

(No Model.)

2 Sheets—Sheet 1.

P. CLIFFORD.  
PIPE CORE.

No. 491,527.

Patented Feb. 14, 1893.

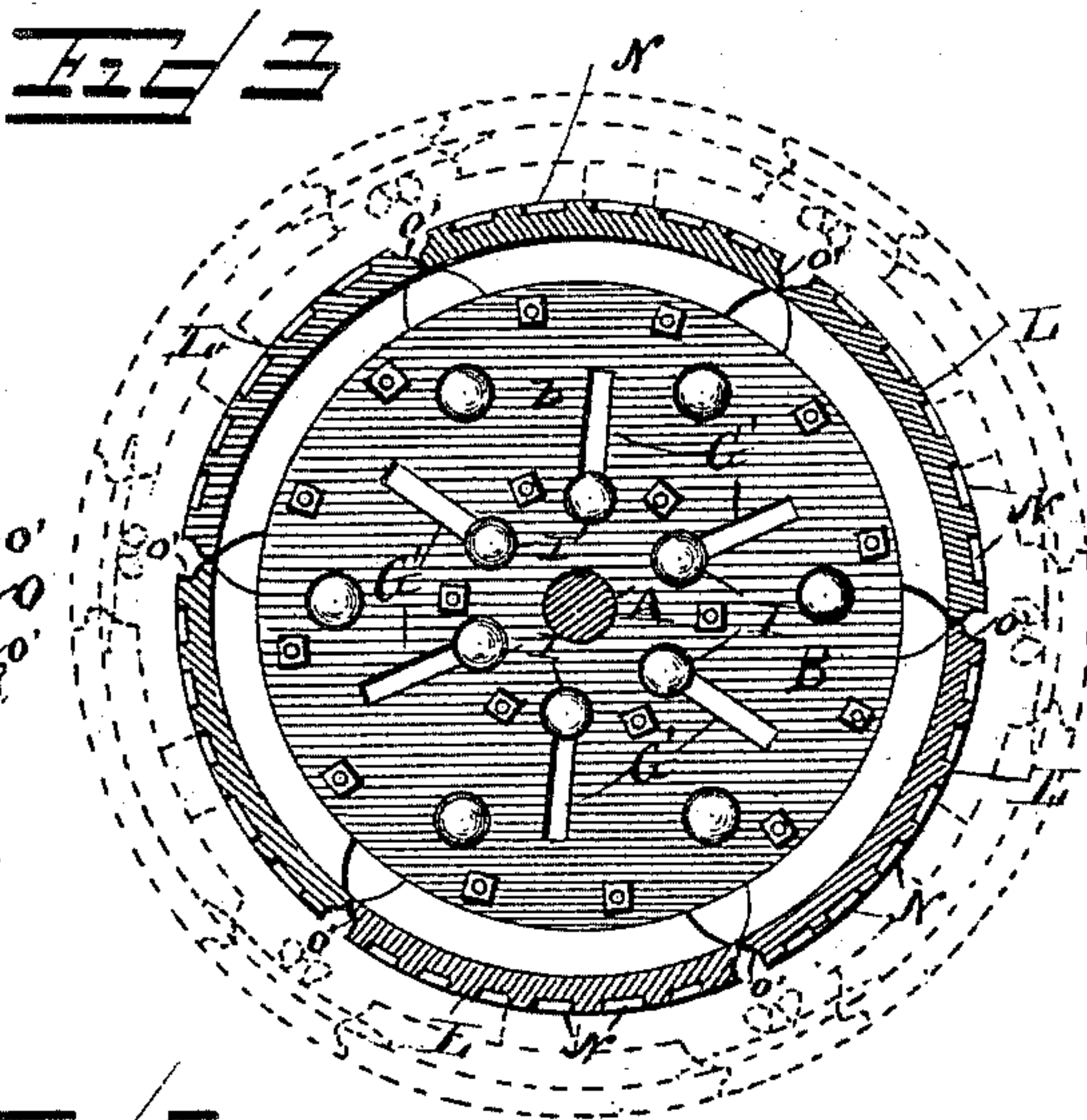
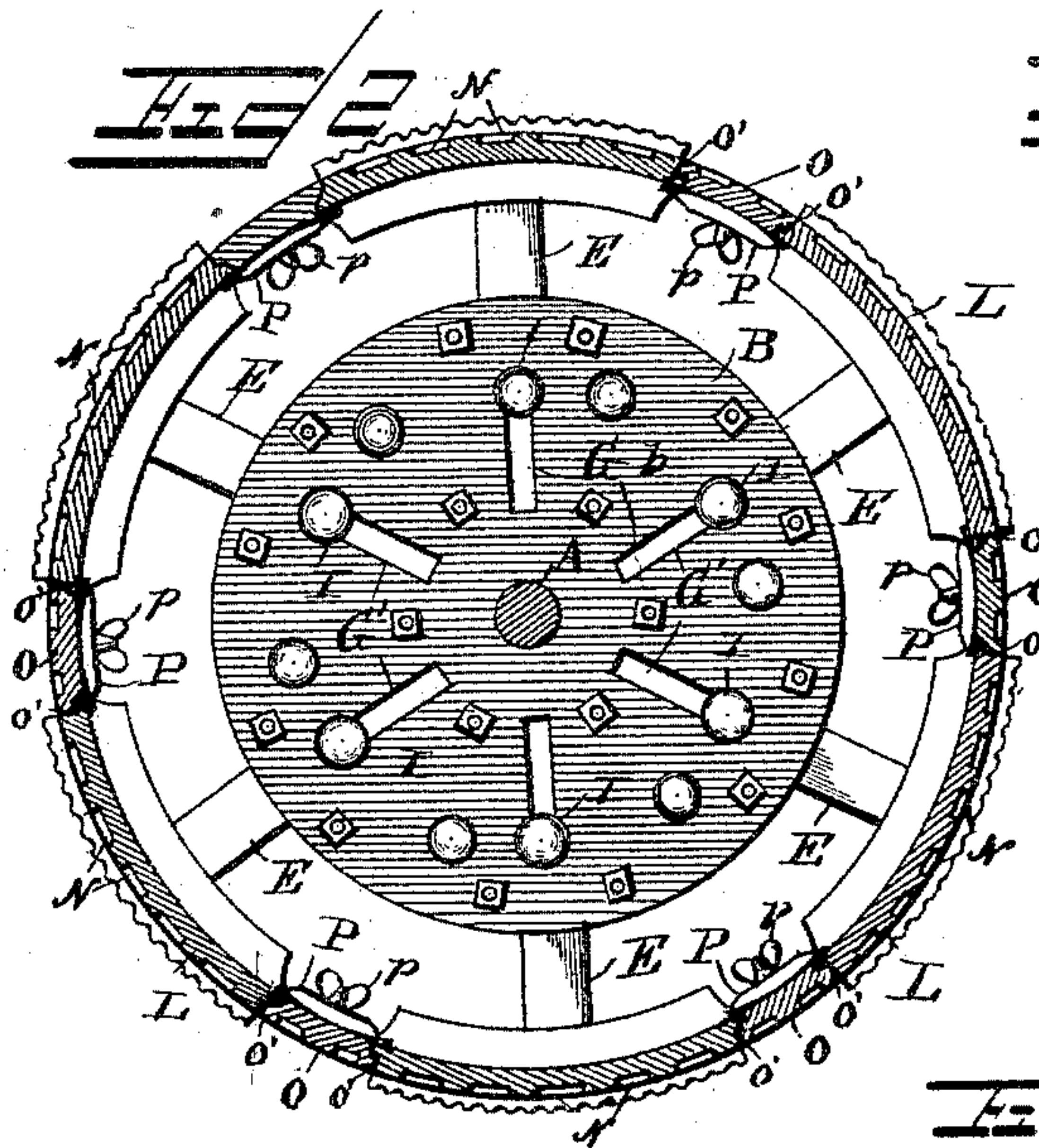
