

No. 827,616.

PATENTED JULY 31, 1906.

P. CAMPBELL.  
PIPE MOLDING MACHINE.  
APPLICATION FILED SEPT. 18, 1906.

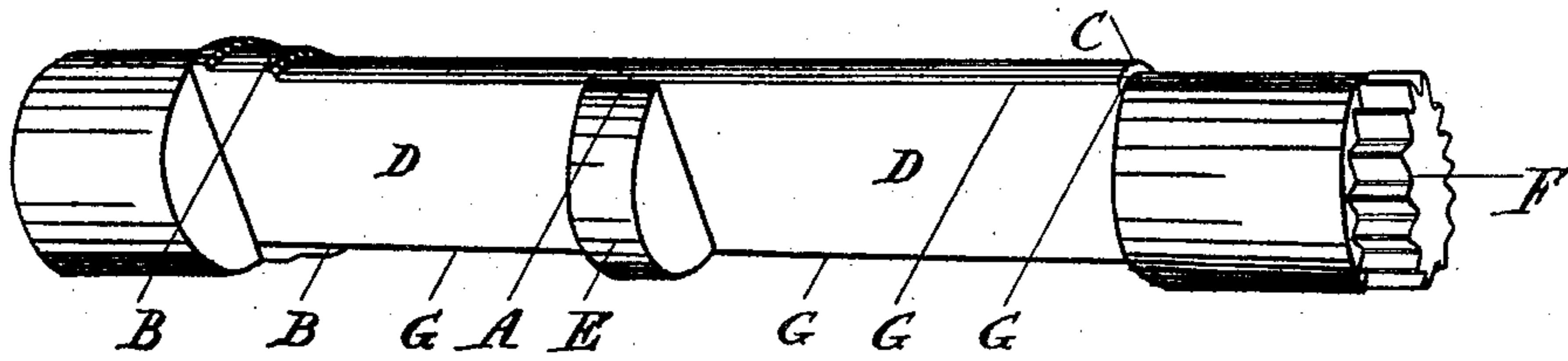


Fig. 1.

