

Nov. 5, 1929.

F. E. McCABE

1,734,175

MOLD CARRIER

Original Filed Sept. 19, 1925 4 Sheets-Sheet 1

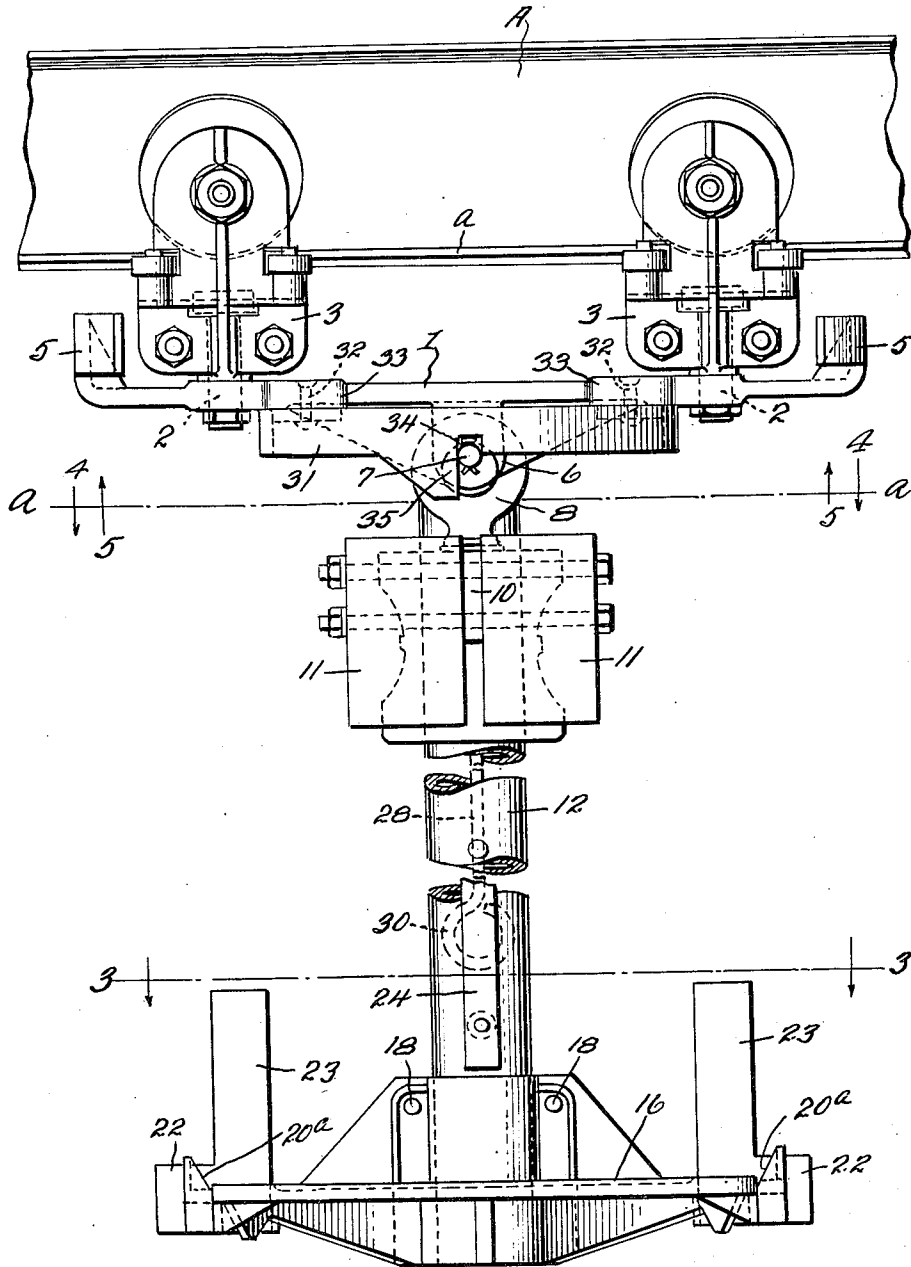