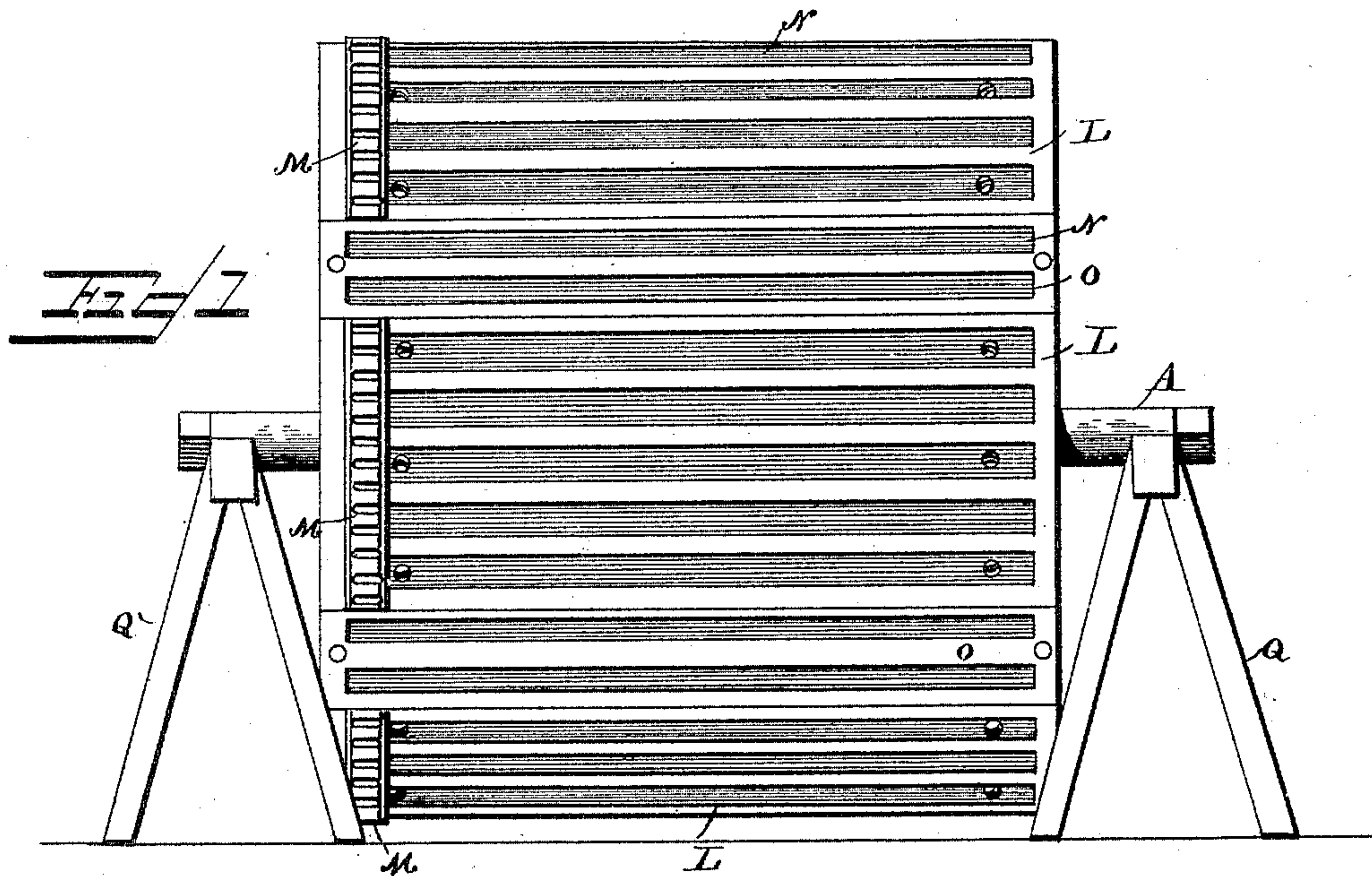
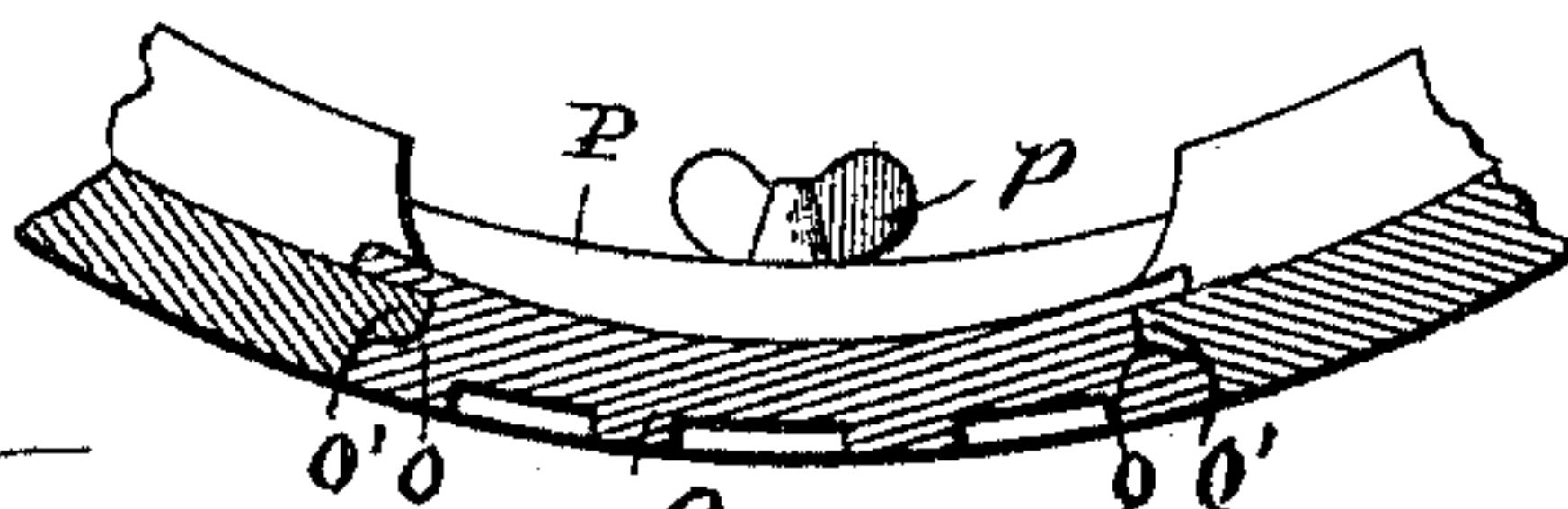


