

R. OLIVER,

Patterns for Curved-Tooth Gear-Wheels.

No. 133,384.

Patented Nov. 26, 1872.

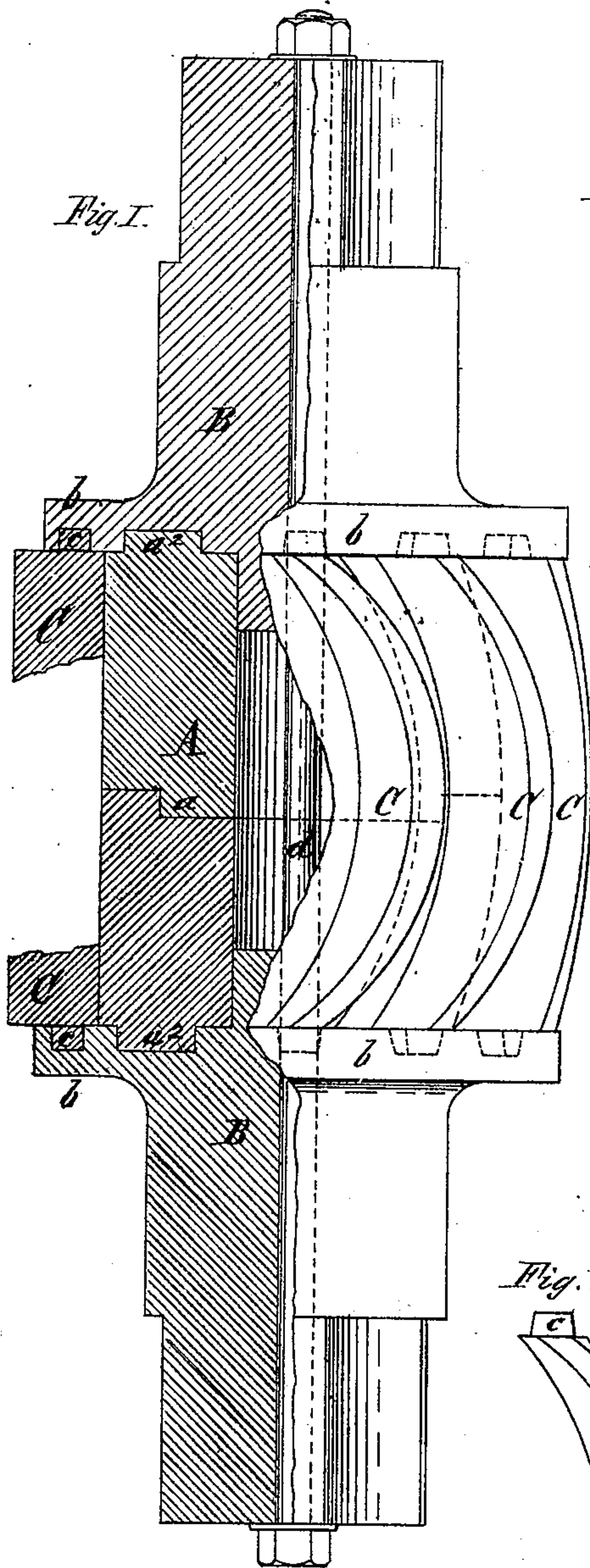


Fig. II.

