C. F. MURRAY & P. M. REILLY.

CONTRACTIBLE INGOT CORE.

APPLICATION FILED JULY 20, 1910.

990,286. Patented Apr. 25, 1911.

Fig. 1.

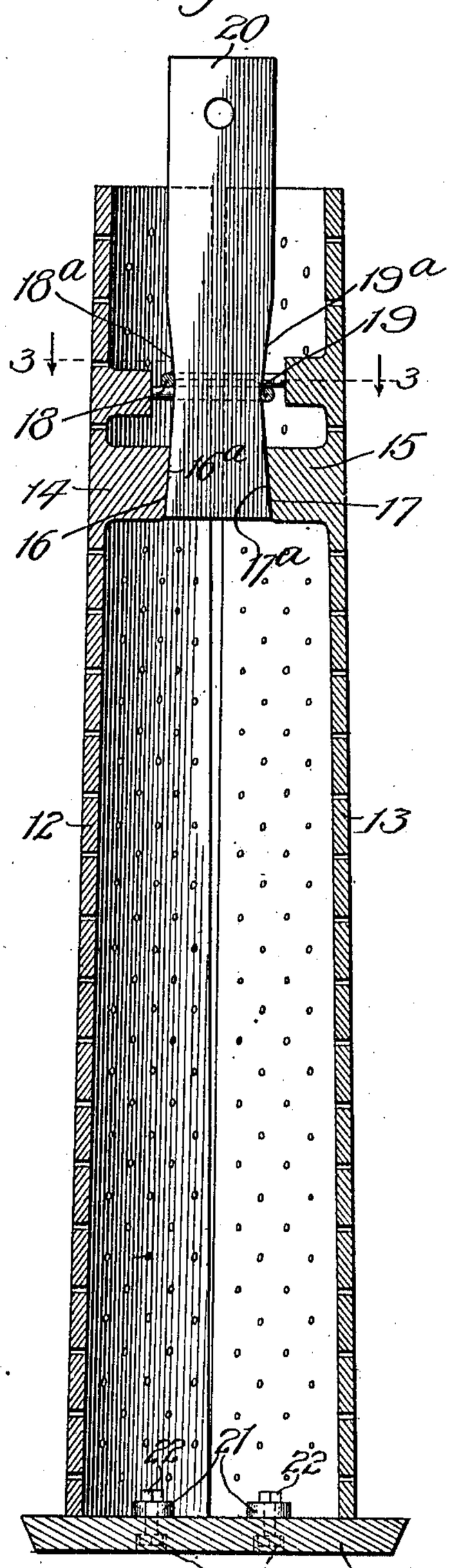


Fig. 2.

