

C. A. HEINZELMAN.
MOLD FOR FORMING ROLLER BEARING CAGES.
APPLICATION FILED NOV. 19, 1910.

993,523.

Patented May 30, 1911.

2 SHEETS—SHEET 1.

Fig. 1.

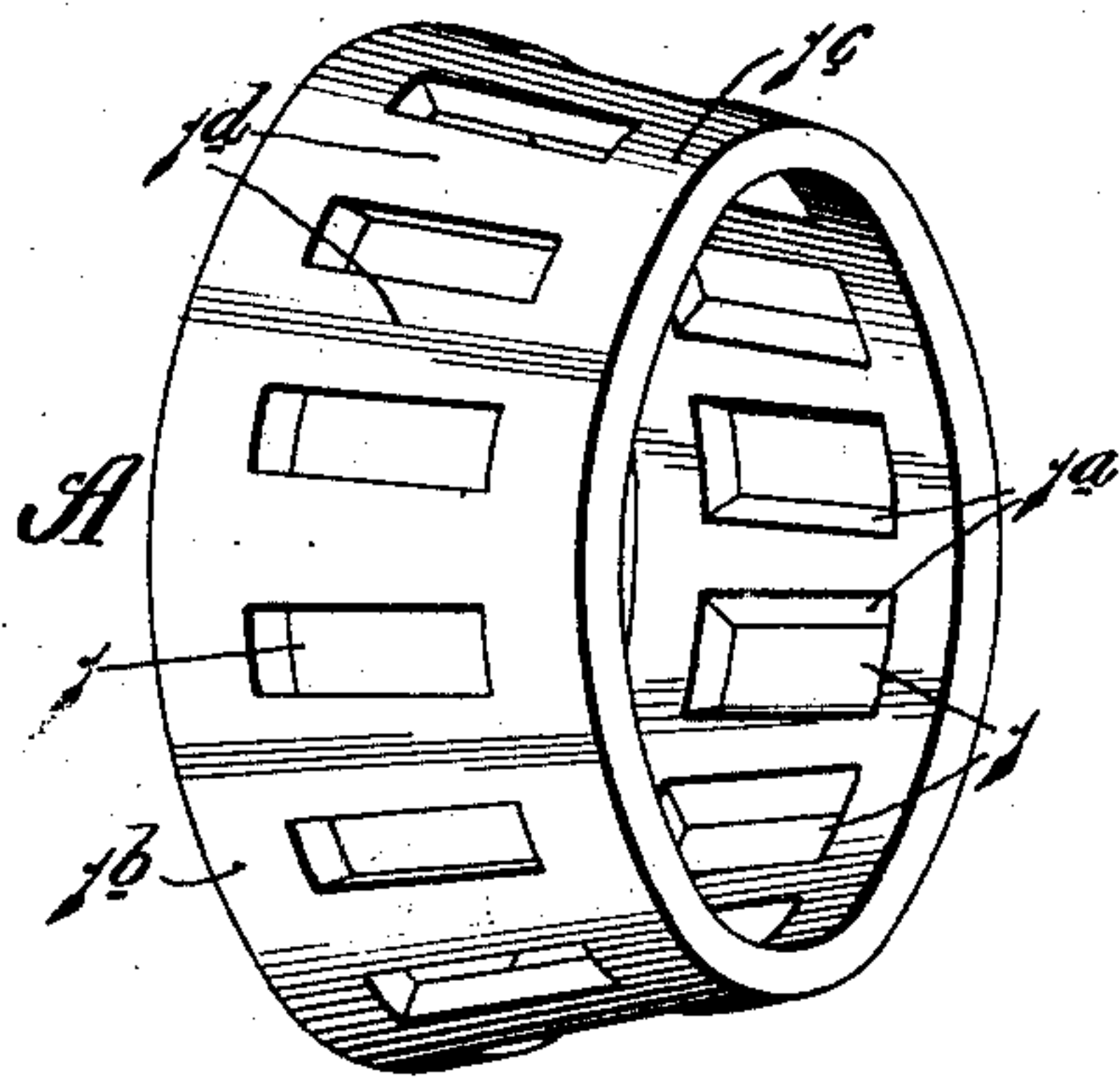


Fig. 2.

