

No. 628,446.

Patented July 11, 1899.

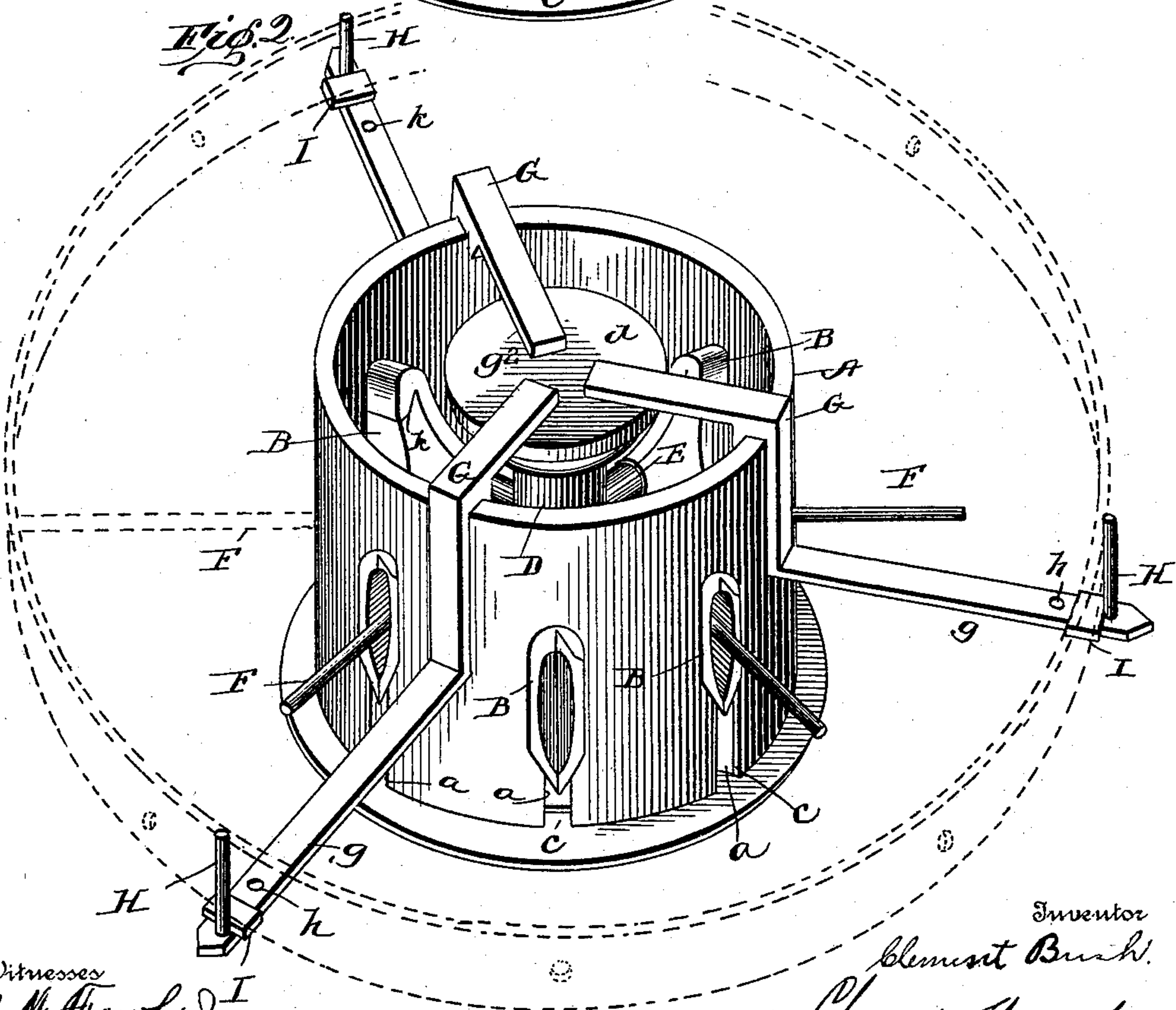
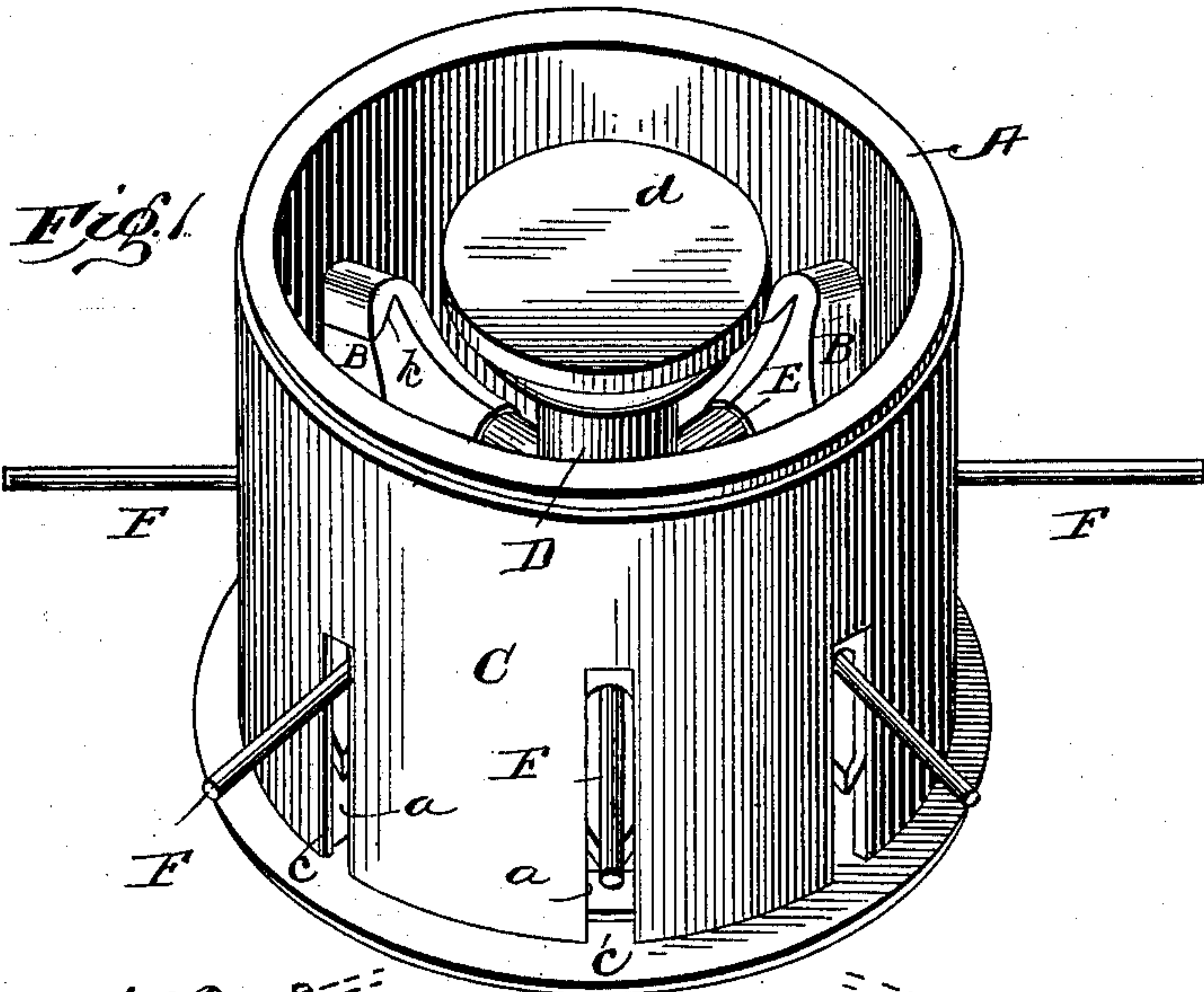
C. BUSH.

