

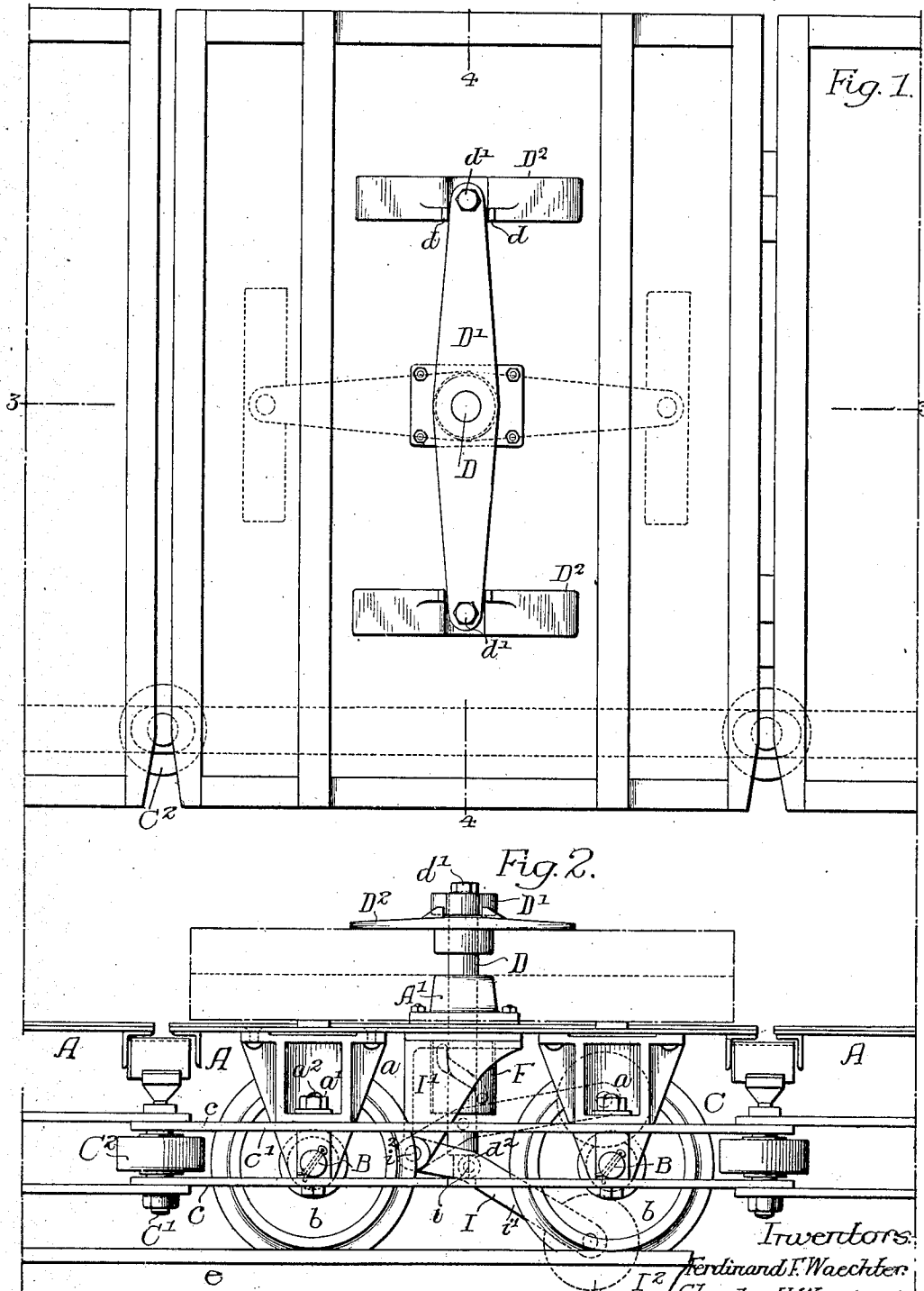
F. F. WAECHTER & C. H. WURSTER, JR.
CLAMP OPERATING MECHANISM FOR CASTING APPARATUS.

APPLICATION FILED JAN. 15, 1909.

Patented Apr. 13, 1909.

3 SHEETS—SHEET 1.

918,403.



Witnesses
Arthur H. Dime
Willard A. Burrows

Inventors.
Ferdinand F. Waechter
Charles H. Wurster Jr.
 by their Attorneys.
Howden & Howden

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Fig. 3.

