No. 649,640. Patented May 15, 1900.

C. HERMAN.

MOLDING APPARATUS.

(Application filed Sept. 19, 1898.)

(No Model.) 3 Sheets—Sheet 2.

FIG. 4.

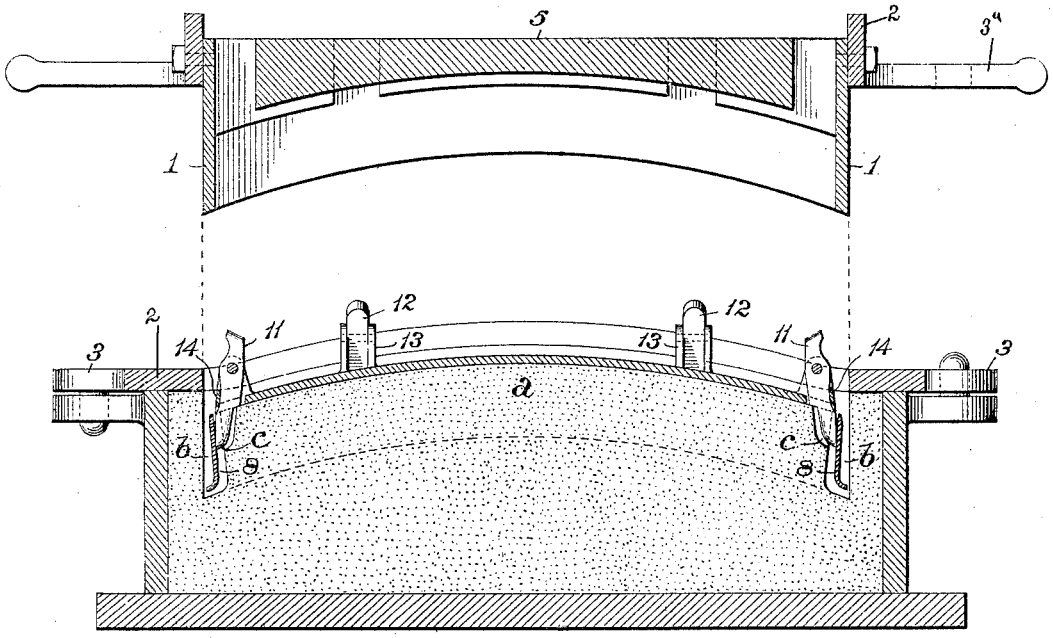

FIG. 5.

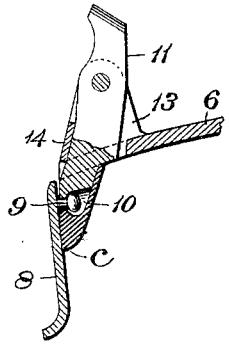

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FIG. 6.

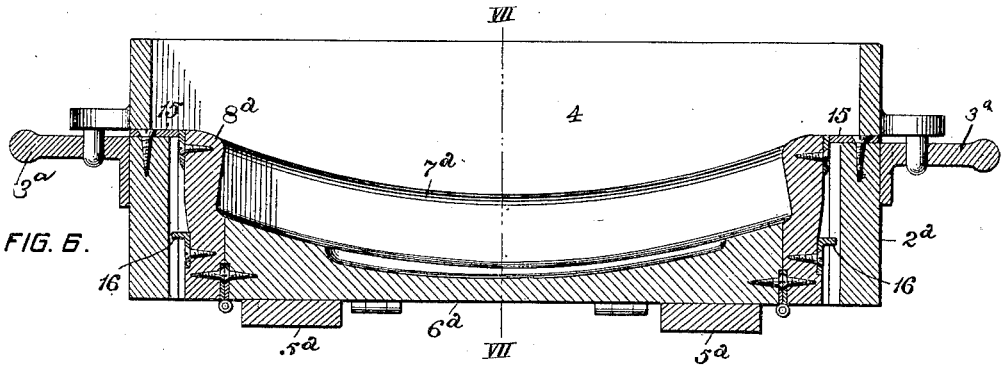


FIG. 7.