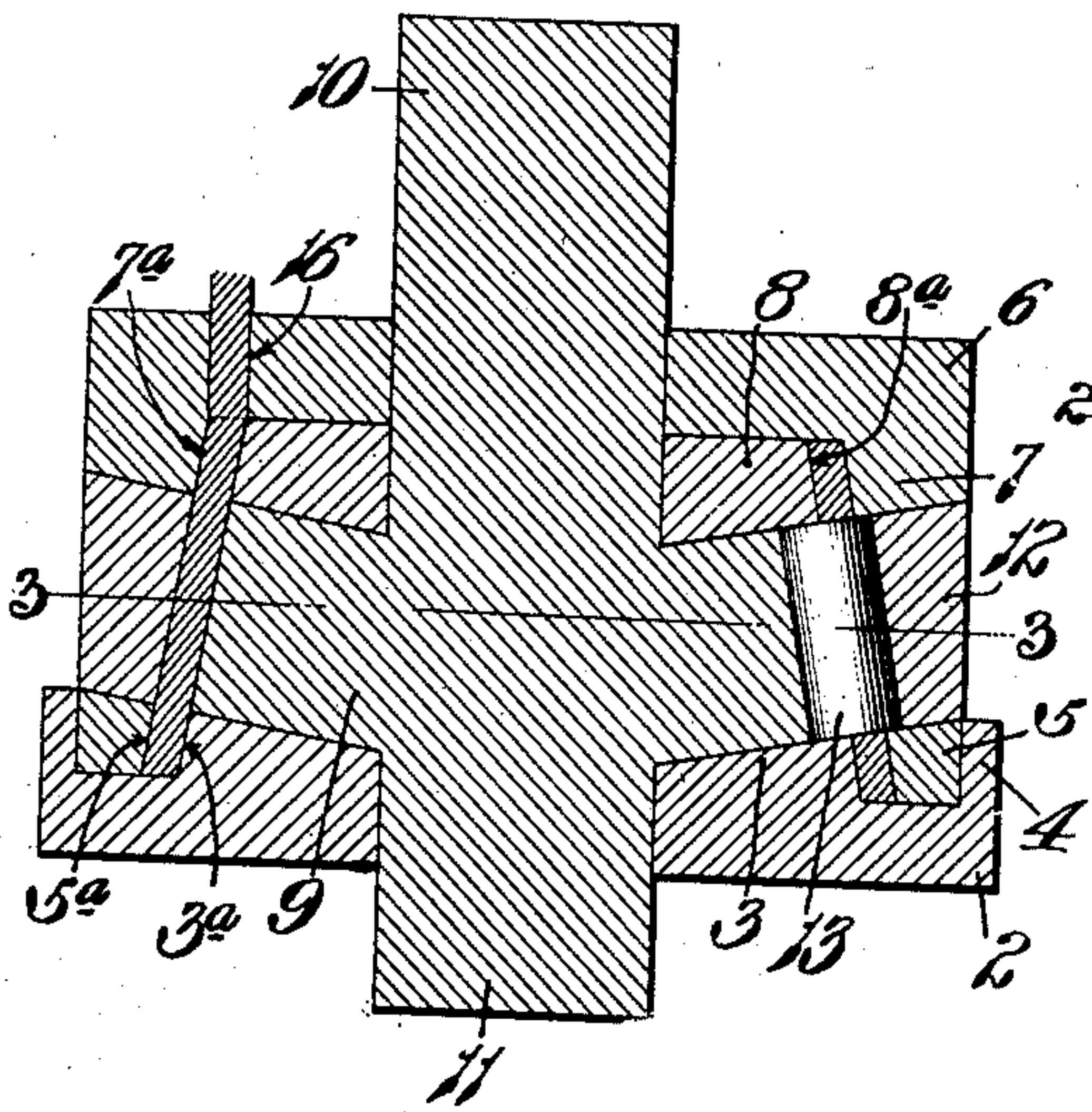
