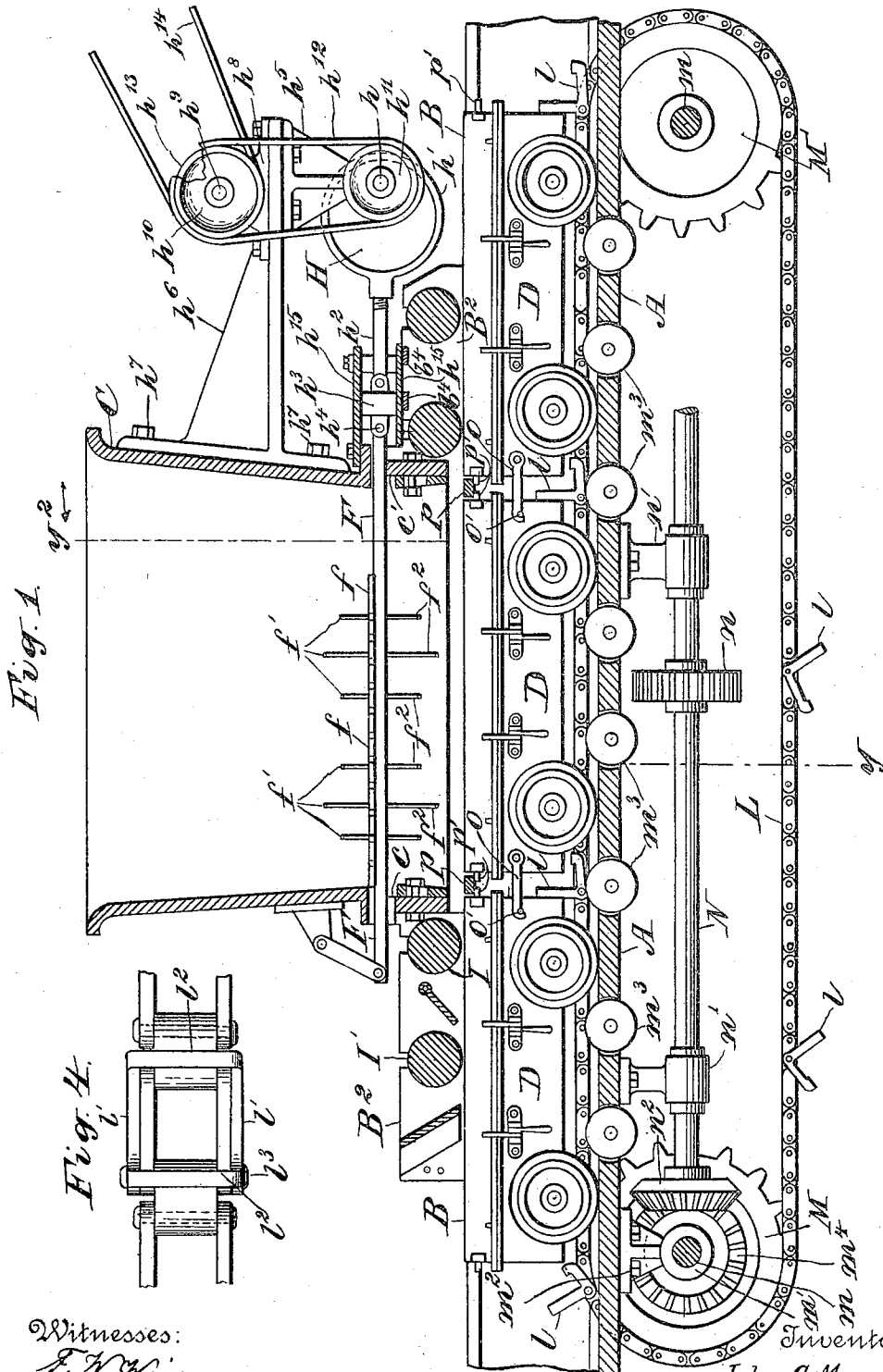


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CARRIER FOR MOLDERS' FLASKS.
APPLICATION FILED DEC. 14, 1909.

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Patented Mar. 15, 1910.

2 SHEETS—SHEET 1.



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CARRIER FOR MOLDERS' FLASKS.

