

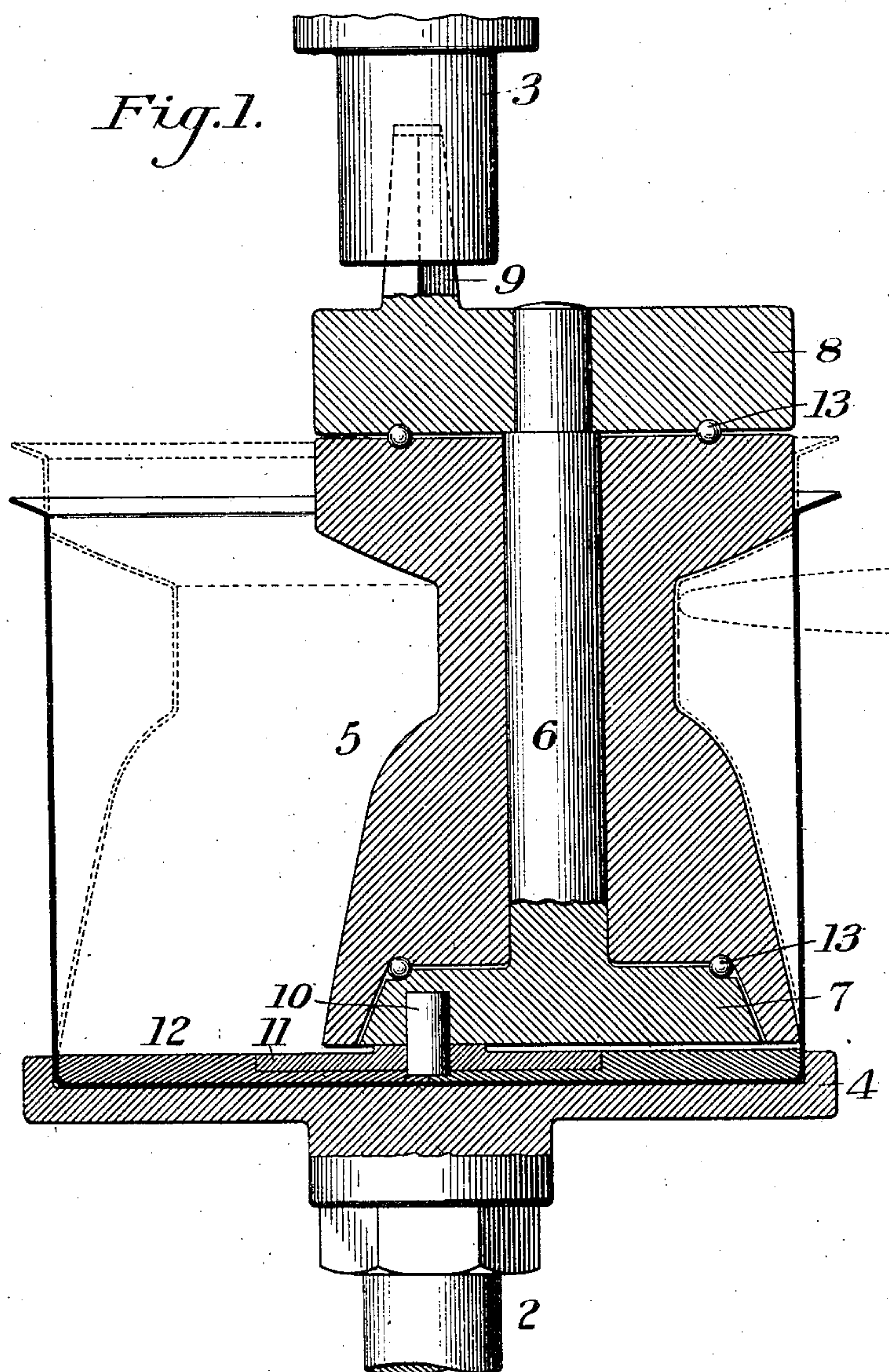
No. 843,518.

