

(No Model.)

2 Sheets—Sheet 1.

J. HALL.
CASTING MACHINE.

No. 590,148.

Patented Sept. 14, 1897.

FIG. 3.

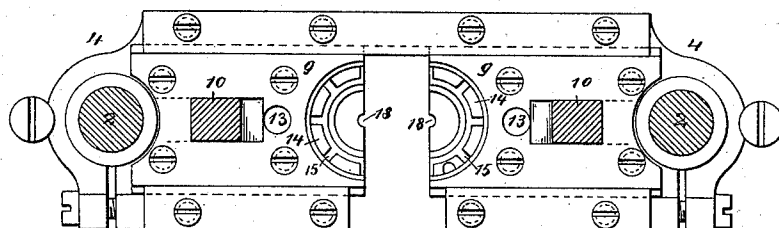


FIG. 1.

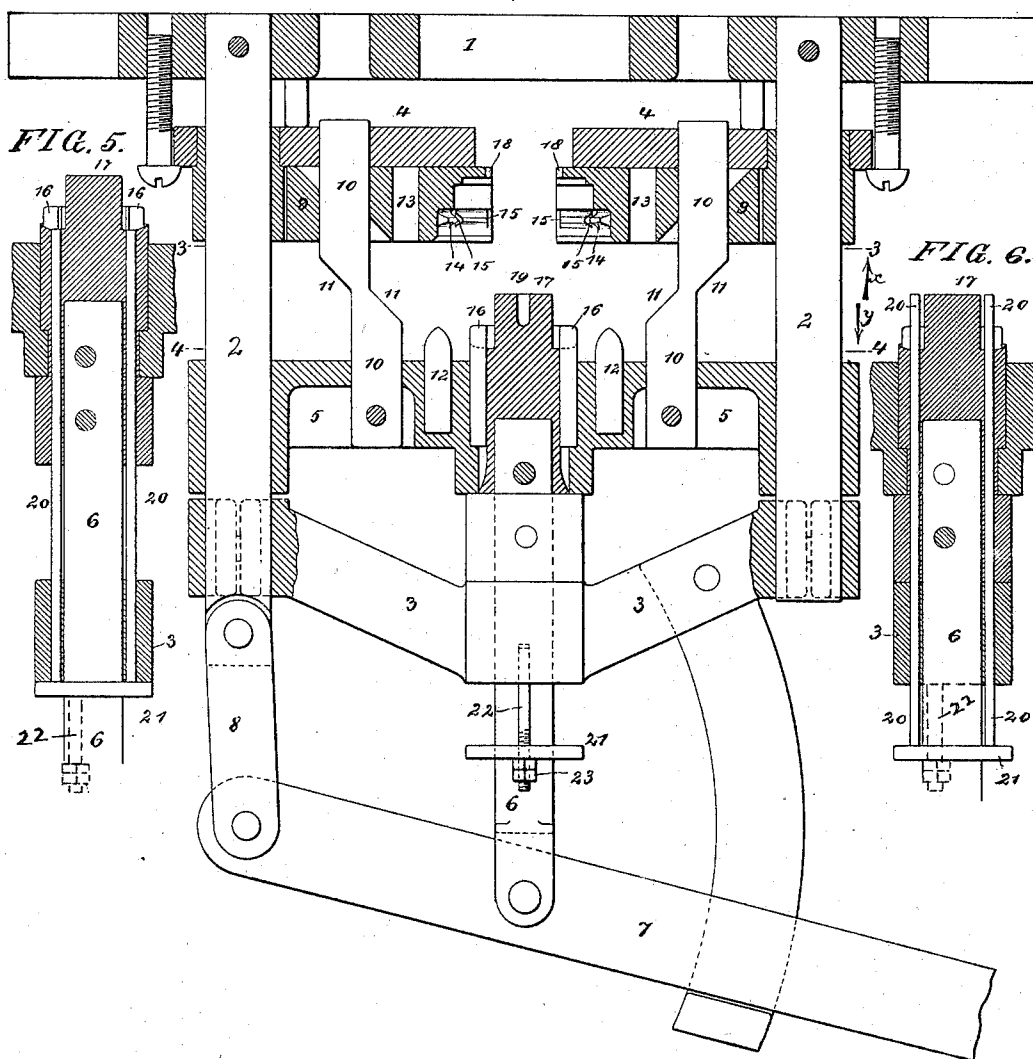


FIG. 5.

