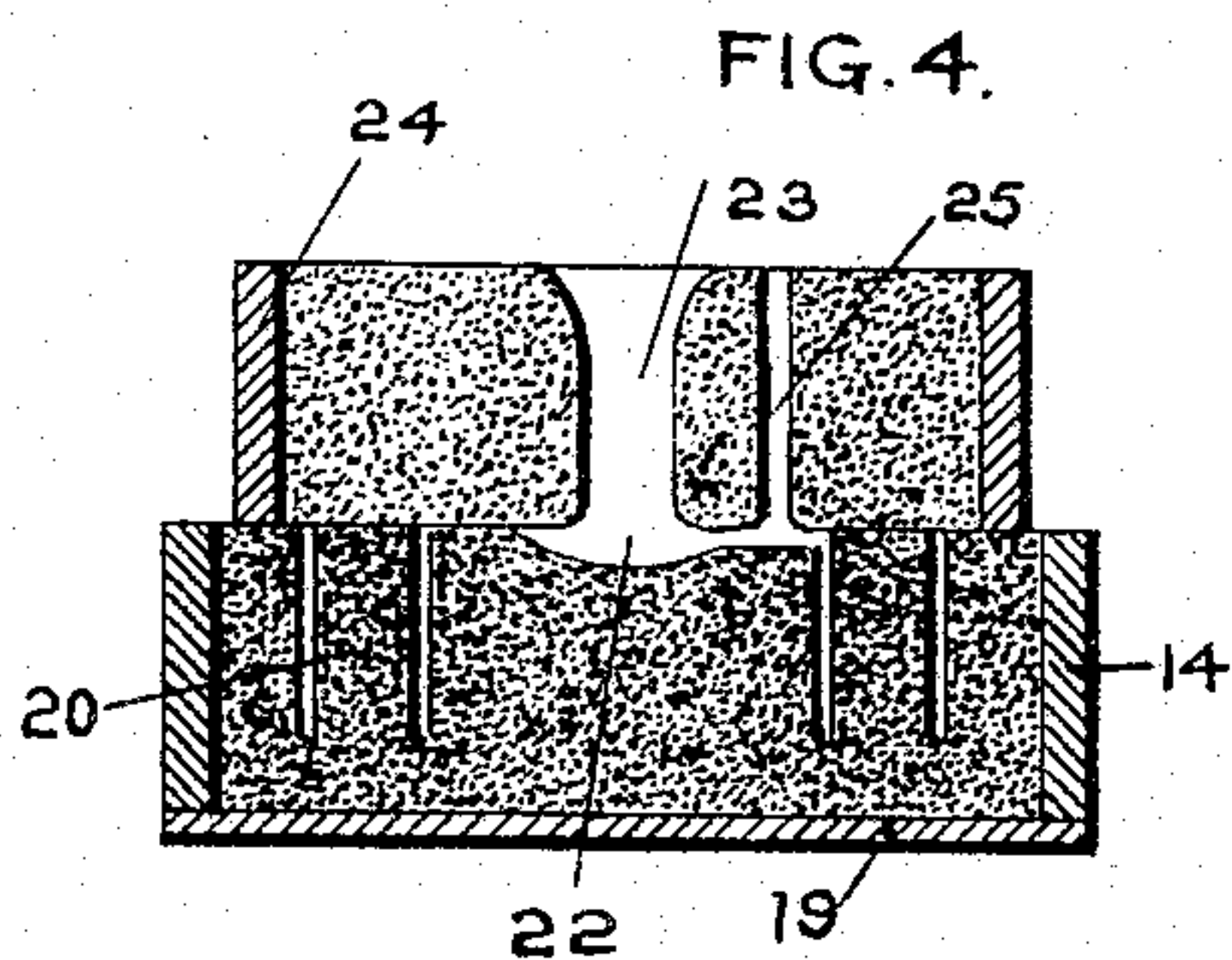