PATENTED FEB. 5, 1907.

R. CLARKE.  
APPARATUS FOR SPINNING SHEET METAL.

APPLICATION FILED JUNE 12, 1905.

2 SHEETS—SHEET 1.



WITNESSES

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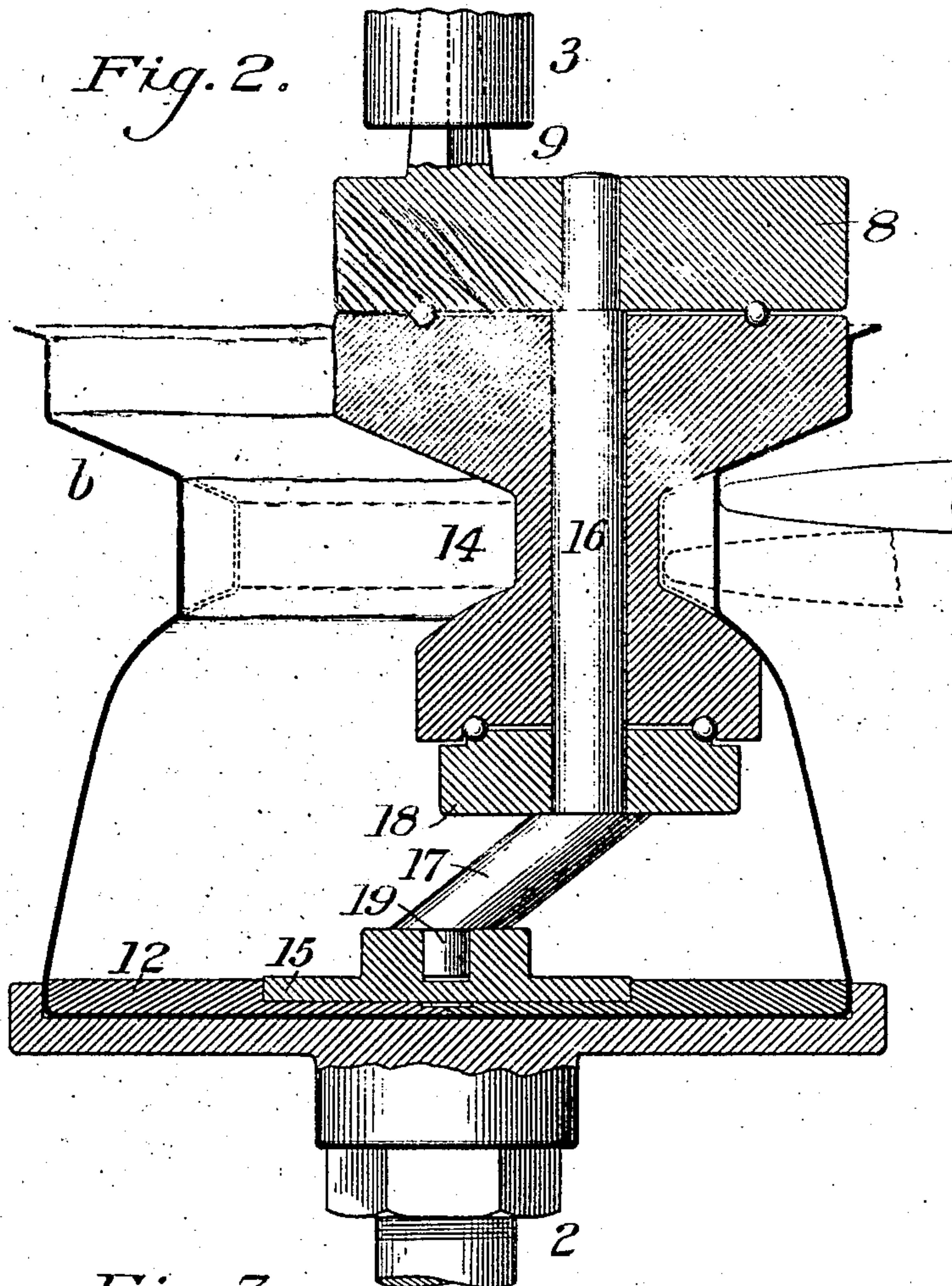
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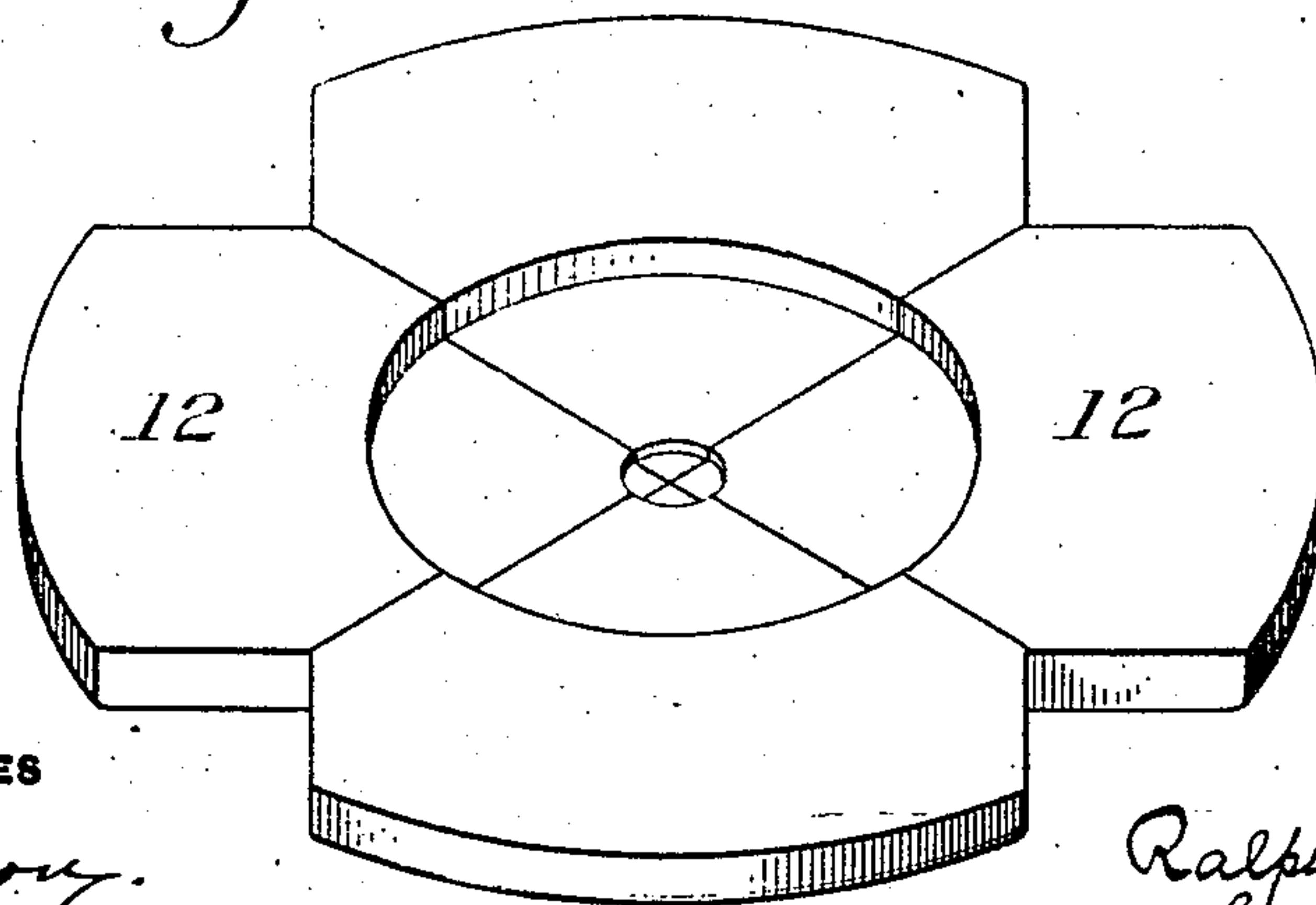
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2 SHEETS—SHEET 2.