Fig. 1

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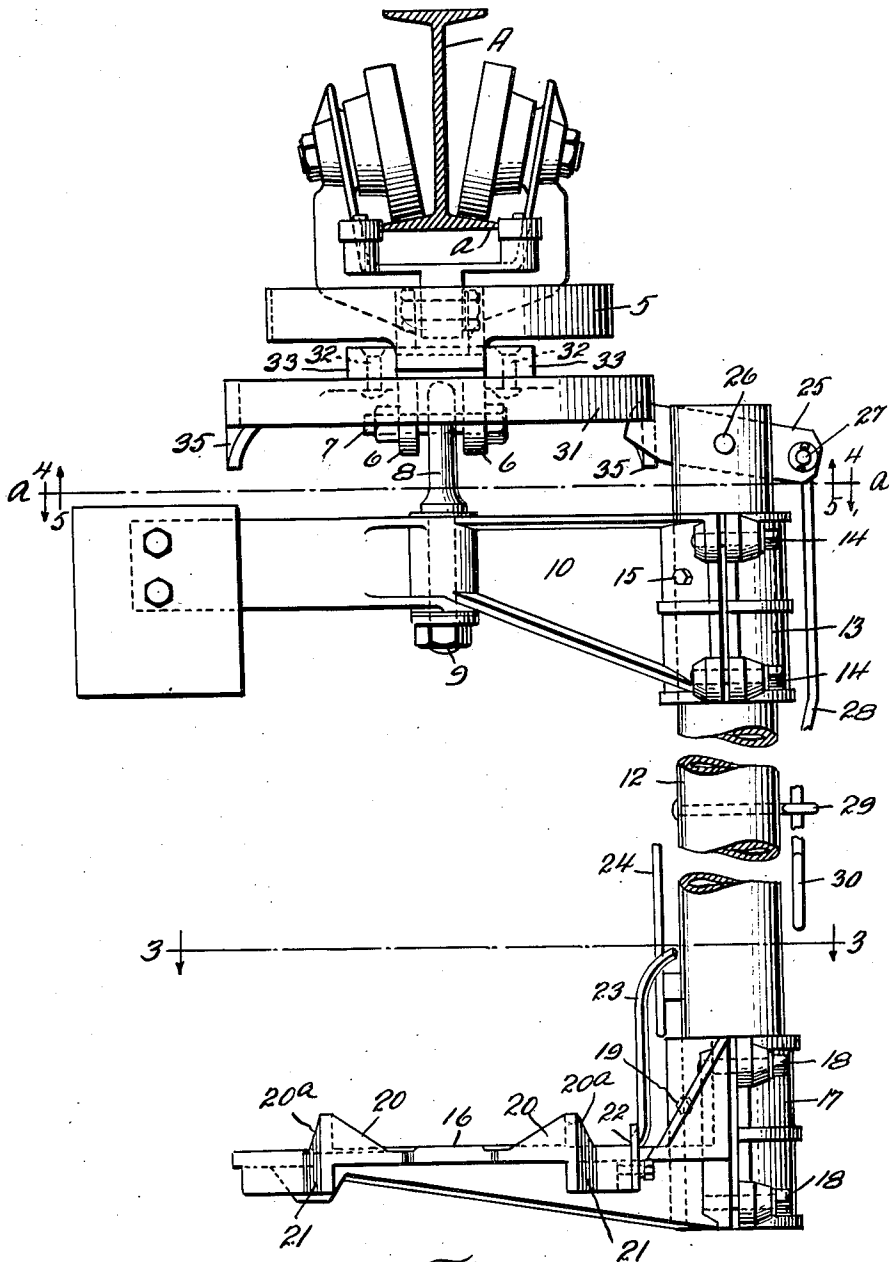