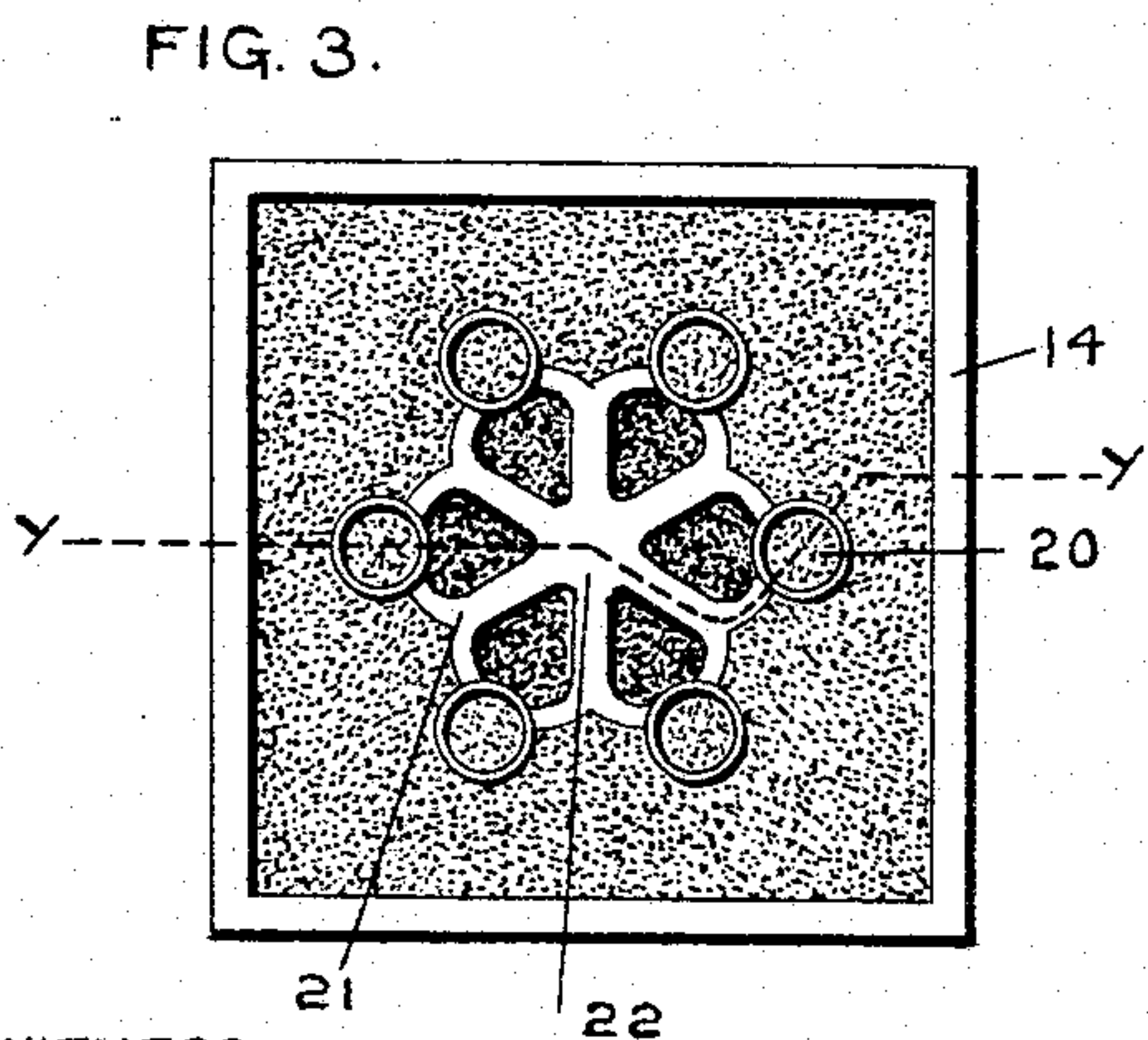
