No. 662,266. Patented Nov. 20, 1900.

C. F. HAGLIN.

MOLD.

(Application filed Nov. 20, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

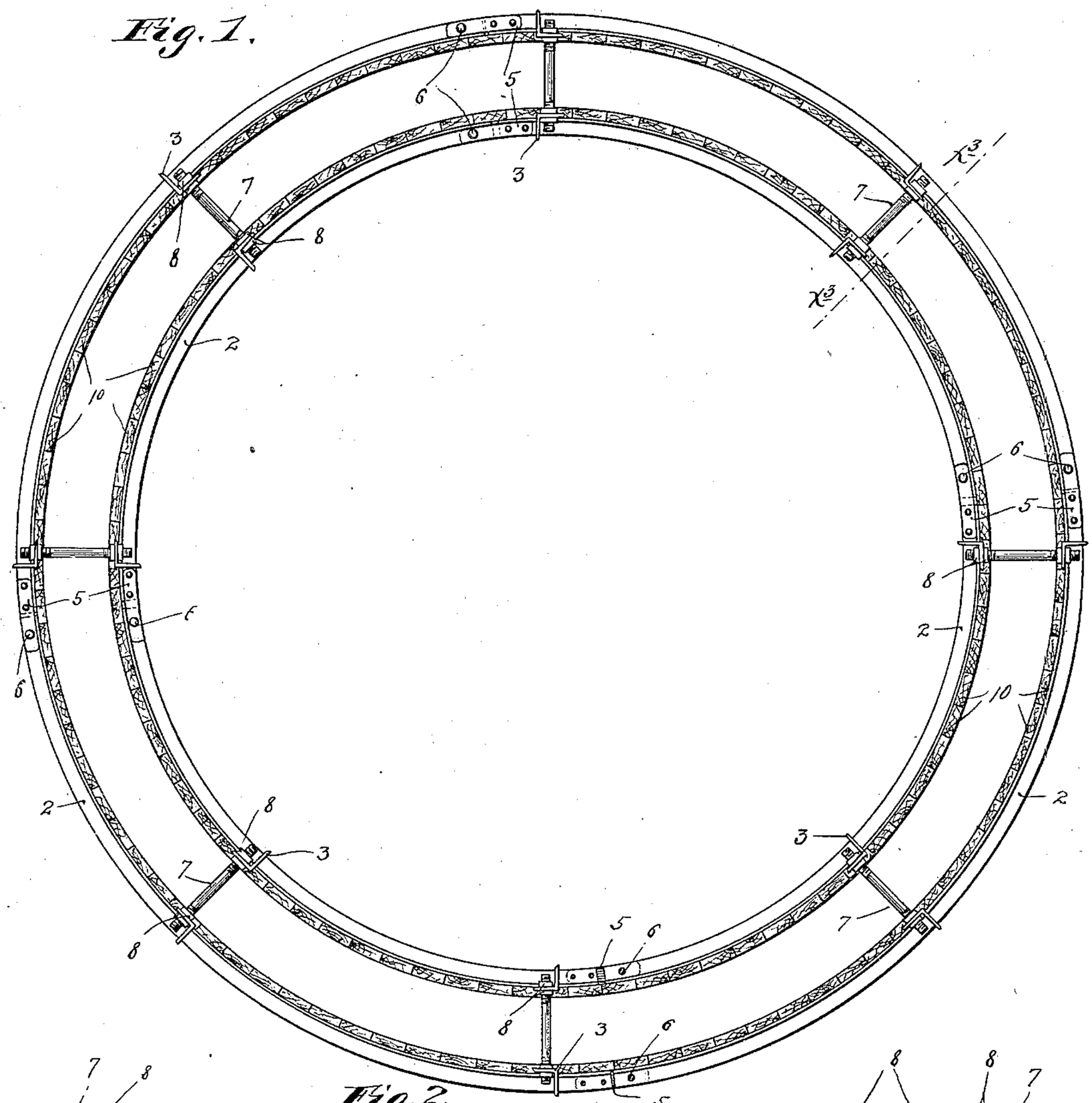
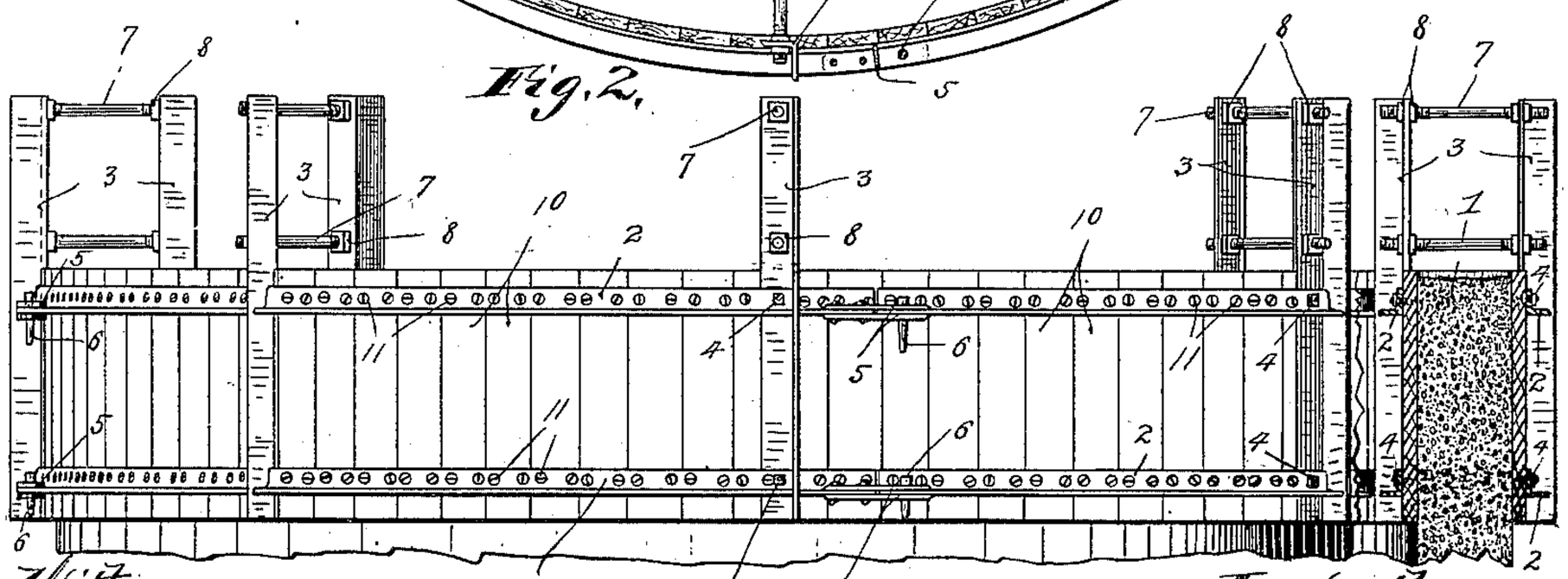