*Fig. 2.*



*Fig. 3.*



WITNESSES

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# UNITED STATES PATENT OFFICE.

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## APPARATUS FOR SPINNING SHEET METAL.

No. 843,518.

Specification of Letters Patent.

Patented Feb. 5, 1907.

Application filed June 12, 1905. Serial No. 264,758.

*To all whom it may concern:*

Be it known that I, RALPH CLARKE, of New Castle, Lawrence county, Pennsylvania, have invented a new and useful Apparatus for Spinning Sheet Metal, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a sectional side elevation showing apparatus constructed in accordance with my invention and illustrating the first step of spinning. Fig. 2 is a similar view showing the second spinning operation, and Fig. 3 is a plan view of the removable bottom.

My invention relates to the spinning of hollow metal articles, and is designed to provide a new and improved apparatus therefor. Heretofore in the spinning of such articles sectional mandrels have been employed, the article being spun to final form over the sectional mandrel, which was then collapsed and taken out section by section through the narrower mouth of the article. This method was objectionable, not only on account of the great weight of the mandrel and the delay necessary in inserting the mandrel and placing it in the lathe, but also on account of the liability of forming longitudinal marks or creases in the article along the joints of the sections of the mandrel and, further, the frequent cracking and breaking of the metal.

My invention does away with the use of sectional mandrels and provides a sectional bottom in combination with a forming-roller, which is eccentrically located relative to the center of the article. It also does away with the offsetting of the tail-stock relative to the head-stock of the lathe by providing a stem which is eccentrically located relative to the axis of the forming-roller.

It further consists in the construction and arrangement of the parts, as hereinafter more fully described, and set forth in the claims.

In the drawings, referring to Fig. 1, 2 is the head-stock, and 3 the tail-stock, of the spinning-lathe, the head-stock having the holding-chuck 4. 5 is the first forming-roller, which I have shown as revolubly mounted upon the stem 6, having the enlarged disk 7 at one end and the bearing-disk 8 at the other end. The bearing-disk is provided with an

eccentric stem 9, which is preferably of conical form fitting into a corresponding recess in the tail-stock. The disk 7 is preferably provided with a pin or stem 10, which is in alignment with stem 9 and fits within a plate 11, which in turn fits within the sectional bottom 12. This bottom 12 is made up of a plurality of pieces, four in the present case, preferably divided on radial lines. The central portion of this sectional bottom is recessed to receive the plate 11, which is preferably flush with the bottom when in place. I preferably provide ball-bearings between the disks 7 and 8 and the ends of the forming-roller, as indicated at 13.

In carrying out the first step of the operation the bottom plate 12 is fitted within the bottom of the article, and the plate 11 is slipped into position to hold the sectional bottom in place. The roller-stem 9 being held in the tail-stock of the lathe, the blank, with its contained bottom, is slipped over the roller until the pin 10 enters the recess in the plate 11. The tail-stock is then moved forward until the blank is forced into the chuck of the head-stock. The head-stock is then rotated and the metal is spun in the ordinary manner, beginning preferably at the bottom and working the metal down to fit the contour of the roller. The bottom part of the article is preferably spun to final form in this first step. The tail-stock is preferably moved laterally to release the roller from the side of the vessel and is then moved endwise to pull the roller, together with the plug 10, out of the spun vessel. In my preferred method a series of blanks are thus partly spun to an intermediate shape between the original shape and the final. A series of the bottoms is preferably provided, so that the blanks may be prepared by putting in the bottom, and one may be put on the lathe as soon as the partly-spun blank is taken off.

