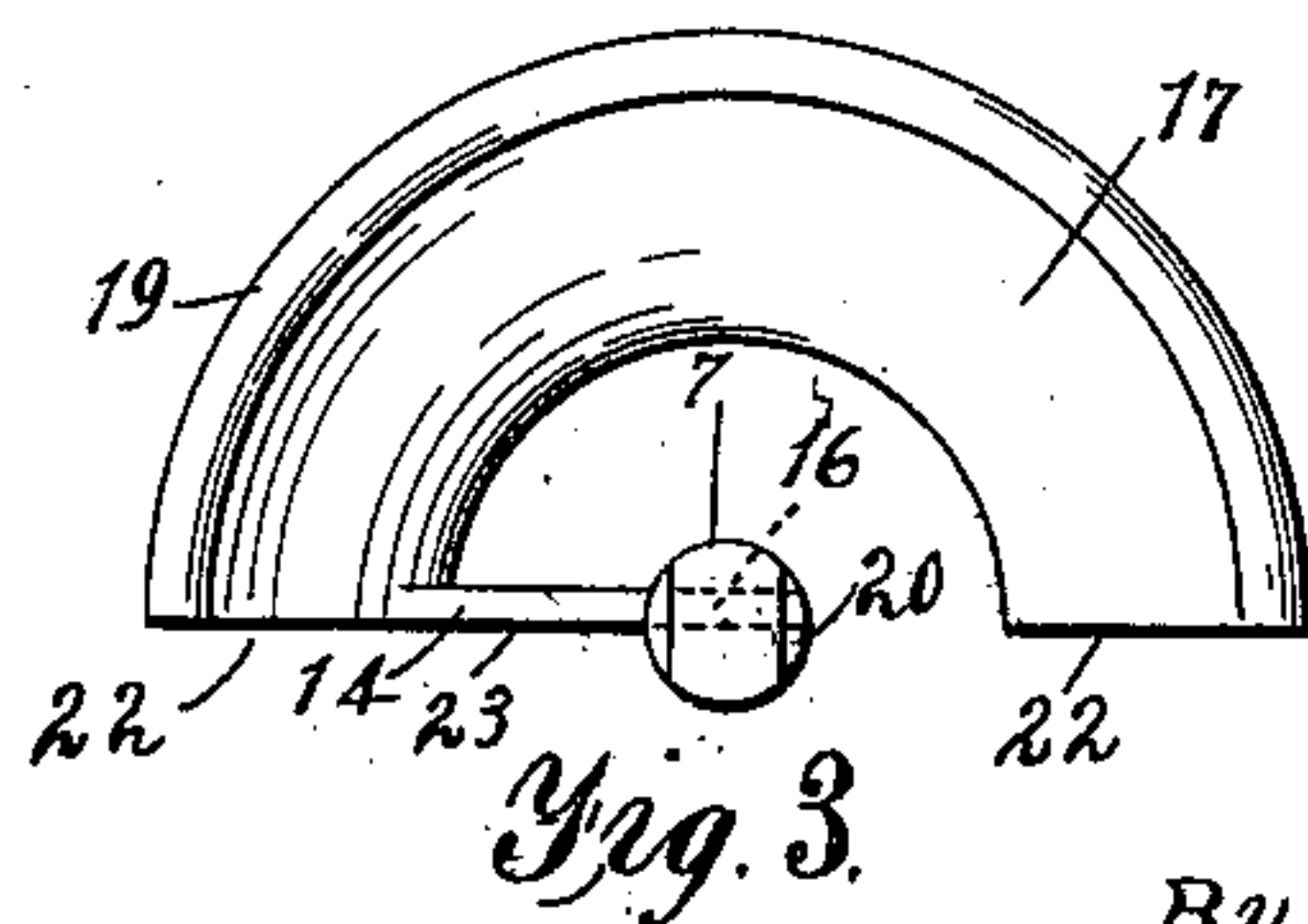
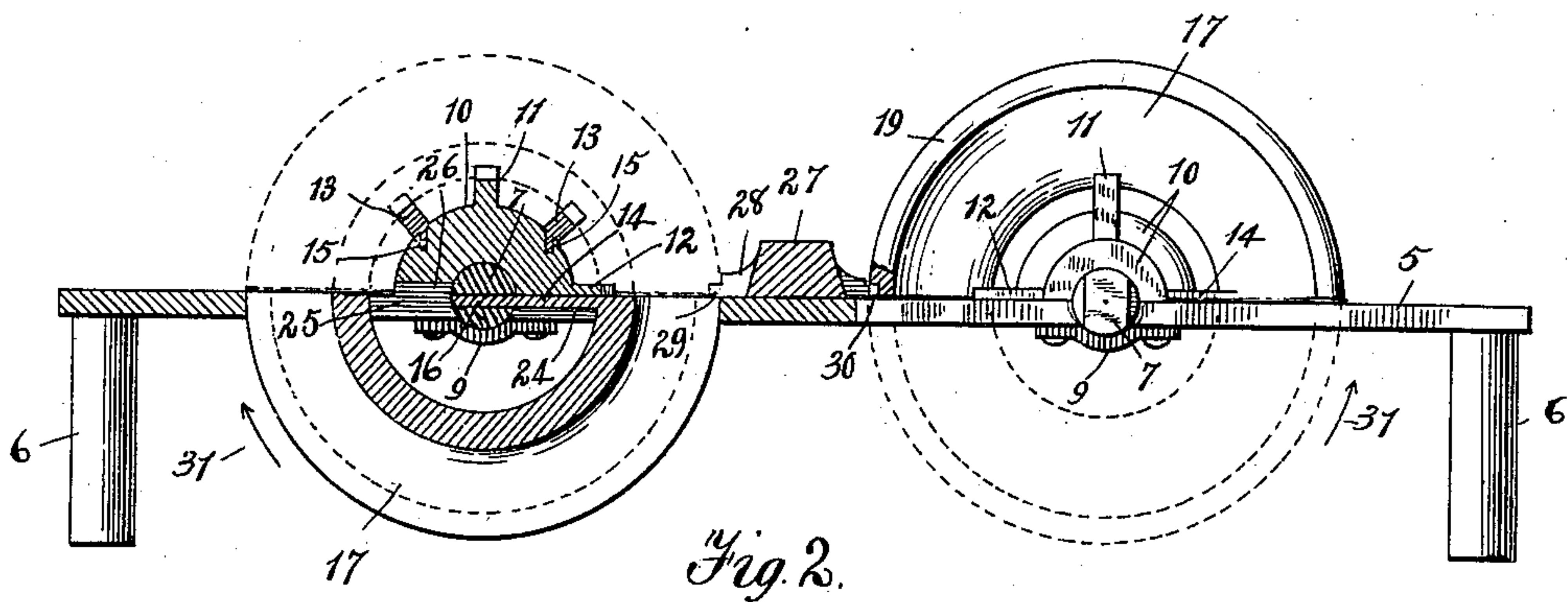
