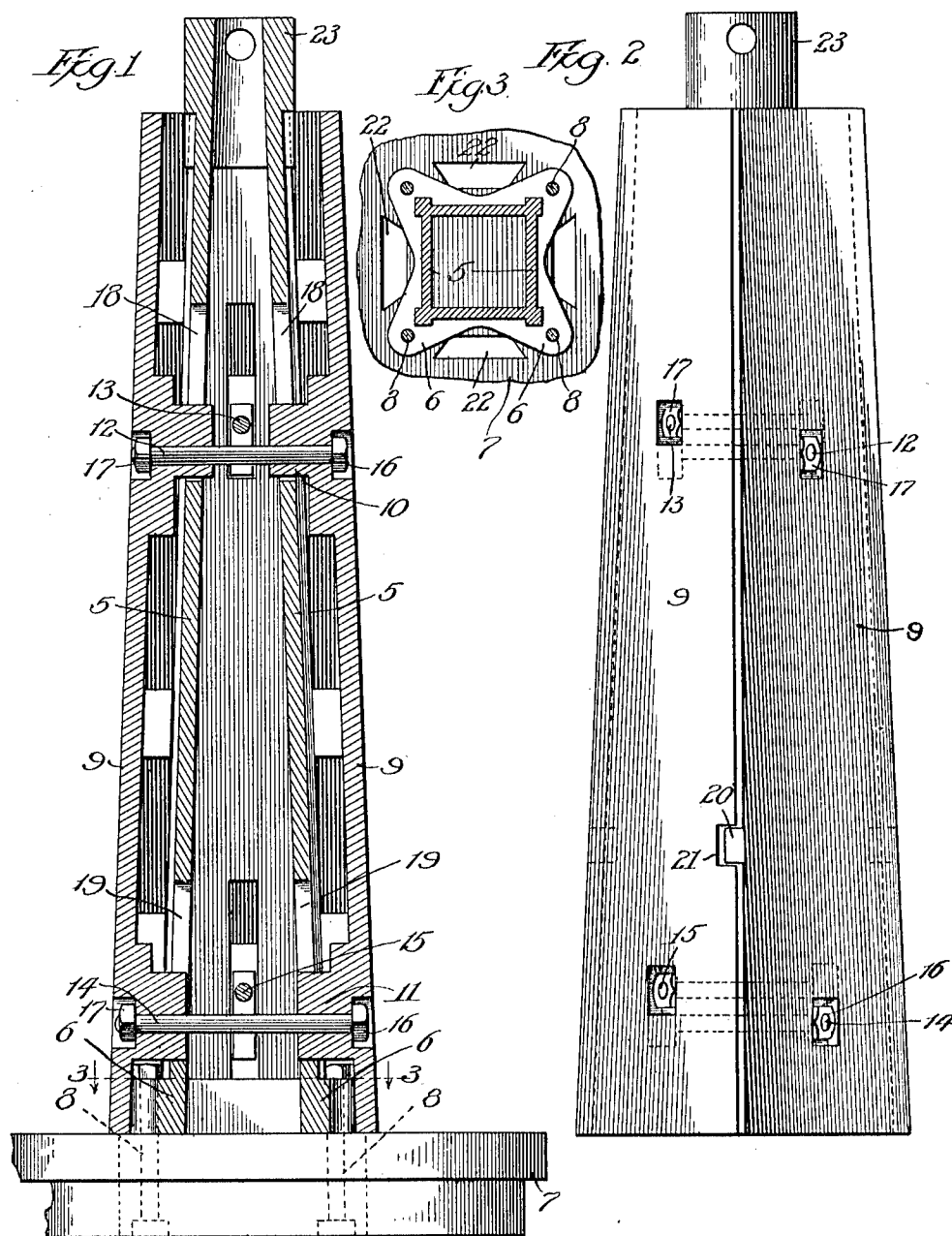


P. M. REILLY.
CORE BARREL.
APPLICATION FILED JUNE 9, 1910.

1,001,553.

Patented Aug. 22, 1911.