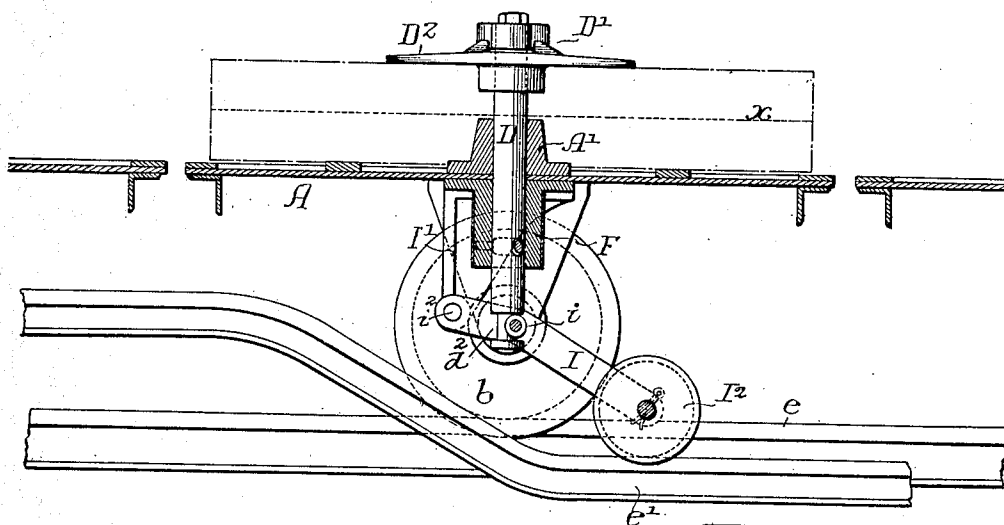
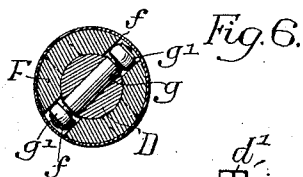
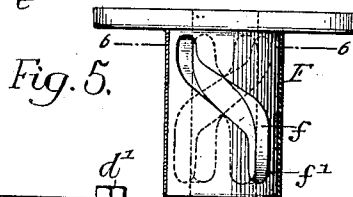
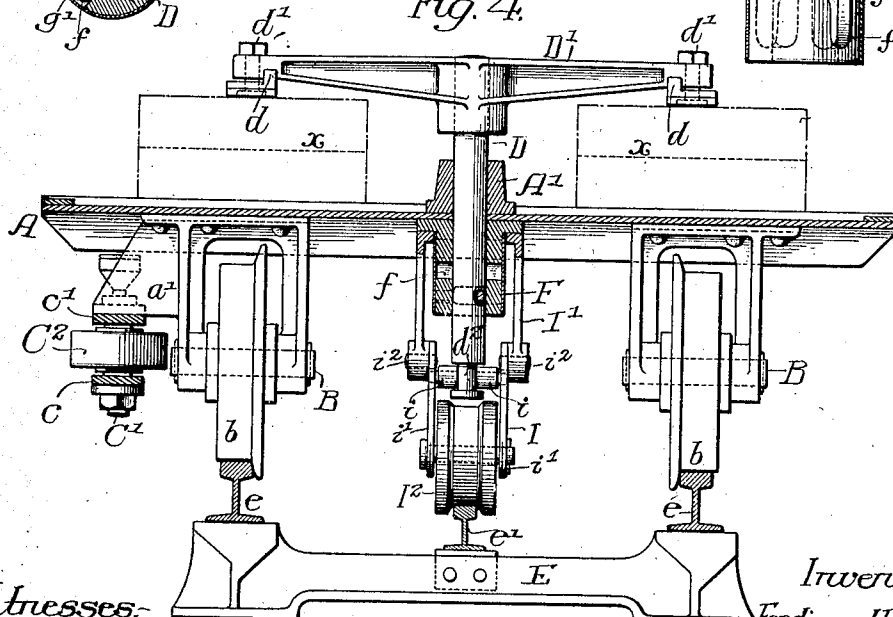


Fig. 4.



