No. 697,083. Patented Apr. 8, 1902.

J. D. HARLESS.

COLLAPSIBLE CORE BAR.

(Application filed Dec. 7, 1901.)

(No Model.) 2 Sheets—Sheet 1.

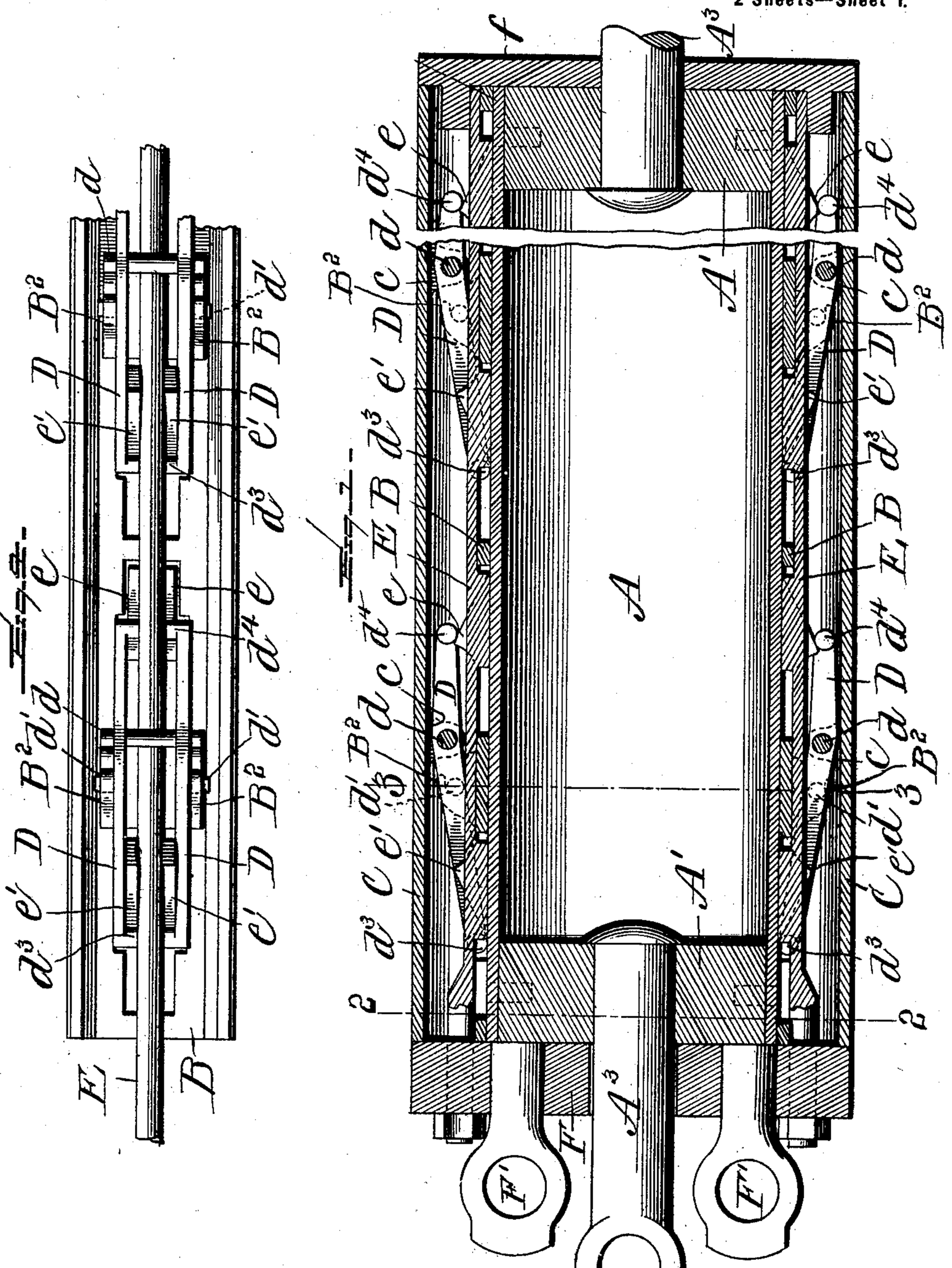

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Fig. 1.