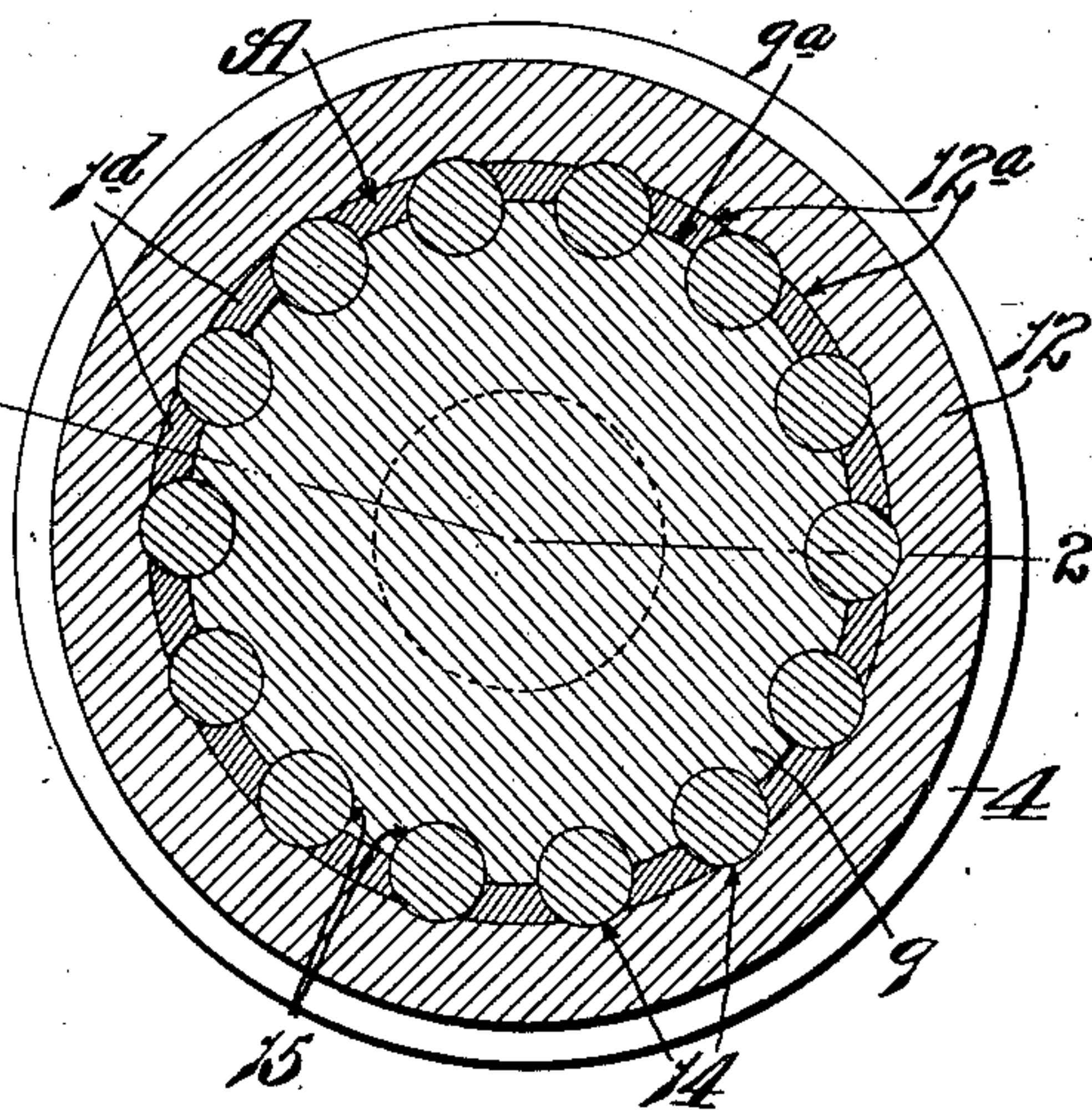