Witnesses:

Litus H. Irone.
Villo A. Burroea

Inventors:

Ferdinand F. Waechter
Charles H. Wurster Jr.
by their Attorneys:
Dorman & Howard

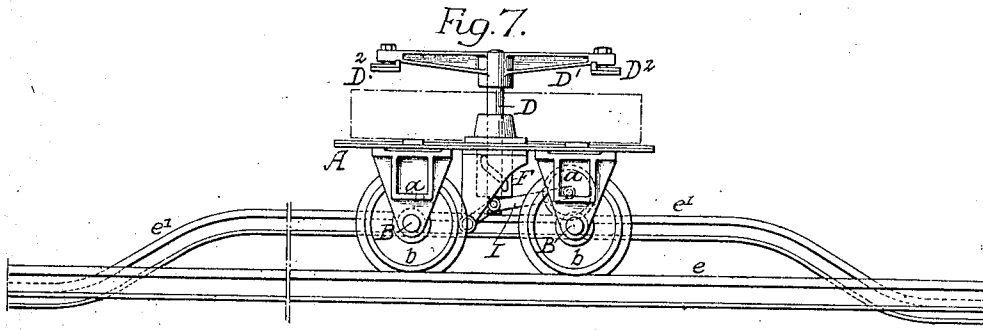
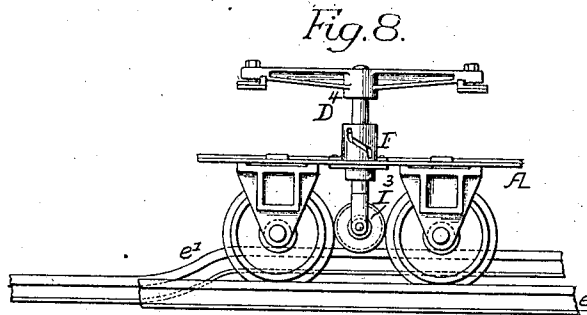
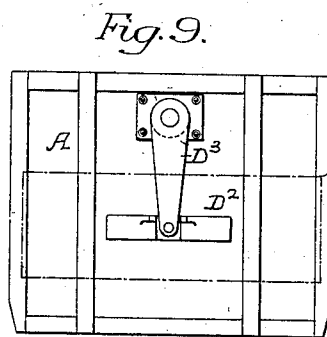
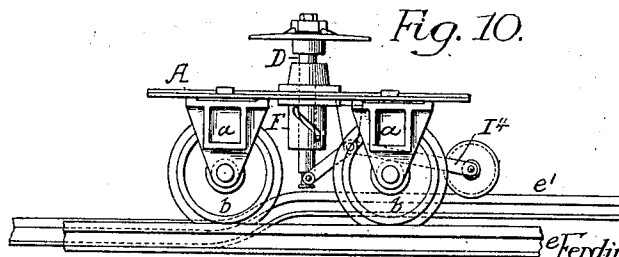
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3 SHEETS—SHEET 3.



Witnesses—
Lester F. Irons
Wills A. Burnside

Inventors
Ferdinand E. Waechter
Charles H. Wurster, Jr.
by their Attorneys
Norson & Norson

UNITED STATES PATENT OFFICE.

FERDINAND F. WAECHTER AND CHARLES H. WURSTER, JR., OF PHILADELPHIA, PENNSYLVANIA, ASSIGNORS TO LINK-BELT COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

CLAMP-OPERATING MECHANISM FOR CASTING APPARATUS.

No. 918,403.

Specification of Letters Patent.

Patented April 13, 1909.

Application filed January 15, 1909. Serial No. 472,538.

To all whom it may concern:

Be it known that we, FERDINAND F. WAECHTER and CHARLES H. WURSTER, JR., citizens of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Clamp-Operating Mechanism for Casting Apparatus, of which the following is a specification.

The object of our invention is to provide mechanism for automatically clamping and releasing the flasks used in casting machines, particularly of the type in which the flasks are carried by an endless series of tables.

In the accompanying drawings:—Figure 1, is a plan view illustrating our invention; Fig. 2, is a side view showing one of the trucks, and a portion of two adjoining trucks; Fig. 3, is a longitudinal sectional view on the line 3—3, Fig. 1; Fig. 4, is a transverse sectional view on the line 4—4, Fig. 1; Fig. 5, is a view illustrating a detail of the invention; Fig. 6, is a sectional view on the line 6—6, Fig. 5; Fig. 7, is a view drawn to a smaller scale showing the truck with the clamp plates elevated; and Figs. 8, 9 and 10, are views of modifications of the invention.

Our invention is especially applicable to the type of molding machine in which a series of trucks carrying the tables are coupled together and travel over suitable endless tracks; the flasks being carried from the molding machine to the pouring point, and from the pouring point to where the cast metal and sand are discharged from the mold.