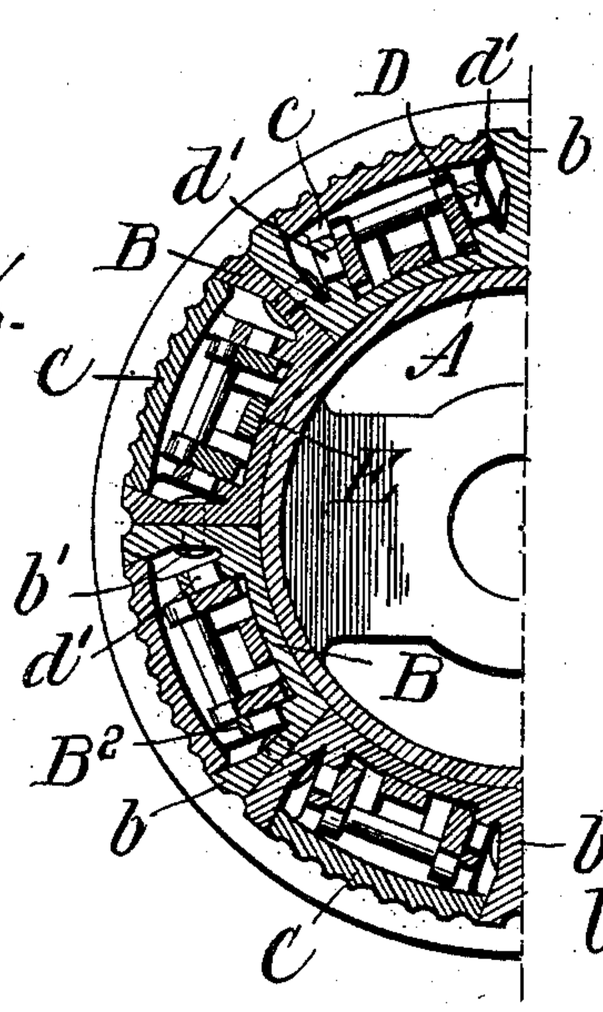


Fig. 2.

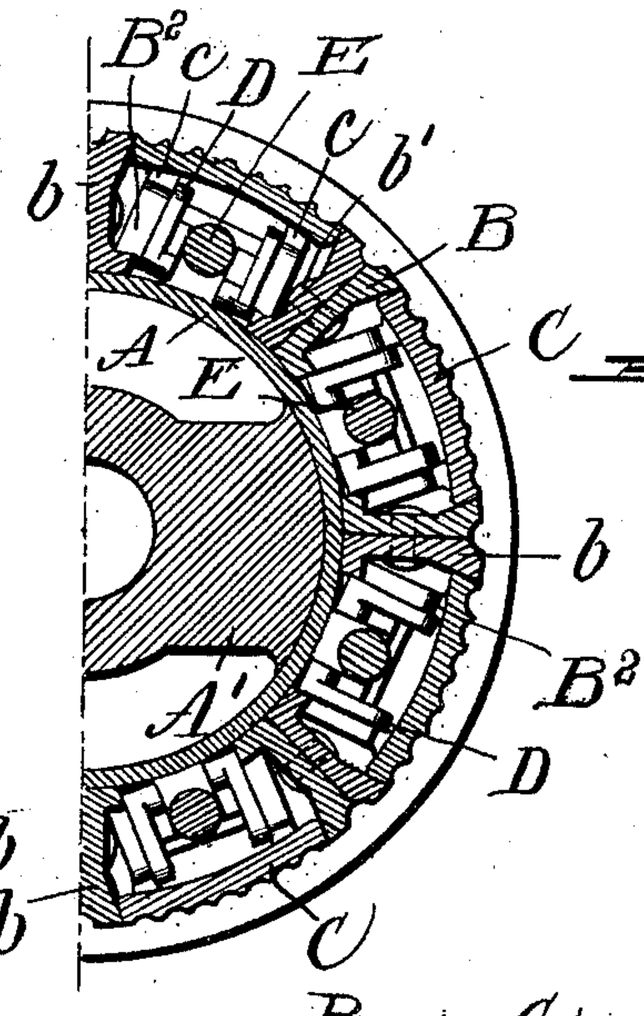


Fig. 3.