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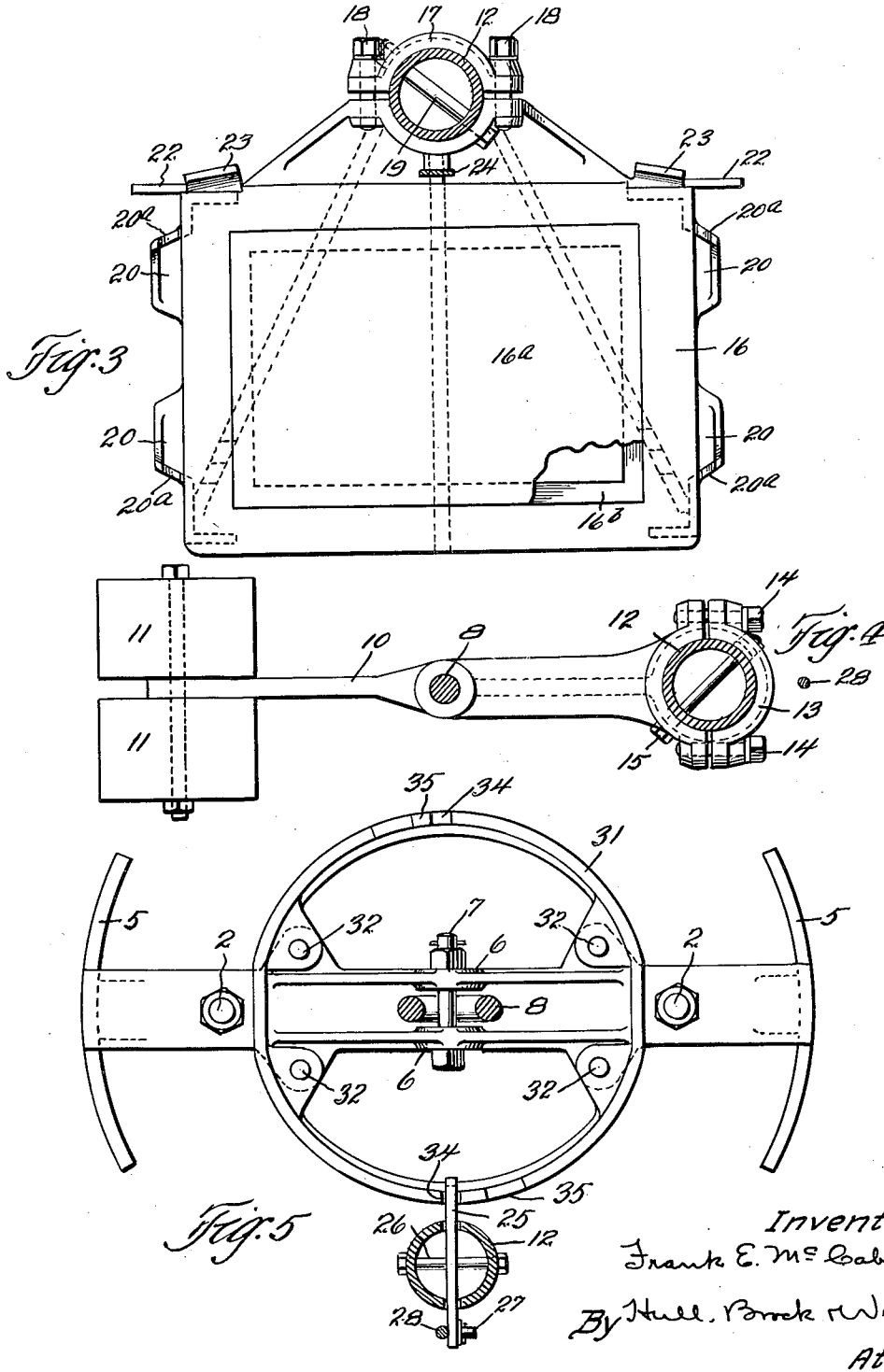
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MOLD CARRIER