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Specification of Letters Patent. Patented Mar. 15, 1910.

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To all whom it may concern:

Be it known that I, JOHN G. MORRISON, a citizen of the United States, and a resident of the borough of Brooklyn, in the county of Kings and city and State of New York, have invented a certain new and useful Improvement in Carriers for Molders' Flasks, of which the following is a specification.

In an application for United States Letters Patent which was filed by me in the United States Patent Office February 18th, 1909, and serially numbered 478,604, I have shown and described a machine for molding various articles that are to be cast, in which the molding operation is performed by passing the flasks in which the molds are to be formed beneath a sand supporting hopper and beneath feeding and compacting devices while supported upon suitable carriages that are adapted to be moved along supporting tracks.

My present invention, while especially applicable for use in connection with molding machines of the class mentioned, is not limited thereto, but may be efficiently employed in connection with various other forms of machines in which supporting carriages or other devices are moved along suitable tracks or guide-ways either in one direction or in opposite directions, as may be desired, and is a division of the invention shown and described in the above mentioned application; the object of the invention being to provide a carrier of this class, which, while simple in construction and efficient in operation, shall, at the same time, accomplish its required results with great positiveness and with the minimum liability of getting out of repair.

To these ends, the invention consists in various peculiarities of constructions and in novel combinations of parts, of which the forms preferred in practice will first be described and the novel features of the invention then pointed out in the subjoined claims.

Referring to the accompanying drawings, which form a part of this specification, Figure 1, is a longitudinal vertical section of a molding machine constructed in accordance with my invention, taken in the line $x x$ of Fig. 2 and looking in the direction of the arrow 1 in that figure, with parts broken away and the driving mechanism for the sand agitating devices shown in side elevation; Fig. 2, a transverse vertical section of such machine, taken in the line $y y$ of Fig. 1, and looking in the direction of the arrow 2 in that figure; Fig. 3, a reverse plan view of the operating devices for the carriers which sustain and carry the molds, and Fig. 4, an enlarged plan view of one of the pushers and of a portion of its carrying chain.

In all the figures, like letters of reference are employed to designate corresponding parts.

A indicates the main platform or base of the machine, which is or may be of any appropriate design and construction, and a and a^1 indicate guide-ways or pairs of tracks with which it is or may be provided.

B and B¹ indicate the flasks in which the molding operations are performed, and C indicates the hopper to which the sand made use of in such molding operations is supplied and from which it is fed to the flasks as they are successively presented to receive it. In the construction of these flasks and this sand receiving and delivering hopper, various forms may be adopted. It is preferred however to construct the flasks in the form of the ordinary and well known two or more part flasks heretofore in use, as the nature of the articles to be molded may require, and to construct the hopper C in the shape of an open ended tubular receptacle of rectangular form in cross-section, with its side walls inclining inward from its upper to near its lower end, whereby to permit of the sand being supplied to its top, and, passing downward through it to its lower end, of being discharged from its bottom.

With the flasks and hopper as thus constructed, the sand required in the molding operations is supplied to the flasks by passing the flasks beneath the lower end of the hopper, to permit of which the hopper is supported in an upright position above and from the base or platform A by frames or girders b , which extend between them and are respectively connected at their top and bottom edges to the hopper and to the platform by bolts b^1 as shown.

For supporting the flasks B and B¹ and passing them beneath the hopper C during the molding operation, carriages D are employed, which, constructed of the requisite length to receive and carry the flasks, are provided with flanged wheels d that are