Our invention relates particularly to the means for automatically clamping the cope and drag parts of the flasks together. In this type of machine the usual practice has been to fasten the clamping plate by hand operated mechanism and also to release it by hand operated mechanism, or to use pieces of iron of sufficient weight to hold the parts of the flask together during the pouring operation. This required two men to adjust the clamps or the weights. By our invention we dispense with the two men and provide mechanism for automatically adjusting the clamps and releasing them at the points required, thus insuring the clamping and releasing of the flasks at the proper moment.

Referring to the drawings, A, A is a

series of tables, each table carrying bearings for the axle B on which the wheels b are mounted; the whole forming a truck carrying the flasks w shown by dotted lines in Figs. 2, 3 and 4. Secured to a bracket a' on one side of each truck are the coupling members C consisting of two bars c spaced apart by blocks c' and secured firmly together by the bolts a". The bars on one truck overlap the bars on the other, and the two sets of bars are secured by pivot pins C', on which are mounted rollers C" which are adapted to suitable guide rails. The wheels b of the truck are mounted on the rails e, e connected by cross ties E, clearly illustrated in Fig. 4.

The above mechanism is common to this type of molding machine.

As before remarked, heretofore the usual practice has been to clamp the flasks by hand operated mechanism, but in the present instance the clamps are moved into position, secured, and then released by automatically operated means. On each table is a bearing A in which is mounted a vertical shaft D carrying at the upper end a cross head D', and secured to each end of the cross head are clamp plates D". The clamp plates are held from turning on the arms of the cross head by lugs b. A bolt d' secures each clamp plate to the cross head.

It will be noticed that in the device shown each table carries two flasks and the cope and drag of each flask are secured by a single cross head. When the cross head is in the position illustrated by full lines in Fig. 1, then the clamp plates D" are directly above the flasks. When the cross head is turned at right angles, as illustrated by dotted lines in Fig. 1, then the clamp plates are entirely free of the flasks and the flasks can be placed in position on the table or removed therefrom.

The lower end of the shaft D is grooved as at d" and mounted in the groove are rollers i carried by the arms of a lever I, pivoted at i" to a bracket I' secured to the underside of the table.

On the outer end of the lever I is a grooved roller I", in the present instance adapted to rest upon a rail e' centrally situated between two supporting rails e, e. The rail e is bent at certain points so as to lift the shaft D and this raises the clamp plates clear of the flasks, and in order to turn the

clamp plates from the position above the flasks to that at one side clear of the flasks, we provide means for turning the shaft D as it is raised or lowered.

5 In the present instance, directly under the table is secured a block F having two ways *f* therein, as illustrated in Fig. 5. These ways are cut as illustrated in said figure and extending through the shaft D is a pin 10 *g* having rollers *g'* adapted to the ways *f* in the block F, and these ways are so cut as to turn the shaft one-quarter revolution as it is raised or lowered. The ways are extended vertically, as indicated at *f'*, so that 15 after the shaft is turned to a point directly over the flasks the clamps will have a certain downward movement, owing to the form of the ways *f'*, and when the clamp plates rest upon the flasks they are prevented 20 from turning by the rollers *g'* being in the portions *f'* of the slots and when the shaft is raised it has a certain amount of vertical movement before being turned to a position clear of the flasks.

25 The shaft D is given a vertical movement at any point desired by the shape of the rail *e'*. At the point where the shaft is to be raised the rail *e'* is bent upward, as indicated in Fig. 3, and, after the clamps have 30 been lowered, the rail *e'* may be discontinued as it is only necessary to provide the rail *e'* at the point where the shaft is to be raised. In some instances it may not be necessary to provide the lever with a roller, as a roller 35 *I*³ may be carried directly by a vertical shaft D⁴, as shown in Fig. 8, but we prefer to use the lever where possible.

It will be seen by the above construction that after the two flasks are placed upon the 40 table, and as the table moves forward, the roller *I*² will travel on the elevated portion of the rail *e'* until a certain point is reached, when the rail will be depressed and the cross head D carrying the two clamp plates will be 45 turned at right angles to a position directly above the flasks and the continued downward movement of the shaft carrying the cross head will cause the clamp plates to bear directly upon the flasks and the clamps 50 will be held from turning by the rollers being locked in the vertical portion *f'* of the ways in the block F. After the flask has passed the bearing point and before the table reaches the point where the flask is 55 to be discharged then it comes in contact with the opposite end of the rail *e'*, which elevates the shaft D and as the shaft is elevated it will turn so that the clamp plates will be clear of the flasks.