Fig. 2.



Witnesses,
Harry Kilgore,
F. S. Merchant

Inventor,
Charles F. Haglin,
By his Attorney,
Jas. F. Williamson

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Fig. 3.

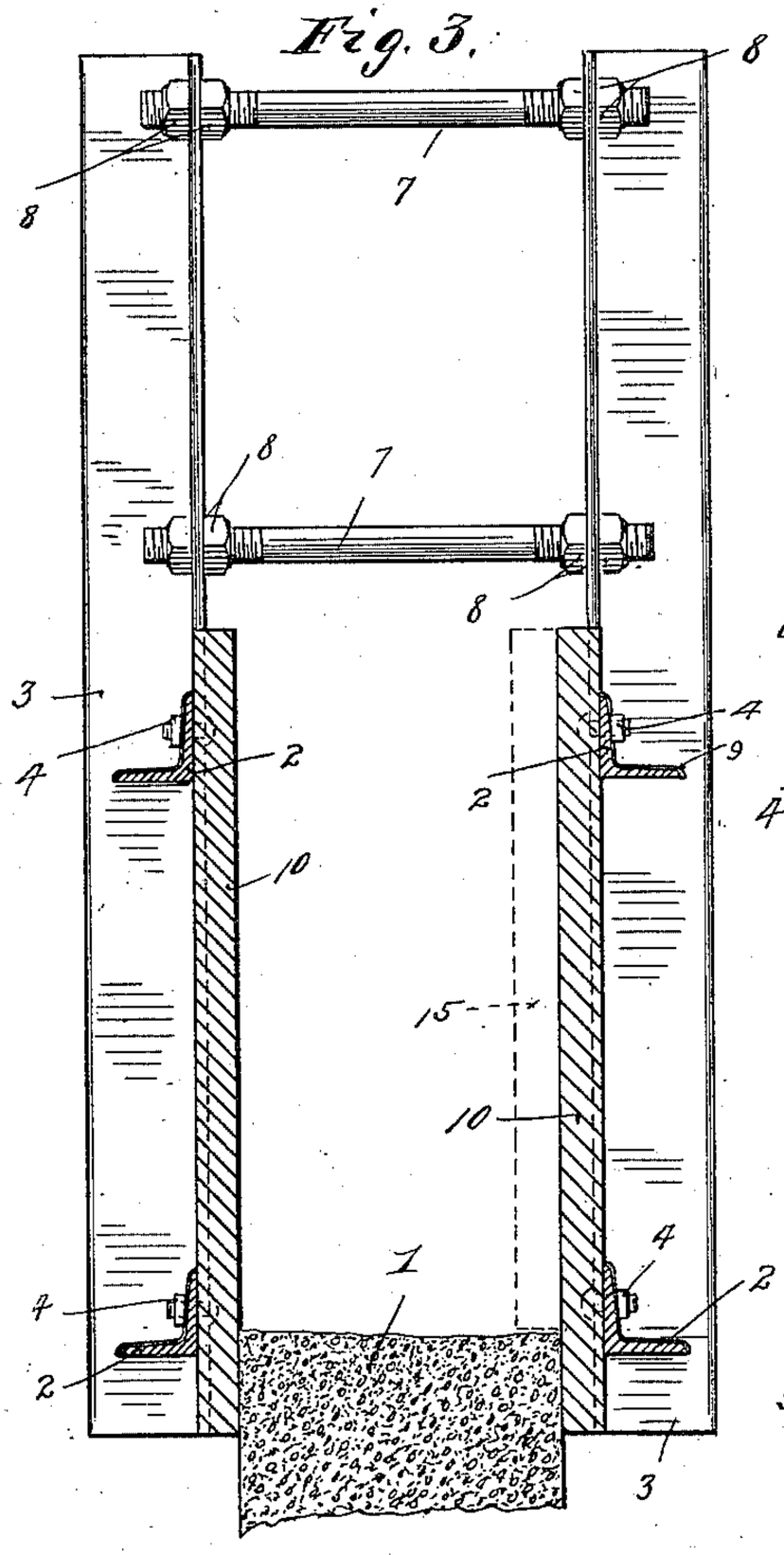


Fig. 4.