adapted to run upon the pairs of rails a and a^1 and are equipped with smooth flat tops d^1 , which, in practice, may serve as "mold-boards" to the flasks in the molding operation. In being thus supported and carried, the flasks, in the operation of the machine, will preferably be passed beneath the hopper C in two rows, one of which, as, for instance, the row or flask B, passing beneath it in one direction on the tracks a , while the row made up from the flasks B¹ is passing beneath the same in an opposite direction upon the tracks a^1 ; and in order to provide for the passage of the two rows of flasks beneath it in opposite directions the hopper C is constructed of a width to extend across and over the paths of movement of the two oppositely traveling rows, and is provided with a dividing wall E, which, extending across the hopper from one of its interior sides to another, in parallel relationship to the lines of travel of the oppositely moving rows of flasks, will be made of a width sufficiently great to extend substantially across the space between them, and have the opposite sides of its upper portion gradually inclined toward each other until they meet and form a sharp edge e at its top. The flasks B and B¹ being thus carried beneath the hopper C in opposite directions, the carriages D upon which they are supported, after having been successively passed beneath one side of the hopper on one pair of rails, as, for instance, upon the pair a , and, after having the molding operations performed in the flasks B carried by them, may be transferred to the other pair of rails, as, for instance, to the pair a^1 , and, after having received fresh empty flasks B¹, be successively passed backward beneath the other side of the hopper in an opposite direction, and have a similar molding operation performed in their flasks, and so on, two different molding operations being thus performed at the same time.

The hopper C, being constructed as above explained, is provided with a series of reciprocating bars F, which extend inward across its interior through apertures c and c^1 formed in its side walls near its lower end, with these bars severally provided with means for not only supporting the sand within the hopper and feeding it downward therein to its lower end as required, but also for agitating and loosening it up and maintaining it in that condition both above and below its supporting and feeding devices. Of these, the means for supporting the sand within the hopper and feeding it downward to its lower end consists of a series of narrow thin blades f , which are secured to each of the bars F, and which, extend outward therefrom in horizontal relationship across the interior of the hopper, with a narrow space left between each two blades, and be-

tween both the ends of the blades of one series and the ends of the blades of the adjacent series, and between the ends of the blades of the outer series and the interior of the hopper and the partition therein respectively; while the means for agitating and loosening up the sand both above and below the blades f consists of two series of relatively thin slats f^1 and f^2 secured to each of the bars F, and, extending outward therefrom at approximately a right-angle, are respectively disposed around the portion of the bar above and below the blades f in spiral lines, with their flat surfaces lying in planes which extend transversely of the hopper. As thus arranged, whenever the sand is supplied to the hopper C, it rests upon the blades f , which practically serve as a bottom to the same, and which, by their back and forth reciprocation, act to slice off from the bottom portion of the sand in the hopper the required amounts necessary to the efficient molding operation, and feed them forward to the lower end of the hopper for supplying the flasks B and B¹; while the slats f^1 and f^2 , by their back and forth movement through the mass of sand contained in the hopper above and below the blades f , serve to agitate and loosen it up and maintain it in that condition in both of those locations.

For imparting the requisite back and forth reciprocating motions to the blades f and slats f^1 and f^2 , eccentrics H are employed, which effect that result through their carrying bars F. To this end, the eccentrics, of which there will be a separate eccentric for each bar, are mounted upon a shaft h , and are separately connected with their respective bars, through the intervention of an eccentric strap h^1 , a connecting rod h^2 , and a cross-head h^3 , to which last, one end of their respective bars is connected by a joint h^4 . As thus connected the back and forth reciprocation of the blades and slats are effected by simply rotating the shaft h ; and, in order to provide for this rotation, the shaft h is mounted in suitable bearings formed in the lower end of hangers h^5 , that are secured to and depend from the under side of brackets h^6 , which, secured to the hopper C by bolts h^7 , extend outwardly therefrom, and support near their outer ends bearings h^8 , in which is journaled a shaft h^9 , that is connected with the shaft h through the intermediaries of pulleys h^{10} and h^{11} and an endless belt h^{12} , and is itself equipped with a pulley h^{13} , by means of which, and a belt h^{14} , it may be connected with a motor or other source of power, not shown. While the bars F are thus reciprocated by the eccentrics H, through the eccentric straps and connecting-rods, the cross-heads h^3 are guided in their back and forth movements by slides h^{15} , which are sup-

ported from the frames or girders b through the intervention of bearing block B^2 and bars b^4 .