APPARATUS FOR CASTING METALLIC WHEELS.

(Application filed Apr. 19, 1899.)

(No Model.)

3 Sheets—Sheet 1.



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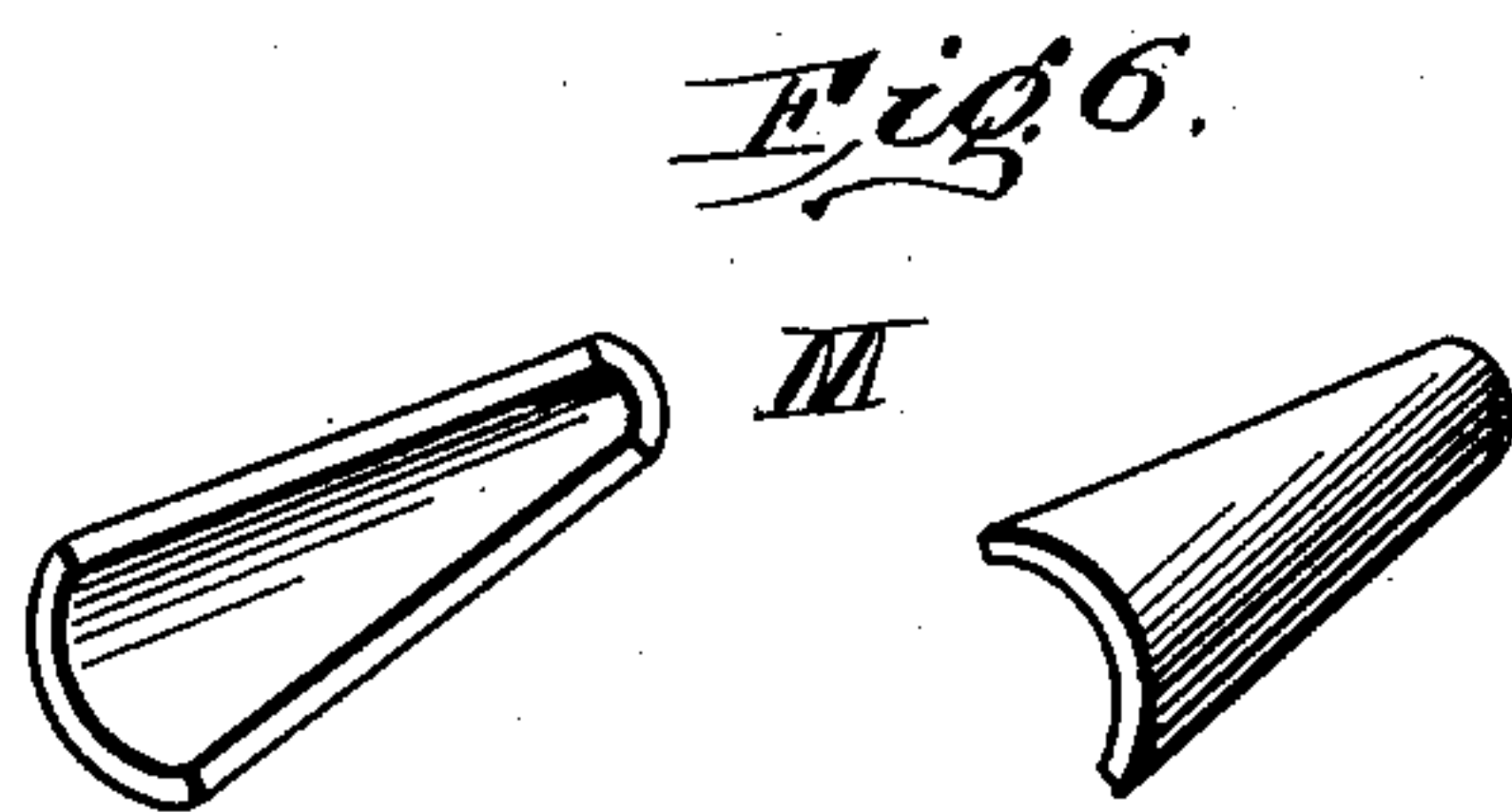
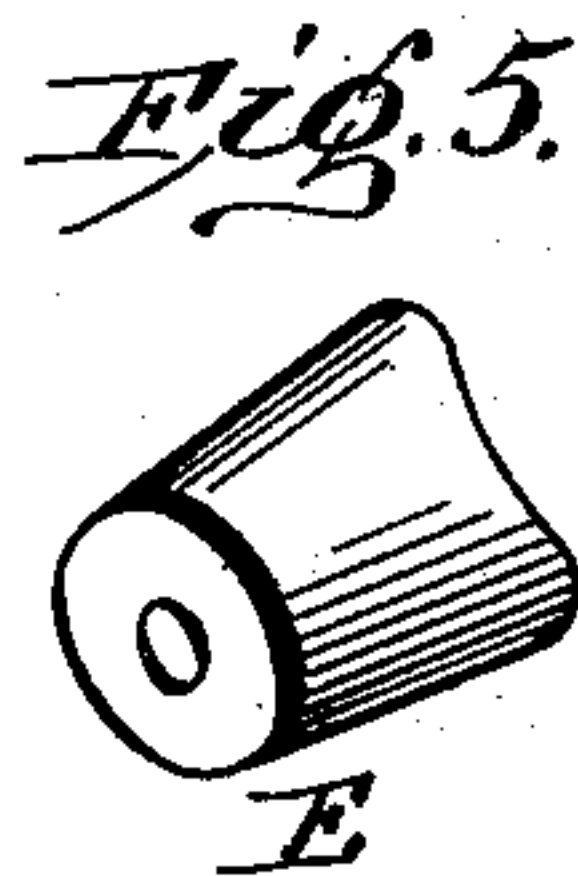
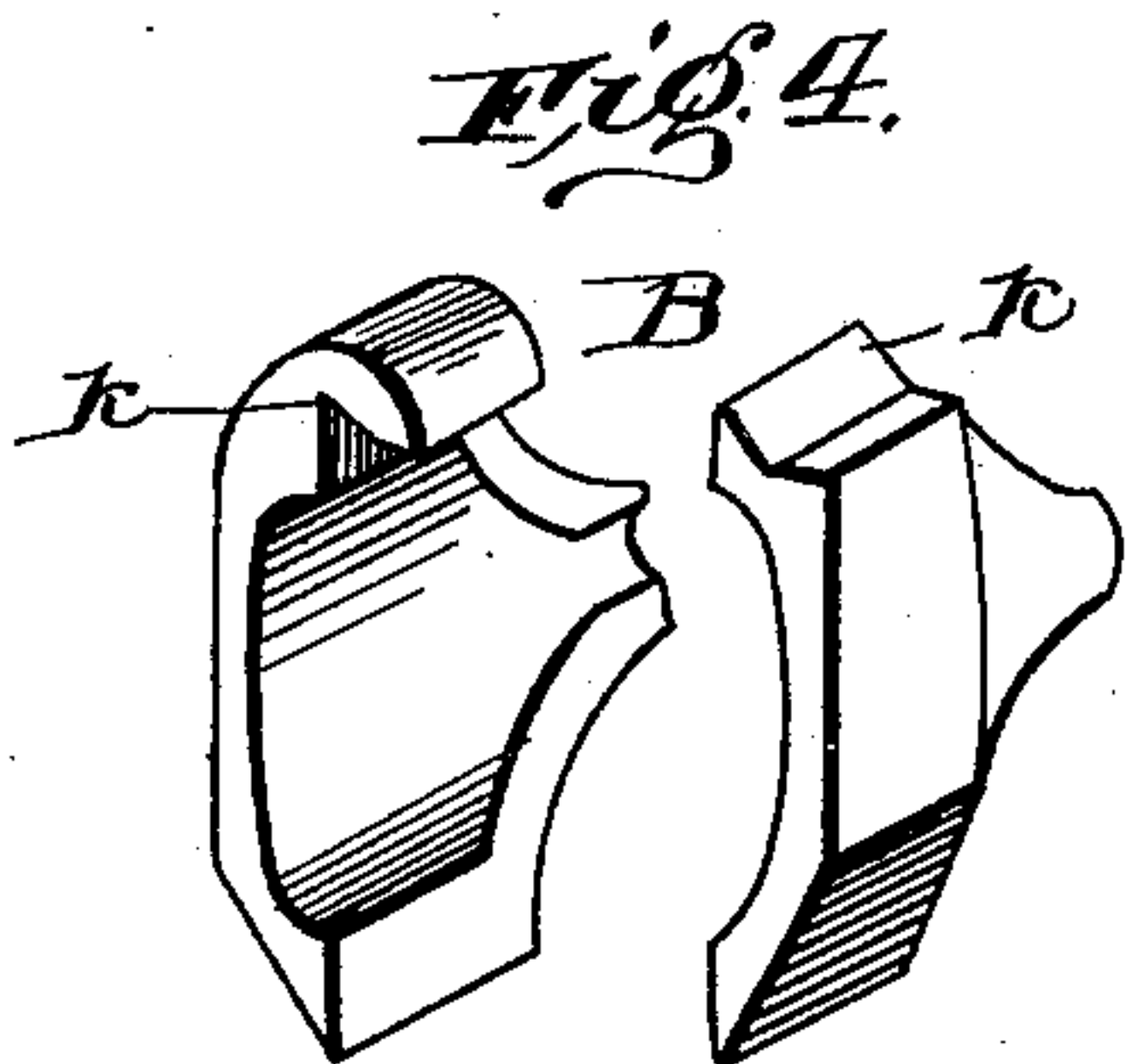