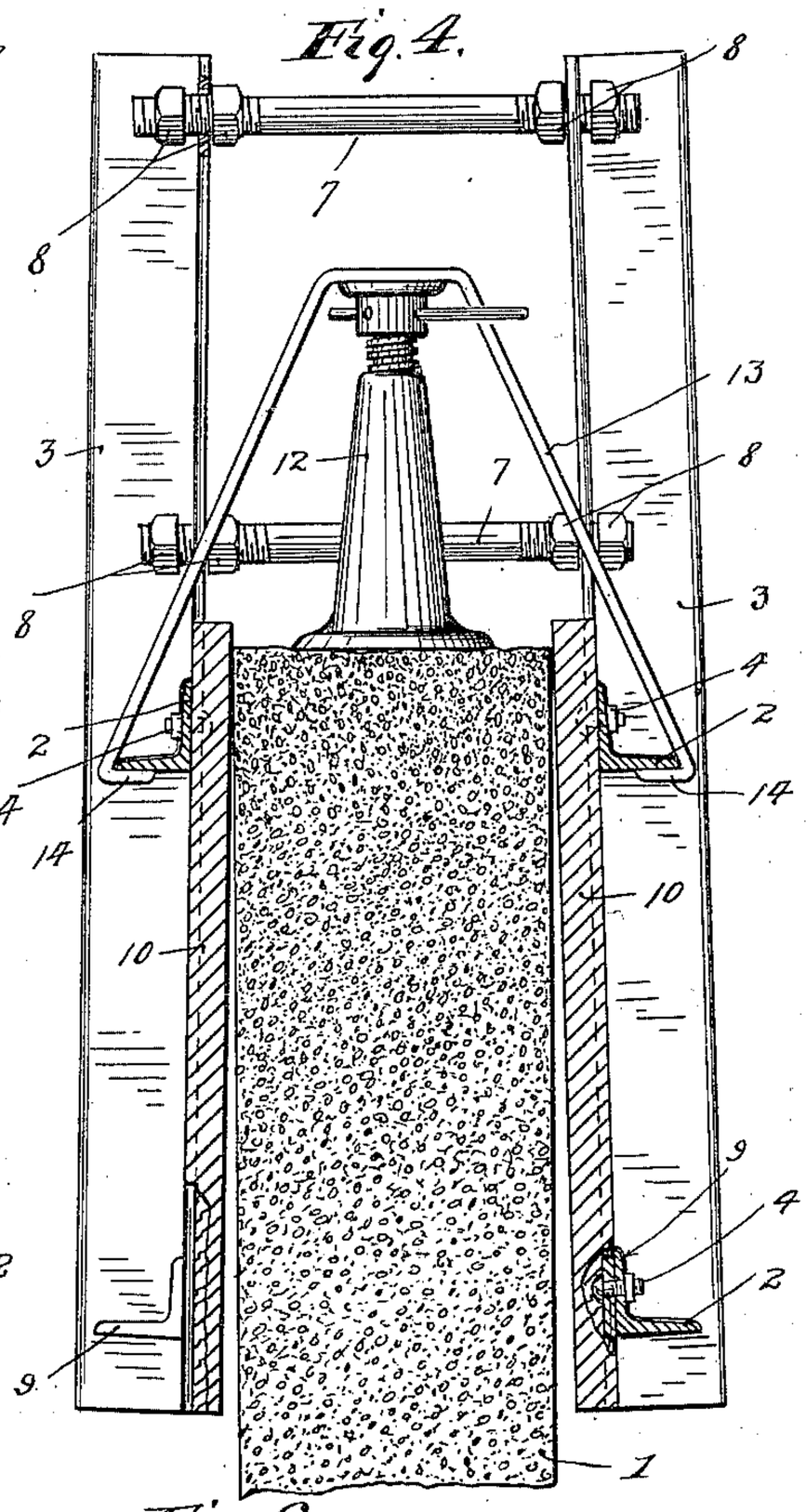
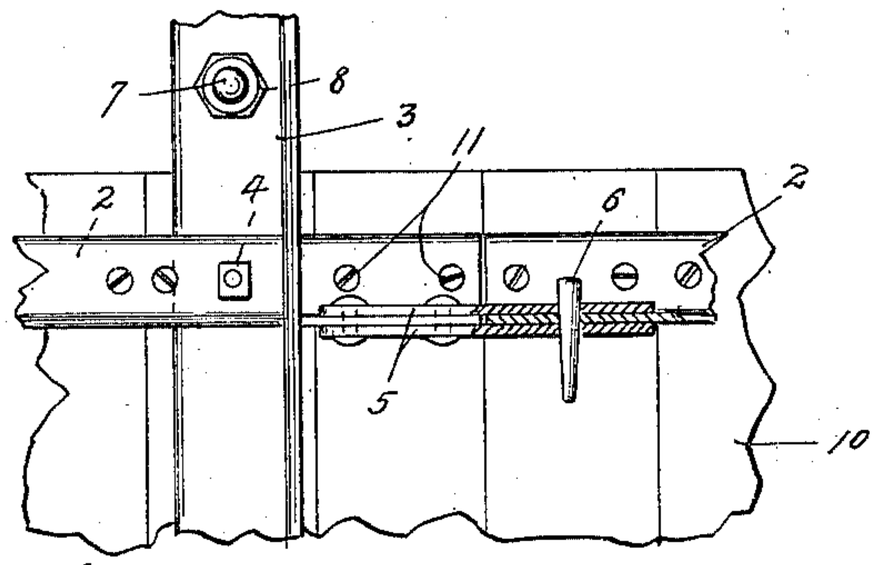


Fig. 5.



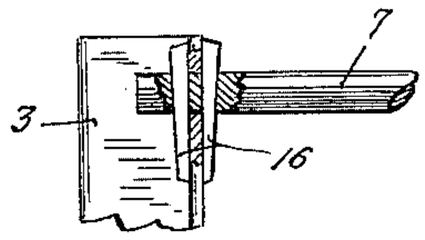


Fig. 6.