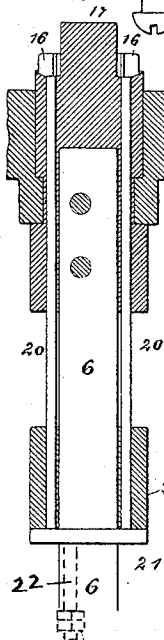
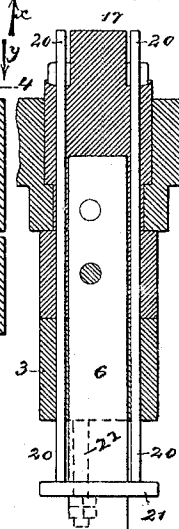


FIG. 6.



Witnesses:
Hamilton D. Turner
Charles De Cou

Inventor:
John Hall
by his Attorneys
Howson & Howson

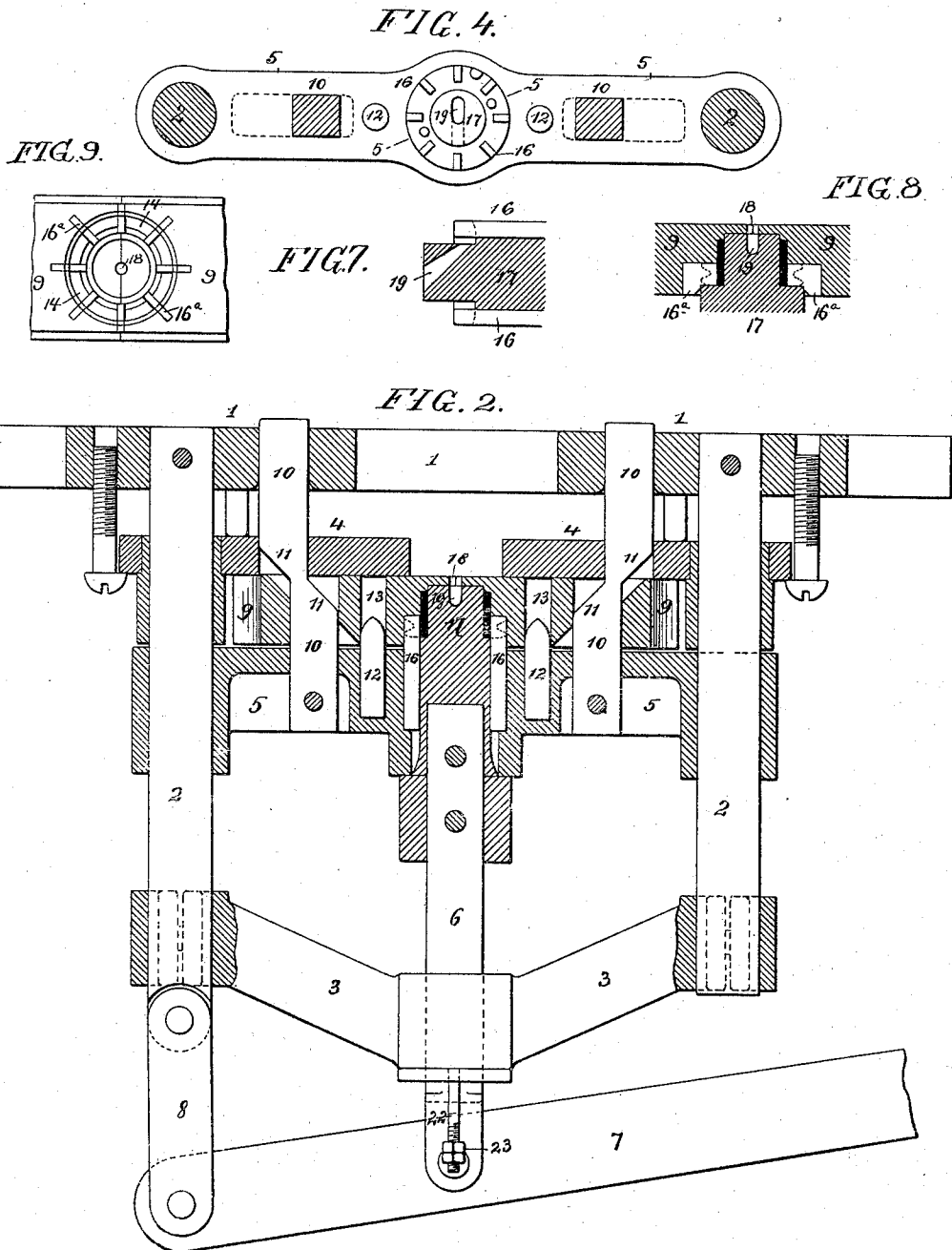
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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

