(No Model.) 2 Sheets—Sheet 1.

A. BRAKE.

CASTING BRAKE SHOES.

No. 553,098. Patented Jan. 14, 1896.

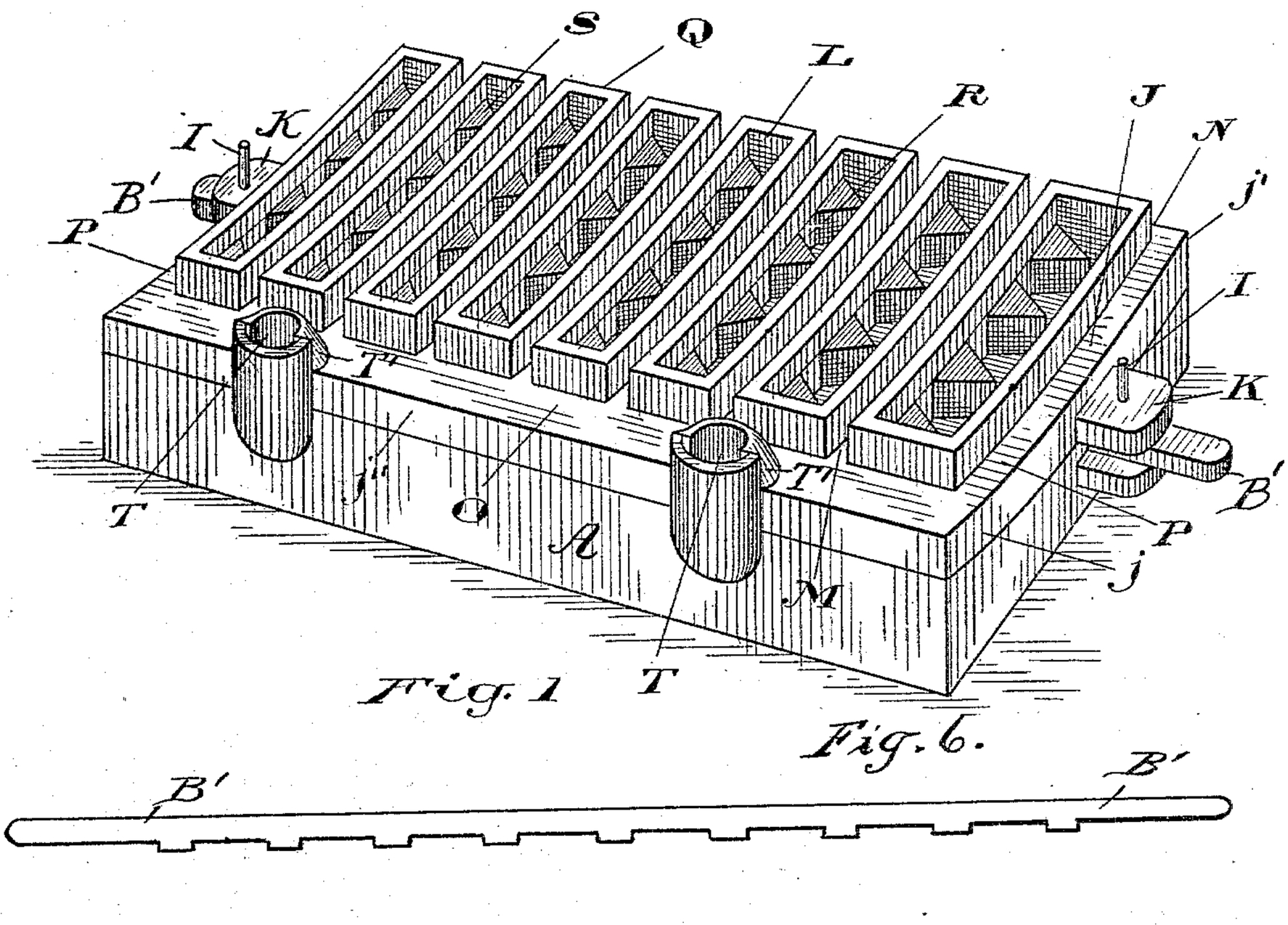

Fig. 1

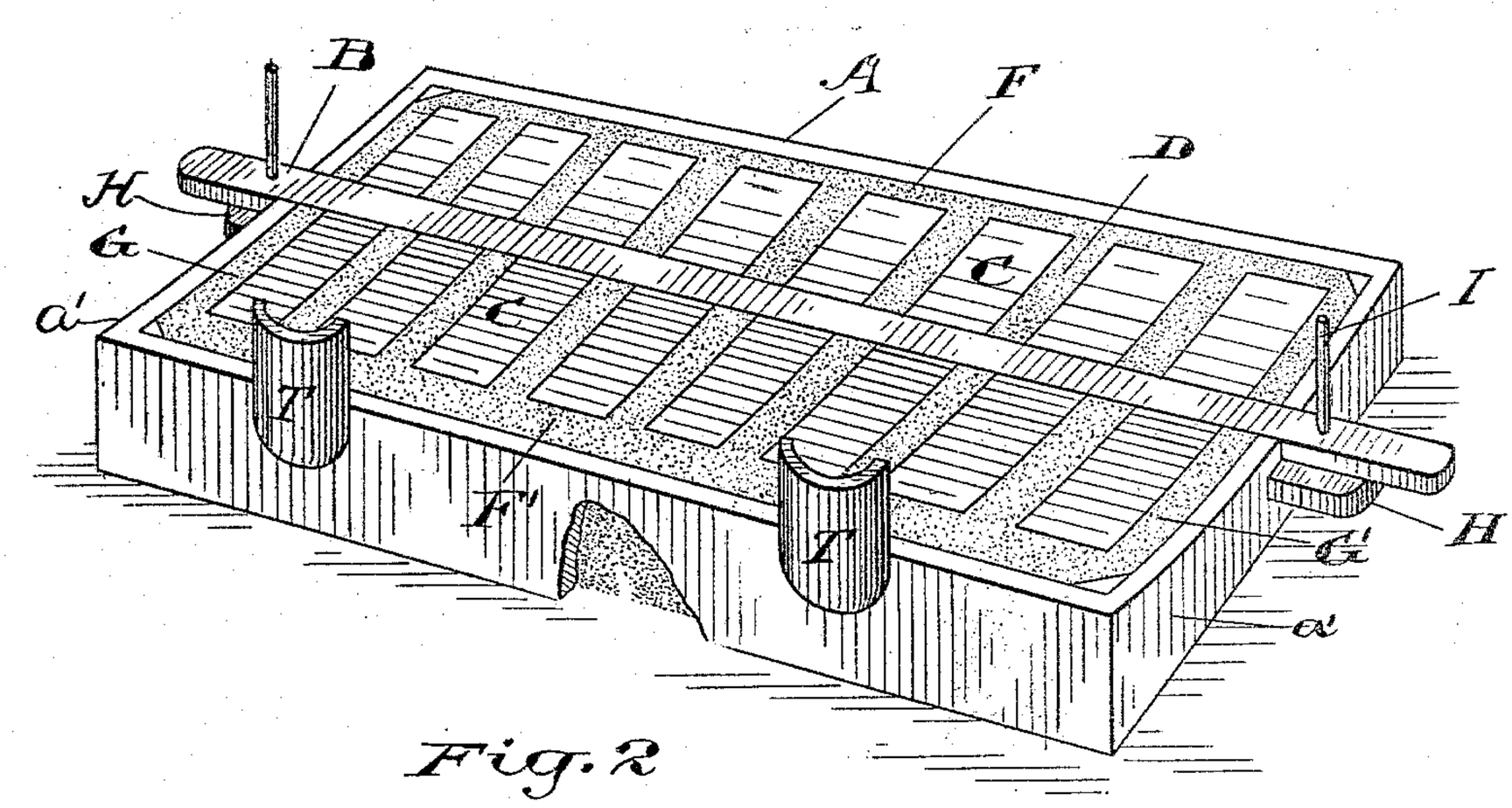

Fig. 6.

Fig. 2

Witnesses
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Inventor
A. Brake
by Curtis
his attorney

(No Model.) 2 Sheets—Sheet 2.