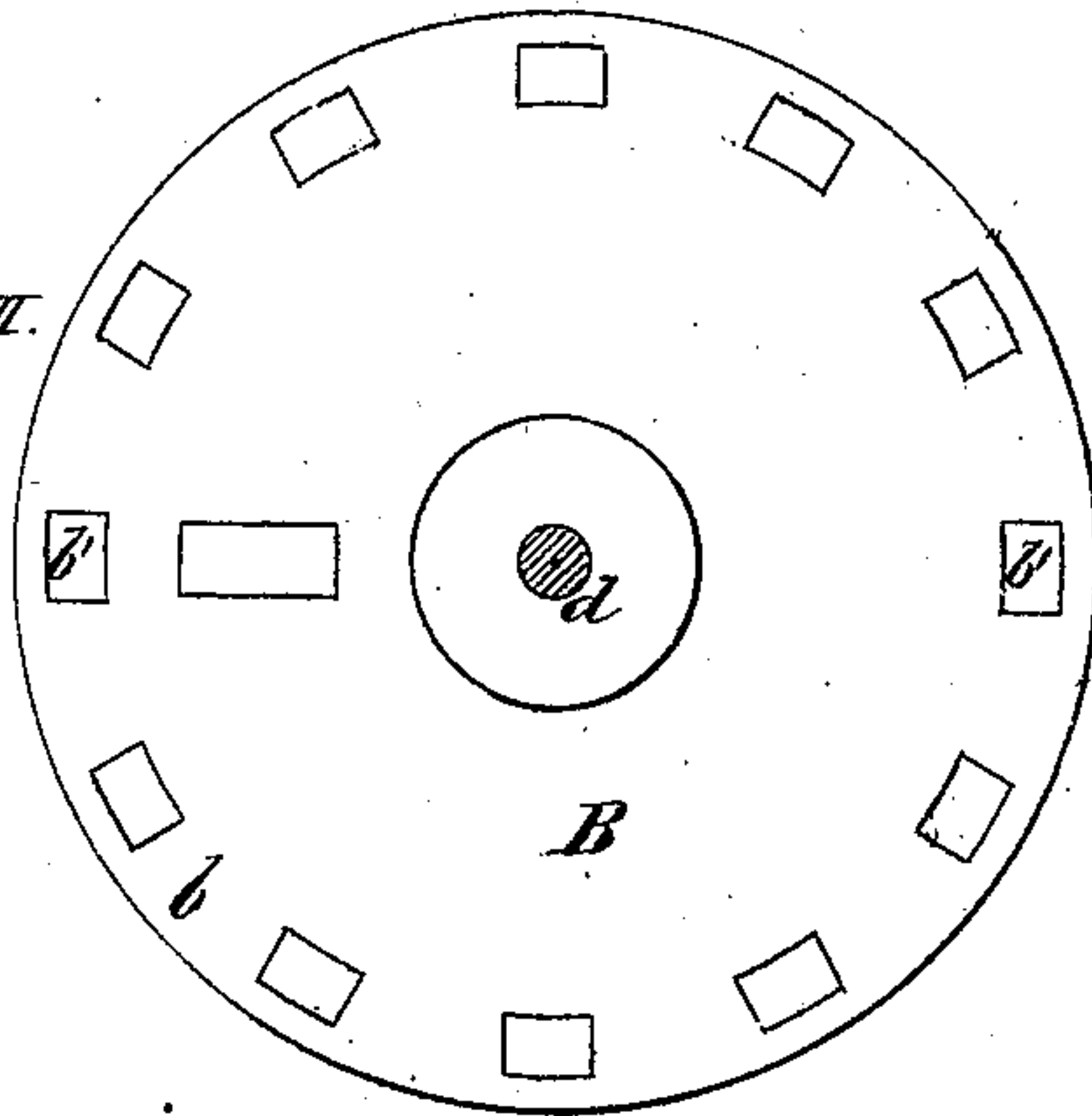


Fig. III.