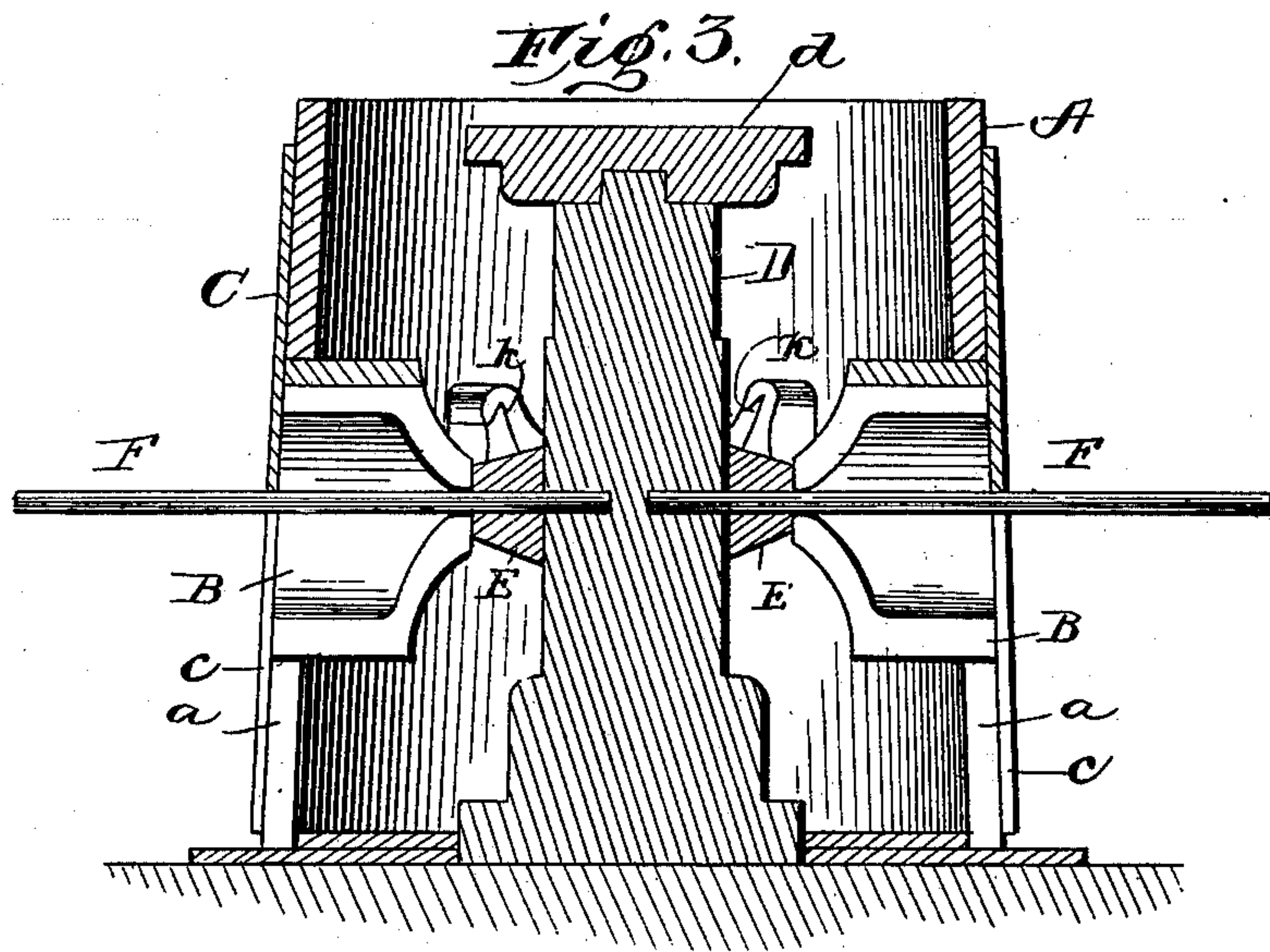
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3 Sheets—Sheet 2.