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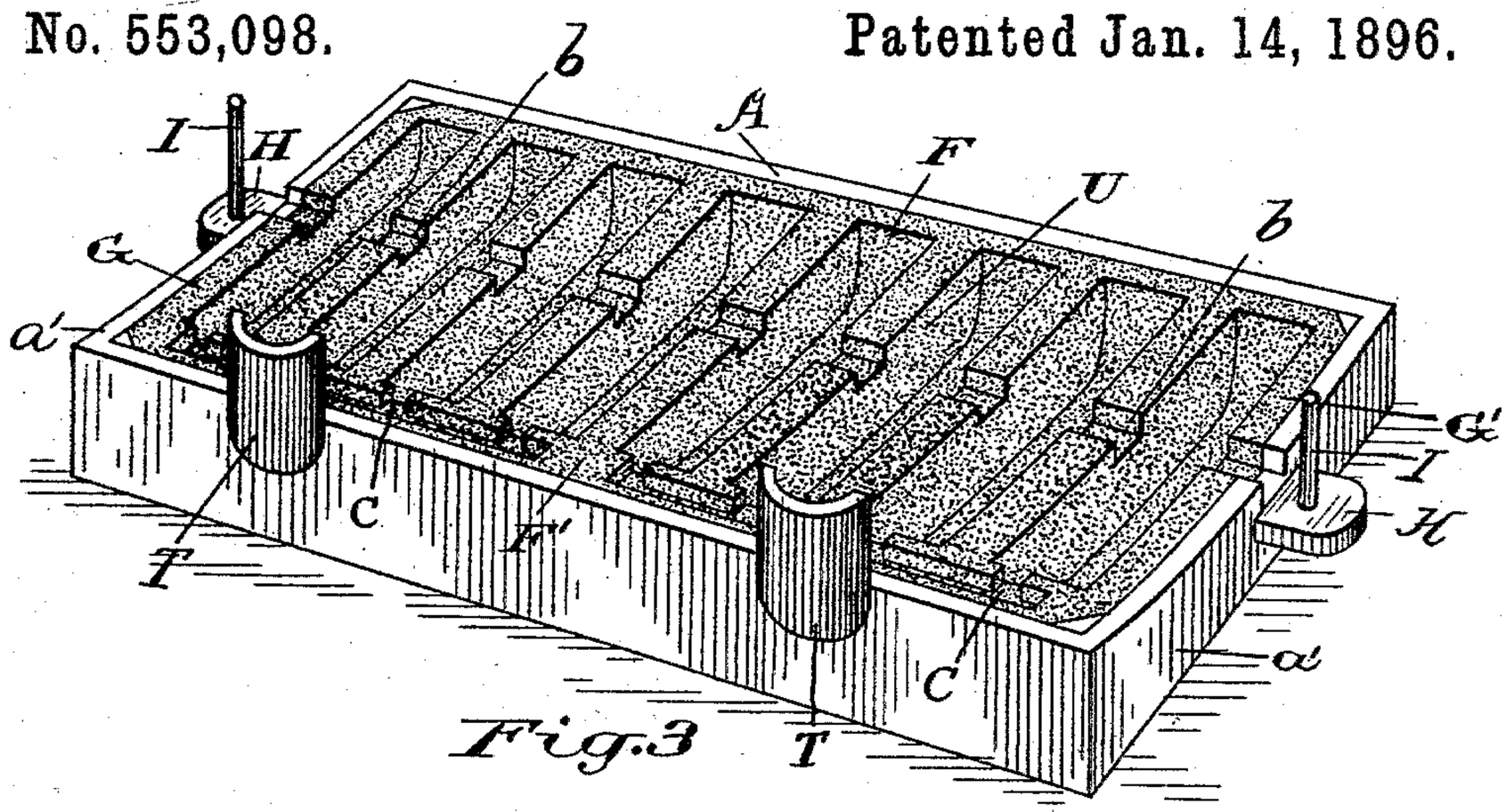

