

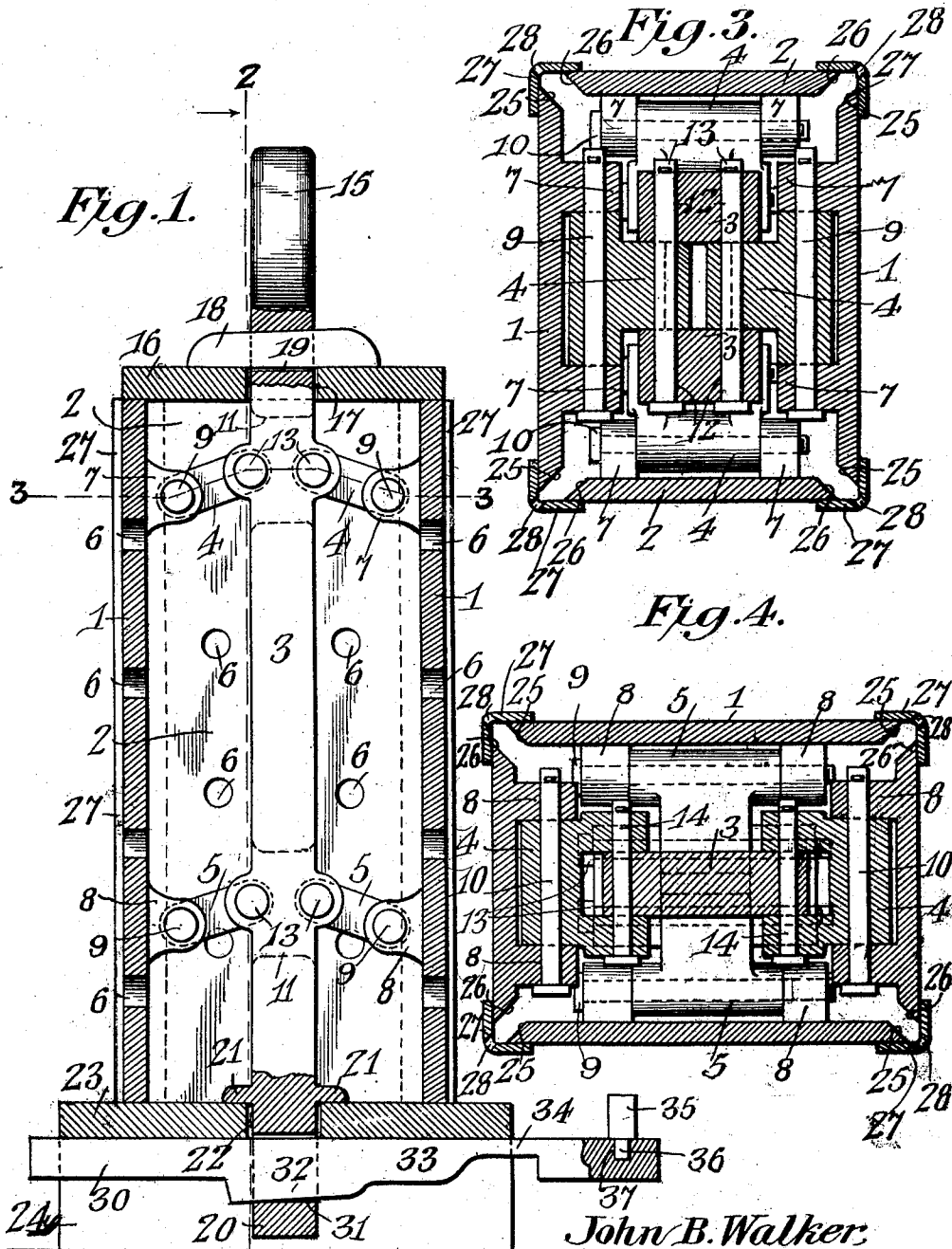
J. B. WALKER.
COLLAPSIBLE CORE.

APPLICATION FILED JAN. 23, 1911.

Patented July 4, 1911.

2 SHEETS-SHEET 1.

997,027.