JOHN HALL, OF PHILADELPHIA, PENNSYLVANIA.

CASTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 590,148, dated September 14, 1897.

Application filed December 9, 1895. Serial No. 571,575. (No model.)

To all whom it may concern:

Be it known that I, JOHN HALL, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Umbrella Notch or Runner Molding Machines, of which the following is a specification.

The object of my invention is to construct a mold intended for the rapid production of umbrella notches or runners cast complete at one operation, an object which I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a sectional plan view, partly in elevation, of said improved molding-machine, showing the parts of the mold separated from each other. Fig. 2 is a similar view, but showing the mold closed and the notch or runner cast therein. Fig. 3 is a transverse section on the line 3 3, Fig. 1, looking in the direction of the arrow *x*. Fig. 4 is a transverse section on the line 4 4, Fig. 1, looking in the direction of the arrow *y*. Figs. 5 and 6 are longitudinal sections of part of the machine, taken on the line 5 5, Fig. 4, and showing two different positions of the parts illustrated. Fig. 7 is a sectional view of part of the mold-plunger, and Figs. 8 and 9 are views illustrating a modification.

1 represents a bar from which project outwardly two posts or rods 2 2, carrying at their outer ends a fixed cross bar or yoke 3 and at or near their inner ends a fixed block or plate 4, said rods or posts 2 also serving as guides for the sliding cross-head 5, which carries the mold-plunger and is connected to a central operating-spindle 6, passing through a bearing in the fixed cross-head 3 and connected at its outer end to a suitable operating-lever 7, which is hung by a link 8 to the outer end of one of said posts 2, as shown in Figs. 1 and 2.

Suitably guided in ways or grooves upon the plate 4 are opposite sliding matrices 9, each of which has a transverse opening, partly inclined and partly straight, for the reception of a cam-bar 10, carried by and moving with the sliding cross-head 5, the inclined surfaces 11 of said cam-bars acting upon the respective inclined surfaces of the matrices 9 in such manner that when the cross-head is thrust forward said matrices will be moved inward to-

ward each other until their inner edges meet, as shown in Fig. 2, while on the retraction of the sliding cross-head 5 the matrices will be drawn apart, as shown in Fig. 1. Both when in the closed position, Fig. 2, and in the open position, Fig. 1, the matrices are locked against any further lateral movement by the engagement of the straight portions of the cam-bars 10 with the corresponding straight portions of the matrices, as will be readily understood on reference to Figs. 1 and 2.