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UNITED STATES PATENT OFFICE.

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CORE-BARREL.

1,001,553.

Specification of Letters Patent.

Patented Aug. 22, 1911.

Application filed June 9, 1910. Serial No. 566,119.

To all whom it may concern:

Be it known that I, PATRICK M. REILLY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, whose post-office address is care of the Illinois Steel Company, South Chicago, Illinois, have invented new and useful Improvements in Core-Barrels, of which the following is a specification.

My invention relates to core barrels, and has particular reference to core barrels which are used in connection with the manufacture of ingot molds.

In order to render my invention intelligible, I will give a brief description of the operations in connection with which my improved core barrel is employed.

In the manufacture of ingot molds, the first operation is to inclose a core barrel within a core box and to ram molding sand in the space between these two parts. The core box is then removed and the core barrel, to which the sand adheres, is then baked in a core oven in the well known manner. The pattern, which corresponds to the outside of the mold to be made, is placed within a flask and sand is rammed between the pattern and the flask. This flask is then removed from the pattern and after the core, with its inclosed core barrel, has been suitably baked, the flask is placed outside of the same. A cap is put in position on the upper end of the core, thus preparing the mold for the casting of the ingot mold. The casting is preferably conducted through a gate so that the ingot mold is cast by the so-called "bottom pour" method.

After the ingot mold has cooled sufficiently to become solidified, the inclosing flask is raised by means of a crane, which is provided with a bearing member which exerts pressure on the tapered inner member within the core barrel. As the flask is raised, the staves, forming the outer portion of the core barrel, are raised a short distance with the flask and on account of the taper of the inner member, these staves become loosened from the inside of the ingot mold and drop down on to the drag forming the bottom of the mold.

The above description applies to the operation of casting ingot molds, as heretofore conducted. Several objections present themselves in the practical application of

this method. In the first place the staves are not fastened to each other or to the inner member, so that after the flask with its contained ingot mold has been removed, the staves are very apt to fall outwardly, with the result that a workman will possibly be injured, or at any rate making it necessary to raise the staves in order to restore them to their proper position on the inner member. Again, there is no method of causing the staves to move in unison with each other, which results in causing an unequal action of the apparatus. A still further disadvantage consists in the fact that sand is very apt to get inside of the staves between the same and the tapered inner member, thereby interfering with the operation of the core barrel. It is true that inclosing bands are sometimes used to retain the staves in position, but it has been found by experience that these bands are very apt to become displaced, causing the staves to fall outwardly, as explained above.

In my improved core barrel all of the above objections are overcome. Opposite staves are connected with each other by means of bolts, which allow the staves to move inwardly as the same are raised, whereas the nuts on these bolts prevent outward movement of the staves beyond a predetermined position. At the corners where adjacent staves abut against each other, an interlocking device is provided which causes the staves to be raised simultaneously and effectually prevents independent action of the various individual staves. In order to prevent the accumulation of sand between the staves and the tapered inner member, I provide holes in the drag, through which the sand readily escapes, thus preventing interference with the operation of the core barrel. These and other advantages of my invention will be more readily understood by reference to the accompanying drawings, which show a preferred embodiment of my invention, in which,—

Figure 1 is a vertical section and partly elevation view through my improved core barrel, showing the drag in position; Fig. 2 is a side elevation of the staves and end of the tapered inner member, showing the interlocking device between adjacent staves, which are in their distended position; and Fig. 3 is a reduced, fragmentary plan and

partly section view, taken on the line 3—3 of Fig. 1, showing the method of attaching the tapered inner member to the drag, the staves being omitted from this view.