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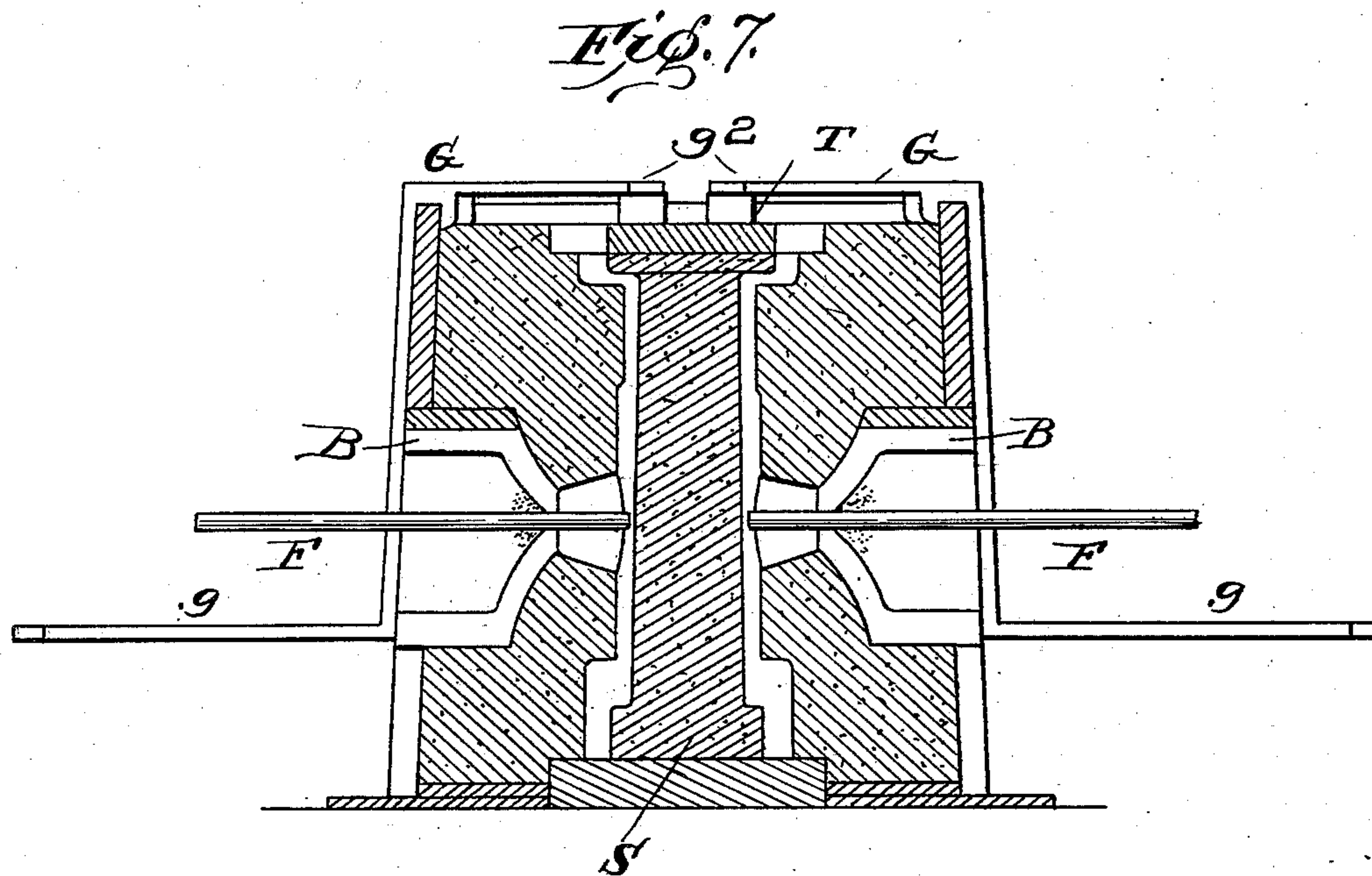
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(Application filed Apr. 19, 1899.)