When the matrices are closed, further locking of the same, as well as accurate adjustment of one to the other, is insured by the engagement of projecting pins 12 on the cross-head 5 with openings 13 in the matrices, said pins 12 having pointed or beveled ends, so as to readily enter the openings 13, the pins being properly centered in said openings when the matrices are closed and are in proper register with each other.

The inner faces of the matrices are shaped to accord with the desired exterior configuration of the notch or runner to be produced, and they have inwardly-projecting rib-sections 14, separated from each other by slots 15, intended to receive projecting core-plates 16 on the mold-plunger 17, the latter having a central cylindrical projection or core-block for forming the bore of the notch or runner.

The matrices 9 have recesses 18 in their meeting edges, so as to form an opening for the admission of the molten metal from which the notch or runner is to be cast, this metal being forced under pressure from a suitable reservoir through a spout terminating against the matrices, as in an ordinary type-casting machine.

In the central core-block of the mold-plunger is a channel 19, extending inwardly and terminating at one side of said core-block, so that when the mold is closed, as shown in Fig. 2, the metal will be discharged laterally into the space between the said core-block and the surrounding walls of the matrices, the said channel being preferably tapering from the inner to the outer end.

Adapted to slide in longitudinal openings in the mold-plunger carried by the cross-head 5 are pins 20, which are connected at their outer ends to a ring or collar 21, surrounding the spindle 6 at a point beyond the fixed bar

or yoke 3, and projecting downward from the central bearing on said cross bar or yoke are a pair of studs 22, threaded at their lower ends for the reception of nuts 23, these studs passing through openings in the ring or collar 21.

The pins 20 fit snugly in the openings of the mold-plunger. Hence the latter has such frictional hold upon said pins that they will move with said plunger, except when their movement is prevented by contact of the ring 21 either with the central bearing of the cross-bar 3 on the forward movement or with the nuts 23 on the studs 22 on the backward movement.

The operation of the machine thus constructed is as follows: Starting with the parts in the position shown in Fig. 1 it will be observed that the matrices are separated and the mold-plunger 17, carried by the cross-head 5, is withdrawn, the pins 20 being projected even with the top of the central core-block by reason of the contact of the ring or collar 21 with the nuts 23 at the outer ends of the studs 22. By manipulating the lever 7 the spindle 6 and cross-head 5 are moved forward, the latter carrying with it the mold-plunger 17, the pins 12, and the cam-bars 10. The first effect of the movement is to cause the cam-bars to act upon the matrices so as to close the same together, the pins 12 then entering the openings 13 in the matrices, as shown in Fig. 2. Meantime the central core-block and core-plates 16 have assumed their proper positions within the matrices, said core-plates 16 entering the slots 15 between the rib-sections 14 of said matrices and the central core-block seating itself snugly in the socket formed for it in the matrices when the latter are closed, thus forming between the walls of the matrices and the central core-block an annular space expanded at one end for the reception of the rib-sections 14 and core-plates 16, so that when the metal is forced into the mold through the central core-block it will form a tube with notched and grooved flange or collar at one end of the same. As the cross-head 5 is projected the motion of pins 20 is arrested by contact of the ring or collar 21 with the central bearing on the fixed cross-bar 3, as shown in Fig. 5, so as not to interfere with the proper molding of the grooved and slotted flange or collar at the end of the notch or runner. As soon as the casting has been completed the cross-head 5 is withdrawn, the first effect of this operation being to partially withdraw the central core-block and core-plates 16 from the molded notch or runner and then to separate the matrices, so as to permit of the withdrawal of the notch or runner with the mold-plunger as the rearward movement continues, the collar 21 at the outer ends of the pins 20 finally striking the nuts 23 of the studs 22, so as to cause an arrest of movement of said pins while the cross-head continues to move rearward, whereby the pins thrust the molded

notch or runner from the central core-block and permit it to fall therefrom into a suitable receptacle.