5 The inner tapered member 5 is provided with ears 6, and is attached to the drag 7 by means of the bolts 8. This inner member is rectangular in shape and has an upward taper, as clearly shown in Fig. 1. Outside
10 of each side of the member 5 is a stave 9, each stave being provided with an upper boss 10 and a lower boss 11. A bolt 12 passes through the bosses 10 on opposite staves and a second bolt 13 passes through
15 bosses 11 on the staves which are disposed at a right angle to the staves through which the bolt 12 passes. Similarly bolts 14 and 15 pass through bosses 11 on opposite staves. Each of the bolts 12, 13, 14 and 15 has a
20 head 16 and on its opposite end a nut 17, having threaded engagement with the end of the bolt. In this way it will be apparent that opposite staves may be moved inwardly but cannot be moved outwardly beyond a
25 position which is defined by the head 16 and the nut 17. The bosses 10 and 11 on each stave project into slots 18 and 19 in the upper and lower portions respectively of the member 5. As clearly shown in Fig.
30 1 these slots are adapted to allow movement of the staves 9 with respect to the member 5, this movement being limited by the length of slots 18 and 19.

As best shown in Fig. 2, each of the
35 staves 9 is provided with a projection 20 on its edge which fits within the corresponding recess 21 in the edge of the next adjacent stave, in this way causing the staves to be moved simultaneously and as a unit.
40 In order to prevent sand from staying between the staves 9 and the member 5, I provide holes or openings 22 in the drag 7, and the sand readily passes outwardly through these holes.

45 The operation of my improved core barrel may now be readily understood. After the flask is in position and the ingot mold has been cast, downward pressure is exerted on the head 23 of the tapered member 5, and
50 at the same time the flask is moved upwardly. This causes the staves 9 to move upwardly with the flask until the bosses 10 and 11 reach the upper ends of the slots 18 and 19 respectively. This upward move-
55 ment of the staves causes them to move inwardly on account of the taper of the member 5 and the staves are thereby freed from the inside of the ingot mold. When this occurs, the retaining action of the inside of
60 the ingot mold, of course, ceases and the staves drop downwardly by the action of gravity into the positions shown in Fig. 1. The sand on the outside of the staves has meanwhile become broken by the movement
65 of the staves and a large part of it drops

off and the rest may be easily and expeditiously removed.

It will be clear to those skilled in the art that many changes can be made in the detailed construction of the parts I have described without departing from the spirit
70 of my invention.

What I claim is:

1. In a core barrel, the combination of a central tapered member, staves outside of
75 and movable with respect to said central member, means for securing together opposite staves, and means for connecting adjacent staves, thereby causing said staves to be moved in unison, substantially as de-
80 scribed.

2. In a core barrel, the combination of a central tapered member, a plurality of staves outside of said central member and
85 movable with respect thereto, means for limiting the movement of said staves with respect to said central member, and interlocking means connecting adjacent staves, thereby causing the movement of said staves to be
90 in unison, substantially as described.

3. In a core barrel, the combination with a drag, of a tapered member attached there-
to, a plurality of staves outside of said tapered member and movable with respect
95 thereto, each stave having an inwardly projecting boss adapted to operate within a corresponding groove in said tapered member, said grooves thereby limiting the movement of said staves with respect to said tapered
100 member, and means for interlocking adjacent staves, substantially as described.

4. In a core barrel, the combination with a central tapered member, of a plurality of staves outside of said central member, each
105 stave having an inwardly projecting boss adapted to operate within a corresponding slot in said central member, and means for connecting oppositely disposed staves, thereby allowing inward movement of said
110 staves when the latter are moved with respect to said central member but preventing outward movement of the staves beyond a predetermined position, substantially as described.

5. In a core barrel, the combination with
115 a central tapered member, of a plurality of staves movable with respect to said central member, and a drag attached to said central member, said drag being provided with sand openings, thereby conducting the sand
120 from between the central member and the staves, substantially as described.

6. In a core barrel, the combination of an inner tapered member, and a plurality of staves outside of said central member, ad-
125 jacent staves being provided on their edges with interlocking means, substantially as described.

7. In a core barrel, the combination of a central tapered member having slots therein,
130

a plurality of staves having inwardly projecting bosses adapted to operate within said slots, and bolts passing through oppositely disposed bosses, thereby allowing inward
5 movement of said staves when the latter are moved with respect to said inner member but preventing outward movement of the staves beyond a predetermined position, substantially as described.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