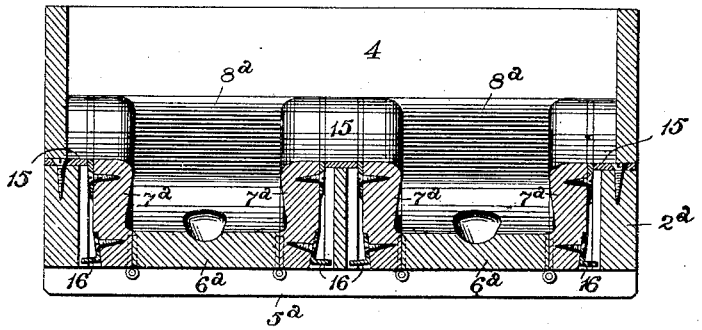
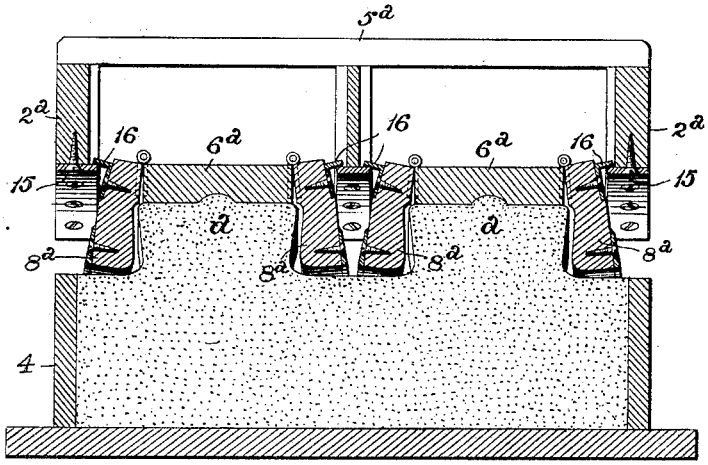


FIG. 8.



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MOLDING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 649,640, dated May 15, 1900.

Application filed September 19, 1898. Serial No. 691,288. (No model.)

To all whom it may concern:

Be it known that I, CHARLES HERMAN, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Molding Apparatus, of which improvements the following is a specification.

The invention described herein relates to certain improvements in apparatus for forming molds for the formation of the shells or boxes on composite brake-shoes—*i. e.*, brake-shoes consisting of a case or shell inclosing a body formed of a different material. In order that the body portion of the shoe may be held firmly in position under all conditions of use, the inner walls are inclined so as to form a dovetailed recess or pocket for the body.

The object of the present invention is to provide for the proper shaping of the side walls of the core of the mold and the easy withdrawal of the forming portion of the pattern from the mold.

The invention is hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a plan view showing two of my improved patterns with their moldboard in position on a half-flask molding. Figs. 2 and 3 are sectional elevations of the same, the planes of sections being indicated, respectively, by the lines II II and III III, Fig. 1. Fig. 4 is a sectional elevation on the same plane as Fig. 2, showing the half-flask inverted, the moldboard and a portion of the pattern removed, and the parts of the other portions of the pattern adjusted for removal. Fig. 5 is a detail view of a portion of the pattern on an enlarged scale. Figs. 6 and 7 are views similar to Figs. 2 and 3, illustrating modifications of the pattern; and Fig. 8 is a sectional elevation showing half of completed mold with the moldboard and pattern partially withdrawn.

In the practice of my invention the box-like portion 1 of the pattern, which is designed to shape the outer wall of the matrix of the mold, passes through the moldboard 2 and may or may not be secured thereto. This moldboard is provided on two opposite edges with perforated lugs 3 for the reception of the dowel-pins of the half-flask 4 and with handles 3^a. A bar 5 is secured longitudinally across the lower outer open end of the box portion for supporting the bottom plate 6 of the core-box portion of the pattern, which consists of the bottom plate 6 and the side and end plates 7 and 8. As clearly shown in Figs. 2 and 3, the side and end plates rest when in operative position against the inner walls of the box portion 1 of the pattern and have their inner surfaces properly shaped to impart the desired inclination to the side and end walls of the core *a* of the mold. It is preferred to form these side and end walls 7 and 8 of comparatively-thin sheet-metal strips and to impart the desired shape or contour to their inner walls by bending the strips longitudinally. In order to withdraw the core-box portion of the pattern from the mold, the side and end plates 7 and 8 are so attached to the bottom plate as to permit of their being shifted away from the sides and ends of the core *a*.