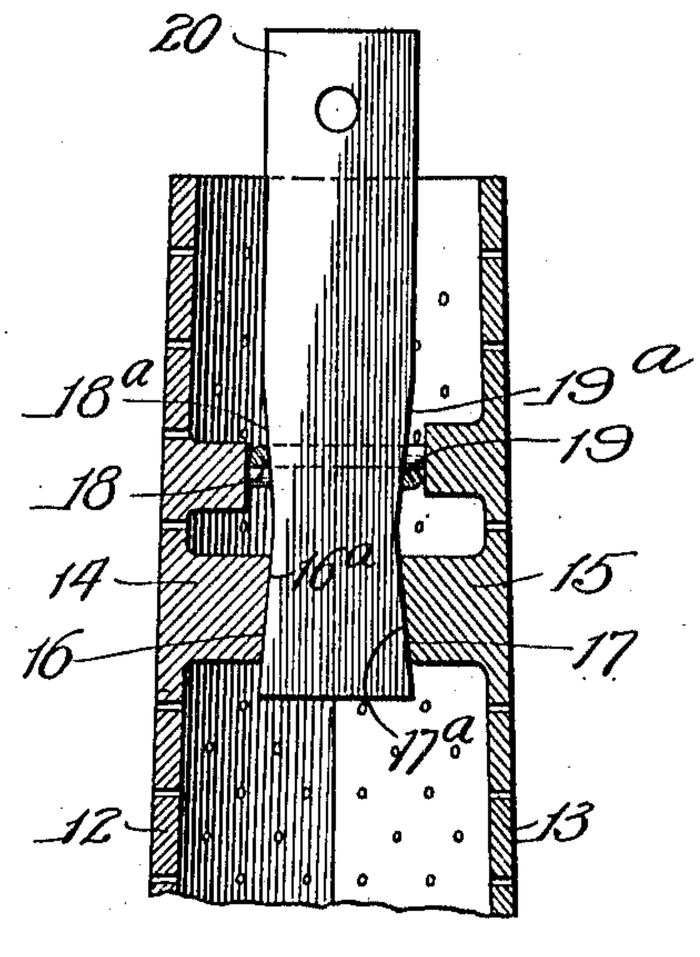
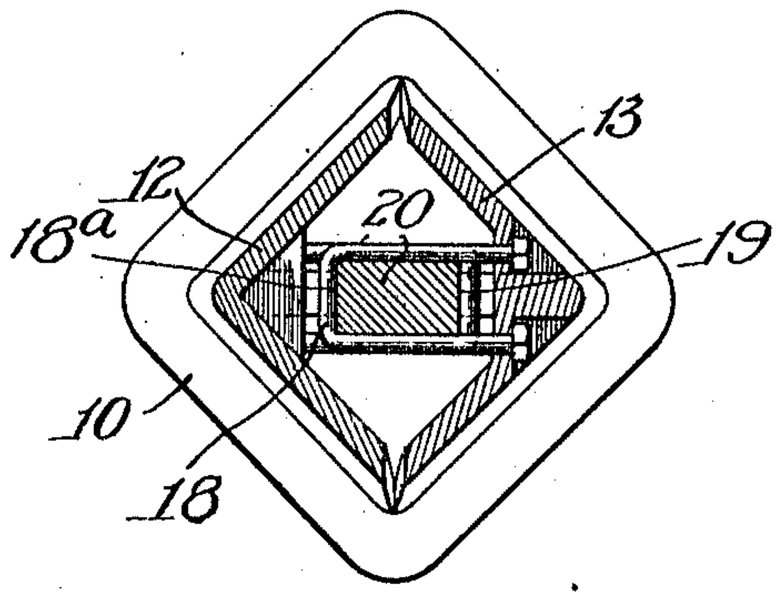


Fig. 3.



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UNITED STATES PATENT OFFICE.

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CONTRACTIBLE INGOT-CORE.

990,286. Specification of Letters Patent. Patented Apr. 25, 1911.

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To all whom it may concern:

Be it known that we, CHARLES F. MURRAY, of Evanston, in the county of Cook, State of Illinois, and PATRICK M. REILLY, of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Contractible Ingot-Cores, of which the following is a specification.

Our invention relates to cores or core barrels of the kind and character of that described in the co-pending application of Charles F. Murray entitled "Contractible core barrels", Serial Number 573,145, and which has particular reference to a device of this character which shall be provided with means for forcibly contracting the two sections of the core, such means including also the means for preventing the separation of the two sections at their upper ends.

As will be readily understood by those skilled in the art, the production of steel ingots is accomplished by casting the fluid metal in molds. The molds in which this metal is cast are also formed of cast metal and are very heavy. These molds are usually about six feet in height and of varying rectangular cross section. The practice in the production of these ingot molds is to employ a core of the proper dimensions, coating this core with sand, then drying the same until the sand coating is rigid and hard, then surrounding the said core with a properly equipped flask, then pouring the molten metal around the core in the opening between the flask and the said core. When the fluid metal has set, the core is removed, and it is to this step of removing the core from the casting that our invention relates. As will be understood, the metal in cooling contracts and binds itself tightly upon the core, and in order to free the same from the casting, it has been found necessary to employ a great deal of force by the use of dolly bars, electric extractors and other means, all of which require considerable labor and consumption of power. We have therefore devised a core or core barrel composed of sections which are adapted to be wedged apart as the core is lifted and which sections are forcibly contracted when the core is to be removed from the casting.

Referring to the drawings, Figure 1 is a sectional elevation of our device showing the sections separated or expanded; Fig. 2 is a fragmentary side elevation showing the sections contracted, and Fig. 3 is an irregular section on the line 3—3 of Fig. 1.