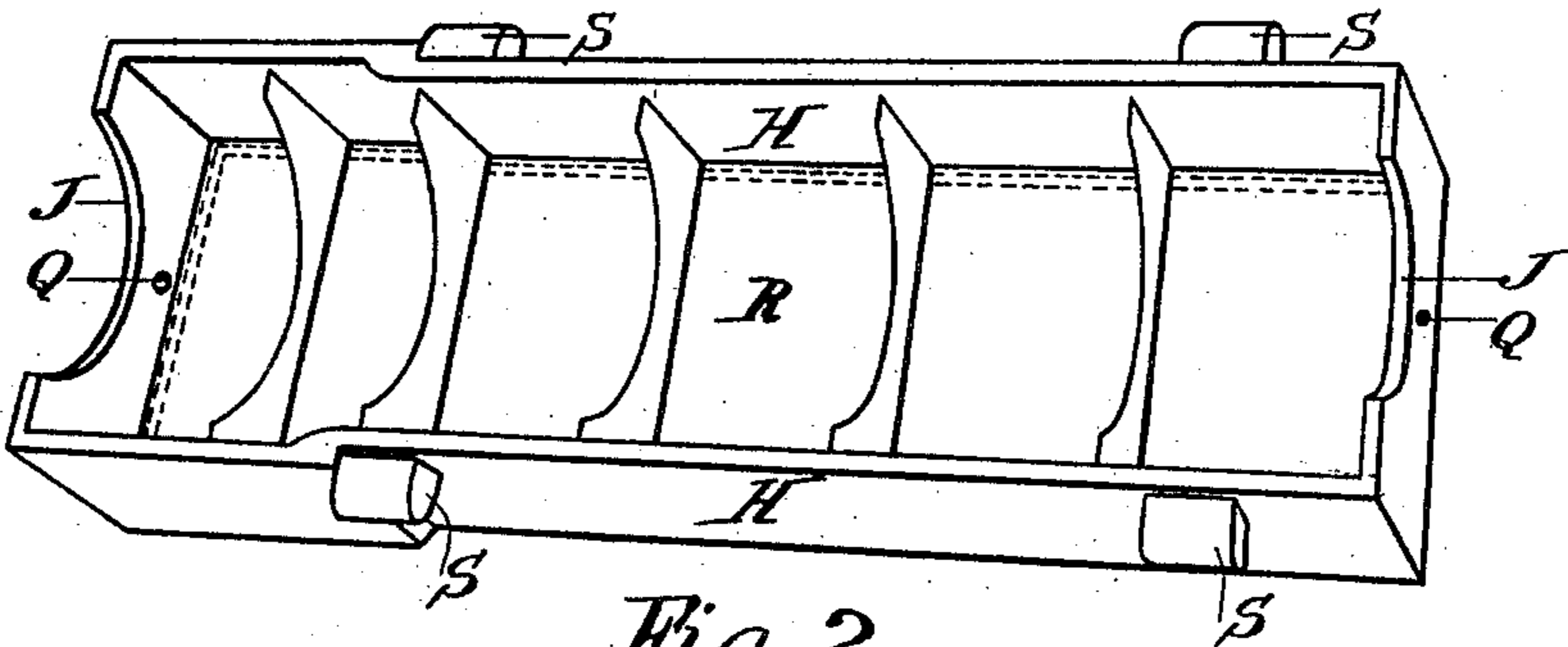


Fig. 2.