Fig. 3.



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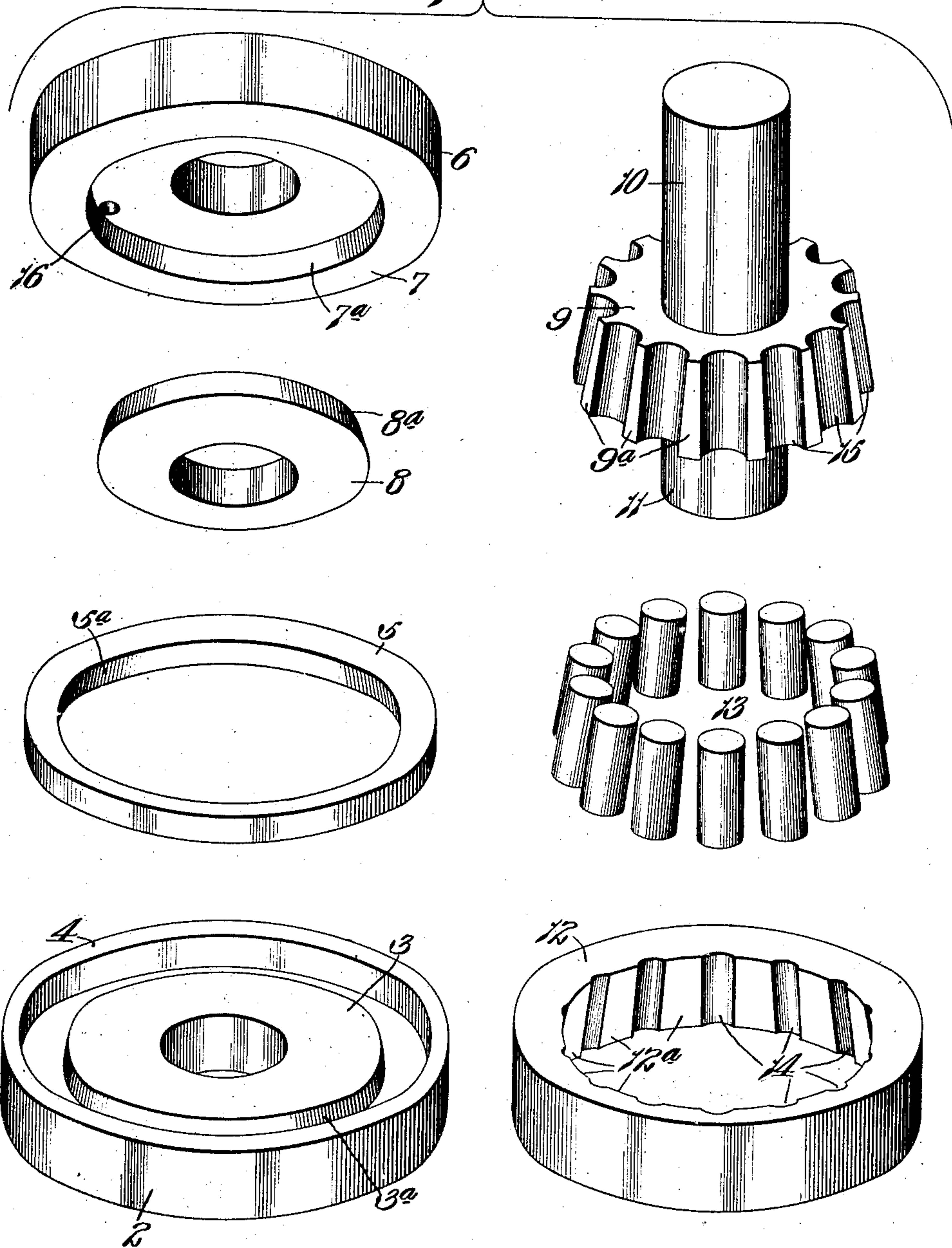
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2 SHEETS—SHEET 2.

Fig. 4.



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UNITED STATES PATENT OFFICE.

CHESTER A. HEINZELMAN, OF BELLEVILLE, ILLINOIS.