Referring more particularly to the drawings, it will be seen that our core is composed of a base member, 10, having countersunk bolt openings, 11, therethrough. The core proper is composed of two sections, 12, 13, slightly tapered vertically and provided on their interior near the top thereof with lugs, 14, 15, having inclined surfaces, 16, 17, thereon. U-bolts, 18, 19 are mounted in the sections, 12, 13, as best shown in Fig. 3, their heads being counter-sunk and provided with the usual nuts. These U-bolts lie in parallel reversed relation and embrace a stem, 20, adapted for vertical movement within the core. This stem is provided with the inclined surfaces, 16^a, 17^a, 18^a, 19^a, which inclined surfaces co-act with the surfaces, 16, 17, and the bolts, 18, 19, respectively. The two sections, 12, 13, are rigidly bolted to the base, 10, through the lugs, 21, by means of the bolts, 22, the resiliency of the metal and the irregularity of the united parts being sufficient to allow for the slight expansion and contraction necessary to free the core from the surrounding body of cast metal.

The device is assembled by joining the two sections, 12, 13, with the U-bolts, 18, 19, loosely mounted therein. The stem, 20, is then placed therein and the U-bolts tightened to the desired extent, the sections then being united to the base by means of the bolts, 22.

In operation, the device, as shown in Fig. 2, is lifted by the stem, 20, this lifting action tending to wedge the two sections, 12, 13, away from each other. By the coöperation of the inclined surfaces, 16, 17, 16^a, 17^a, the core is then placed where a coating of sand may be placed on its exterior, a flask is placed thereover and the metal poured around the core. When the metal has set sufficiently, the stem, 20, is driven down by the use of a sledge or other means, and through the coöperation of the U-bolts, 18, 19, and the inclined surfaces, 18^a, 19^a, on the stem, 20, the two sections are forcibly contracted, thus freeing the core from the surrounding body of cast metal. The flask containing the casting is then lifted therefrom and the operation above described repeated as often as desired.

We have shown our device as applied to open top molds, although it may as well be

applied to closed top molds, in which case an opening would be formed through the stem, 12, to permit the escape of the gases.

It will be noted that the device disclosed herein is composed of an exceedingly small number of parts, none of which require machining or expensive labor in assembling; that there are no loose parts and that the different working parts may be manufactured of heavy material and thus eliminate the tendency to breakage.

The device shown in the drawings is composed of but two sections or halves, but it will be readily understood that it may as well be formed of a larger number of sections and still come within the scope of our invention. Undoubtedly these and various other modifications will readily suggest themselves to those skilled in the art and we therefore do not limit ourselves to the precise construction herein shown and described.

We claim:

1. A collapsible core having means to expand the same, means to contract the core, and an operating device for the expanding and contracting means, a portion of one of said means coöperating with the operating device to limit the operation of the other means, substantially as described.

2. A collapsible core having means to expand the same, means to contract the core, and an operating device for the expanding and contracting means, a portion of the contracting means coöperating with the operating device to limit the operation of the expanding means, substantially as described.

3. A contractible and expansible ingot mold core comprising, in combination, a plurality of sections, a central stem, means on the stem to coöperate with the sections to cause expansion thereof, and U-shaped bolts coöperating with said sections and said stem adapted to cause the forcible contraction of said sections and also to limit the expansion thereof, substantially as described.

4. A contractible and expansible core barrel, comprising in combination, a plurality of sections having inclined wedge surfaces upon their interiors, a stem mounted within said sections and having oppositely disposed wedge surfaces thereon, U-bolts mounted within said sections, the wedge surfaces on the interior of said sections together with one set of wedge surfaces on said stem being adapted to forcibly expand said sections, and the U-bolts, together with the oppositely disposed wedge surfaces on said stem, being adapted to cause the forcible contraction of said sections, substantially as described.

5. A contractible and expansible core barrel, comprising in combination, a plurality of sections rigidly secured to a base and having inclined wedge surfaces upon their interiors, a stem mounted within said sections and having oppositely disposed wedge surfaces thereon, U-bolts mounted within said sections, the wedge surfaces on the interior of said sections together with one set of wedge surfaces on said stem, being adapted to forcibly expand said sections, and the U-bolts, together with the oppositely disposed wedge surfaces on said stem being adapted to cause the forcible contraction of said sections, substantially as described.

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