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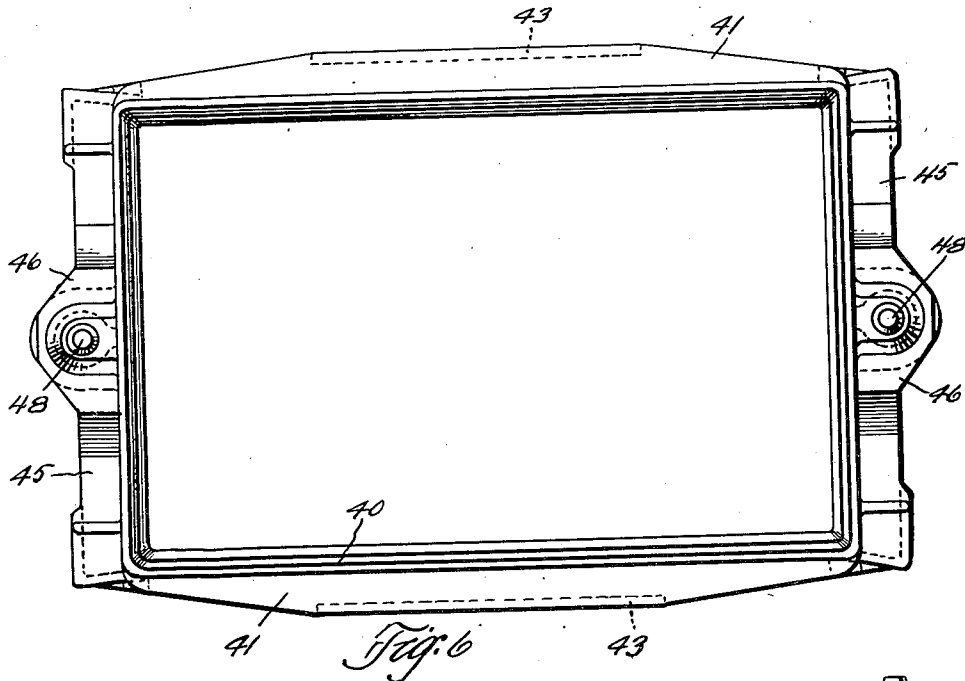
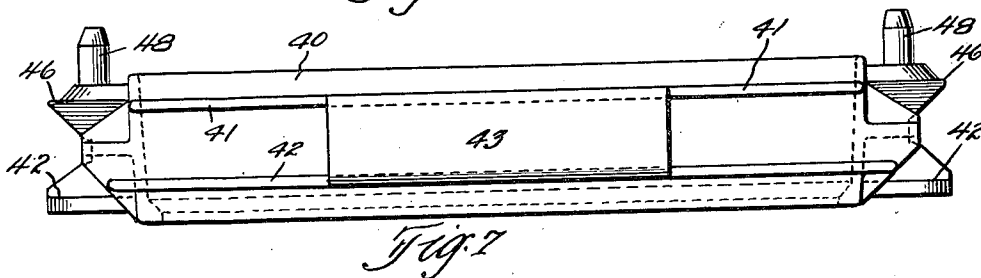
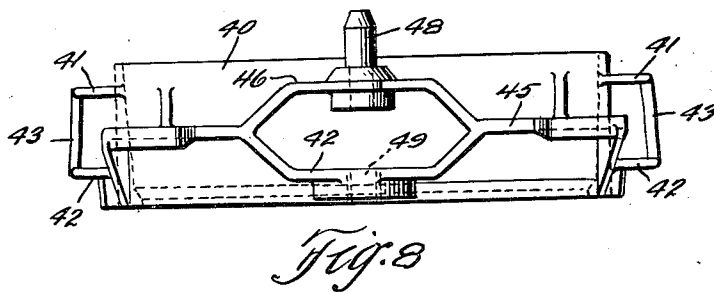
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MOLD CARRIER