For compacting the sand in the flasks B and B^1 , after it has been supplied to them by the hopper C and other appliances co-operating with it, pressure rolls I and I^1 are employed, under which the flasks are passed after having been supplied with the requisite sand; and in order to permit of their accomplishing the required compacting results, and, at the same time, to render the successive steps of the molding operation continuous, these rolls are journaled in bearing blocks B^2 , which are secured to the upper edges of the frames or girders b , with the rolls for each row of flasks so supported in them that their peripheries will come in close relationship to the top of the flasks as the latter are passed under them. With the rolls I and I^1 thus arranged, whenever the machine is in operation and the successive flasks of each row are carried forward by their supporting carriages D , these flasks will first pass beneath the hopper C , where the sand required in the molding operation is supplied to them, after which, in their continued forward movement, they will travel beneath their respective compacting rolls I and I^1 , where the compacting of the sand in them by the rolls is effected and the molding operation thereby completed.

As thus far described the mechanism possesses no novelty in itself, but is or may be the same as that illustrated and described in the application aforesaid to which reference may be had. My invention, on the other hand, relates more particularly to the means by which the propulsion of the carriages or other devices D along the tracks or guide-ways a and a^1 is effected, and these may be modified in various ways. I prefer however to employ for this purpose endless bands or chains L and L^1 , which are severally provided with pushers l through which the engagement of the chain with the carriages is effected. As thus equipped each of these bands or chains is supported upon sprocket wheels M and M^1 , with one of the bands or chains, as, for instance, the chain L , arranged in connection with the tracks or guide-way a , and the other, as, for instance, the band or chain L^1 located with respect to the tracks or guide-way a^1 . With the chains L and L^1 thus supported, the sprocket wheels M and M^1 are disposed beneath the main platform or base A , with the wheels M located near one of its ends, and the wheels M^1 located near the other end thereof. As thus arranged each of the sprocket wheels M and M^1 is fixedly secured upon a shaft m , that is journaled in suitable hangers m^1 , which, depending from the under side of the main platform or base A , are secured thereto by appropriate bolts or screws m^2 . With

the sprocket wheels M and M^1 thus supported, the operative portion of each of the bands or chains extending between them travels above the main platform or base, while the inoperative part thereof returns beneath the same; and in order to prevent this operative part from sagging, it is supported by flanged rolls m^3 , which are journaled in the main platform or base A , as shown. As thus arranged and organized, the movement of the chains may be effected by simply rotating the sprocket wheels M and M^1 . To effect this rotation, a shaft N is employed, which, provided with a spur-gear n for connection with a motor or other source of power, not shown, and mounted in suitable hangers n^1 depending from and secured to the under side of the main platform or base, is equipped at one end with a bevel gear n^2 for engagement with the gear m^4 , fixedly secured to the shaft m carrying the sprocket wheels M of one of the chains, and at its other end is provided with a second bevel gear n^3 for engagement with the bevel gear m^5 fixedly secured to the shaft m of the sprocket wheels M^1 of the other chain. By this arrangement as will be seen, provision is made for the rotation of the sprocket wheels M and M^1 , and through them for the requisite movements of the chains L and L^1 in opposite directions.

In the construction of the pushers l , various forms may be adopted. In the drawing however they preferably consist of two right angular or bell-crank shape side plates l^1 , which are disposed at the proper distances apart to embrace the chains and are connected at their opposite ends by bars l^2 extending across between them. As thus constructed they are applied to their respective chains at the proper distance apart to engage with the successive carriages, by being pivoted to the chains by pivot pins l^3 , which pass through the angular portions of their side pieces l^1 and through the chains, as shown. In being thus applied to the chains, each of the pushers as it is brought into operation to carry forward a carriage along the tracks will have one of its arms stand upright with respect to its chain and engage with the rear of the carriage, or with an appropriate abutment suitably placed on the carriage for coöperating with it, with its other arm lying horizontally upon such chain; and, by its cross bar engaging with the top of the same, serving as a stop to hold its other arm in the upright position to which it is brought when engaging with a carriage and carrying it forward along the tracks.

In some instances the carriages with the flasks upon them may be carried along the tracks and beneath the hopper and compacting devices singly. It is preferred however to combine them in trains, as shown

in the drawings, and when thus combined the carriages may be connected by any appropriate connecting devices, as, for instance, by pivoted hooks *o* on one car engaging with pins *o*¹ projecting from another, and so on throughout the series. Again, when thus combined in trains the space between the adjacent cars may be closed by a filling piece *p*, which extends between them and rests upon the handles *p*¹ of the flasks, whereby to prevent the sand delivered by the hopper from falling down between the cars and between the flasks, as it would do if such filling pieces were not employed.