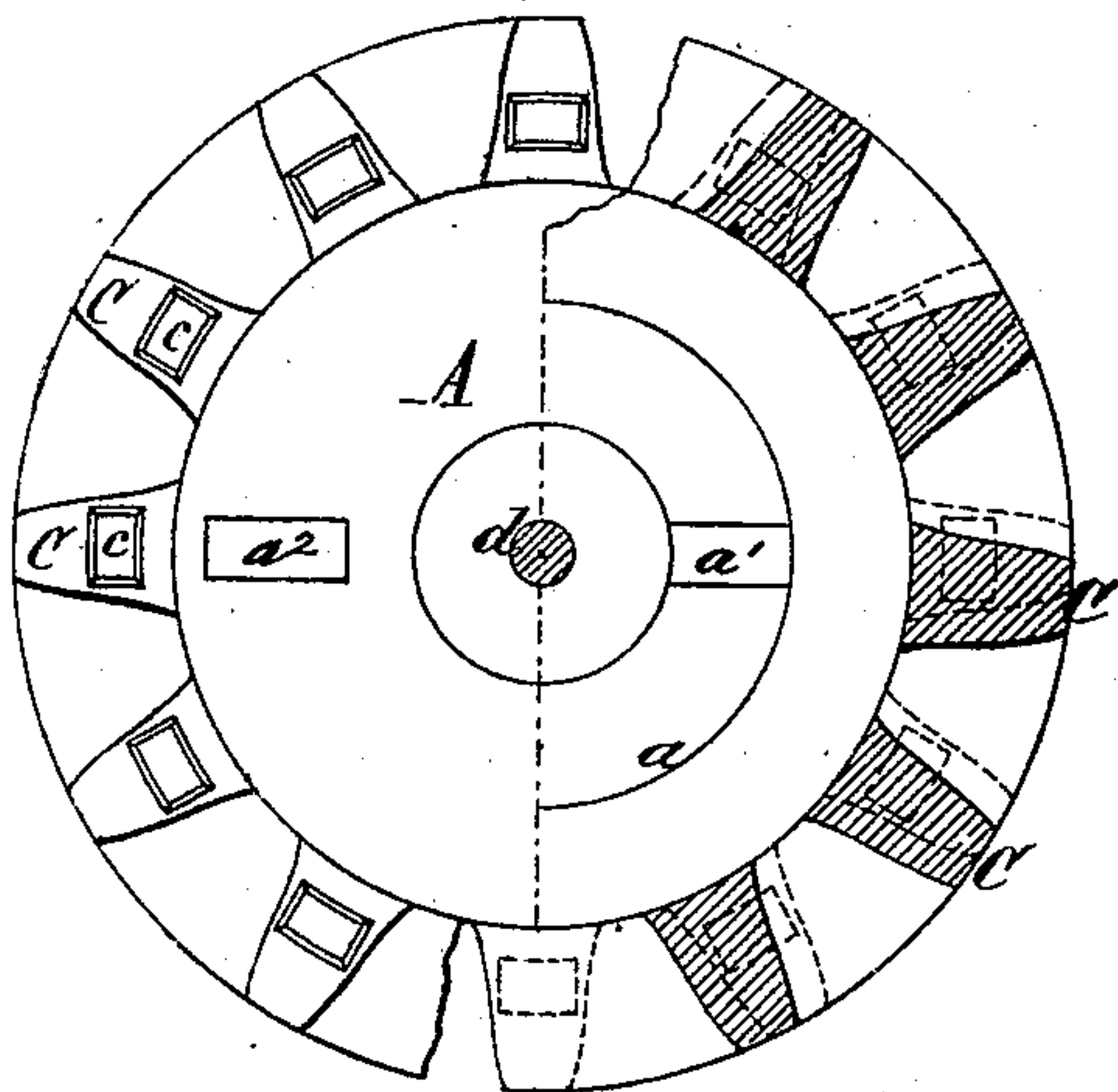


Fig. V.