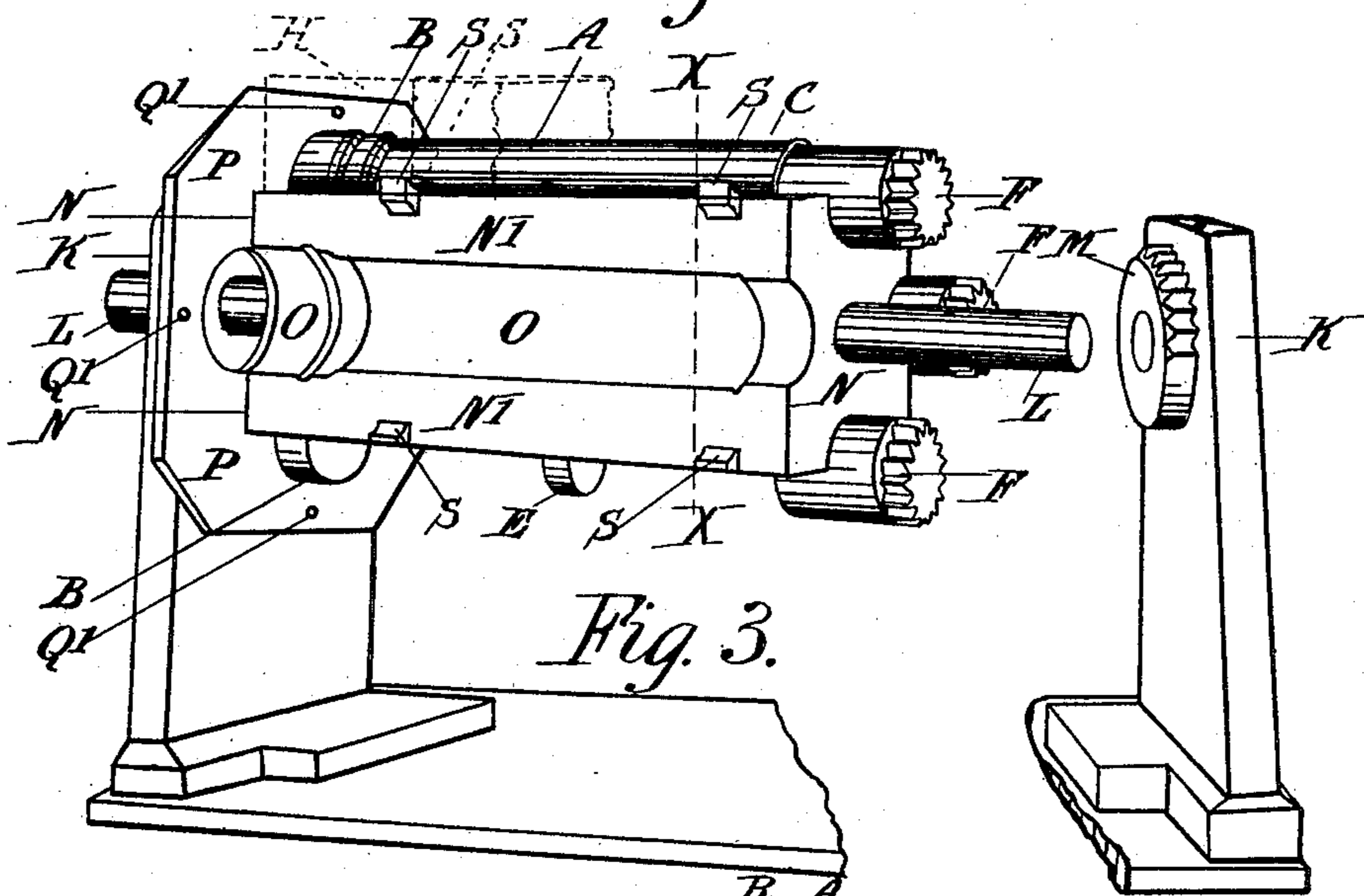


Fig. 3.