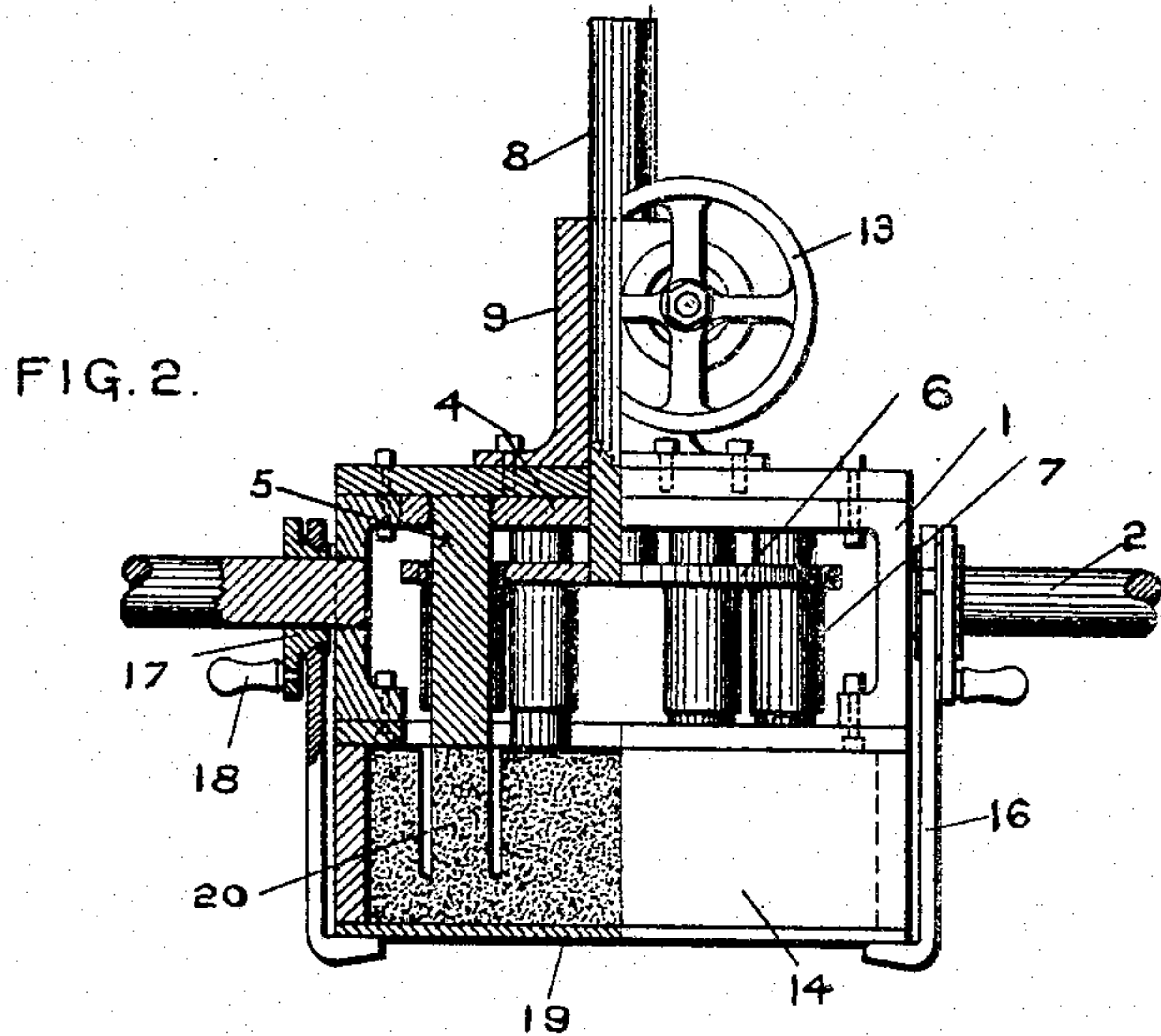