In carrying out the second step of the operation the partly-spun blank is slipped over the roller 14 (shown in Fig. 2,) which is carried upon the tail-stock of the same or another lathe in the same manner as the first roller. The plate 15 of this second roller fits into the circular recess in the sectional bottom plate 12, and as the roller is of smaller diameter in its base portion than the first roller I preferably offset the stem 16, as shown at 17. This



spaces the disk 18 apart from the base of the article and brings the pin 19 in line or substantially in line with the stem 9. The recessed portion of the roller 14 is thus brought within the upper portion of the partly-spun article, and this upper portion of the article is then spun into such portion to narrow the upper part and shape it to its final form. The mouth, however, of the article is still large enough so that the inner or base portion of the roller 14 and the sectional bottom 12 may be drawn out through it. The roller is withdrawn in the same manner as before, and a series of articles are thus spun from the partially-formed shape into the desired shape. The first spinning operation preferably completes the form of the base portion of the article, while its upper portion near the mouth is shaped in the second operation. This may be varied, however, as desired. After the blank has been spun to the final shape the upper portion *b* of the article is cut off, thus giving in the present case a tea-kettle.

The advantages of my invention result from the use of the sectional bottom in combination with the eccentric former, which is preferably in the form of a roller, thus doing away with the use of the heavy sectional mandrels heretofore employed. By using two or more successive formers of different shape I can narrow the mouth and at the same time withdraw the former without using a sectional former. The blank may be annealed between the successive spinning operations, if desired, to reduce the liability of cracking the metal. By using the sectional bottom with the eccentric mandrel the creases or marks which are liable to be made along the article at the points of the sectional mandrel are not produced, and the article is of a superior appearance and quality.

If desired, the pin 10 may extend entirely through the plate 11, in which event the sectional bottom 12 will be formed with a small recess to receive the pin 10, as shown in Fig. 3. It will be understood that the bottom 12 can be readily removed in sections.

Changes in the precise embodiment of invention illustrated and described may be made within the scope of the claims without departing from the spirit of the invention or sacrificing any of its advantages.

I claim—

1. In spinning apparatus, a sectional bottom, in combination with an eccentric former coöperating therewith; substantially as described.

2. In spinning apparatus, a sectional bottom, means for holding the bottom sections

in place, and an eccentric forming-roller co-operating therewith; substantially as described.

3. In spinning apparatus, a sectional bottom, and an eccentric forming-roller having an end bearing supported in said bottom; substantially as described.

4. In spinning apparatus, a sectional bottom having a central plate interfitting with the sections, and an eccentric roller having an inner end bearing supported in the bottom; substantially as described.

5. In spinning apparatus, a sectional bottom having a center support, and an eccentric roller having a bearing carried on said central support; substantially as described.

6. In spinning apparatus, a sectional bottom plate having a central removable plug, an eccentric roller having an inner bearing coacting with the plug, and an outer bearing for the roller having a stem in alinement with the bottom plug; substantially as described.

7. In spinning apparatus, an eccentric forming-roller, a disk bearing against the upper end of said roller, and a stem eccentrically mounted upon said disk, substantially as described.

8. In spinning apparatus, an eccentric forming-roller, a bearing-disk at each end of said forming-roller, and a stem eccentrically mounted on one of said disks, substantially as described.

9. In spinning apparatus, a sectional bottom having a central recess, a central plate fitted flush into said recess, and an eccentric forming-roller having an end bearing supported by the central plate, substantially as described.

10. Forming mechanism for spinning apparatus comprising a stem, a forming-roller journaled thereon, bearing-plates carried by the stem and engaging the ends of the roller, and journals carried by the bearing-plates eccentric with respect to the stem.

11. Forming mechanism for spinning apparatus comprising a stem having a permanent bearing-plate at one end, a forming-roller journaled upon the stem and engaging the bearing-plate, a removable bearing-plate carried by the opposite end of the stem and bearing against the adjacent end of the roller, and journals upon the bearing-plates eccentric to the stem.

In testimony whereof I have hereunto set my hand.

RALPH CLARKE.

Witnesses:

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L. A. JOHNSTON.