MOLD FOR FORMING ROLLER-BEARING CAGES.

993,523.

Specification of Letters Patent.

Patented May 30, 1911.

Application filed November 19, 1910. Serial No. 593,209.

To all whom it may concern:

Be it known that I, CHESTER A. HEINZELMAN, a citizen of the United States, residing at Belleville, Illinois, have invented a certain new and useful Improvement in Molds for Forming Roller-Bearing Cages, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to molds such as are used in the operation of forming cast metal articles.

The object of the invention is to provide a mold of novel construction for forming a roller-bearing cage which consists of an approximately tubular-shaped cast metal member provided with longitudinally extending openings or pockets in which rollers are arranged.

Figure 1 of the drawings is a perspective view of the cage which my mold produces; Fig. 2 is a vertical sectional view of the mold; Fig. 3 is a horizontal sectional view taken on approximately the line 3—3 of Fig. 2; and Fig. 4 is a perspective view showing the various parts of the mold separated.

The cage A which my improved mold produces, consists of a tapered tubular-shaped member provided with longitudinally extending openings or pockets 1 for receiving rollers, not shown, the side edges 1^a of said pockets being beveled inwardly so as to provide tapered seats for the rollers.

The mold is composed of a number of parts which are so designed that when they are assembled, as shown in Fig. 2, a space corresponding to the shape of the cage A is formed, for receiving the molten metal that is poured into the mold.

The bottom member of the mold consists of two parts, namely, a plate 2 provided on its upper side with a disk-shaped boss 3 and a vertically disposed annular flange 4, and a removable ring 5 arranged inside of said flange and spaced away therefrom to form an annular recess for the metal. The top member of the mold also consists of two parts, a plate 6 provided on its under side with an annular flange 7 and a removable circular plate 8 which is adapted to be ar-

ranged inside of said flange, the diameter of the plate 8 being less than the diameter of the flange 7 so as to form an annular recess for the metal. The middle member of the mold fits between the top and bottom members previously described, and said middle member consists of the following parts, a part 9 provided with two cylindrical-shaped guides 10 and 11 which project through openings in the top and bottom members of the mold, respectively, an annular-shaped part 12 which surrounds the part 9, and a plurality of cylindrical-shaped devices 13 that fit in cooperating grooves 14 and 15 on the inner surface of the part 12 and in the periphery of the part 9, as shown clearly in Fig. 4.

The peripheral edge 3^a of the disk-shaped portion 3 on the bottom member of the mold is tapered upwardly and the inner edge 5^a of the ring 5 is also tapered upwardly and at the same angle, as these faces cooperate with each other to produce the portion of the cage A which I have designated by the reference character 1^b in Fig. 1. The peripheral edge 8^a of the plate 8 and the inner face 7^a of the flange 7 on the top member of the mold are tapered at the same angle as the surfaces 3^a and 5^a of the bottom member so as to form the portion of the cage designated by the reference character 1^c in Fig. 1. The cooperating surfaces 9^a and 12^a on the parts 9 and 12 of the middle member of the mold form the portion 1^d of the cage A which lie between the roller-receiving openings 1 in the cage, and said surfaces are, of course, beveled at the same angle as the molding surfaces of the top and bottom members of the mold, the roller-receiving openings 1 in the cage being formed by the cylindrical-shaped devices 13 which are arranged between the parts 9 and 12 of the middle member, said parts 9 and 12 and devices 13 cooperating with each other to form a number of slots which communicate with the annular recesses in the top and bottom members of the mold. The ends of the devices 13 are square and the top and bottom members of the mold are so formed that they will securely clamp said devices in position when the mold is assembled, the top and bot-

tom faces of the parts 9 and 12 of the middle member being inclined upwardly from the vertical axis of the mold so that they will lie flush with the upper and lower ends of the devices 13, and the surfaces of the top and bottom members of the mold which bear on said parts 9 and 12 being inclined at the same angle.