John B. Walker.
INVENTOR

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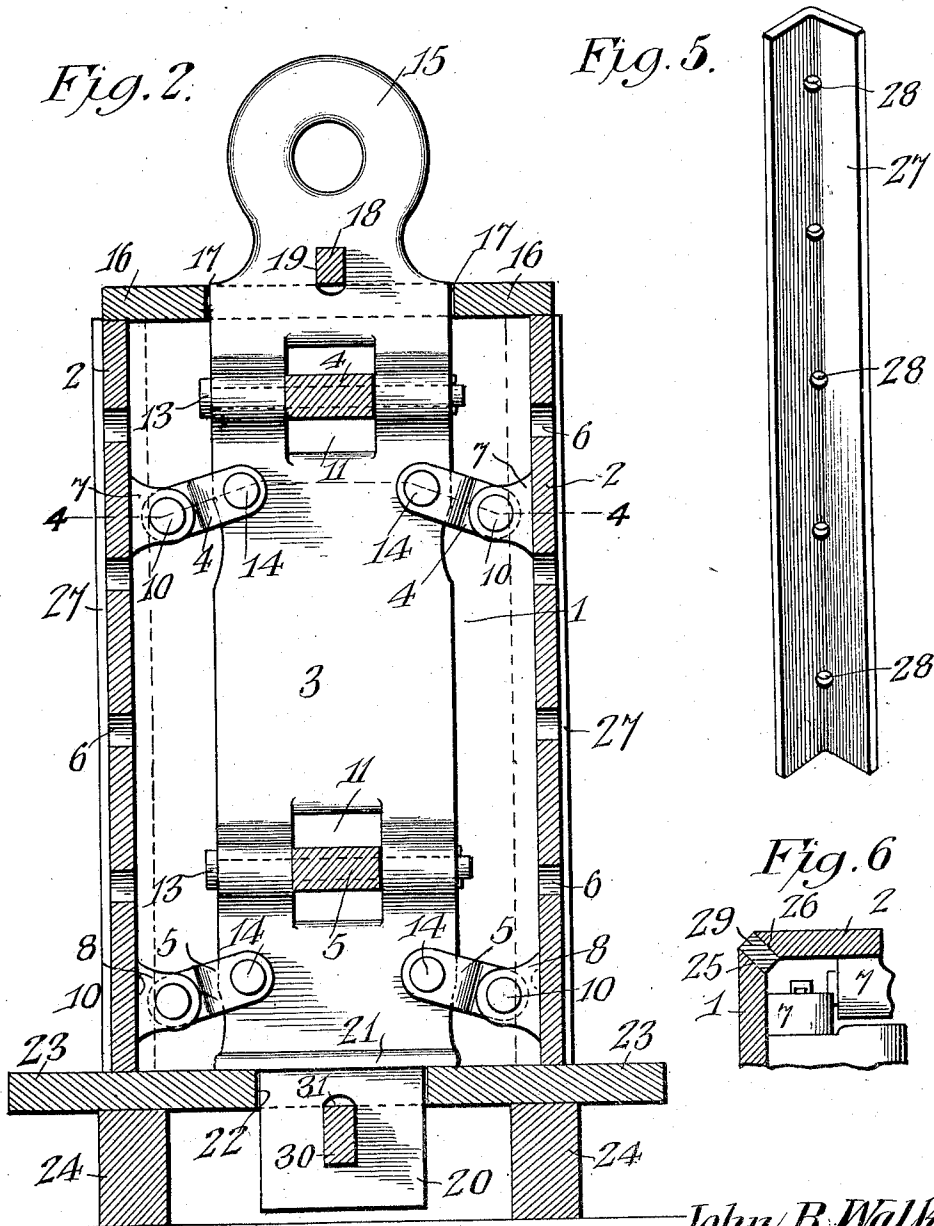
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UNITED STATES PATENT OFFICE.

JOHN B. WALKER, OF ENSLEY, ALABAMA.

COLLAPSIBLE CORE.

997,027.

Specification of Letters Patent.

Patented July 4, 1911.