Fig. 3

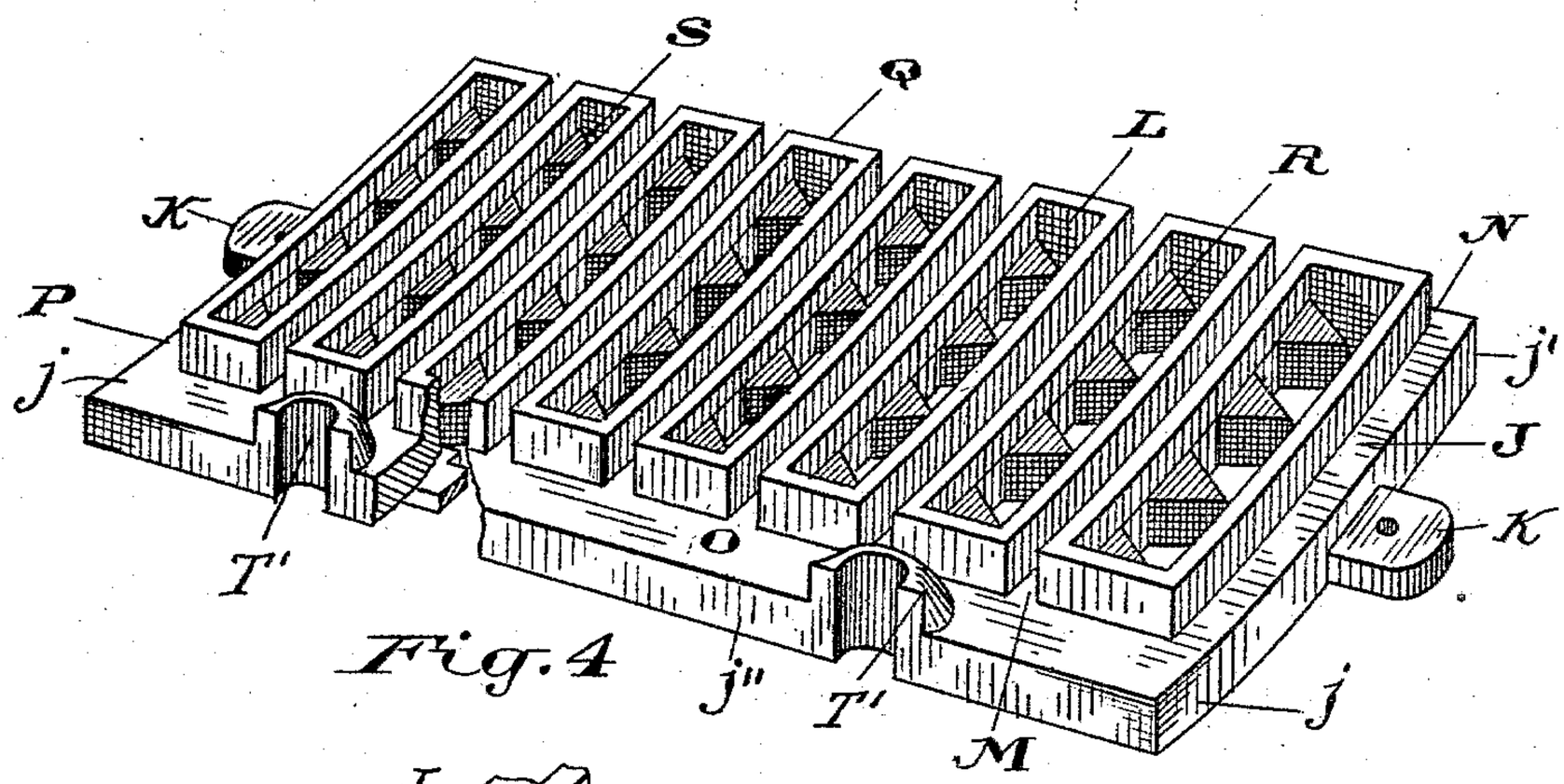

Fig. 4

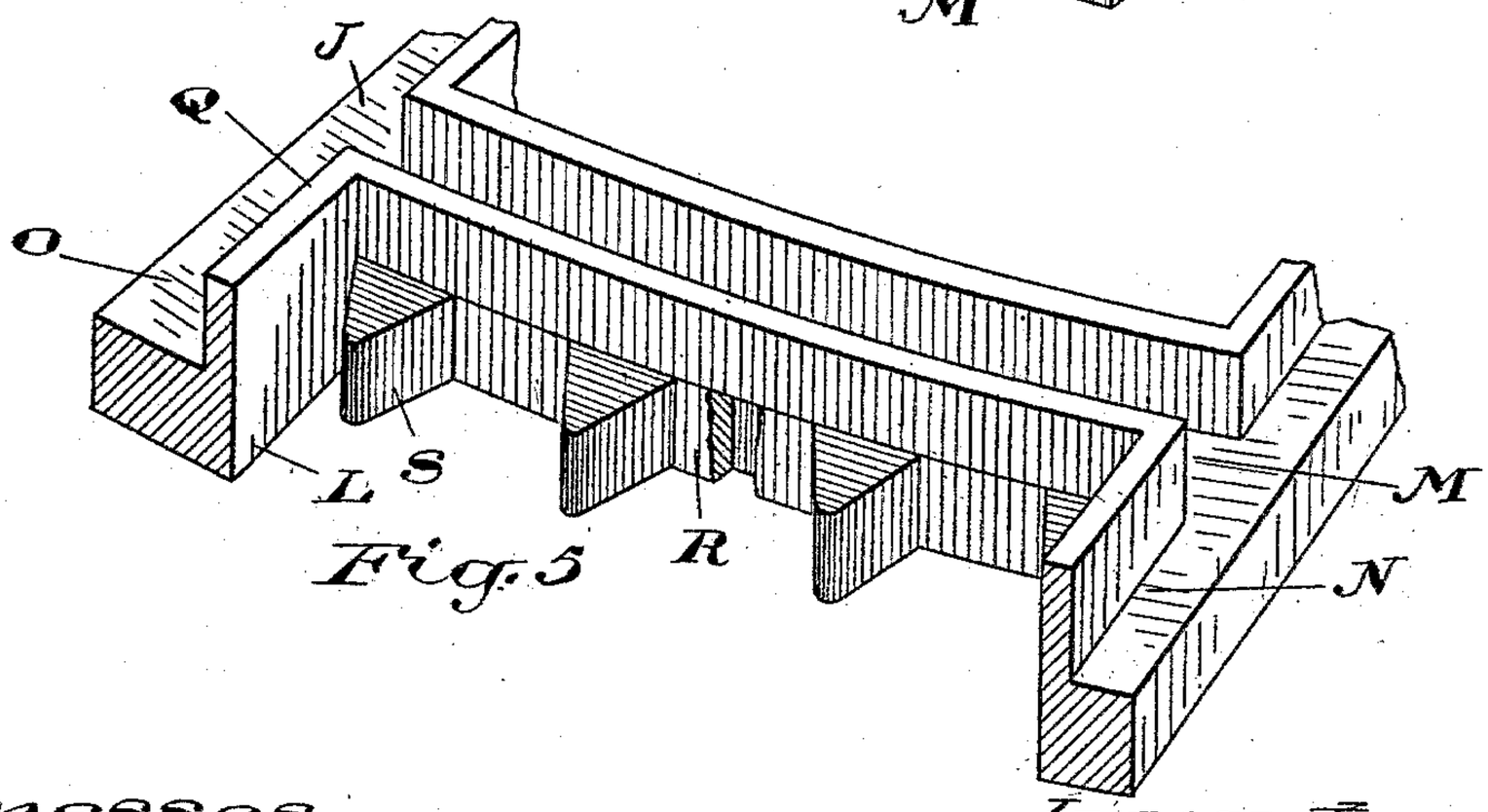

Fig. 5

Witnesses
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Leonard Southdes

Inventor
A. Brake
by C. H. Duell
his Attorney

UNITED STATES PATENT OFFICE.

ARCHIBALD BRAKE, OF TORONTO, CANADA.

CASTING BRAKE-SHOES.

SPECIFICATION forming part of Letters Patent No. 553,098, dated January 14, 1896.