The members of the mold are assembled in the manner shown in Fig. 2, and the molten metal is then poured into the hole 16 in the plate 6 of the top member, said molten metal flowing into the spaces between the various parts of the mold and thus forming a tapered cylindrical-shaped cage provided with longitudinally extending roller pockets or openings, as shown in Fig. 1. The cage can be removed easily as the various parts of the mold are so formed that they can be taken apart easily, and as the guides 10 and 11 on the part 9 of the middle member hold the top and bottom members in alinement, it is a very simple matter to assemble the mold preparatory to pouring the metal.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A mold for forming a one-piece cylindrical-shaped cage provided with roller-receiving pockets, said mold comprising end members which form the annular-shaped portions of the cage that are located at the ends of the roller pockets, and a middle member having removable cylindrical-shaped devices and cooperating faces that form the portions of the cage which lie between the roller-receiving pockets and connect the annular-shaped portions of the cage together.

2. A mold for forming a one-piece cylindrical-shaped cage provided with roller-receiving pockets, said mold comprising a bottom member that has an annular-shaped recess, a top member that has an annular-shaped recess, and a middle member having a number of spaced slots that communicate with said recesses.

3. A mold for forming a one-piece cylindrical-shaped cage provided with longitudinally extending roller-receiving pockets, said mold comprising a bottom member which consists of separable parts that cooperate with each other to form an annular-shaped recess, a top member consisting of separable parts that cooperate with each other to form an annular recess, and a separable middle member having a number of longitudinally extending slots that communicate with the recesses in said top and bottom member.

4. A mold for forming a one-piece cylindrical-shaped cage provided with longitudinally extending roller pockets, said mold comprising a bottom member that consists of a plate provided on its upper side with a

disk-shaped boss, an annular-shaped flange surrounding said boss and a ring arranged inside of said flange and spaced away from said boss so as to form an annular recess, a top member which consists of a plate provided on its under side with an annular flange and a removable disk-shaped part arranged inside of said flange and spaced away from same so as to form an annular recess, and a middle member consisting of an inner part, an outer part and a plurality of cylindrical-shaped devices interposed between said parts.

5. A mold for the purpose described, comprising a middle member which consists of an outer part and an inner part provided with guides, and top and bottom members mounted on said guides and each consisting of a plurality of separable parts.

6. A mold for the purpose described, comprising top and bottom members provided with annular recesses and a middle member that consists of a substantially disk-shaped part provided on its periphery with longitudinally extending recesses, a ring-shaped part provided on its inner side with longitudinally extending recesses, and a plurality of cylindrical-shaped devices arranged between said parts in said longitudinally extending recesses.

7. A mold for forming a tapered cylindrical-shaped cast metal cage provided with roller-receiving pockets, said mold consisting of top and bottom members provided with tapered annular-shaped recesses, and a middle member provided with a plurality of spaced slots which communicate with said recesses.

8. A mold for forming a tapered cylindrical-shaped cast metal cage provided with roller-receiving pockets, said mold consisting of a top member, a bottom member, and a middle member, each of said members being composed of a plurality of separable parts and the middle member comprising a plurality of cylindrical-shaped devices which form the roller pockets in the cage.

9. A mold for forming a tapered cylindrical-shaped cast metal cage provided with roller-receiving pockets, said mold being composed of a bottom plate provided on its upper side with a disk-shaped projection and an annular flange, a removable ring arranged inside of said flange and provided with a beveled edge that cooperates with a beveled edge on said disk-shaped portion, a top plate provided on its under side with a flange whose inner face is beveled, a disk-shaped part arranged inside of said flange and provided with a beveled edge, a middle disk arranged between said disk-shaped part and disk-shaped portion and provided on its peripheral edge with longitudinally extending grooves, guides on said middle disk which pass through openings in said top and

bottom plates, a ring surrounding said middle disk and provided on its inner side with cooperating recesses, and cylindrical-shaped devices arranged in said recesses and confined in position by said top and bottom plates.

In testimony whereof I hereunto affix my

signature in the presence of two witnesses, this fourteenth day of November 1910.

CHESTER A. HEINZELMAN.

Witnesses:

WELLS L. CHURCH,
GEORGE BAKEWELL.