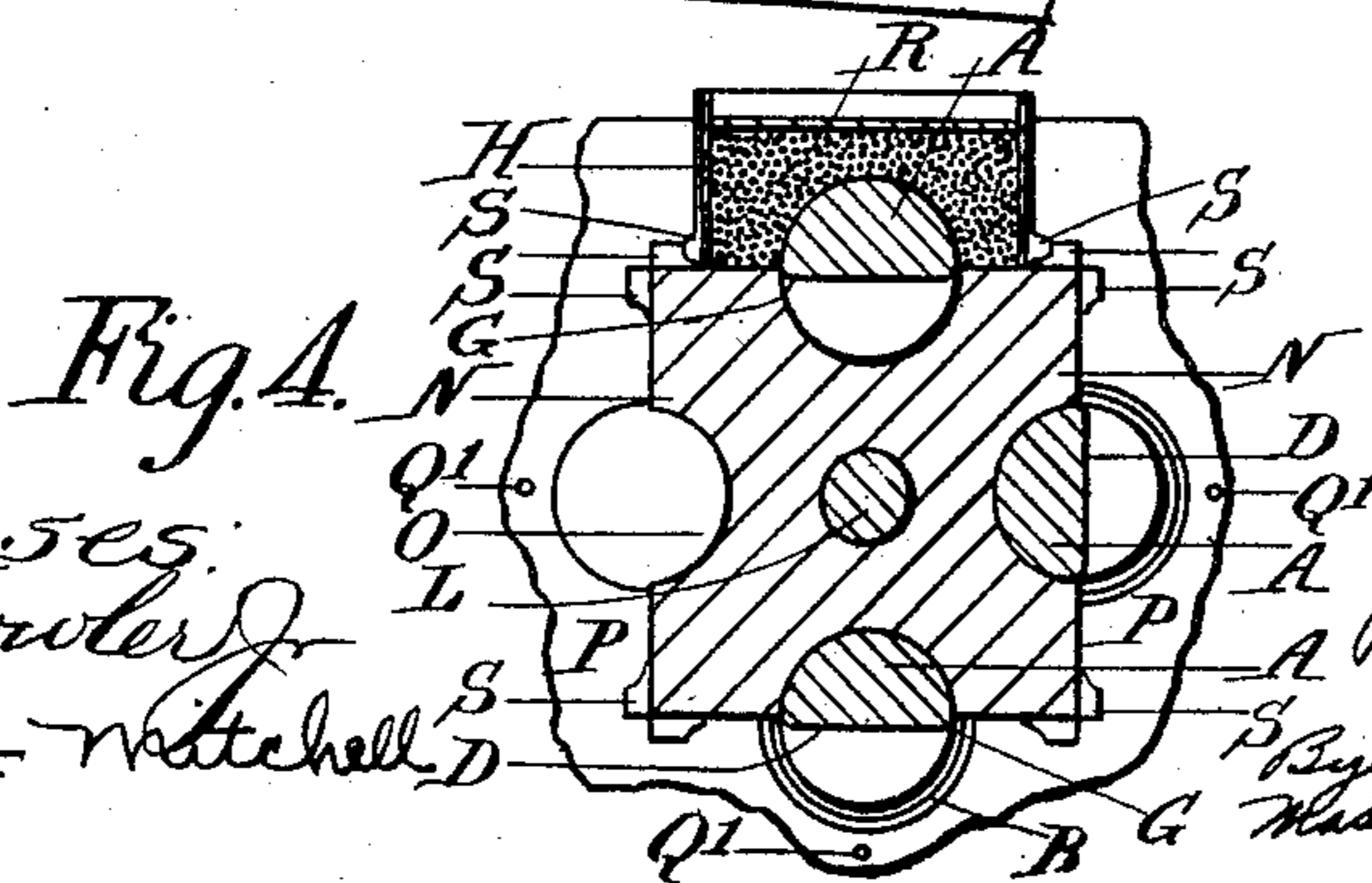


Fig. 4.

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# UNITED STATES PATENT OFFICE.

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## PIPE-MOLDING MACHINE.

No. 827,616.

Specification of Letters Patent.

Patented July 31, 1906.

Application filed September 18, 1905. Serial No. 279,057.

*To all whom it may concern:*

Be it known that I, PETER CAMPBELL, a subject of the King of Great Britain and Ireland, residing at 52 Page street, Albert Park, a suburb of the city of South Melbourne, in the county of Bourke, State of Victoria, and Commonwealth of Australia, have invented certain new and useful Improvements in Pipe-Molding Machines, of which the following is a specification.

My invention relates to a machine used for molding the sand into which the metal is run to form pipes. In hand-molding in the past it has frequently been the practice to use two half-boxes—an upper and a lower. The pattern was placed on a board or plate and the lower molding-box placed on this plate. The molding-box was then filled with sand and the sand rammed and turned over on a bed. The top portion of the molding-box was then placed in position and the sand rammed. The top portion was then lifted off and the pattern removed. Into the lower half sand was placed, and into the center of this sand was inserted the lower half of a longitudinal pattern. The sand was rammed around said pattern and the surface of the box and the sand and the pattern leveled. The upper half of the pattern was then placed over the lower half, the upper half of the box placed over it, and the whole rammed up with sand. With my invention the placing of a half-pattern within a half-box, the entrance of the sand therein, and the ramming of the said sand are performed by a machine. In this the pattern rotates in a holder which rotates and to which holder the half-box is affixed. The half-box only travels through half a circle, (more or less,) while the pattern has two motions—one around its own axis and the other around with its holder. Each half-box is treated in the same manner and then one placed on top of the other and a complete box and mold thus formed.

Referring to the drawings which form a part of this specification, Figure 1 represents on an enlarged scale a perspective view of a metallic pattern of a spigot and socket jointed pipe having a print or core-rest at each end. Fig. 2 shows in perspective and enlarged a half-molding or sand box used in my machine looking at it from the inner or meeting surface of the surface which meets

its fellow half-box. The same surface is applied to the pattern-holder. Fig. 3 depicts a perspective view of a rotating pattern-holder from which for the convenience of illustration one of the patterns and the right cheek have been removed. A portion of a box in dotted lines is shown on the upper flat. Fig. 4 shows a section through the middle of the pattern-holder, a box being on the upper flat and full of sand. The ramming-plate is "home."

Similar letters of reference indicate similar or corresponding parts where they occur in the several views.

On reference to the drawings it will be seen that A is the pattern of a pipe on one end of which is a socket-print B and on the other end a spigot-print C. Two intermediate longitudinal segments or portions D are removed from one side of the pattern, leaving in the middle a rib E. My pattern has therefore a round side and a removed side. To the spigot end C is attached a toothed pinion F. The leading and the trailing edges G of the removed portion of the pattern A are chamfered or rounded off, as at G.

The half-box or sand-holder H, in which the mold is made, has at each end semicircular bearers J to accommodate the prints. It has also lugs or catches S thereon to engage with corresponding lugs or catches on the pattern-holder, (hereinafter described.) This box fits comfortably between the cheeks hereinafter described, and through each end is a pin-hole Q to accommodate a locking-pin, also hereinafter described.