With the parts constructed and organized as above explained, the propulsion of carriages or other devices in opposite directions along suitably disposed tracks or guide-ways is effected, when the mechanism is in operation, by bringing them alternately into engagement with the pushers *l* of first one of the oppositely moving chains and then of the other, and passing them through the machine in first one direction and then in the other while thus respectively engaged. In thus effecting this propulsion a portion of the carriages or other devices may be passed through the machine in one direction on one pair of tracks or on one guide-way, while the remainder of them are passing in an opposite direction on the other pair of tracks or other guide-way, or the entire number may be passed through the machine in one direction on one pair of tracks or on one guide-way, and, after having been thus passed therethrough, may be returned on the other pair of tracks or guide-ways, the movements of the carriages or other devices through the machine in either case being in opposite directions, as will be seen.

While thus shown and described as employed in connection with a molding machine, for propelling the various flasks beneath the sand supplying and compacting devices, and as especially applicable thereto, it is to be understood that the carrier is not restricted to such employment, but may be advantageously applied in connection with other forms of machines that are provided with carriages or other devices which are to be moved forward in opposite directions upon suitable disposed tracks or guide-ways.

Although in the drawings I have shown, and in the foregoing described, the form of the invention which I prefer to employ in practice, I wish it distinctly understood that I do not limit myself strictly thereto, as it is obvious that I may modify the same in various of its details without departing from the spirit of the invention.

Having now described my invention, and specified the best means contemplated by me for carrying it into practice, I claim and de-

sire to secure by Letters Patent of the United States,—

1. The combination, with two guide-ways, and a carriage or other device movably mounted on each of such guide-ways, of an endless band or chain for coöperating with each of the guide-ways provided with means for engaging with the movable carriage or other device to move it along said guide-way, sprocket wheels upon which the said bands or chains are mounted, and means by which the bands or chains are caused to move in opposite directions with respect to each other, substantially as described.

2. The combination, with a carriage or other movable support, tracks upon which such carriage or other device may be propelled, and an endless band or chain provided with means for engagement with the carriage or other movable device for moving it along the tracks, sprocket wheels upon which the endless band or chain is carried, a series of rollers over which the band or chain is passed and upon which it is supported intermediate the sprocket wheels, and mechanism for rotating the sprocket wheels to propel the band or chain, substantially as described.

3. The combination, with a plurality of carriages or other supporting devices, two pairs of tracks along which the carriages or other devices may be propelled, and two endless bands or chains arranged in relation to such pairs of tracks with each provided with pushers for engaging the band or chain with the carriages, of sprocket wheels upon which the bands or chains are supported, and mechanism by which such bands or chains may be moved to propel the carriages or other devices in one direction on one pair of tracks and in the opposite direction on the other pair of tracks, substantially as described.

4. The combination, with a plurality of carriages or other movable devices, a plurality of guide-ways or pairs of tracks along which the carriages or other devices may be propelled, and two endless bands or chains arranged in relation to such guide-ways or tracks with each provided with pivoted pushers for engaging the band or chain with the carriages or other devices, of sprocket wheels upon which the bands or chains are supported, a series of rollers intermediate the sprocket wheels for supporting and carrying the bands or chains between them, and mechanism by which the bands or chains may be moved to propel the carriages or other devices in one direction on one pair of tracks and in the opposite direction on the other pair of tracks, substantially as described.

5. The combination, with a plurality of carriages adapted to support and carry

molders' flasks, and two pairs of tracks along which the carriages may be propelled, and two endless bands or chains arranged in relation to such pairs of tracks with each provided with pivoted pushers for engaging the band or chain with the carriages, of sprocket wheels upon which the chains are carried, a series of rolls intermediate the sprocket wheels for supporting the bands or chains between them, and mechanism by which the bands or chains may be moved to propel the

carriages in one direction on one pair of tracks and in the opposite direction on the other pair of tracks, substantially as described.

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In testimony whereof I have hereunto set my hand in the presence of two witnesses this 11th day of December, 1909.

JOHN G. MORRISON.

Witnesses:

LÉON DION,

GRACE T. DIXON.