60 In the mechanism above described the casting apparatus is provided with two sets of flasks; each table being provided with two flasks, but in some types of machines a single row of flasks may be used, in which case we 65 simply employ a single arm D³, Fig. 9, in-

stead of the cross head D' and attached to this arm is a single clamp D².

In some instances we may provide means for simply lifting the clamp plates without turning them, but in most instances it is 70 necessary to move the clamp plates entirely clear of the flasks.

In Fig. 10, we have shown a modification in which a lever *I*⁴ of the first class is used, 75 instead of a lever of the second class, as illustrated in Fig. 3, but in this construction the clamp is held to the flask by the elevated rail which lifts the roller and when the rail is discontinued or bent so as to allow the roller to drop, the clamp plate is raised and 80 turned by the weight of the roller.

We claim:—

1. The combination in a casting apparatus, of a traveling table, a clamp thereon adapted to hold the flask in position, a cam rail, and 85 means carrying the clamp and adapted to contact with the cam rail so that the clamp will be raised as the table travels over the cam rail.

2. The combination in a casting apparatus, 90 of a traveling table, a clamp carried thereby, a rail for raising the clamp, and means on the table for turning the clamp as it is raised.

3. The combination in a casting apparatus, of a traveling table adapted to receive a 95 flask, a vertical shaft adapted to bearings on the table, a clamp carried by the shaft and adapted to extend over the flask, a fixed cam rail, and means contacting with the cam rail whereby the said shaft is raised as the means 100 travel over given portions of the cam rail.

4. The combination in a casting machine, of a carriage for receiving two flasks, one 105 on each side of the center, a vertical shaft extending through the center of the table, a cross head carried by said vertical shaft, clamp plates on the cross head arranged to clamp both flasks, and automatic means for raising, lowering and turning the vertical 110 shaft.

5. The combination in a casting apparatus, of a traveling table, flasks carried thereby, a vertical shaft extending between the 115 flasks, a cross head at the upper end of the shaft, two clamp plates carried by the cross head, a lever connected to the shaft, a roller carried by the lever, and a fixed rail shaped to actuate the lever to vertically move the shaft to clamp or release the flasks.

6. The combination in a casting apparatus, of a traveling table, a flask carried thereby, a vertical shaft mounted in bearings on 120 the table, a clamp carried thereby, means for moving the shaft vertically, a block having a spiral way therein, and a projection on the shaft extending into the way so that as the 125 shaft is raised or lowered it will be turned.

7. The combination in a casting apparatus, of a traveling table adapted to receive 130 two flasks, a central vertical shaft extend-

ing through the table, a cross head on the central shaft, two clamp plates carried by the cross head, a pivoted lever engaging the lower end of the shaft and having a roller, a rail with which the roller is adapted to come in contact to elevate the lever, a block surrounding the shaft and secured to the table, ways in the block, and a projection on the shaft adapted to the ways so that as the shaft is raised by the lever it will be turned.

8. The combination in a casting apparatus, of a traveling table, a vertical shaft adapted to bearings in the table, a clamp plate carried by the shaft, a block secured to the underside of the table and having ways therein shaped to turn the shaft a quarter revolution, a band extending through the shaft and having rollers adapted to the ways, a lever pivoted to a bracket on the table and having a pin engaging the shaft, a roller on the lever, and a rail with which the roller contacts, said rail being shaped to move the roller vertically as it passes over the free portions of the rail.

9. The combination in a casting apparatus, of a traveling carriage adapted to receive two flasks, a vertical shaft extending

through the table and mounted in suitable bearings, a cross head on the upper end of the said shaft, two flask clamps carried by the cross head, a block secured to the underside of the table through which the shaft extends, a curved way in the block, a projection on the shaft extending into the way, the lower end of the way being vertical so that when the projection is in this portion of the way it will be locked from turning, a bracket on the underside of the shaft, a lever pivoted to the bracket and having pins engaging the shaft, a weighted roller on the end of the lever, a rail over which the table travels, said rail having elevated and depressed portions so that as the table travels over the rail it will move the shaft vertically, the shaft turning as it is raised and lowered.

In testimony whereof, we have signed our names to this specification, in the presence of two subscribing witnesses.

FERDINAND F. WAECHTER.

CHARLES H. WURSTER, JR.

Witnesses:

JOS. H. KLEIN,

WM. A. BARR.