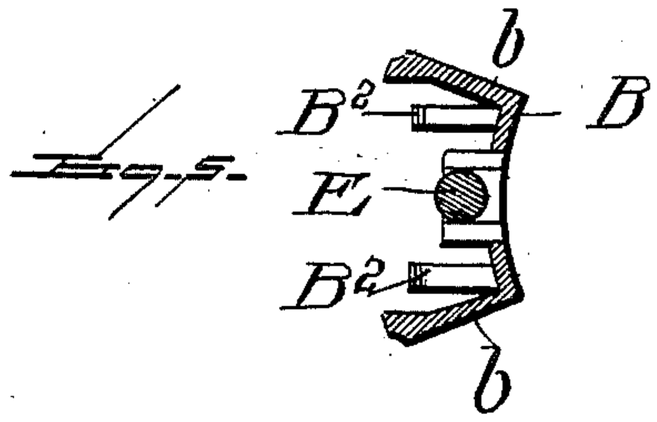


Fig. 4.

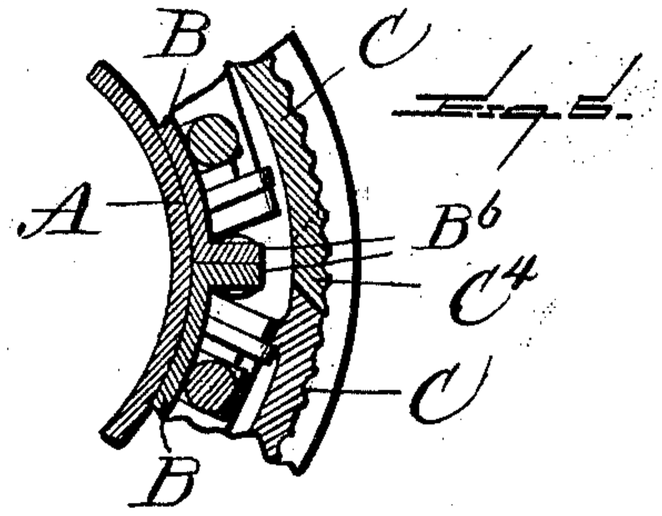
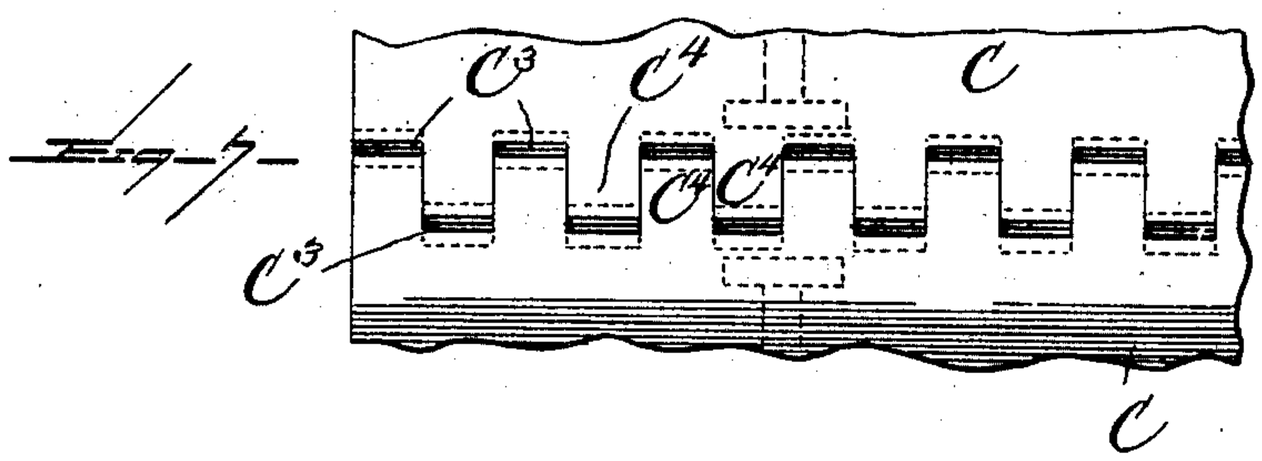


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOSEPH DAVID HARLESS, OF BIRMINGHAM, ALABAMA.