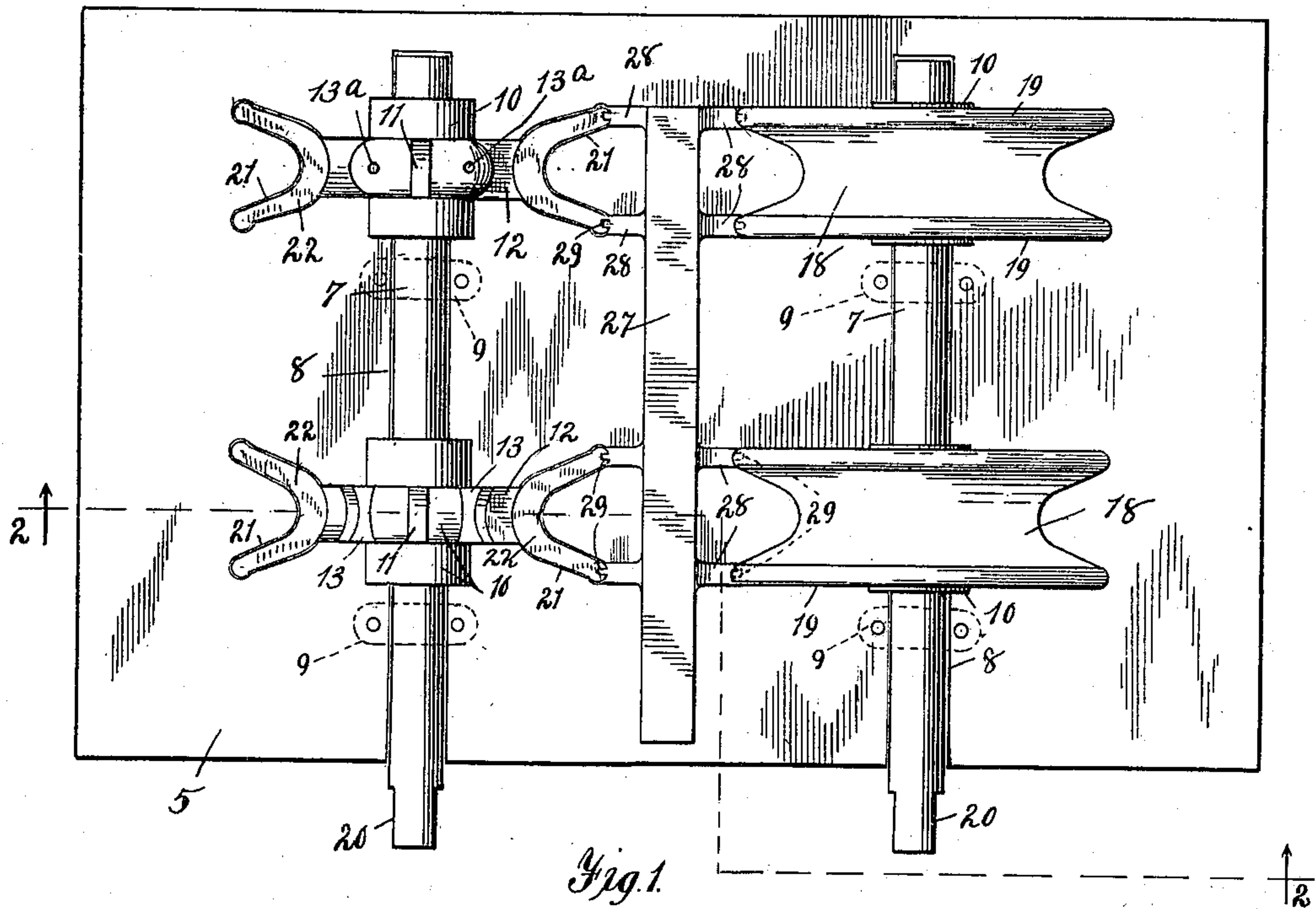