Into the top of the box is placed a ramming-plate R. This fits inside the outer portion of the box and is the whole area of same. The edges of the ribs of the flask are sunken to permit it to sink and compress the sand. The plate R is pressed or rammed inward within the section or box H by any suitable means operated by compressed air, water, or other means. The said plate may be in one piece or several.

Mounted upon bearings K, which bearings may be open-topped, is an axle L. This is turned by hand. To the inside of one of these bearings is attached a stationary half-toothed wheel M. The upper periphery of this is provided with teeth. The lower periphery is minus the same.

To the middle portion of the axle L is attached a rotating pattern-holder N. This has four flats or sides, one of which is N'. Along each flat is formed a longitudinally-  
 5 semicircular pattern-way O. This is of the exact conformation of the exterior of one-half of the pattern. From each surface of the holder protrude lugs or catches S to engage corresponding lugs or catches on each box.

10 On each end of the pattern-holder are cheeks P. In these are holes or bearings to accommodate the prints which protrude outside the cheeks. Through each cheek is a pin-hole Q' to accommodate a locking-pin,  
 15 which passes through the said cheek and into the end of the box H. The box H is thereby held to one of the flats N' or to other flats.

I do not bind myself to four sides to the pattern-holder, since under some circumstances two or three or more may be used.

The cycle of operations with my invention is as follows: On the feeding side of the machine (seen in Fig. 3) is situated a feeding or other platform upon which the boxes to be  
 25 sand-filled and rammed are placed. The meeting surface of a box such as H is pressed against the flat N', (seen in Fig. 3,) and suitable lugs S thereon engage in suitable lugs S upon the said flat. The locking-pins are  
 30 passed through the holes Q' in each end of the cheek and also through the holes Q in the box end, and the box is held to the pattern-holder. The axle L is then turned and the full side of the pattern is presented to the box. As this  
 35 axle rotates it turns the flat N' through an angle of ninety degrees, carrying with it the sand-box H. As this box moves through the ninety degrees there is liberated into the said box a predetermined quantity of sand.

40 This shakes down as the box and flat reach the upper horizontal plane. The pattern-holder then remains stationary while the ramming-plate R is placed in the box and on top of the sand. Pressure is then applied  
 45 and the ramming-plate locked in position in any well-known way. The pressure being removed, the pattern-holder is then turned through another ninety degrees and is stopped for an instant and the locking-pins are re-  
 50 moved. Before completing the turning of the last quarter of a revolution the pattern has also rotated one-half a revolution on its own axis by reason of the pinion F on its end and the stationary toothed wheel M. In doing  
 55 this the rounded edge G of the pattern smooths the surface of the mold and places upon it an even face. The removed side of the pattern is then presented to the mold, and the pattern is therefore free from the said  
 60 mold. The box is then removed and transferred to another box. A core is inserted in the bottom box, and the top box being placed in position and the runners and risers having been made the complete mold is ready for the  
 65 metal.

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

1. In a molding-machine the combination with a support, of a pattern carried by said  
 70 support, said pattern comprising a body provided with a print or a core-rest at each end, said body provided with longitudinally-cut-out portions producing flat surfaces, a rib extending from said body between said cut-out  
 75 portions, chamfered or rounded edges formed upon the side of said body which is provided with said cut-out portions, a toothed pinion secured to one of said prints, and means engaging said pinion and being capable of rotating said pattern.  
 80

2. In a molding-machine the combination with a support, of a rotatable pattern carried by said support, said pattern provided with a  
 85 central rib and with cut-out portions upon opposite sides of said rib, a pinion fixed to one end of said patterns, and means engaging said pinion and being capable of rotating said pattern.

3. In a molding-machine the combination with a support, of a rotatable pattern carried  
 90 by said support, said pattern comprising a body portion provided with rounded ends and with a rib formed intermediate said ends, said body provided with cut-out portions upon opposite sides of said rib, and means engaging  
 95 said pattern and being capable of imparting rotary movement thereto.

4. In a molding-machine, the combination with a support, of a revoluble pattern-holder carried by said support, said holder provided  
 100 with longitudinal ways, a pattern positioned between and within each of said ways, means for rotating said pattern-holder, and means for partly covering each of said patterns.