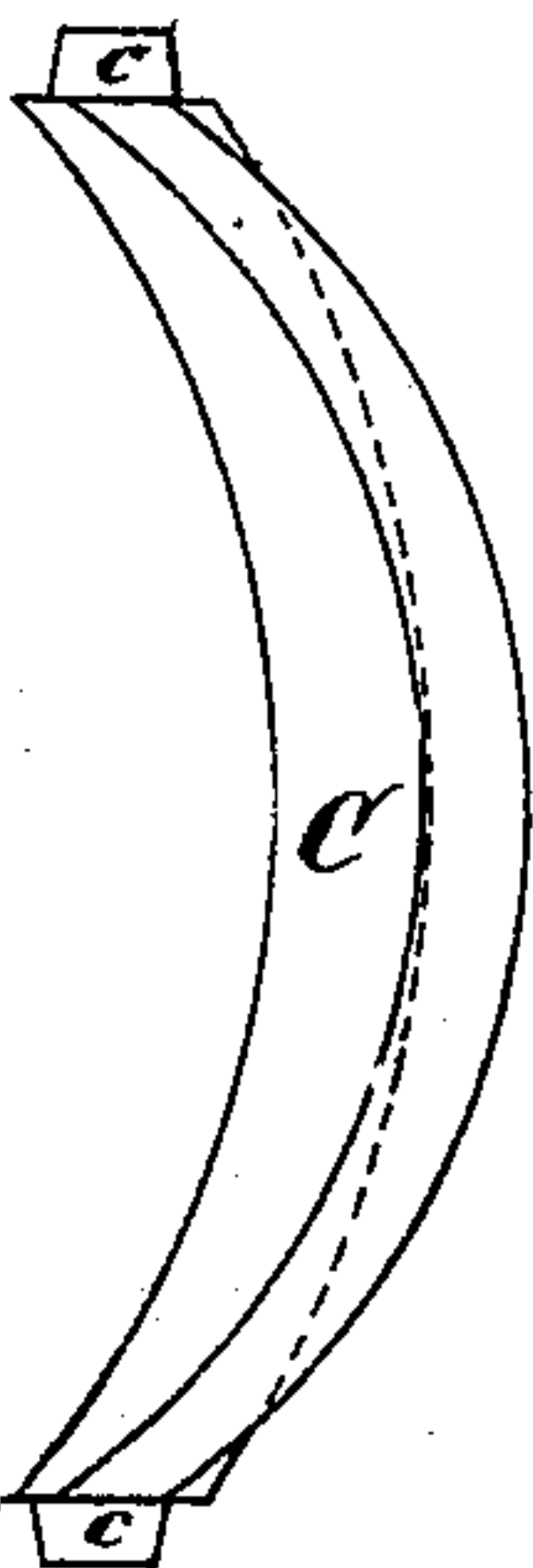
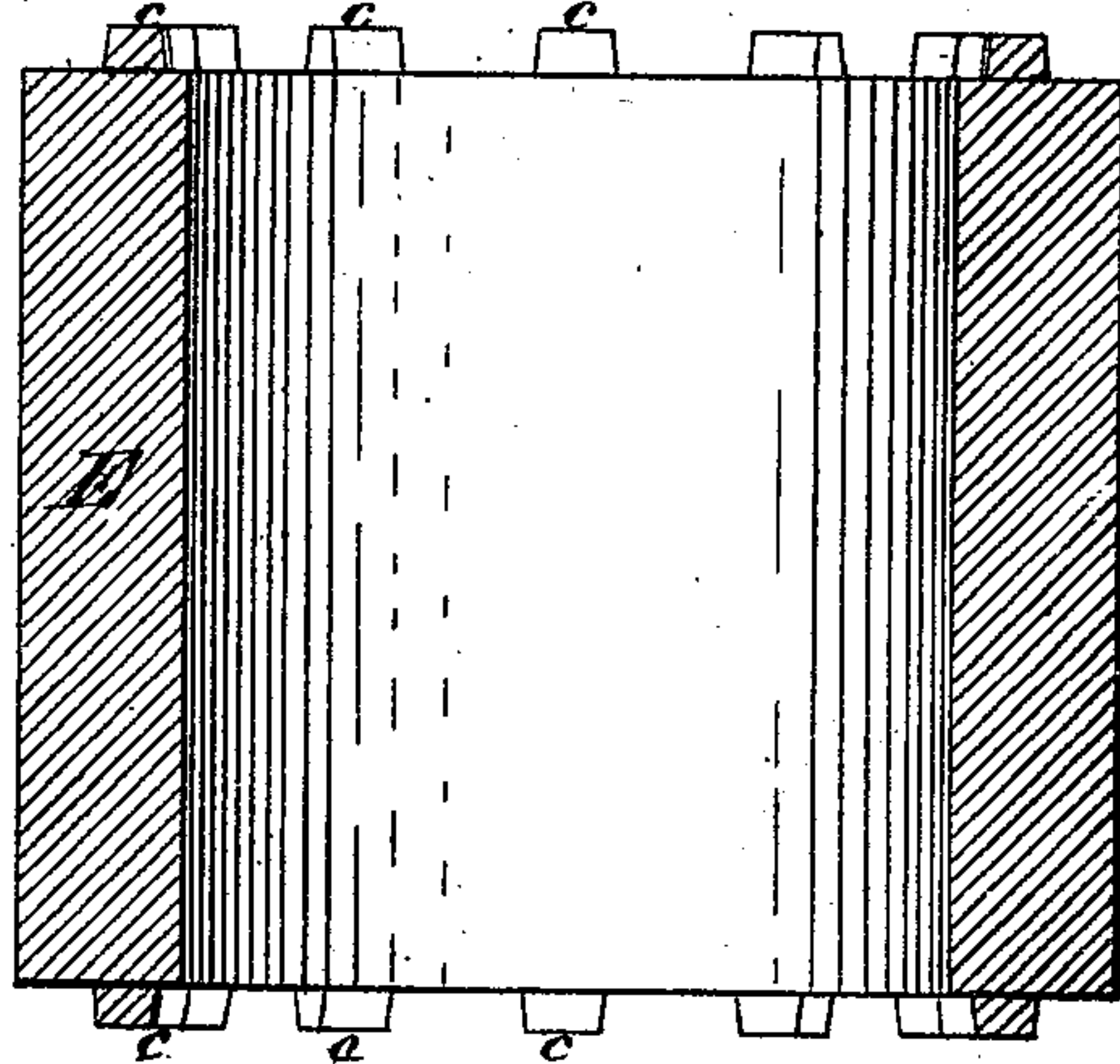