M. E. WELCH.
MOLDING MACHINE.
APPLICATION FILED JAN. 3, 1910.

981,903.

Patented Jan. 17, 1911.



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UNITED STATES PATENT OFFICE.

MICHAEL E. WELCH, OF NORTH CHICAGO, ILLINOIS.

MOLDING-MACHINE.

981,903.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, MICHAEL E. WELCH, citizen of the United States, residing at North Chicago, in the county of Lake and State of Illinois, have invented certain new and useful Improvements in Molding-Machines, of which the following is a specification.

My invention relates to molding machines and has particular reference to devices adapted to facilitate the molding of patterns having undercut rims and with the parts symmetrically arranged about an axis, such as wheels, pulleys, drums and other circular articles.

The chief objects of the improvements which constitute the subject matter of this application for patent are:—to produce an apparatus for the purpose stated in which the pattern is formed in sections, one of which is pivotally mounted and adapted to be withdrawn from the sand before the cope is lifted, thus permitting of the casting of overhanging parts that would prevent the drawing of the pattern in the usual manner; to furnish a simple and efficient means for accomplishing the above result, and to provide an apparatus that will allow a plurality of patterns, either in duplicate or of various designs and shapes, to be simultaneously removed from the cope by a single movement of an operating lever.

Other objects, stated in detail, are:—to facilitate the molding of wheels having rims either plain or grooved and with overhanging margins and provided with hubs connected to the rims either by spokes or an intact web; to furnish means whereby the number of spokes may be changed in a wheel or pulley pattern so that the cast wheel may be correspondingly varied, and to arrange a pattern gate having a purpose in addition to that ordinarily belonging to it, this novel function being the provision of lugs or pins adapted to engage recesses in the movable section of each pattern, thus securing an accurate alinement of the pattern rim in case it should be untrue, or the bearings become worn from use.

I accomplish the desired results by the employment of the apparatus illustrated in the accompanying drawing, which forms a part of this application, the details of construction being disclosed in the following views:—

Figure 1 is a top plan view of a molding machine equipped with duplicate series of

patterns designed for producing a plurality of grooved wheels suitable for trolleys; Fig. 2 is a front elevation, partly in section, the cutting planes of the section being on the line 2—2 of Fig. 1, and Fig. 3 is an end elevation of one of the rock shafts with a pattern wheel segment and connecting spoke attached thereto.

