turning, which is an important feature in the manufacture and sale of horseshoe-blanks.

I claim—

1. In a machine for rolling horseshoe-blanks, the combination of a roll provided with an annular portion forming a part of the bottom of a groove and having an annular shoulder forming one side of the groove, a ring removably mounted on the roll provided with an annular portion forming the remaining part of the bottom of the groove, and having an annular shoulder forming the remaining side of the groove, substantially as described.

2. In a machine for rolling horseshoe-blanks, the combination of a roll provided with an annular portion forming a part of the bottom of a groove and having an annular shoulder forming one side of the groove, a ring removably mounted on the roll and provided with an annular portion forming the remaining part of the bottom of the groove and having an integral annular shoulder forming the remaining side of the groove, and a roll adjacent to the groove-bearing roll having an annular flange rotatable therewith which extends between the shoulders, substantially as described.

3. In a machine for rolling horseshoe-blanks, the combination of a roll provided with an integral annular portion forming a part of the bottom of a groove and having an integral annular shoulder forming one side of the groove, a ring removably mounted on the roll and provided with an annular portion forming the remaining part of the bottom of

the groove, an annular shoulder on the ring forming the remaining side of the groove, and a nut in threaded engagement with the roll for holding the removable ring in place, substantially as described.

4. In a machine for rolling horseshoe-blanks, the combination of an arbor provided with a threaded portion and with an annular portion forming a part of the bottom of a groove and having an annular shoulder forming one side of the groove, a ring removably mounted on the arbor provided with an annular portion forming the remaining part of the bottom of the groove and having an integral annular shoulder forming the remaining side of the groove, a ring-nut engaging with the threaded portion of the arbor, and hollow washers interposed between the removable ring and the ring-nut and forming in combination with the ring-nut the means for holding the removable ring in operative position, substantially as described.

5. In a machine of the class described, the combination of a roll provided with an annular portion forming a part of the bottom of a groove and having an annular shoulder forming one side of the groove, a ring removably mounted on the roll provided with an annular portion forming the remaining part of the bottom of the groove and having an integral

annular shoulder forming the remaining side of the groove, a roll mounted adjacent to the groove-bearing roll having an annular flange rotatable therewith extending between such annular shoulders and provided with a creasing-ring formed in two pieces riveted together, and a roll mounted adjacent to such flanged roll provided with a removable and an integral annular shoulder forming the sides of a groove which meshes with the creasing-ring, substantially as described.

6. In a machine for rolling horseshoe-blanks, the combination of a roll provided with an annular portion forming a part of the bottom of a groove and having an annular shoulder forming one side of the groove, a plurality of rings adapted to be alternately mounted upon the roll, each provided with an annular portion of a different width for forming the remaining part of the bottom of the groove and having an annular shoulder for forming the remaining side of the groove, whereby each ring may when desired be used in combination with the groove-bottom and shoulder portion of the roll to form a groove of a different size, substantially as described.

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