COLLAPSIBLE CORE-BAR.

SPECIFICATION forming part of Letters Patent No. 697,083, dated April 8, 1902.

Application filed December 7, 1901. Serial No. 85,050. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH DAVID HARLESS, of Birmingham, in the county of Jefferson and State of Alabama, have invented certain new and useful Improvements in Collapsible Core-Bars; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

This invention is an improvement in cores or core-bars for use in metal-founding, its object being to provide a strong comparatively light collapsible core-body which can be surfaced with clay, loam, or other suitable refractory material and placed in position in the mold and after the casting is made can be collapsed and readily removed from the mold or casting.

The present invention is particularly designed for cylindrical cores of large castings, such as water-pipes; and it consists in the novel construction and combination of parts, as hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a longitudinal central section through the core-body. Fig. 2 is a semitransverse section on line 2 2, Fig. 1. Fig. 3 is a similar section on line 3 3, Fig. 1, the core being collapsed. Fig. 4 is a top plan view of one of the channeled core-sections with top plate removed, the core being collapsed; and Fig. 5 is a detail section of one of such sections. Fig. 6 is a detail transverse section showing a modified construction of casting B and plates C, the core being collapsed. Fig. 7 is a detail plan view of parts shown in Fig. 6, the core being collapsed.

Referring to the drawings by letters of reference marked thereupon, A designates a pipe of a length equal to that of the core-body, having its ends closed or stiffened by heads A′. To this pipe are fastened exteriorly a series of segmental channeled castings B, which extend longitudinally of the core and may have their side flanges *b* riveted together, as at *b*′, these castings being of such size and form in cross-section that when fitted together they will form a complete cylinder or casing inclosing the pipe A. Pipe A might even be omitted; but it increases the strength and rigidity of the core-body and facilitates the assembling of the castings B in position.

A radially-movable plate C is fitted to and adapted to close the outer side of the channel in each casting B. This plate is adjustably held in place by means of levers D, which are pivoted at *d* to lugs *c* on the inner face of plate C, and adjacent to pivot *d* the levers D are provided with lugs *d*′, which are engaged with and fulcrumed upon hook-lugs B^2, rising from the bottoms of castings B. By rocking levers D on fulcrums *d*′ the plates C may be moved in or out radially of the core. The outer faces of plates C may be corrugated or roughened, so as to cause the loam, clay, or other refractory material with which the core-body is incased to adhere thereto.

Within each casting B, between it and the attached plate C, is a longitudinally-movable cam-bar E, which is provided with pairs of oppositely-facing cams *e e*′, which respectively engage with lugs d^3 and d^4 on the opposite ends of the levers D, as shown. Consequently when the cam-bar is shifted longitudinally each lever D will be oscillated, one set of cams moving under and raising one end thereof, while the other set of cams moves from beneath the other end thereof. The cams, however, always hold the levers D positively in any position to which they are adjusted. The number of levers D and coacting cams *e e*′ employed will of course depend upon the length of the core.

The cam-bars E are all connected at one end to a cap F on one end of the core-body, which cap is provided with eyes F′, by which it can be shifted. The other end of the core-body may be closed by a cap *f*, attached thereto, as shown. The cap *f* also prevents the plates C moving longitudinally, so as to disengage lugs *d*′ from hooks B^2.

To each end of the core-body may be attached eyebolts A^3, which are fast to the heads A′ and project through central openings in caps F *f*, so that the core can be moved without disturbing the adjustment of cap F and cam-bars E.

Operation: When the core is to be prepared, cap F is pushed closely against head A′, so as to force cam-bars E inward, rock levers D, and move all the plates C fully outward,

thereby greatly enlarging the diameter and circumference of the core-body. Then the body is covered with loam, clay, or other suitable refractory material and properly dried and baked. The core may be handled during these preparatory steps and when adjusting it in the mold previous to the casting operation by means of the eyebolts A^3. When the casting is completed and sufficiently chilled to allow the removal of the core, (which in large castings should be vertically arranged with eyes F′ uppermost,) the core is lifted by its eyes F′, which results, first, in shifting the cam-bars E so as to retract the plates C, thereby contracting and reducing the diameter 'of the body, which can then be easily withdrawn from the mold and casting. The cap F is then pushed back against head A′, thereby shifting the cam-bars, causing the expanding of the core-body, as before, ready to receive another coating of refractory material preparatory to being again used as a core.