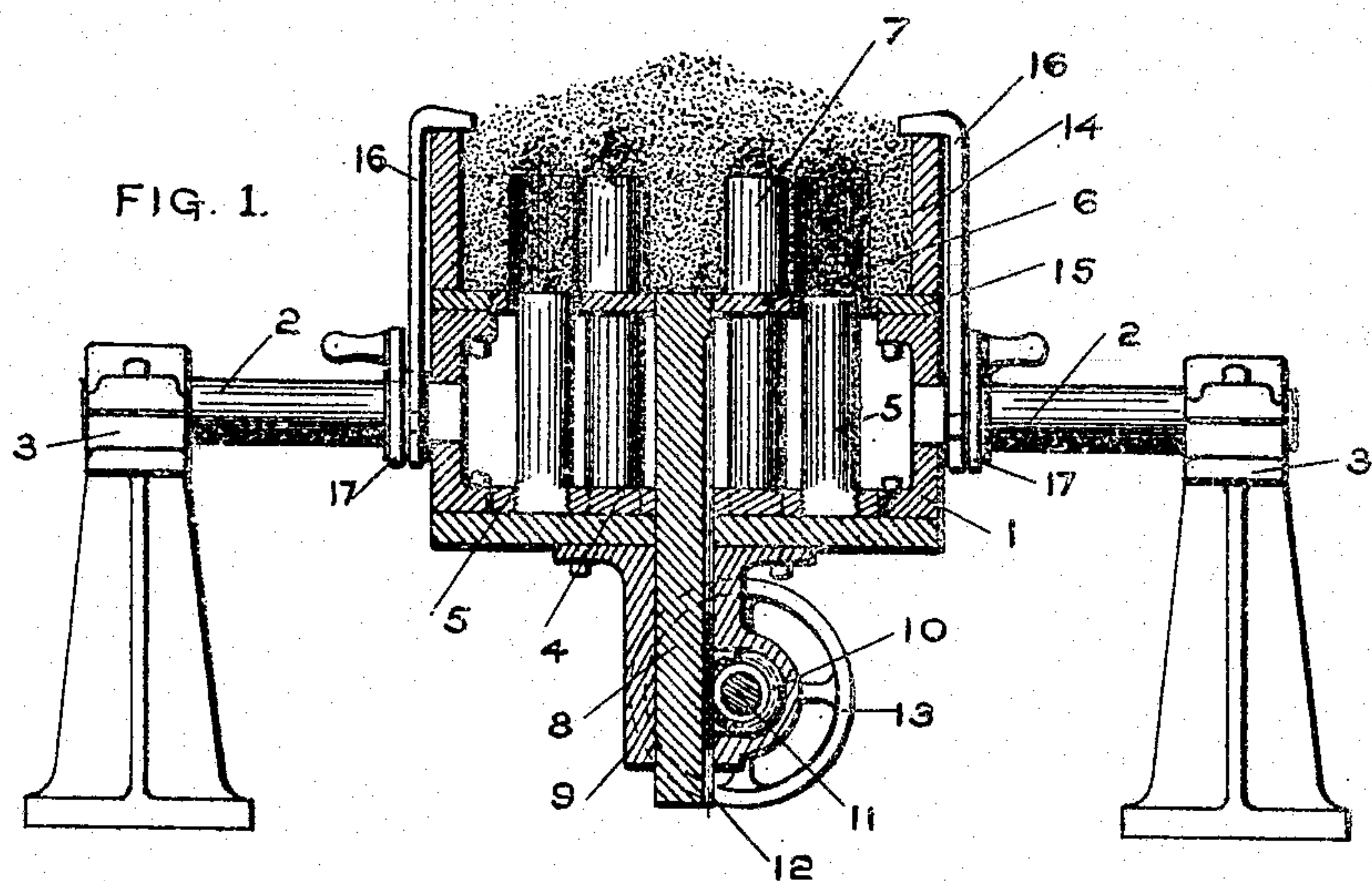