Fig. IV.



Edward Wilhelm
Jno. J. Bonnet

Witnesses

Robert Oliver
by Jay Hyatt

Inventor.

Atty.

UNITED STATES PATENT OFFICE.

ROBERT OLIVER, OF BUFFALO, NEW YORK, ASSIGNOR TO PRATT & CO., OF
SAME PLACE.

IMPROVEMENT IN PATTERNS FOR CURVED-TOOTH GEAR-WHEELS.

Specification forming part of Letters Patent No. 133,384, dated November 26, 1872.

To all whom it may concern:

Be it known that I, ROBERT OLIVER, of the city of Buffalo, in the county of Erie and State of New York, have invented certain Improvements in Patterns for Gear-Wheels, of which the following is a specification:

This invention relates to the construction of a pattern for casting a peculiar kind of gear-wheels, provided with curved teeth, for which Letters Patent of the United States, No. 80,291, were granted to John Letzkus, July 28, 1868, to which reference is here made for a full description of said wheel.

Heretofore the patterns for these wheels have been constructed with fixed cogs or teeth, and divided in the middle by a cut at right angles to the axis, so that when the wheel is molded each part can be withdrawn from the sand by a screwing movement designed to correspond with the curvature of the teeth. This latter operation generally distorts and enlarges the mold more or less, whereby imperfect castings are produced, which require a great deal of labor in adjusting the same.

The object of my invention is to remedy these defects; and it consists, first, of a pattern for a curved-toothed wheel composed of a central cylindrical body, two removable heads representing the hubs of the wheel, and the curved teeth, made separate and secured in place between the two heads, so that in molding the wheel the heads can be removed and the cylindrical body withdrawn without disturbing the teeth, which are left embedded in the sand, and afterward separately withdrawn into the open central space previously occupied by the body of the pattern and out of the flask without impairing the shape of the molded sand; second, in the process of forming the patterns for the detachable curved teeth by first turning a hollow cylinder so as to fit the cylindrical body of the pattern, and then dividing the said hollow cylinder into sections corresponding with the required number of teeth, whereby an accurate fit of the teeth to the cylindrical body is insured; third, in the process of forming the detachable curved teeth with tenons for securing them in the proper positions between the two heads by first forming in the heads the required

number of sockets or mortises, and then fitting therein blocks designed to form the tenons, and applying glue to the ends thereof, and arranging the hollow cylinder from which the teeth are to be formed on the body of the pattern, and clamping it between the two heads, whereby the said blocks or tenons are glued in their proper positions to the ends of the hollow cylinder, which is afterward divided and formed into teeth, as above described.