For small cores, particularly, the modified construction shown in Figs. 6 and 7 might be used. In this the flanges B^6 on the sides of castings B are made shorter than before, and the plates C are made slightly wider than the castings, so that they overlap the side flanges thereof. The edges of plates C, moreover, are formed with interlocking lugs and recesses C^3 C^4 to cover over the flanges B^6 and preserve a practically uniform surface on the core-bar whether it be expanded or contracted.

The plates C (shown in Figs. 6 and 7) are moved in and out on radial lines, just like the plates C in Figs. 1, 3, and 4, the same operative means being used in both instances. The lugs and recesses C^3 C^4 do not interfere with the radial movements of the plates.

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

1. In a core-bar, the combination of a plurality of channeled castings forming the body of the bar, a radially-movable plate in each casting, levers pivotally connected at adjacent points to both castings and plates, and means for shifting said levers, substantially as described.

2. In a core-bar, the combination of the body, a series of radially-movable plates thereon, levers, interposed between the several plates and body, pivotally connected both to the plates and body, and movable oppositely-facing cams engaging opposite ends of the levers, substantially as described.

3. In a core-bar the combination of the body, the annular series of radially-movable plates thereon, levers interposed between the plates and body and pivotally connected with both plates and body at adjacent points, movable oppositely-facing cams engaging opposite ends of the levers, and means for simultaneously shifting said cams, for the purpose and substantially as described.

4. In a core-bar the combination of an annular series of channeled castings forming the surface of the bar, a radially-movable plate in each casting forming the body of the bar, and cams and connections for simultaneously adjusting said movable plates, substantially as described.

5. In a core-bar the combination of an annular series of channeled castings forming the surface of the bar, a radially-movable plate in each casting, levers interposed between the plates and castings and pivotally connected to both at adjacent points, oppositely-facing cams engaging opposite ends of the levers, and means for simultaneously shifting said cams, substantially as described.

6. In a core-bar the combination of the body, a series of radially-movable plates on the exterior thereof and connected therewith, oppositely-disposed cams between the body and plates, levers pivoted to the plates and body and adapted to engage the opposite cams at their opposite ends, and means for shifting the cams, substantially as described.

7. In a core-bar the combination of longitudinally-channeled castings, a radially-movable plate in each casting, and levers pivotally connected to the plates and castings; with longitudinally-movable cam-bars between the plates and castings having oppositely-facing cams engaging opposite ends of the levers, substantially as described.

8. In a core-bar the combination of an annular series of longitudinally-channeled castings, the radially-movable plates in said castings, and levers pivotally connected to the plates and castings; with longitudinally-movable oppositely-facing cams engaging opposite ends of the levers, and means for simultaneously shifting said cams, substantially as described.

9. In a core-bar the combination of the support, the annular series of externally-channeled castings attached thereto, the radially-movable plates fitted in said castings, the levers pivoted to the plates and castings, and pairs of oppositely-facing cams engaging the opposite ends of the levers; with cam-bars connecting and operating said cams, and the cap to which said cam-bars are attached, substantially as described.

10. In a core-bar the combination of the support, the series of longitudinally-channeled castings attached thereto, the radially-movable plates in said castings, and levers pivotally connected to the plates and castings at adjacent points; with longitudinally-movable cam-bars between the plate and castings, oppositely-facing cams on said bars engaging opposite ends of the levers, and means for simultaneously shifting said cam-bars, substantially as and for the purpose described.

11. In a core-bar the combination of the support, the annular series of channeled castings attached thereto, the radially-movable plates fitted in said castings, the levers pivoted to the inner sides of the plates and also pivoted to lugs on the castings, and pairs of oppo-

sitely-facing cams engaging the opposite ends of the levers; with cam-bars connecting and operating said cams, a movable cap on one end of the core to which said cam-bars are attached and whereby they may be simultaneously shifted, and eyebolts attached to said cap-piece, all substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

JOE DAVID HARLESS.

In presence of—
W. J. SANDERSON,
A. M. FORD.