Witnesses.
Harry Kilgore.
F. D. Merchant.

Inventor.
Charles F. Haglin.
By his Attorney.
Jas F Williamson

UNITED STATES PATENT OFFICE.

CHARLES F. HAGLIN, OF MINNEAPOLIS, MINNESOTA.

MOLD.

SPECIFICATION forming part of Letters Patent No. 662,266, dated November 20, 1900.

Application filed November 20, 1899. Serial No. 737,600. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. HAGLIN, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Molds; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to provide an efficient mold or forming device for use in the construction of concrete bins. Such bins are desirable in the construction of grain-elevators and other storage buildings. Usually these bins are round or cylindrical; but they may take other forms and may be either square or hexagonal in cross-section, for example.

To the above ends my invention consists of the novel devices and combinations of devices hereinafter described, and defined in the claims.

The invention is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Figure 1 is a plan view of the complete mold. Fig. 2 shows the mold principally in side elevation, but with some parts sectioned, the same being secured to the upper portion of a bin which is in the process of construction. Fig. 3 is a transverse vertical section on the line $x^3 x^3$ of Fig. 1, with the mold shown as raised or in position to control the formation of the next layer or vertical section of the concrete bin. Fig. 4 is a section on the same line as Fig. 3, but showing the mold loosened from the last-formed section of the concrete bin and showing also one of the several lifting devices by means of which the mold is raised. Fig. 5 is a detailed view, in side elevation, some parts broken away, showing one of the devices for drawing together the ends of the adjacent sections of the mold; and Fig. 6 is a detail with some parts broken away, showing a modification in the construction for spacing apart the inner and the outer sections of the mold.

In the drawings, the numeral 1 indicates a portion of a concrete bin of cylindrical form.

The mold illustrated, being designed to form a cylindrical bin, is made up of segmental cylindrical sections spaced apart to form two complete concentric moldboards, between which the cement is filled in in the process of the construction of the bin. As shown, each section of the mold extends through ninety degrees or one-fourth of a circle, or, in other words, each moldboard is formed by four sections. Of course any desired subdivision of the moldboard in excess of three may be made, and it might be possible to use but two sections. Each mold-section is made up of a metallic framework consisting in the construction illustrated of segmental horizontally-extended pairs of angle-irons 2, tied together by vertical angle-irons 3, constituting vertical projections, the said angle-irons being secured together by short nutted bolts 4. The adjacent ends of the segnemtal angle-irons 2 nearly, but not quite, abut or meet, and detachable joints are formed between the same by means of vertically-spaced plates 5, riveted to one of the abutting members and overlapping with the horizontal flange of the connected member, as best shown in Fig. 5. The projecting ends of the joint-plates 5 are provided with alined perforations, and the horizontal flange of the segmental angle-iron 2 embraced thereby is also provided with a perforation, but which is slightly out of line with the perforations of said joint-plates 5, through which a wedge-shaped lock-key 6 is passed to connect the mold-sections, as hereinafter more specifically described. At their upper portions the vertical angle-irons 3 are spaced apart by pairs of horizontally-disposed spacing rods or bolts 7, that are screw-threaded at their ends and provided with pairs of nuts 8. The screw-threaded ends of the bolts 7 are passed through suitable perforations in the parallel flanges of the angle-irons 3 and the pairs of nuts 8 clamp the said flange between them. Thus the concentric annular frames are properly spaced apart, as will hereinafter more fully appear.

By reference to Fig. 4, wherein one of the segmental irons is omitted, it will be noted that the outturned flanges of the vertical angle-irons 3 are perforated by L-shaped seats 9, which fit said segmental angle-irons 2 and through which the latter are passed.

The outer annular framework is provided with an inner covering, and the inner annu-

lar frame is provided with an outer covering, formed by closely-positioned and vertically-disposed planks 10, which are shown as secured to the segmental angle-irons 2 by means of screws 11. The planks 10 extend above and below the horizontally-extended angle-irons 2 and terminate at their upper ends below the lower members of the spacing-rods 7.

In forming the lowermost or first section or layer of the concrete bin the cement is filled in between the concentric moldboards formed by the vertical boards 10. Then as soon as the cement has sufficiently hardened or set the entire mold is raised until the lower ends of the boards 10 overlap only the extreme upper portion of the section of the bin thus formed, this position being illustrated in Fig. 3. To accomplish the above adjustment or raising movement of the mold, it is necessary to loosen the section of the mold from the section of the bin thus formed.