C. W. KING.  
MOLDING MACHINE.  
APPLICATION FILED JULY 25, 1908.

939,030.

Patented Nov. 2, 1909.



WITNESS.

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# UNITED STATES PATENT OFFICE.

CHARLES W. KING, OF BIRMINGHAM, ALABAMA.

## MOLDING-MACHINE.

939,030.

Specification of Letters Patent.

Patented Nov. 2, 1909.

Application filed July 25, 1908. Serial No. 445,411.

*To all whom it may concern:*

Be it known that I, CHARLES W. KING, a citizen of the United States, residing at Birmingham, in the county of Jefferson and State of Alabama, have invented new and useful Improvements in Molding-Machines, of which the following is a specification.

My invention relates to an improvement in an apparatus for molding brass ferrules and light cylindrical articles of relatively small diameter wherein the maximum difficulty encountered has been in providing the core around which the article is cast. The present practice is to provide a baked sand core which is inserted between the cope and the drag, each of which is formed with a half mold and which require accurate matching. In this practice it is necessary to tap the patterns from which the mold is formed to remove them from the cope and drag, and this tapping necessarily enlarges the mold which results in no uniformity of weight in the articles as cast and different thicknesses of metal on opposite sides of the article frequently result from this as well as inaccurate matching of the cope and drag.

It is the purpose of my invention to obviate these difficulties by providing a casting apparatus which will form both the mold and core in the drag simultaneously, thereby eliminating baked cores, the mold being disposed vertically in the drag and provided with gates so arranged that there is no necessity for matching the cope accurately with the drag, my practice being to use a cope considerably smaller than the drag and which makes a sand joint therewith, there being no contact between the boxes themselves.

My invention comprises the novel features of construction and arrangement of parts hereinafter more fully described and claimed, reference being had to the accompanying drawings, in which:—

Figure 1 represents a vertical sectional view through the apparatus with the drag mounted in position for packing the sand around the patterns. Fig. 2 represents a view of the apparatus in its reversed position with the patterns withdrawn from the sand, this view showing the apparatus partly in elevation and partly in section. Fig. 3 is a top view of the completed drag after removal from the molding machine. Fig. 4 is a vertical sectional view of the cope and

drag showing how the two can be used without accurate matching.

Similar reference numerals refer to similar parts throughout the drawings.

I have illustrated my improved molding apparatus as comprising a metal box or frame 1 suitably connected at opposite sides to shafts 2, which are journaled in bearings 3. The lower portion of the box, as illustrated in Fig. 1, is provided with a metal plate 4 into which I screw the plungers 5 which project into and make a close fit with openings in the top plate 6 of the box, into which the cylindrical patterns 7 are inserted by being threaded or they may be otherwise rigidly fastened to the plate 6. The plate 4 is bolted or otherwise connected to the box while the plate 6 is separate therefrom and adapted to be moved downward by means of a shaft 8, which passes through suitable openings in the bottom of the box 1 and through suitable boxing 9, in which is mounted a cog wheel 10 keyed to a shaft 11 and adapted to engage a rack 12 on the shaft 8, a hand wheel 13 being provided by means of which the shaft 8 and plate 6 may be adjusted to the position shown in Fig. 1, or that shown in Fig. 2.

In Fig. 1 I show the drag 14 mounted upon a rectangular plate 15 forming a portion of the top of the box surrounding the plate 6. This drag is held in position by two clamps 16, which at their lower ends are mounted on eccentric plates 17 which are mounted to turn on the shaft 2 and provided with suitable handles 18, by means of which they may be moved to set and lock the clamps 16 in engagement with the drag to hold it firmly in position during the tamping of the same. It will be noted that the sand in this case is tamped both into and around the cylindrical patterns 7, the sand within the patterns being packed against the upper ends of the plungers 5 which stand on a level with the upper surface of the plate 6 and close the lower ends of the patterns. After the drag has been packed, the clamps 16 are released, a follow board 19 is placed in position and the clamps are set to engage the follow board and tightened so as to hold the drag in fixed relationship with the box 1 as the latter is turned on its pivotal supports and inverted to the position shown in Fig. 2. After the inversion of the apparatus, the hand wheel 13 is operated to lift



the plate 6 and draw the patterns 7 from the sand, it being noted that the plungers 5 remain stationary, pressing against the upper ends of the green sand cores 20 which have been formed therein and which will therefore remain undisturbed by the withdrawal of the patterns. As a result we have a complete annular mold, open at its upper end and of unvarying size and continuous contour. As a result the ferrules or like articles cast in such a mold will have an absolute uniformity of weight and distribution of metal and will have no lines of matching along the sides of the ferrule, and further will have so perfect a finish both inside and outside as to necessitate practically no dressing.