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To all whom it may concern:

Be it known that I, JOHN B. WALKER, a citizen of the United States, residing at Ensley, in the county of Jefferson and State of Alabama, have invented a new and useful Collapsible Core, of which the following is a specification.

The invention relates to improvements in collapsible cores.

10 The object of the present invention is to improve the construction of collapsible cores, and to provide a simple and comparatively inexpensive core barrel, designed for making iron and steel ingot molds, and adapted to maintain the sections or staves of the barrel rigidly in proper position while the core is being rammed up, and capable also of permitting a small amount of movement to allow for shrinkage when the metal cools, and of limiting such movement of the staves or sections so as to prevent a crumbling of the core.

20 A further object of the invention is to provide a collapsible core barrel of this character in which the staves or sections will have sufficient inward movement to permit the casting to be removed by lifting it over the core barrel and also to permit the staves or sections to be moved inward, and the barrel to be pulled out of the casting by a single operation.

30 Another object of the invention is to provide a collapsible barrel of this character, equipped with means for preventing the sand from breaking at the corners or angles formed by the movable sections or staves.

35 With these and other objects in view, the invention consists in the construction and novel combination of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended; it being understood that various changes in the form, proportion, size and minor details of construction, within the scope of the claims, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

40 In the drawings:—Figure 1 is a vertical sectional view of a collapsible core, constructed in accordance with this invention. Fig. 2 is a vertical sectional view on the line 2—2 of Fig. 1, the plunger being shown in elevation. Fig. 3 is a horizontal sectional view on the line 3—3 of Fig. 1. Fig. 4 is a horizontal sectional view on the line 4—4 of Fig. 2. Fig. 5 is a detail perspective view

of one of the angle bars. Fig. 6 is a detail sectional view of one corner of the core barrel, showing another form of the filler strip.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

60 In the accompanying drawings in which is illustrated the preferred embodiment of the invention, 1 and 2 designate angularly related side and end sections or staves, connected at their inner faces with a vertically movable plunger 3 by inclined upper and lower toggle links 4 and 5. The sections or staves, which are constructed of suitable metal, form a rectangular core barrel, but the core barrel may be of any other preferred form and may be composed of any other desired number of sections to adapt the core barrel for use in molds for different articles of various sizes and shapes, the core barrel not being restricted in its use to the making of iron and steel ingot molds. The sections or staves, which have vent openings 6, are provided at their inner faces with spaced eyes 7 and 8, located at the upper and lower portions of the sections or staves of horizontal pintles 9 and 10 for hinging the outer ends of the toggle links to the sections or staves. The links 4, which connect the side sections or staves 2 with the vertically movable operating member or plunger, are approximately T-shaped and are located at the side faces of the operating member or plunger, and their outer portions or heads extend across the space between the eyes 7, and they are pivoted at their inner ends in upper and lower vertical slots 11 of the plunger 3. The plunger 3, which is substantially flat, is provided adjacent to the slots with enlargements, which are arranged in pairs and in which are formed eyes or openings 12 for the reception of inner horizontal pintles 13. The other links 5, which are located at the side edges of the plunger, are approximately U-shaped and extend across the space between the eyes 8, and they straddle the side edges of the vertically movable plunger and are hinged to the same by horizontal pintles 14, which pass through openings in the plunger 3. As the toggle links are inclined and extend upwardly and inwardly from the inner faces of the staves or sections, the latter when separated or in an extended position are adapted to be moved inward by exterior pressure, when

the plunger is free to move upwardly. The downward movement of the plunger with respect to the staves or sections expand the core barrel. The horizontal pivots or pintles, which hinge the toggle links to the sections or staves and to the vertically movable plunger, are each provided at one end with a head and at the other end with a removable key, but any other desired form of pivot or pintle may be employed.

The plunger is provided at its upper end with an eye 15 and it carries a rectangular cover 16, consisting of a plate having a central slot 17 to receive the plunger and retained thereon by a tapered key 18, secured in a slot 19 of the plunger and engaging the upper face of the top or cover. The top plate 16 is designed to remain on the core barrel at all times, both when the core is being rammed and when the metal is being poured into the mold. The top plate 16 besides forming a cover for the core barrel maintains the sections or staves in proper position with relation to the plunger and renders easier the operation of the core.