In the manufacture of some forms of brake-shoes the matrix for the sides and ends of the shoe-shells is formed entirely with one part of the flask, as shown in Figs. 1 to 4, inclusive. In a mold of such construction the space *b* between the outer walls of the matrix and the walls of the core *a* is so narrow that the plates 7 and 8 cannot be swung out on the arcs of circles having centers coinciding with the edges of the bottom plate 6, but should be held in approximate parallelism with the sides and ends of the core *a* while being shifted. To this end the plates are provided with one or more pins 9 at or adjacent to their upper edges, the heads of said pins fitting loosely within sockets 10, formed in arms 11 and 12 a distance above their lower ends. These arms are pivotally mounted between lugs 13 on the bottom plate 6. The inward movements of the arms 11 and 12, carrying the plates 7 and 8, are limited by the inner ends of the slots in the edges of the plate 6, through which said arms pass, and the outer movements of the arms are limited by stops, which may be formed by straps 14, secured to the lugs 13. As clearly shown in Fig. 5, the pins

9 are made sufficiently long to permit of an oscillatory movement of the plates 7 and 8 on the ends *c* of the arms 11 and 12 as fulcra when the plates are moved outwardly by the shifting of the arms on their pivotal supports. If the plates were rigidly secured to the arms, their outer edges would have a greater range of movement than their inner edges, so that if the inner edges be shifted sufficiently far to clear the core *a* their outer edges would strike against the outer wall of the space *b*. The loose connection of the plates to the arms above the ends of the latter permits of such an oscillation of the plates that their upper and lower edges have an approximately-equal outward movement from the core.

In forming a mold the moldboard is arranged with the pattern projecting upwardly, and the half-flask is placed in position thereon, as shown in Figs. 1, 2, and 3. After the sand has been rammed in the flask the latter, with the moldboard in position, is turned over, as shown in Fig. 4. The moldboard and the box portion 1 of the pattern are then withdrawn, leaving the core-box portion of the pattern in position. The molder then shifts the plates 7 and 8 away from the core by pressing the upper ends of the arms inwardly with his fingers, thereby permitting of the withdrawal of the core-box portion of the pattern.

In the manufacture of some forms of brake-shoe shells the core *a* is formed in one half-flask, as shown in Fig. 8, and the female portion of the matrix in the other half-flask. As the cores project up clear of any other portion of the mold, there is ample room for the outward movement of the sides and ends of core-forming box. For the formation of this style of mold the moldboard is made in the form of a frame 2^a, having bars 5^a secured across one end for supporting the core-box during the formation of the mold. The core-box consists of the bottom plate 6^a and the side and end plates 7^a and 8^a, the latter being pivotally connected to the edges of the bottom plate. During the molding operation the moldboard and core-box are arranged as shown in Figs. 6 and 7 and the half-flask adjusted in proper position in the former. After the sand has been rammed the flask, moldboard, and core-box are inverted and the moldboard and core-box are raised. During a portion of the movement of the moldboard the core-box is not shifted; but as soon as the sides of the moldboard, which retain the side and end plates of the core-box in position during the ramming of the sand, are raised clear of the core-box shoulders 15 on the moldboard will strike against lugs 16 on the side and end plates 7^a and 8^a, and thereby cause them to swing out away from the core sufficiently far to permit of the removal of the core-box.

As it is generally customary to form two matrices in one flask, the improvements are shown in duplicate; but it will be readily understood by those skilled in the art that the improvements can be readily adapted to the formation of one or any desired number of matrices.

It will be observed that in both forms of apparatus the side and end plates of the core-box are held in operative relation to each other by an inclosed shell or frame, which in one construction—*i. e.*, that shown in Figs. 1 to 5, inclusive—is formed by the pattern 1. In the construction shown in Figs. 6, 7, and 8 this retaining frame or shell is formed by the moldboard 2^a.

I claim herein as my invention—

1. The combination of an apertured moldboard, a core-box consisting of a bottom plate and side and end plates, and arranged in the opening in the moldboard, and means for holding said plates in operative relation to each other during the molding operation, substantially as set forth.

2. The combination of an apertured moldboard, a box-like pattern arranged in the opening in the moldboard, and a core-box consisting of a bottom and side and end plates, the side and end plates being movably connected to the bottom plate, said parts being held in operative relation to each other by the box-pattern, substantially as set forth.

3. A core-box having in combination a bottom plate and side and end plates carried by the bottom plate, and means whereby the inner and outer edges of each of said plates may be simultaneously shifted an approximately-equal distance, substantially as set forth.

4. A core-box having in combination a bottom plate, arms pivotally mounted on said plate and side and end plates loosely connected to said arms at points distant from their ends, substantially as set forth.

In testimony whereof I have hereunto set my hand.

CHARLES HERMAN.

Witnesses:
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F. E. GAITHER.