(No Model.)

3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR CASTING METALLIC WHEELS.

SPECIFICATION forming part of Letters Patent No. 628,446, dated July 11, 1899.

Application filed April 19, 1899. Serial No. 713,619. (No model.)

To all whom it may concern:

Be it known that I, CLEMENT BUSH, a citizen of the United States, residing at Quincy, in the county of Adams and State of Illinois, have invented certain new and useful Improvements in Apparatus for Casting Metallic Wheels; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the letters of reference marked thereon.

This invention relates to improvements in apparatus for casting metallic wheels of that type wherein the spokes of the wheel or article to be cast are inserted in the mold in such manner as to be united at their inner ends with the metal which forms the hub of the wheel, while at their other ends they are confined by a rim of any approved pattern, usually, however, of metal.

The objects of the invention are to provide an apparatus whereby the manufacture of such wheels may be simplified, the certainty and accuracy of the results increased, and the cost of manufacture reduced to a minimum.

With such objects in view the invention may be said to embody a flask in which the cast portion of the wheel is given form, embodying or having combined with it a pattern of peculiar construction for giving shape to the mold in which the cast is made within the flask and for giving access to said mold for the introduction of the spokes for uniting the hub and rim of the completed wheel.

Further than this the invention consists in certain novel details of construction and combinations and arrangements of parts, all as will be now described, and pointed out particularly in the appended claims.

Referring to the accompanying drawings, Figure 1 is a perspective view of my apparatus prepared for the reception of the sand or loam in which the mold-cavity is formed.

Fig. 2 is a similar view with the chill-retaining cylinder and some of the temporary spokes or mold-positioners removed and with the rim and core retaining arms or spiders in position. Fig. 3 is a vertical cross-section of the apparatus illustrated in Fig. 1. Fig. 4 is a detail perspective view of one of the chills of the preferred form, with its two halves separated to show interlocking portions. Fig. 5

is a similar view of one of the stubs for giving shape to the cavity in which the metal around the inner ends of the spokes is formed. Fig. 6 is a perspective view of a modified form of sectional chill with the two sections separated. Fig. 7 is a vertical cross-section of the apparatus with the patterns removed and the core inserted ready for the pouring operation.