The plunger is provided at its lower end with a reduced rectangular portion or lug 20, and it has supporting flanges 21, projecting horizontally from the upper end of the reduced portion or lug 20. The lug extends through a central opening 22 in a drag plate or base 23, which constitutes the bottom of the mold and which may be in the form of a stool, as illustrated in the accompanying drawings, in which supports 24 are provided. The drag plate or base may be provided with suitable vent holes, and the supports elevate it sufficiently to maintain the lower end of the plunger out of contact with the supporting surface. Any suitable base may be employed and either end of the core barrel formed by the staves or sections may be arranged at the bottom of the mold.

The side edges 25 and 26 of the staves or sections are beveled and when the core barrel is entirely collapsed, the beveled edges are brought into contact with each other. The expansion of the core barrel spaces the beveled side edges of the staves or sections from each other, and in order to prevent the sand from breaking at the corners or angles formed by the staves or sections, the collapsible core barrel is equipped with filler strips 27, which may, as illustrated in Figs. 1 to 5 inclusive, consist of pieces of angle iron or other suitable material. When the angle filler strips 27 are employed, they are placed over the corners of the core, as illustrated in Figs. 3 and 4 of the drawings, and they are adapted to remain in position while the core barrel is being rammed and also while the metal is being poured, as they will not interfere with the inward movement of the sections, which is necessary to compensate for the shrinkage of the metal. The

angle strips cover the intervening spaces between the side edges of the sections of the core, and the sides or wings overlap and fit against the outer faces of the said sections. The angle strips are provided at their angles with vent openings, which are located at the spaces between the side edges of the sections of the core, and they are removed when it is desired to completely collapse the core barrel. Instead of employing angle filler strips, the space between the side edges of the staves or sections of the core barrel may be filled by straight wooden strips 29, as illustrated in Fig. 6 of the drawings. The wooden filler strips remain in the core barrel only while the latter is being rammed, and they are removed prior to the baking of the core and the pouring of the metal.

The operating number or plunger is held at the limit of its downward movement by a key 30 to maintain the staves or sections rigidly in proper position for ramming the core barrel. The key 30, which extends horizontally through a slot 31 in the reduced lower portion or lug of the plunger, engages the lower face of the drag plate or base, as clearly illustrated in Fig. 1 of the drawings. The key is provided with a plurality of portions 32, 33 and 34 of different widths. The large portion 32 is wedge-shaped and holds the plunger at the limit of its downward movement, and the intermediate portion 33, which is slightly narrower than the wedge-shaped portion 32, is located between the wedge-shaped portion 32 and the portion 34, and is adapted to permit a limited upward movement of the plunger sufficient to allow for the shrinkage of the casting in cooling. The portion 34, which is relatively narrow, is adapted to permit a complete collapsing of the core barrel. The key projects beyond the opposite edges of the base plate, and it is equipped at one end with a removable projection 35, preferably in the form of a dowel pin and having a reduced lower portion 36, fitted in a socket 37 in the upper edge of the key. The projection 35 is spaced from the base plate when the wedge-shaped locking portion 32 is in engagement with the plunger. The wedge-shaped portion 32 operates to hold the staves or sections rigidly upon the base while the core is rammed and also until the metal is poured. As soon as the metal is poured, the key is moved longitudinally to carry the intermediate width or portion 33 to the slot of the plunger, such movement of the key being limited by the projection 35, which engages the edge of the base. When it is desired to collapse the core barrel completely, the projection is removed from the key and the latter may be withdrawn from the slot of the plunger. This will also permit the core barrel to be detached from the base and withdrawn

from the mold. The casting may be either lifted over the core barrel, or the core barrel may be withdrawn from the casting without the application of any force.

5 When the latter is desired, the core barrel may be collapsed and lifted from the mold by a single operation, it being only necessary to lift the vertically movable operating member or plunger to secure both results.