Application filed December 21, 1894. Serial No. 532,611. (No model.)

To all whom it may concern:

Be it known that I, ARCHIBALD BRAKE, of the city of Toronto, in the county of York and Province of Ontario, Canada, have invented a certain new and useful Improvement in Casting Brake-Shoes; and I hereby declare that the following is a full, clear, and exact description of the same.

In the manufacture of brake-shoes the cost of the manufacture is considerably higher than what it should be, owing to the present complicated, slow, and tedious method of arranging the molds for casting the brake-shoes, and this invention relates to a certain new and useful means whereby a considerable saving of time in the construction of molds can be effected, with a consequent saving in the cost of manufacture of the brake-shoes; and the invention consists essentially in arranging a series of shoe-patterns on a bar and providing a drag of sufficient size to receive the series of shoe-patterns and fitting the drag with a metallic cope which will serve the dual purpose of a follow-board and cope, in order that the follow-board may be entirely dispensed with in the construction of the molds and a saving effected of approximately two-thirds of the molder's time, the invention being hereinafter more fully set forth, and more particularly pointed out in the claims.

In the drawings, Figure 1 is a perspective view of the box. Fig. 2 is a perspective view of the drag with the shoe-patterns arranged and tamped therein. Fig. 3 is a perspective view of the drag and mold cavities. Fig. 4 is a perspective view of the cope. Fig. 5 is a detail perspective view showing one of the openings in the cope. Fig. 6 is a detail view of the metallic bar B′, illustrating the projections on the under side thereof.

Like letters of reference refer to like parts throughout the specification and drawings.

The drag A is of ordinary size and shape. Supported in the drag A is a bar B, to which are fastened a series of shoe-patterns C. Between each adjacent pair of shoe-patterns C is an interval D, and between the under side of the shoe-patterns C and the bottom of the drag A is the usual space for sand. The intervals D between each adjacent pair of shoe-patterns C are of a uniform size, and between the ends of the shoe-patterns C and the sides of the drag A are spaces F F′, respectively, and between the outer sides of the end shoe-patterns and the ends of the drag A are spaces G G′, respectively.

Connected to each end *a′* of the drag A is a lug H, and extending upwardly from each of the lugs H is a pin I. The lugs H are located substantially at the middle of each end *a′*, and the pins I pass through the ends of the bar B, in order that the bar may always be in its proper position and the shoe-patterns in the correct position within the drag.

Fitted to the top of the drag A is a metallic cope J. Each end *j* of the cope is provided with an outwardly-extending lug K having the pins I passed through them when the cope is placed on the drag.

The metallic cope J completely covers the top of the drag A, and the under side of the cope J is curved to correspond with the curvature of the shoe-patterns C, in order that the under side of the cope will fit snugly against the top of the shoe-patterns and make a perfect bearing for the molding-sand packed into the spaces D between the shoe-patterns, so that a perfect clearance will be formed at the top of the spaces D for the removal of the shoe-patterns C.

In the top of the cope J are a series of openings L, which correspond in size and location with the size and location of the shoe-patterns C, and between each adjacent pair of openings L is a metallic bar or strip M, and these metallic strips correspond in size and location with the size and location of the spaces D between each adjacent pair of shoe-patterns C. Between the extreme edge *j′* of the cope J and the openings L is a metallic strip N corresponding in size with the space F, and between the opposite edge *j″* is a metallic strip O corresponding in size with the space F′, and at each end of the cope J are metallic strips P corresponding with the spaces G G′ to form a perfect bearing for the molding-sand in the spaces F F′ and G G′. Surrounding each of the openings L is an upwardly-extending metallic flange in order that there will be sufficient depth to the metallic cope J between the top of the flange Q and the under side of the cope J to receive and securely hold the molding-sand within the openings L.

When it is desired to employ chills in conjunction with the cope one side of each of the openings L is fitted to receive a metallic plate R. To each of the plates R are connected a series of chills S. These chills S may be of any suitable size or shape in order to give the required chill to the shoe. By securing the chills S to a plate R and attaching this plate R to the cope it is possible to render the chills interchangeable, and by this means make any style of chilled shoe, and also by securing the chills to a plate which is removably connected to the cope it is possible to entirely remove the chills and cast a soft-metal shoe.