Fig. 7.



Witnesses

W. C. Schneider.  
S. P. Walkeupf.

By his Attorneys,

C. A. Snow & Co.

Inventor  
Patrick Clifford.



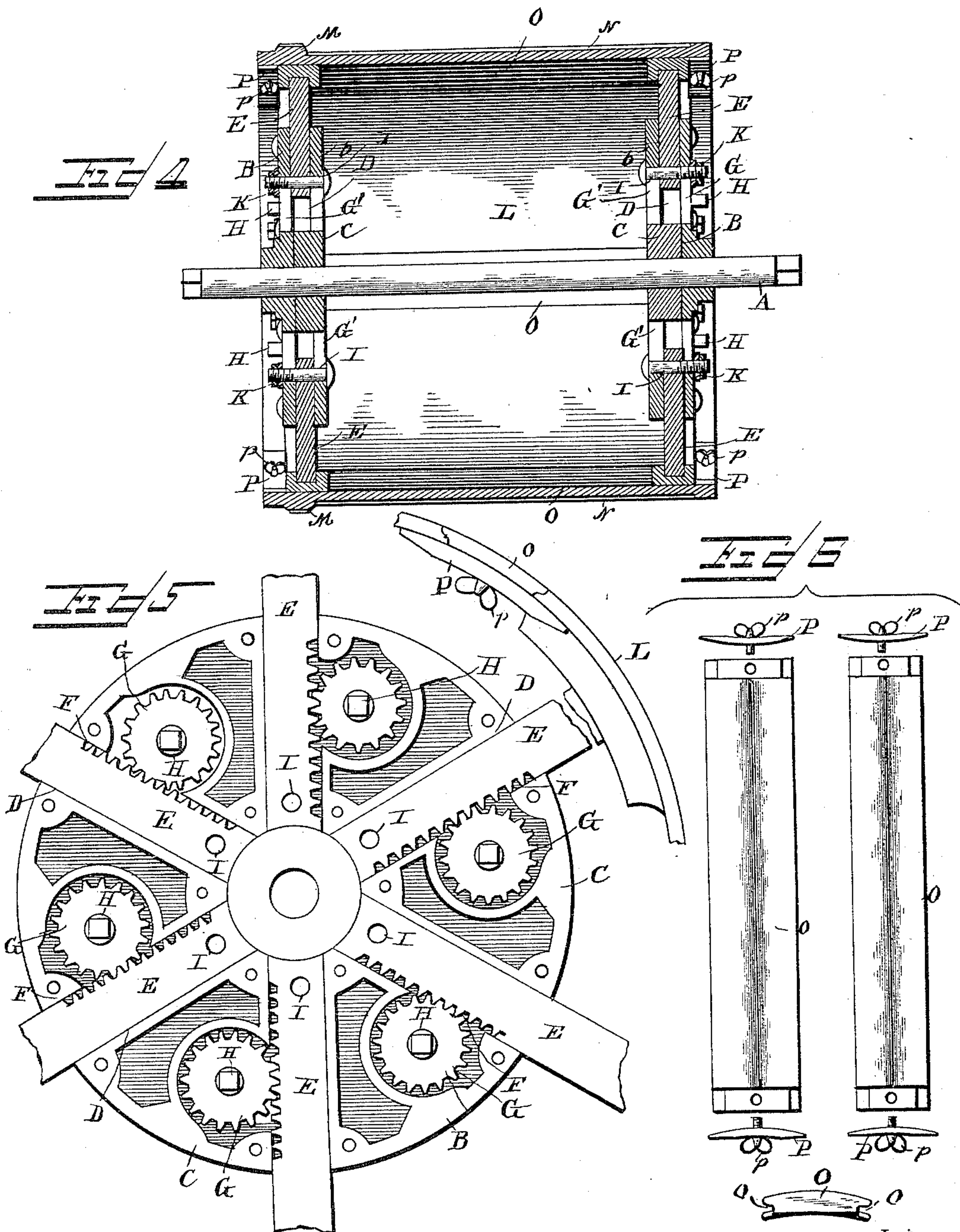
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2 Sheets—Sheet 2.