Like letters of reference in the several figures indicate the same parts.

In carrying this invention into practice I provide a casing, preferably cylindrical and lettered A in the accompanying drawings, which casing might be and will for convenience herein be termed a "flask," within which the hub portion of the wheel is cast and through the walls of which the spokes during the casting operation are adapted to project radially into engagement with the rim of the wheel. For the purpose of accommodating the spokes and permitting the removal of the wheel after the hub has been cast around the inner ends of the spokes the wall of the flask A has vertical slits *a* therein corresponding in position to the positions of the spokes in the completed wheel, and the upper ends of these slits are widened out to form openings, through which parts, which I shall herein term "chills," are adapted to project and through which in turn the inner ends of the spokes are inserted into the mold-cavity. These chills and the openings for their reception are preferably staggered to approximate the staggered arrangement of the spokes on the hub of the wheel, and in the drawings it will be noted that this is shown in Fig. 2, where proximate openings are in different horizontal planes. The chills, preferably made in interlocking halves B, are inserted through the openings at the upper ends of the slits *a* in the flask A and project inwardly to a point where the ends of the cavities for the stubs on the hub of the wheel terminate, and at their inner ends they have openings approximately the size of the spokes to be used in the wheel. These openings flare outwardly or are larger at the outer ends of the chills than at the inner ends. Thus the spokes may be inserted at quite a sharp angle, if found necessary, and without disturbing the mold material contained within the flask, as will be

presently explained. The sections of the chills are held together by the walls of the openings in the flask, through which they project, and they are held inwardly by a removable casing C, which may be slipped over the flask and is provided with slits *c*, through which the temporary spokes may be inserted and which will permit the casing to be removed at will. Centrally of the flask I locate a pattern D, approximating the shape of the hub of the wheel, which pattern may have its upper end separable, as at *d*, and in the walls of this pattern there are formed a series of recesses corresponding to the positions of the inner ends of the spokes. Between the hub-pattern D and the ends of the chills before described there are located a series of stub-patterns E, each one of which is centrally perforated, the central perforation registering with the opening in the end of the chill and the opening in the hub-pattern corresponding thereto. Thus in assembling the parts a temporary spoke or retainer, such as F, is passed inwardly through each of the chills and through one of the stub-patterns and into the central hub-pattern. It will be noted that when thus assembled the inclosing casing forces all of the chills inwardly, and the stub-patterns, being located between the ends of the chills and the central hub-pattern, will center the latter and hold it firmly in position. With the parts in this position sand, loam, or mold material is rammed in around the parts and the flask filled, all in the ordinary way. After this has been accomplished the outer casing is removed, the upper or flanged end of the hub-pattern also removed, and then the temporary spokes or retainers are withdrawn. The central hub-pattern may then be removed by raising the flask if the taper is upwardly, as shown, or by lifting the pattern if the taper is downwardly, after which the stub-patterns may be each removed by reaching in through the central cavity with a convenient hook or other appliances, leaving the mold intact, and when mounted upon a suitable base is ready for the reception of the spokes and fluid metal. Before the spokes and rim are applied and before the fluid metal is poured a series of hangers or spiders G are hung upon the edge of the flask in position for their outwardly-extending arms *g* to receive and support the rim of the wheel. The rim having been placed upon the spiders G, it is centered with respect to the mold by means of pins H, which may be inserted in any one of the series of holes *h* in the arms *g*, and it is centered vertically in accordance with the width of the rim by means of blocks or wedges I, which may be placed beneath the rim at each of its points of support. Thus a narrow rim where no "dish" is given to the wheel should be raised by the wedges somewhat higher than a wide rim in order that the spokes may project properly from the hub. The spokes now have their inner ends passed into the mold-cavity through

the flaring openings in the chills until their outer ends will pass inside of the rim, when said outer ends are inserted into the openings provided therefor in the rim and the spokes drawn outwardly until the usual shoulders on the spokes engage the rim. When in this position, each spoke will have its inner end projecting into one of the stub-cavities (see Fig. 7) and in position to have the metal cast about it, and it will be particularly observed that in inserting the spokes no danger of injuring the mold is incurred, inasmuch as the mold material holds the chill firmly in position, and the openings in the inner ends of the latter effectually guide and support the inner ends of the spokes out of contact with the sand, loam, or mold material.