Referring to the details of the drawing, the numeral 5 indicates a rectangular frame or bed plate supported upon posts or legs 6, and forming a foundation upon which the patterns are carried. Mounted parallel to each other upon said plate, are two similar rock shafts 7. These shafts are arranged in slots 8, which extend through the plate, the opposite sides of the slot being connected by boxes 9 attached to the under surface of the plate and forming bearings upon which the ends of the shafts rest. Each rock shaft is let into its slot or recess 8 one-half its diameter, so that the axis of the shaft coincides with the plane of the upper surface of said bed plate 5. This relation of the shaft to the frame plate is an important feature and essential to the proper working of the device as will be apparent in the further description of the details.

Arranged upon the upper face of the frame plate 5, are fixed sections 10 of the pattern, which constitute the hub of the wheel, and at the same time, serve as boxes or bearings in which the said shafts turn, and also render the structure more rigid by connecting the separated portions of the plate upon opposite sides of the slots. Extending radially from some of the said hubs 10 are spokes 11, 12, 13, and 14, the spokes 14 being omitted in certain cases. The spokes 11 are fixed in or integral with the hub 10 of the pattern, and extend vertically. The spoke 12, also fixed, is more properly a half spoke, or section, formed by splitting a spoke lengthwise on a plane coinciding with the axis of the wheel, and as the spokes are symmetrically arranged the said section will have its under face in a plane with the upper surface of the foundation or frame plate 5. The spokes 13 are removably attached to the hubs by dowel pins 15 integral with said spokes and said pins are loosely fitted in suitable sockets 13^a in the hubs. These pins 15 are arranged at an angle with the body of the corresponding spokes in order to allow the latter to be arranged at an angle with the plane of the bed plate as

shown in Fig. 2. The spoke 14 is movable with the shaft and is attached thereto by having its inner end let into the shaft as shown at 16 (Fig. 3). This spoke is also a section, or half spoke formed in the same manner as the spoke 12. This sectional spoke 14 carries upon the outer extremity a web segment 17 of a wheel which is concentric with the shaft axis. In the particular pattern disclosed in the drawing, the rim of the web segment is furnished with a deep groove 18, and the portions of the rim separated by said groove are finished with peripheral flanges 19.

One end of each shaft 7 projects from the bed plate and the extremity is squared or flattened as indicated at 20, to permit the shaft to be turned by a wrench or operating crank (not shown). It will be evident that when the said shaft is turned on its axis, the rim and attached spoke 14 will move therewith, and to permit this movement the plate 5 is cut away in the path of the moving members so as to offer no obstruction thereto. Thus in order to allow the necessary movement of the rim the plate is pierced by apertures 21, symmetrically arranged upon opposite sides of the shaft, and corresponding in outline to the cross sections of the rims, the ends 22 of the latter being shown in alinement with the said apertures upon the left hand side of Fig. 1. It will be noted that the sectional spoke 14 is decentered relatively to the shaft axis at its connection thereto, being attached so that the plane of the outer surface of the said spoke coincides with the axis of the shaft. This relation is clearly shown in Figs. 2 and 3. As the web segment 17 subtends an arc of 180°, in order to completely remove it from its operative position, shown upon the right hand in Figs. 1 and 2, to the inoperative position below the plate, the shaft 7 must be given one half a revolution. Inspection of Figs. 2 and 3 of the drawing will show that the end faces 22 of the segment will coincide with the upper face of the bed plate 5 in both positions of the pattern, and as the outer face 23, (Fig. 3) of the spoke 14 is in alinement with the said end faces it will be necessary to cut away the bed plate in the line of travel of the spoke, between the shaft and the aperture 21 upon both sides, leaving openings 24, 25. It will be seen by reference to Fig. 2 that the spoke 14 occupies the opening 24 when the web segment is in the inoperative position beneath the plate, but when in the operative position shown upon the right hand of said figure the said spoke will have passed upward entirely through the opening 25, in order to bring its face 23 in coincidence with the upper surface plane of the plate, and in order to permit the spoke to rise to this extent above the plate, it is necessary to cut the hub away to form a re-

cess 26 which is continuous with the opening 25.