P. CLIFFORD.  
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Witnesses

W. E. Schneider.  
D. P. Walhaus.

By his Attorneys,

Cashow & Co.

Inventor  
Patrick Clifford.



# UNITED STATES PATENT OFFICE.

PATRICK CLIFFORD, OF RHINELANDER, WISCONSIN, ASSIGNOR OF ONE-HALF  
TO LOUIS FRIDET, OF SAME PLACE.

## PIPE-CORE.

SPECIFICATION forming part of Letters Patent No. 491,527, dated February 14, 1893.

Application filed August 30, 1892. Serial No. 444,515. (No model.)

*To all whom it may concern:*

Be it known that I, PATRICK CLIFFORD, a citizen of the United States, residing at Rhinelander, in the county of Oneida and State of Wisconsin, have invented a new and useful Pipe-Core, of which the following is a specification.

This invention relates to pipe cores; and it has for its object to provide an improved expandible and collapsible pipe core or core-barrel designed to be used in casting pipes of any character.

To this end the main and primary object of the invention is to provide a core barrel of this character which relieves the pipe casting while cooling, and dispenses with the use of straw-rope for that purpose, as well as the prevention of cracks or flaws in the casting. The construction of the adjustable core barrel allows the same to be adjusted to any size of pipe to be made, and also to be contracted or collapsed to a smaller diameter than the pipe cast therearound, so that it can be readily removed from the casting without disturbing the same.

With these and many other objects in view which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination and arrangement of parts hereinafter more fully described, illustrated and claimed.

In the accompanying drawings;—Figure 1 is an elevation of a core barrel constructed in accordance with this invention, in position upon the horses, for the make-up of the same. Fig. 2 is a vertical sectional view of the same expanded to a certain size of pipe. Fig. 3 is a similar view illustrating the core collapsed as it is removed from the mold. Fig. 4 is a longitudinal sectional view of the barrel. Fig. 5 is an end view of the same with the outer plate of one of the barrel heads removed. Fig. 6 is a detail side view of two sizes of the removable and interchangeable slide staves. Fig. 7 is a detail sectional view illustrating the connection of the slide staves with the staves.

Referring to the accompanying drawings;—A represents the central spindle or shaft which carries the various parts of the core-barrel. Fixedly secured to the spindle or shaft

A near each end thereof are the opposite core or barrel disk heads B, each of which comprises the opposite head plates or disks *b*, between which are clamped the spacing blocks C. The spacing blocks C are clamped between the opposite plates of each head, apart from each other, so as to leave a radial series of guide recesses D, within said heads, which accommodate the radially adjustable stave-arms E. The said stave arms E are provided upon one edge thereof with the teeth F, into which gear the small pinions G, journaled in the heads and provided with squared shanks or spindles H, projecting beyond the outer plate of the heads so as to receive a wrench or other suitable tool to turn the pinions, so that the said stave arms can be moved radially in and out of the opposite heads as desired.

It will be seen that the stave arms E are arranged in pairs, one in each head, so that by simultaneously turning the opposite corresponding pinions, the arms of each pair are thereby simultaneously and evenly controlled. Adjustment bolts I pass through perforations in the inner ends of the stave arms E within the opposite heads, and through the combined bolt and ventilating slots G', extending entirely through each head, and arranged in a radial series with respect to the spindle or shaft A. Nuts K engage the outer threaded ends of said bolts and provide means for holding the stave arms in any adjusted position.