In the operation of the invention the shoe-patterns C are placed within the drag A. The cope J is then fitted to the drag A and the box is turned upside down. The molding-sand is placed in the box from the under side of the drag A and is packed into the spaces D between the shoe-patterns C and into the spaces F F′ and spaces G G′, and into the bottom of the drag, the cope J remaining in place and making a perfect bearing on all of the molding-sand in the spaces. After the molding-sand has been packed into the spaces D and spaces G G′ and the bottom of the box is filled level with the lower edge of the drag the box is turned upside down. After the box has been turned upside down the molding-sand is filled into the openings L in the cope J, the shoe-patterns C making a perfect bearing for the bottom of the molding-sand in the openings L. When the openings L have been packed full of molding-sand the cope is removed to permit of the withdrawal of the patterns from the drag. The gates leading to the molds and through which the molten metal is poured consist of outer semicircular bosses T fixed to or formed on the sides of the drag and inner semicircular vertical bosses T′ fixed to or formed on the side of the cope and set with their edges to align with the edges of the bosses on the drag, substantially as shown in the drawings. To prevent the metal from running into the spaces *b*, or recesses formed in the walls between the molds in the drag by the pattern-bar B, a metallic plate or bar B′, the projecting ends of which are shown in Fig. 1 of the drawings, is arranged across the middle of the cope. This metallic bar B′ has formed on it at proper distances a number of downward-extending projections, as shown in Fig. 6, which are counterparts of the spaces *b* or recesses formed in the walls between the molds, and are designed to accurately fill these spaces. The metallic bar B′, of course, is arranged in the cope with the under face thereof even with the under face of the sand, and so that only the projections extend below the sand to fit in and fill the recesses in the partition-walls of the molds. In the sand of the mold are formed runners or ways C, made in the usual or well-known manner, through which the melted metal finds its way into the molds. The metal then flows into the spaces left by the shoe-patterns C. Above each of the spaces left by the shoe-patterns C is one of the openings L, and as the molding-sand in the openings L is level with the under side of the cope J the metal will rise in the spaces left by the shoe-patterns until it comes in contact with the bottom of the sand in the openings L. The metallic strips M are above the sand walls U between the mold cavities and form a tight contact with the sand walls. It might also be stated that when packing the sand into the box while the shoe-patterns C are within the drag the cope J forms a perfect bearing on all the molding-sand within the drag A and allows of a perfect clearance for the removal of the shoe-patterns C when being withdrawn.

By fitting each of the openings L in the cope J with a series of chills S it is possible to chill the brake-shoes at any desired point.

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

1. A molding apparatus, comprising the drag, a plurality of patterns mounted on a support adapted to set across the drag with the patterns depending in the drag, a cope adapted to serve as a bottom-board and form a perfect support for the mold-sand and provided with openings registering with the mold-patterns in the drag, and a metallic bar arranged across the cope and provided with projections to set in recesses in the sand-walls of the molds, substantially as specified.

2. A molding apparatus comprising a drag having vertical semi-circular gate-pieces formed thereon, a cope to set on the drag and serving the dual purpose of a follow-board and a cope, and provided with semi-circular gate-pieces registering with the gate-pieces on the drag, and a plurality of patterns, mounted on a common support, in the drag, substantially as described.

3. A molding apparatus comprising a drag having vertical semi-circular gate-pieces thereon, a cope to set on the drag and to serve the dual purpose of a follow-board and a cope, and provided with semi-circular gate-pieces to register with and close on the gate-pieces on the drag, and formed with openings, chills supported against the walls of the openings, a plurality of patterns in the drag and a support common to the patterns, substantially as described.

4. The combination with the drag, of a flanged cope to set over the drag, and formed with openings having vertical surrounding flanges extending above the upper surface of the cope, and seats in the walls thereof, and chills secured in the said seats, substantially as and for the purpose specified.

Toronto, October 8, 1894.

A. BRAKE.

In presence of—
C. H. RICHES,
M. A. WESTWOOD.