10 The core barrel is adapted for large square cores, such as iron and steel ingot molds, and the arrangement of the toggle links form a perfect support or brace for the large flat sections or staves.

15 Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. A collapsible core including a plurality of angularly related sections to form a rectangular core, mechanism connected with the sections between the side edges thereof for moving the sections inwardly and outwardly toward and from each other, and exteriorly arranged angular filler strips fitting against the outer faces of the sections at the side edges thereof and covering the space between the same to prevent the sand from breaking down, said strips being adapted to permit inward movement of the sections.

2. A collapsible core including a plurality of sections movable inwardly and outwardly, mechanism connected with the sections for expanding and contracting the same, said mechanism including a movable operating member, and means for locking the member against movement and for permitting a limited movement of the member and a slight inward movement of the sections to allow for shrinkage of the cast metal in cooling.

3. A collapsible core including a plurality of sections movable inwardly and outwardly, a vertically movable plunger, links connecting the plunger with the sections, and locking mechanism engaging the plunger for holding the sections against inward movement and adjustable to permit a limited movement of the plunger and a slight inward movement of the sections to allow for the shrinkage of the cast metal in cooling.

4. A collapsible core including a plurality of sections movable inwardly and outwardly, mechanism connected with the sections for expanding and contracting the same, said mechanism including a movable operating member, and a key engaging the member and having a plurality of portions of different widths adapted to lock the said member against movement and to permit a limited movement thereof.

5. A collapsible core comprising a plurality of sections movable inwardly and outwardly, mechanism connected with the sections for expanding and contracting the same, said mechanism including a movable operating member, and a key having a wedge-shaped portion engaging the said member to lock the same against movement, said key being also provided with a narrower portion to permit a limited movement of the said member.

6. A collapsible core comprising a plurality of sections movable inwardly and outwardly, mechanism connected with the sections for expanding and contracting the same, said mechanism including a movable operating member, and a key having a wedge-shaped portion engaging the said member to lock the same against movement, said key being also provided with a relatively narrow portion adapted to permit the complete collapsing of the sections.

7. A collapsible core comprising a plurality of sections movable inwardly and outwardly, mechanism connected with the sections for expanding and contracting the same, said mechanism including a movable operating member, and a key engaging the movable member and provided with a wedge-shaped portion for locking the same against movement and having a plurality of portions of different widths, one of the latter portions permitting a slight movement of the member and the other permitting a complete collapsing of the core.

8. A collapsible core comprising a plurality of sections movable inwardly and outwardly, mechanism connected with the sections for expanding and contracting the same, said mechanism including a movable operating member, and a key engaging the said member and provided with a wedge-shaped locking portion and having a plurality of narrower portions of different widths, and a removable stop for limiting the movement of the key.

9. A collapsible core including a base, a plurality of sections, a plunger located within the sections and extending through the base, toggle links connecting the sections with the plunger, and a key engaging the plunger and the base and having a plurality of portions of different widths adapted to lock the plunger and capable also of permitting a limited movement of the same.

10. A collapsible core including a base, a plurality of sections, a plunger located within the sections and extending through the base, toggle links connecting the sections with the plunger and provided below the same with a slot, a key extending through the slot of the plunger and engaging the same and the base, and a removable projecting device carried by the key and arranged to engage the base.

11. A collapsible core including a base having an opening, a plurality of sections arranged upon the base, a vertically movable

plunger located within the sections and having a reduced portion extending through the opening of the base and provided with a slot, toggle links connecting the sections
5 with the plunger, and a key operating in the slot of the plunger and engaging the same and the base.

12. A collapsible core including a base having an opening and provided with supporting means, a plurality of sections arranged upon the base, a vertically movable
10 plunger located within the sections and extending through the opening of the base and provided with means for engaging the upper

face of the base, links connecting the sections 15 with the plunger, a key located beneath the base and engaging the same and the plunger, and a top plate detachably mounted on the upper portion of the plunger and forming a cover for the core. 20

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

JOHN B. WALKER:

Witnesses:

J. A. DUPUY,

R. P. McLEOD.