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UNITED STATES PATENT OFFICE

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MOLD CARRIER

Original application filed September 19, 1925, Serial No. 57,333. Divided and this application filed March 25, 1927. Serial No. 178,253.

This invention relates to a mold carrier that is especially suitable for use in molding systems of the class to which my former application Serial No. 57,333, filed September 19, 1925, relates; the present case being a division of said application.

The system to which reference is made involves a mold forming station, a pouring station, a shake-out station, and an overhead track which extends past all said stations and, for reasons peculiar to the system, the track branches and passes on opposite sides of the pouring station. This arrangement requires that the carriers which transport the molds past the various stations be capable of turning so that the molds sustained thereby may be brought in proper relation to the opposite sides of the pouring station and thereafter faced in the same direction preparatory to delivery to the shake-out station.

The objects of the invention are to provide a very substantial and relatively simple mold carrier for use in systems of the aforesaid class that is especially convenient of handling and by means of which a stack of molds may be easily transported through the various stations; to provide a construction wherein the mold sustaining part of the carrier is rotatable with respect to its supporting structure; to provide latch mechanism that is simple, dependable and easily operated for maintaining the rotatably suspended structure in given positions with relation to the supporting structure; to provide a mold carrier that will readily negotiate relatively sharp curves in a track; to provide in a mold carrier a flask support or platform that is designed to so cooperate with the flasks that their correct position upon the platform is insured without special care on the part of the operator; and to provide means for properly spacing from each other adjacent carriers upon the track.

A further object is to provide the mold platform of the carrier with a removable face plate so that in case the molten metal poured into the molds welds to the plate, the plate may be removed and a fresh one substituted so that the carrier is not thus tem-

porarily put out of commission and the normal operation of the system disturbed.

These and other objects which will appear as this description proceeds are attained in the embodiment of the invention illustrated in the accompanying drawings wherein Fig. 1 is a front elevation, and Fig. 2 a side elevation, of my improved mold carrier; Fig. 3 is a sectional plan on the lines 3—3 of Figs. 1 and 2; Figs. 4 and 5 are horizontal sections on the line *a—a* of Figs. 1 and 2, Fig. 4 being taken as though looking in the direction of the arrows 4, 4, and Fig. 5, as though looking in the direction of the arrows 5, 5; and Figs. 6, 7 and 8 are a plan view, a side elevation, and an end elevation, respectively, of the mold flask that is designed for use with the carrier.

The overhead track on which the carriers travel is preferably in the nature of an I-beam, and the same is designated A in Figs. 1 and 2. The carrier comprises a beam 1 that is suspended, through swivel bolts 2, from trolleys 3 that ride upon the bottom flanges *a* of the I-beam whereof the track A is composed. These trolleys are of standard construction and swing easily with respect to the beam 1 so that in negotiating curves and passing through switches, no difficulty is experienced. At its opposite ends, the beam 1 is formed with bumpers 5 which are adapted to engage the like parts of adjacent carriers and thus limit the distance within which one carrier may approach another. Supported by and between ears 6 that depend from the middle portion of the beam 1 is a bolt 7 that is engaged through the eye 8 of a king bolt 9 on which is swiveled a head 10. Counterbalancing weights 11 are applied to one end of the head 10, while the opposite end of the head is formed for application to a tubular column 12, the column being clamped between the head and a cap 13 that is applied thereto and secured in place by screws 14. The parts are relatively positioned by a bolt 15 which passes through registering apertures in the head, column and cap.

Similarly connected to the lower end of the column 12 is a mold or flask support or platform 16, the cap, screws and positioning bolt

associated with said support being designated, respectively, by the reference numerals 17, 18 and 19. The support 16 is, generally, in the nature of a flat shelf, and at its ends has guides 20 for properly positioning the flask thereon, as will more clearly appear hereinafter. It will be observed from Fig. 2 that walls 21 of said guides depend a material distance below the top plane of the support, and spaced from the walls 21, that are located adjacent the rear side of the support, are stop lugs 22 which extend beyond and are substantially in line with the rear edge of the support. Rising from the rear corners of the support are guides 23 which have their upper ends curved rearwardly, said guides assisting in properly positioning the flask with respect to the support as it is lowered thereon. A guide strip 24 is applied to the front side of the column 12 and extends from a point somewhat below the upper ends of the guides 23 to an elevation equal to or somewhat above the level of the topmost flask of the stack of molds that is adapted to be supported by the carrier.

As previously mentioned, it is necessary at certain stages in the operation of the system to turn the molds, and this is accomplished by virtue of the rotatable connection between the supported and supporting portions of the carrier that is effected through the king bolt 9, and it may be explained that the angle of rotation between said portions required to meet the needs of the system is substantially 180°. Latch mechanism which I shall now describe is employed for properly locating and holding the mold sustaining part of the carrier in its two extreme positions.