5. In a molding-machine the combination  
 105 with a support, a pattern carried by said support, of a removable box carried by said support and partly surrounding said pattern, said box provided with sides and ends, a bearing formed upon each of said ends, lugs  
 110 extending from said sides, transverse ribs positioned between said sides, a removable plate positioned between said sides and ends, and means for securing said plate within said sides.  
 115

6 In a molding-machine the combination with a support, of a revoluble pattern carried by said support, a box positioned upon said  
 120 support and partly inclosing said pattern, said box provided with a removable rammer-plate, and means for securing said plate within said box.

7. In a molding-machine the combination of a rotatable pattern-holder, a rotatable pattern carried by said holder, of a box partly  
 125 inclosing said pattern, said box comprising sides and ends, and a removable top, and means for securing said top within said box and said box upon said pattern-holder.

8. In a molding-machine the combination 130

of a revoluble pattern-holder, a revoluble pattern carried by said holder, a removable box partly inclosing said pattern, means for securing said box upon said pattern-holder, said box comprising side walls and ends, a removable plate closing a portion of said box, and means for removably securing said plate within said box.

9. In a molding-machine, the combination with a support, of a revoluble polygonal pattern-holder carried by said support, cheeks secured to the ends of said pattern-holder, a revoluble pattern engaging each of the sides of said pattern-holder, a removable box positioned upon each of the sides of said pattern-holder and partially inclosing the pattern, and means for rotating said pattern-holder and said pattern.

10. In a molding-machine the combination with a support, of a revoluble polygonal pattern-holder carried by said support, a revoluble pattern secured upon each side of said pattern-holder, and a removable box carried by each side of said holder and covering a pattern.

11. In a molding-machine, the combination with a support, of a revoluble pattern-holder carried by said support, a revoluble pattern carried by said holder, and means for imparting rotary movement to said pattern upon each complete revolution of said holder.

12. In a molding-machine the combination of a revoluble pattern-holder, revoluble patterns carried by said holder, and means for successively imparting rotary movement to each of said patterns upon each complete revolution of said holder.

13. In a molding-machine the combination with a rotatable holder, a removable box carried by said holder, a movable pattern positioned within said box and supported upon said holder, and means for moving said pattern and rotating said holder.

14. In a molding-machine, the combination with a support, of a revoluble pattern-holder carried by said support, a revoluble pattern carried by said holder, a box positioned upon said pattern-holder and partially inclosing said pattern, and means for imparting rotary movement to said pattern upon each complete revolution of said holder.

15. In a molding-machine, the combination with a support, of a revoluble pattern-holder carried by said support, a revoluble pattern carried by said holder, and a removable box

carried entirely by said holder and partially surrounding said pattern.

16. In a molding mechanism, the combination with a support, revoluble patterns carried by said support, and means for successively imparting rotary movement to said patterns.

17. In a molding-machine, the combination with a pattern-holder, of a revoluble pattern carried by said pattern-holder, a box carried entirely by said pattern-holder and partly inclosing said pattern, and means for imparting rotary movement to said pattern upon each complete revolution of said pattern-holder.

18. In a molding-machine, the combination with a support, of a revoluble pattern-holder carried by said support, said pattern-holder provided with longitudinally - extending grooves, and a pattern seated within each of said grooves.

19. In a molding mechanism, the combination with a support, of a movable, polygonal pattern-holder carried by said support, said holder provided with a longitudinal groove upon each side, a movable pattern positioned within each of said grooves and projecting beyond one end of said holder, and means adapted to engage the projecting ends of said patterns for successively imparting rotary movement to each of the same.

20. In a molding mechanism, the combination with a support, of a movable, polygonal pattern-holder carried by said support, a movable pattern positioned upon each side of said holder, a box positioned upon each side of said holder and partly inclosing the pattern carried by the same side, and means for successively imparting movement to each of said patterns.

21. In a mechanism of the class described, the combination with a polygonal holder, of a movable pattern positioned upon each side of said pattern-holder, a removable box positioned upon each side of said holder and partly inclosing the pattern carried by the same side, a rammer-plate positioned within said box, and means for successively imparting movement to said patterns.

In witness whereof I affix my signature in the presence of two subscribing witnesses.

PETER CAMPBELL.

Witnesses:

CHARLES FEAST,  
CECIL W. LE PLASTEUR.