Secured to the outer end of and carried by each pair of stave arms E are the curved or arc core staves L, which by means of the adjustments described, always are in the same circle to provide a perfect circular core. Each of the core staves L, is provided near one end thereof with the raised bead M, which bead is designed to form the socket or flanged end of the pipe, and both the beads, and the faces of the staves, themselves, are preferably provided with serrations or grooves N, which hold the mud to the core and give the same a purchase upon the staves, while at the same time thereby avoiding an unnecessary thickness of the mud, and consequently a variance in the sizes of pipe cast by the same core. When by means of the adjustments herein described, the staves L have been adjusted so as to form the proper size of pipe, to complete the con-



tinuity of the outer periphery of the barrel; then to close the spaces between the adjacent edges of the staves, I employ the removable and interchangeable slide staves O. The said  
 5 slide staves O are provided in the opposite edges thereof with the grooves *o*, which engage the rabbeted edges *o'*, of the staves. After the slides O have been slid in position to close the spaces aforementioned, the same  
 10 are locked to the staves by means of the curved locking strips P, lapping the adjacent ends of the staves and clamped to the undersides of the slides, by means of the locking thumb screws *p*, passing therethrough and  
 15 engaging the threaded perforated ends of the slides. The core-barrel is now completed for the reception of the usual mud coating. After adjusting and expanding the barrel to the proper size as described, the same is placed  
 20 upon the usual horses Q, so that it can be turned by one person, while the mud is being placed, and smoothed off, thereon, by another, preparatory to the baking of the mud on the core as is usually done in casting. The core  
 25 barrel, as thus completed, is placed in the ordinary mold and the metal poured therearound.

After the metal has set in the mold, the core barrel can be readily withdrawn without  
 30 disturbing the mold or the cast pipe by collapsing the core. In order to do this, after the core-barrel is unlocked by releasing the slide staves of their securing devices at one end, the same can be readily driven out of  
 35 the casting at one end, inasmuch as the said slides have no beading to catch in the casting. After the slides have been driven out, the staves can be collapsed and easily removed.

The many advantages, both from the stand  
 40 point of expedience and expense, will readily suggest themselves to those skilled in the art, by the use of the herein described core barrel.

It will of course be understood that the hereindescribed core barrel can be made of  
 45 any suitable metal and of any desired weight at the option of the manufacturer.

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

50 1. In a core barrel, the opposite heads, the staves radially adjustable to and from said heads, slide staves removably placed between said staves, and removable locking strips clamped to each end of the slide staves out  
 55 side of the heads, substantially as set forth.

2. In a core barrel, the opposite heads, a

series of arc staves radially adjustable to and from said heads and provided with raised beads at one end, and longitudinal grooves or serrations in their faces and said beads and  
 60 slide staves adapted to be removably slid between said staves, and having corresponding grooved faces and locking devices for said slide staves at each end thereof outside of the heads, substantially as set forth. 65

3. In a core barrel, the opposite disk heads having a radial series of guide recesses, radially adjustable toothed stave arms moving in said guide recesses, operating pinions mounted in said heads and engaging the teeth of  
 70 said arms, and the staves secured to the outer ends of said stave-arms, substantially as set forth.

4. In a core-barrel, the combination of the opposite heads having a radial series of slots, 75 and a radial series of guide recesses, the toothed stave arms moving in said guide recesses, the operating pinions journaled in said heads and engaging the teeth of said stave arms, the adjustment bolts moving in said  
 80 slots and engaging the inner ends of said stave arms, and the staves secured to the outer ends of the stave arms, substantially as set forth.

5. In a core barrel, the combination with 85 the central spindle or shaft; of the opposite heads, a series of separate arc staves radially adjustable to and from said heads and provided with rabbeted edges, means arranged on the heads for adjusting the staves, and  
 90 grooved slide staves removably locked between the adjacent staves and engaging the rabbeted edges thereof, substantially as set forth.

6. In a core barrel, the combination with 95 the opposite heads and the radially adjustable stave arms moving therein; of a series of arc staves secured to the outer ends of said stave arms and provided with rabbeted edges, grooved slide staves removably placed be- 100  
 tween the adjacent staves and engaging the rabbeted edges thereof, and a locking device connected with each end of said slide staves, substantially as set forth.

In testimony that I claim the foregoing as 105 my own I have hereto affixed my signature in the presence of two witnesses.

PATRICK CLIFFORD.

Witnesses:

JOHN H. SIGGERS,  
 E. G. SIGGERS.