Above the head 10, the column 12 has a kerf, and a latch bar 25 is pivotally supported therein upon a pin 26. To the outer end of the latch bar is articulated, as at 27, the upper end of the latch rod 28 which is guided near its lower end through an eye 29, carried by the column. The rod terminates at its lower end in a ring or handle 30 by means of which it may be elevated. The weight of the rod normally maintains the latch bar 25 in the position shown in Fig. 2. The inner end of the latch bar cooperates with a latch ring or element 31 that is shown secured, as by rivets 32, to ears 33 that are formed on the beam 1. At diametrically opposite points the latch ring is provided with notches 34 for the reception of the inner end of the latch bar; and to facilitate the registering of the latch bar with the notches the ring is provided with stop lugs 35 that are engaged by the bar when the same is in line with the notches. These stop lugs limit the rotation of the suspended structure precisely to a movement of 180°, and the operator is thus relieved of having to pay attention to the positioning of the parts.

A flask especially designed for use with the

carrier is illustrated in Figs. 6, 7 and 8 and the same comprises a rectangular frame 40 which is stiffened along each side by top and bottom flanges 41 and 42 that are connected together intermediate their ends by a web 43. This effects a sort of tubular formation for the longer sides of the flask which, while being light, is very strong. The end walls of the frame are strengthened by flanges 45 which divide at their centers into top and bottom branches 46 and 47, respectively, the former being provided with dowel pins 48 and the latter with openings 49 that are arranged to receive the dowel pins of the flask therebelow when the flasks are stacked one upon another. In placing the flasks upon the support or platform 16, the bottom one is properly positioned longitudinally of the support by means of the upwardly diverging walls 20^a of the guides 20 that are located at the opposite ends of the support, and in a fore-and-aft direction by the engagement of its rear side with the guides 23. The flasks thereabove are aligned by means of their dowel pins 48, and registry of the dowel pins of one flask with the socket of the one above is enhanced by the guide strip 24, the flasks, when being placed in position, being engaged with said strip and then lowered onto the pins of the flask below. The previously mentioned stop lugs 22 and walls 21 serve as locating means for the pick-up yoke of the shake-out apparatus that constitutes a part of my molding system, as will be seen by reference to my above mentioned application.

It sometimes happens that the molten metal that is poured into the molds, and finds access through the sprue to the mold support, welds to the support and causes considerable difficulty in removing the castings and flasks. This is especially serious when it occurs in the equipment of a molding system as it disturbs to some extent the operation of the whole system. I meet this situation in connection with my mold carrier by constructing the platform or support 16 with a removable face plate 16^a, the same being shown as set within a recess or rabbet 16^b of the frame like structure of the platform and as having its top surface flush with the corresponding surface of said structure. Upon occurrence of the above difficulty, the face plate is removed with the flasks and castings and another is substituted without interruption of the operation of the system.

Attention is also called to the loose connection between the head 10 and the beam 1 effected through the enlarged eye 8 of the king bolt 9 that loosely encircles the bolt 7 from which it is supported. This allows the suspended structure to swing freely with respect to the supporting structure, relieving the parts of any strains which would otherwise be imposed upon them and insuring easy operation of the trolleys along the track.

When the suspended structure swings generally in the plane of the latch bolt 25, said bolt rocks on its pivot; and the notches 34 in the latch ring 31 are sufficiently wide to prevent clamping or twisting of the latch bolt when the structure swings generally in a direction at right angles to the aforesaid plane. This loose connection between the head 10 and beam 1 has a further important advantage in that it functions as a shock absorber between the beam and the suspended molds when, through carelessness or accident, adjacent carriers are allowed to collide with considerable force, it being remembered that the beams of adjoining carriers are free to engage each other through their rigid bumpers 5. If the full force of the shock or jar resulting from such impact were transmitted to the molds, it would damage the mold cavities.

Having thus described my invention, what I claim is:—

1. A mold carrier for use in a molding system involving a track, said carrier comprising a trolley movable along the track, a mold support rotatably sustained by the trolley, and latch mechanism for locking said support in different positions with respect to the trolley.
2. In a mold carrier for use in a molding system involving an overhead track, a trolley on said track, a member sustained by the trolley, a mold support rotatably suspended from said member, and latch mechanism for locking the support in different positions with respect to the member.
3. In a mold carrier for use in a molding system involving an overhead track, a trolley structure on said track, a king bolt depending from said structure, a head swiveled on said bolt, a column depending from the head, and a mold support attached to the lower end of the column.
4. In a mold carrier for use in a molding system involving an overhead track, a trolley structure on said track, a king bolt depending from said structure, a head swiveled on said bolt, a weight applied to one end of the head, a column depending from the opposite end of the head, and a mold support attached to the lower end of the column.
5. In a mold carrier for use in a molding system involving an overhead track, a trolley structure on said track, a king bolt depending from said structure, a head swiveled on said king bolt, a column depending from the head, a mold support carried by the lower end of the column, a latch element supported by the trolley structure, and a second latch element supported adjacent the head, said latch elements cooperating to hold the head and the parts supported thereby in given angular positions with respect to the trolley structure.
6. In a mold carrier for use in a molding