The symmetrical arrangement of the patterns upon the bed plate permits of the application of a single gate consisting of a bar 27 occupying the middle line between the shafts, and having lateral branches 28 which register with the flanges 19. Each branch is provided with guide lugs or pins 29 which project into the path of the flanges 19 and the latter are furnished with notches 30 with which the said pins 29 engage when the patterns are in operative position.

With the segments in their inoperative positions below the bed plate, to operate the machine the shafts 7 are turned in the proper direction to carry the web segments to their operative positions above the plate 5. As the guide pins 29 project upon opposite sides of the gate 27 it will be necessary to turn the left-hand shaft clockwise, and the right hand shaft contra-clockwise to carry the rims above the plate, the movements of the shafts in these directions being indicated by arrows 31. The cope (not shown) is then applied in the usual manner over the patterns and the sand rammed precisely as in the use of ordinary patterns. The ramming being completed, the shafts are turned in a reverse direction, this movement carrying the segments 17 to their initial or in operative positions at first assumed. With the rims completely removed from the sand, the cope is then lifted from the plate. If the removable spokes 13 are used they will be lifted off with the cope, the dowel pins 15 slipping readily from their vertical sockets. The said spokes are then withdrawn from the mold and replaced in position, and the segment rims 17 carried above the plate again to receive a second cope. When this has been filled and rammed the shafts are again turned to withdraw the rims and the spokes 13, when used, carefully removed. The two copes thus formed are then assembled to form a complete mold to be poured in the usual manner.

Having thus described my invention, what I claim as new is:—

1. In a molding machine, the combination with a frame plate, of a shaft mounted thereon, a pattern section fixed on said plate concentric with the shaft axis and having removable parts, and a pattern segment attached to the shaft and adapted to be moved into and out of operative position when the said shaft is turned.

2. In a molding machine, the combination with a frame plate, of a rock shaft mounted thereon, a plurality of hub segments fixed on said plate concentric with the shaft axis, and a plurality of pattern segments attached to the shaft, and adapted to be moved into and out of operative position when the said shaft is turned.

3. In a molding machine, the combination with a frame plate, of a plurality of rock shafts mounted thereon, hub segments fixed on said plate concentric with the axes of
5 said shafts, and a plurality of pattern segments attached to said shafts and adapted to be extended into operative positions above said plate when the shafts are rocked in one direction, and retracted to inoperative posi-
10 tions below the plate by the reverse movement of the shafts.

4. In a molding machine, the combination with a frame plate, of a plurality of rock shafts mounted thereon, hub segments fixed
15 on said plates concentric with said shafts, rim segments attached to said shafts, each of said rim segments adapted to cooperate with one of the hubs to form a complete pattern, and means on the plate adapted to en-
20 gage the rims to form guides therefor.

5. In a molding machine, the combination with a frame plate, a rock shaft mounted thereon, a hub segment fixed on the plate concentric with said shaft, spokes on the
25 hub, and a rim segment attached to the shaft and adapted to be moved into engagement with said spokes when the shaft is turned in one direction and retracted below the plate when the shaft is turned in the opposite
30 direction.

6. In a molding machine, the combination with a frame plate, and a rock shaft thereon, of a hub segment fixed on the plate concentric with said shaft, spokes removably
35 attached to said hub, and a rim segment

adapted to be moved into cooperative engagement with said spokes to form a complete pattern, and also to be retracted to an inoperative position below the said plate.

7. In a molding machine, the combination 40 with a frame plate, of a shaft mounted thereon, a hub segment fixed on the plate concentric with the shaft, a rim segment adapted to be moved through openings in said plate when the shaft is turned, a gate 45 on the frame plate, and guide pins on the gate adapted to engage sockets in said rim.

8. In a molding machine, the combination with a frame plate, of a sectional pattern, one of the sections being fixed on said plate, 50 and the other section pivotally mounted and adapted to be moved through openings in the said plate into and out of engagement with the fixed section, and members removably attached to the said fixed section. 55

9. In a molding machine, the combination with a frame plate, of a pattern formed in sections, one of said sections being fixed in said plate, and the other section pivotally mounted and adapted to be moved through 60 openings in the plate into and out of cooperative relation with the fixed section, guides for the movable section, and members removably attached to the said fixed section.

In testimony whereof I affix my signature 65 in the presence of two witnesses.

MICHAEL E. WELCH.

Witnesses:

J. G. WELCH,

F. G. STAFFORD.