The first outward movement of the core-block while the molded notch or runner was still held in the matrices 9 effects the shearing off of the gate contained in the chamber 19 of said core-block, and owing to the tapering form of said chamber and gate the latter will readily free itself from the chamber when the core is fully withdrawn.

In some cases strips or plates for forming the notches in the grooved flange or collar of the notch or runner may be carried by the matrices instead of by the plunger, such construction being shown at 16^a in Figs. 8 and 9.

By means of my improved machine I am enabled to produce with great rapidity and by a single operation a perfectly-formed notch or runner having a true central opening or bore, a tube of uniform thickness, and a flange or collar with accurately-finished groove and notches, so that the cost of manufacture is very materially reduced as compared with the ordinary plan of casting, boring, turning, and milling.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. An umbrella notch or runner molding machine in which are combined laterally-separable matrices having therein transverse openings, the inner and outer walls of which are partly straight or at right angles to the line of movement of the matrices, and partly beveled or inclined at an angle other than a right angle to such movement, and a longitudinally-reciprocating cross-head carrying a mold-plunger and cam-bars, said cam-bars passing through the openings in the matrices and having sides partly straight or parallel with the direction of movement of the cross-head and partly beveled or inclined at an angle other than a right angle to such movement whereby as the cross-head is reciprocated the matrices will be caused to move from and toward each other and will be locked in both the advanced and retracted positions, substantially as specified.

2. An umbrella notch or runner molding machine in which are combined laterally-separable matrices having openings therein laterally beyond the molding-openings, and a longitudinally-reciprocating cross-head carrying a mold-plunger and having cam-bars for effecting the closing and separation of said matrices, and centering-pins one on each side of the plunger adapted to enter the openings in the matrices when the same are closed, substantially as specified.

3. An umbrella notch or runner molding machine in which are combined laterally-separable matrices each having a series of spaced ribbed sections formed therein, core-strips separating said ribbed sections one from another and a mold-plunger reciprocating in a plane at right angles to the movement of the

matrices and having a projecting core-block for forming the bore of the notch or runner, the projecting portion of said core-block being free from contact with the inner edges of the core-strips, substantially as specified.

4. An umbrella notch or runner molding machine in which are combined separable matrices each having rib-sections with intervening slots and a reciprocating mold-plunger having a central projecting core-block and projecting core-strips, the latter being adapted to enter the slots between the rib-sections of the matrices, substantially as specified.

5. An umbrella notch or runner molding machine provided with laterally-separable matrices having end portions which unite to close the end of the mold when the matrices are in contact with each other, but having openings for the passage of the molten metal, in combination with a laterally-reciprocating mold-plunger having a central projecting core-block with channel therein for the passage of metal into the mold, said channel being adapted to register with the openings in the ends of the matrices, substantially as specified.

6. An umbrella notch or runner molding machine provided with laterally-separable matrices having end portions which unite to close the end of the mold when the matrices are in contact with each other, but having openings for the passage of the molten metal, in combination with a laterally-reciprocating

mold-plunger having a central projecting core-block with channel therein for the passage of metal into the mold, said channel being adapted to register with the openings in the ends of the matrices, and being flared from the inner to the outer end, substantially as specified.

7. An umbrella notch or runner molding machine in which are combined separable matrices, the reciprocating mold-plunger, sliding ejector-pins guided in said plunger, and suitable stops therefor, whereby the movement of the ejector-pins with the mold-plunger in either direction is arrested before the said mold-plunger reaches the limit of its movement, substantially as specified.

8. An umbrella notch or runner molding machine in which are combined separable matrices, a reciprocating mold-plunger, ejector-pins guided in said plunger and having a flange or collar at the outer ends, a stop for arresting said flange or collar on the inward movement of the mold-plunger, and projecting studs having nuts for arresting the movement of the flange or collar on the outward movement of said mold-plunger, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN HALL.

Witnesses:

FRANK E. BECHTOLD,
JOS. H. KLEIN.