system involving an overhead track, a trolley structure on said track, a king bolt depending from said structure, a head swiveled on said king bolt, a column depending from the head, a mold support carried by the lower end of the column, a latch element supported by the trolley structure, a second latch element supported adjacent the head, said latch elements cooperating to hold the head and the parts supported thereby in given angular positions with respect to the trolley structure, and means extending downwardly alongside the column for actuating the latch comprised of the aforesaid latch elements.

7. In a mold carrier for use in a molding system involving an overhead track, trolleys supported by and spaced apart along said track, a beam to which said trolleys are swiveled, a king bolt depending from said beam, a head swiveled on said bolt, a column secured to and depending from the head, a mold support carried by the lower end of the column, a latch member secured to the aforesaid beam, said member having notches, a latch bolt movably carried by the upper end of the column and arranged to enter the notches of the latch member when brought into register therewith, and an operating means connected to the latch bolt.

8. In a mold carrier for use in a molding system involving an overhead track, trolleys supported by and spaced apart along said track, a beam to which said trolleys are swiveled, said beam being provided with a bumper at each end projecting beyond the adjacent trolley, a king bolt depending from said beam, a head swiveled on said bolt, a column secured to and depending from the head, a mold support carried by the lower end of the column, a latch ring secured to the aforesaid beam and which is substantially concentric with the king bolt, said ring having substantially diametrically opposed notches, stops adjacent said notches, a latch bolt pivotally carried by the upper end of the column, one end of which is arranged to enter the notches of the latch ring when brought into register therewith, and an operating rod connected to and depending from the opposite end of the latch bolt.

9. A mold carrier for use in a molding system involving a track, said carrier comprising a trolley movable along the track, a mold support swingably and rotatably suspended from the trolley, and latch mechanism for holding the support in different orientated positions with respect to the trolley.

10. A mold carrier for use in a molding system, involving a track, said carrier comprising a trolley structure movable along the track, mold supporting means swingably and rotatably suspended from the trolley structure, and latch mechanism having cooperating parts carried respectively by the trolley structure and mold supporting means and

yieldable with respect to each other to allow for relative swinging movement between the mold supporting means and the trolley structure.

5 11. In a mold carrier for use in a molding system involving an overhead track, a trolley structure on said track, a king bolt having an eye that is loosely engaged about a part carried by the trolley structure, and mold supporting means swiveled on said bolt.

10 12. In foundry apparatus, a track, a mold carrier mounted on said track, a mold support pivotally mounted on said carrier, and an inter-locking means associated with said carrier and said support for securing said support in different positions relative to said carrier whereby the position of the support relative to the carrier may be adjusted to correspond with the position of the carrier on the track.

20 13. In foundry apparatus a mold carrier system comprising a track, separate carriers mounted on said track, means comprising bumpers for spacing said carriers on said track, and compensating means for avoiding shock or damage to molds when said bumpers collide.

25 14. In foundry apparatus a mold carrier system comprising a track, a plurality of individual carriers mounted on said track, bumpers on said carriers, mold supports carried by said carriers, and a flexible mounting between said supports and said carriers whereby the supports may move freely and avoid shock or damage to the molds when movement of the carrier along the track causes the bumpers of adjacent carriers to collide with each other.

30 15. In foundry apparatus a mold carrier system comprising a track, trolleys mounted on said track, mold supports suspended from said trolleys, bumpers on said trolleys, and a universal joint between said support and said trolley whereby the support may swing freely when bumpers collide and avoid damage to the molds.

45 In testimony whereof, I hereunto affix my signature.

FRANK E. McCABE.

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