In Fig. 3 I illustrate a plan view of the drag with a preferred arrangement for simultaneously molding six ferrules. The gates 21 lead to the several molds from a common central gate 22. This gate is of sufficient width to permit a ready matching therewith of the opening 23 for the hot metal in the cope 24. This cope, it will be noted, is of smaller area than the drag and is packed with the sand smooth on the bottom so as to make a sand joint, which will effectively close the upper ends of the molds in the drag and, what is of the greatest importance, without the necessity of matching the cope and drag or of any special adjustment of such parts, it being only necessary to set the cope so that the port 23 will register with the large gate 22 of the drag. The cope is provided with a vent 25 and may be packed in any manner now practiced.

The arrangement of the patterns and their shape, length and sizes may be varied as conditions may require, the principal feature of my invention consisting in the provision of the central plungers around which the cylindrical pattern or patterns and stripping plate are withdrawn from the sand and which by their engagement with the sand cores formed within the cylindrical patterns, serve to hold the latter in position, leaving the mold completed with its sand core in position, when withdrawn from the molding apparatus.

It will be noted that both the patterns and plungers are removable and that they can be changed for different sizes and diameters of ferrules, it being only necessary to provide the patterns when smaller than those shown, with annular threaded rims at their lower ends which can be screwed flush with the upper face of the pattern plate while the different plungers will vary slightly in diameter corresponding to the inner diameters of the patterns used. It will also be noted that since the top of each plunger stands flush with the top surface of the pattern plate, it functions regardless of the length of the pattern, therefore in the appa-

ratus shown, ferrules of the same diameter but of different lengths can be molded at the same time, the plungers being alike, or, if desired, plungers and patterns of different diameters can be used at the same time. These parts being removable the interchanging can be effected with slight delay and comparatively no trouble.

Obviously, any desired number of patterns and plungers may be used, and where I refer to a plurality of same, such is meant to cover the use of one or more.

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

1. A molding apparatus comprising a support for a mold box, a receding stripping plate having openings, hollow patterns mounted over said openings, and fixed plungers mounted below said plate and adapted to make a close sliding fit in the openings in said patterns and project into and through the latter as they recede, said plungers standing level with the top of said stripping plate when in initial position, and means to reverse the mold box before causing the patterns to recede.

2. The combination with a reversible molding apparatus, of a mold box, means to clamp said mold box to said apparatus, a receding stripping plate forming a bottom closure for the box in initial position, hollow patterns mounted on said plate, means to lift said stripping plate, after the apparatus has been reversed, and withdraw the patterns from the sand, which has been tamped into and around them in said mold box, and means which abut against the sand cores, formed within the patterns, engaging them in a plane with the stripping plate and holding them against displacement as the patterns are withdrawn, substantially as described.

3. In a molding apparatus of the character described, a frame, means to pivotally support said frame, a receding stripping plate forming a part of the upper portion of said frame, a stem connected to said plate and means to move said stem to position said plate, hollow patterns connected to said plate which has openings opposite the openings in said patterns, and a plurality of fixed plungers which close the lower ends of said patterns in their initial position standing level with the surface of the stripping plate and which extend beyond the other ends of said patterns after the latter are moved to their other extreme position, substantially as described.

4. A molding apparatus comprising a receding stripping plate having one or more openings therein, a hollow pattern mounted over each opening, a plunger disposed below the plate, the upper end of which stands on a level with said upper surface of said plate



and forms a bottom closure for each pattern which projects above said plate, means to reverse the apparatus, and means to move the stripping plate causing each pattern to slide  
5 up around its respective plunger, the position of said plunger with relation to the sand tamped within the patterns remaining unchanged.

5. In an apparatus of the character described, a frame mounted on trunnions, a mold box, means to clamp said box to said frame, the box being uppermost in its initial position and closed below by said frame, a movable plate forming part of said bottom  
15 closure for said box and having mounted thereon one or more hollow patterns disposed over openings in said plate, said frame carrying a plunger which serves as a bottom

closure for said patterns in their initial position standing on a level with the upper surface of said stripping plate and also serves  
20 as a guide as the patterns are lowered with said plate, a follow board, and means to clamp same and said box to the frame, and means to withdraw said patterns from the  
25 mold box after sand has been tamped in the latter and the frame inverted, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.  
30

CHARLES W. KING.

Witnesses:

NOMIE WELSH,  
ANNIE L. PEACE.