The inner ends *g*² of the spiders G project over the top of the flask and are adapted to hold the core or core-pieces S for the axle-opening in place. Such core piece or pieces are of the usual construction and are illustrated in Fig. 7 as being held down by the overlying ends of the spider, and, if desired, wedges T or other means may be used to properly position them.

To prevent any possible escape of the molten metal through the apertures in the ends of the chills and around the spokes held thereby, it is found desirable to throw a handful of sand or loam into the said chills from the outside after the spokes are properly positioned, thus effectually closing the cracks around the spokes, which advantage, it will be seen, follows from the formation of the chills with flaring openings.

In the preferred construction, as before stated, the chills are divided in half, and, as shown in Fig. 4, the two halves are preferably provided with interlocking portions, such as *k*, for holding them in their correct relative positions; but it is obvious that this is not essential, inasmuch as other means may be resorted to for retaining the two sections of the chill in proper relative position—such, for instance, as the wall of the opening through which the chills pass in the flask—and, in fact, such chills may be of any approved shape, and I have shown in Fig. 6 a modified form, where the chill M is substantially circular in cross-section and has within it a conical cavity; but in each instance the chill must be sectional in order to permit the removal of the completed wheel after the hub has been cast around the inner ends of the spokes. When the casting has been done, it will be found that the chills may be drawn out and taken off of the spokes and the flask slipped off, the spokes during such movement of the flask passing through the slots and out.

Rims of different diameters may be properly centered, as well as rims of different widths, and so, too, by using different sizes of hub and stub patterns the size of the hubs may be correspondingly varied, adapting the apparatus for use in making many different sizes of wheels. So, too, in manipulating a number

of flasks it is only essential to have one casing, inasmuch as when one flask has been set up ready for casting the casing is no longer in use there and may be taken to the next flask and put into commission for holding the chills in that flask, and so on.

Having thus described my invention and in what manner the same is to be performed, I declare that what I claim as new, and desire to secure by Letters Patent, is—

1. In an apparatus for forming metallic wheels the combination with a flask having slits extending inwardly from the edge for the insertion and removal of the wheel-spokes, of a series of radially-arranged chills mounted in said slits and having openings at their inner ends for the wheel-spokes; substantially as described.

2. In an apparatus for forming metallic wheels the combination with a flask having a series of openings in its side wall and slits extending from said openings to the edge of the flask, of a series of tapering chills mounted in said openings and converging toward the center of the flask; substantially as described.

3. In an apparatus for forming metallic wheels the combination with a flask having openings in its side wall and slits extending from said openings to the edge of the flask, of a series of sectional chills mounted in said openings and having apertures at their inner ends for the passage of the spokes; substantially as described.

4. In an apparatus for forming metallic wheels the combination with a flask having a series of slits therein extending to the edge for the admission and escape of the wheel-spokes, of a series of sectional converging chills having apertures at their inner ends for the admission of the spokes; substantially as described.

5. In an apparatus for forming metallic wheels the combination with a flask having a series of apertures in its side walls and slits extending from said apertures to the edge of the flask, of a series of sectional converging chills mounted in said apertures, the sections of said chills having interlocking projections; substantially as described.

6. In an apparatus, for forming metallic wheels, the combination with a flask having apertures and slits connecting said apertures with one edge of the flask and converging chills mounted in said apertures and in turn having apertures for the admission of the spokes, of a series of spiders having outwardly-extending arms for supporting the wheel-rim with which the spokes cooperate; substantially as described.

7. In an apparatus for forming metallic wheels the combination with a flask having openings in its wall of a series of chills converging inwardly from said openings and having outwardly-flaring openings within them for the admission of the spokes; substantially as described.

8. In an apparatus for forming metallic wheels the combination with a flask having a series of slots extending out to the edge for the escape of the wheel-spokes, a series of inwardly-converging chills having apertures for the passage of the spokes, a central hub-pattern and a series of independent stub-patterns for bridging spaces between the hub-pattern and inner ends of the chills; substantially as described.

9. In an apparatus for forming metallic wheels the combination with a flask, of a central hub-pattern, a series of converging chills and stub-patterns bridging the spaces between the hub-pattern and inner ends of the chills, said chill, stub-patterns and hub-pattern having apertures in alinement with each other and temporary spokes or retainers for holding said parts in their adjusted positions; substantially as described.

10. In an apparatus for forming metallic wheels the combination with a flask having slits in its wall extending out to one edge for the escape of the spokes, of spiders mounted on said flask and having outwardly-extending arms for supporting the wheel-rim and inwardly-extending arms for retaining the central core; substantially as described.

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