In the accompanying drawing, Figure I is a partly sectional elevation of my improved pattern. Fig. II is a plan view of one of the heads. Fig. III is a top-plan view with a portion of the cylindrical body and detachable teeth in central horizontal section. Fig. IV is a sectional elevation of the cylinder from which the teeth are formed, provided with the tenons. Fig. 5 is an elevation of one of the detachable teeth.

Like letters designate like parts in each of the figures.

A represents the central body of the pattern, of cylindrical form. For large wheels it is preferably constructed in two parts, joined together by an offset, *a*, and a tenon, *a*¹, fitting in a corresponding mortise in the other part, and slightly reduced in size in the middle, so that each part can be readily drawn from the sand. B B represent the two removable heads forming the hubs and rims of the wheel. They are arranged in contact with the ends of the body A, and provided with flanges *b* projecting over the latter. The body A is provided with tenons *a*², fitting in corresponding mortises in the heads B to prevent turning of the same. The flanges *b* are provided on their inner side with sockets or mortises *b*¹ corresponding with the required position of the teeth. C represents the detachable curved cogs or teeth arranged on the surface of the core A between the flanges of the heads B. They are provided at each end with a tenon, *c*, fitting in the mortises *b*¹ of the heads B, whereby they are secured at the proper distances apart. *d* is a screw-bolt, passing axially through the pattern, for holding the parts together.

As the teeth are curved in their longitudinal direction it is extremely difficult to obtain

the equidistant arrangement and a close fit of the same upon the cylindrical surface of the body A. To overcome this difficulty I construct the teeth in the following manner: The inner side of the flanges *b* of the heads B are first provided with the mortises *b'* corresponding with the position of the teeth. In these mortises are placed blocks of wood designed to form the tenons *c*, and glue applied to the ends thereof. A hollow cylinder, E, fitting snugly on the body A between the heads B B, and corresponding in thickness with the height of the teeth, is then placed on the body A and clamped between the heads B, whereby the tenons *c* are glued to the ends of the cylinder E. The latter is then removed and the teeth laid out between each opposite pair of tenons, and formed by cutting away the material between them. In this manner a close fit of the inner surface of the teeth upon the core A, and of their tenons in the mortises of the heads B, is readily obtained.

The operation of molding my improved pattern is as follows: The flask is made in three parts, the end parts receiving the heads B B, while the middle part receives the body and teeth of the wheel. When the wheel is molded the screw-bolt *d* is withdrawn from the pattern, and the heads B and body A removed,

leaving the teeth C embedded in the sand. By taking hold of the tenons at the ends each tooth is readily drawn into the open central space in the mold previously occupied by the core A, and removed from the flask without the least danger of distorting or damaging the mold.

What I claim as my invention is—

1. The pattern for a curved-toothed wheel, composed of the cylindrical body A, heads B, and detachable teeth C, substantially as and for the purpose hereinbefore set forth.

2. The process of forming the detachable curved teeth C from a hollow cylinder, E, turned to fit the cylindrical body A, whereby the required close and accurate fit of the same upon the cylindrical body is insured, substantially as hereinbefore set forth.

3. The process of constructing the detachable curved teeth C with tenons by inserting blocks in the mortises *b'* and gluing them to the ends of the cylinder E, and afterward dividing the latter and forming the teeth, substantially as hereinbefore set forth.

ROBERT OLIVER.

Witnesses:

EDWARD WILHELM,
JNO. J. BONNER.