The action of the couplings formed by the plates 5 and wedges or lock-keys will now be stated. The said wedges or lock-pins 6 have camming actions on the horizontal flanges of the segmental angle-irons 2, so that by driving the said wedges or pins downward the sections of the inner mold frame or board will be forced apart, while the sections of the outer mold frame or board will be drawn together. Otherwise stated, when the wedges or lock-keys 6 are driven upward or removed the segmental sections of the outer mold may be drawn apart, while the sections of the inner moldboard may be forced slightly together. In order to force the sections of the inner moldboard together, so as to loosen the same from the bin, it will be necessary to remove one or more of the planks 10. It will also be necessary to loosen the nuts 8 of the spacing-bolts 7 in order to permit the mold to be readily raised.

As this mold is very large and heavy, a power device is required to raise the same, and as a simple and efficient means for accomplishing this end I employ several jack-screws 12 and lifting-frame 13. The lifting-frames 13 are shown as approximately V-shaped, flattened at the apex and provided at their lower ends with hooks or lugs 14, adapted to engage under the flanges of the upper angle-irons 2, as shown in Fig. 4. The jack-screws 12 being applied as illustrated in Fig. 4, the mold may be raised, as already indicated. The lifting-frame 13 may be removed from working position in several different ways—as, for instance by springing the legs thereof apart far enough to permit the lugs 14 or one of them to clear the angle-iron 2. The lifting devices above described may therefore be easily applied and removed.

When the mold is raised approximately to the position relative to the last-formed section of the bin, (indicated in Fig. 3,) the lower portion thereof is clamped onto the said bin by properly adjusting the nuts 8, and the mold is then supported from the bin without the use of the lifting devices above described. It will of course be understood that the next section or layer of the bin is formed by filling in concrete between the concentrically-spaced moldboards of the mold, secured as above noted and illustrated in Fig. 3.

The bin should of course be thicker at the bottom than at the top, and to provide for this additional layers of planks may be added to either one or the other of the concentric moldboards, and, as illustrated in Fig. 3 and as preferred, the additional layer (indicated by dotted lines and marked 15) is added to the outer moldboard, so that the inner surface of the bin is formed with a constant diameter throughout its vertical length. These additional planks 15 may be screwed or otherwise secured to the planks 10, and at their lower ends they should terminate above the lower ends of the planks 10, to which they are secured.

In Fig. 6 the spacing-bolts 7, instead of being screw-threaded and provided with nuts, are perforated and provided with tapered keys or wedges 16, which operate as substitutes for the nuts.

It will be understood that my invention above described in its preferred form is capable of many modifications of construction within the scope of my invention. In lieu of the keys or wedges 6 and the joint-plates 5 cam devices and various other forms of connecting-joints may be employed.

It will be further understood that my invention is not limited to an annular or cylindrical mold adapted to form cylindrical bins, but is broad enough to include molds for the above purpose—to wit, the formation of concrete bins having cross-sections of square or hexagonal form, for example, in which case the mold would be made up of supplemental sections of the proper form to give the desired bin. Again, it will be understood that the mold or device above described is as well adapted to the formation of concrete water-tanks as it is for the above-noted purpose, and the term "bin," as used in the claims, is intended to include such water-tanks and similar receptacles.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. A device for use in the construction of concrete bins, comprising approximately parallel moldboards having vertical projections, and spacing and clamping devices connecting said projections above the moldboards, whereby said moldboards may be properly spaced from above and may be drawn and clamped onto the hardened top layer of the partially-formed bin, substantially as described.

2. A mold for use in the construction of concrete bins, comprising concentric annular moldboards having vertical projections extending above said moldboards, and spacing bolts or rods arranged in pairs to tie together the upper parts of said vertical projections and space apart the concentric moldboards,

and provided with nuts for clamping said moldboards onto the partially-formed bin, substantially as described.

3. In a mold for use in the construction of concrete bins, the combination with the segmental frames formed by the horizontal frame-sections 2 and vertical projections 3, of the facings 10, secured to said frame-sections 2, and the pairs of spacing-bolts 7, connecting the upper ends of said vertical projections 3, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES F. HAGLIN.

Witnesses:
M. M. McGRARY,
F. D. MERCHANT.