

No. 682,484.

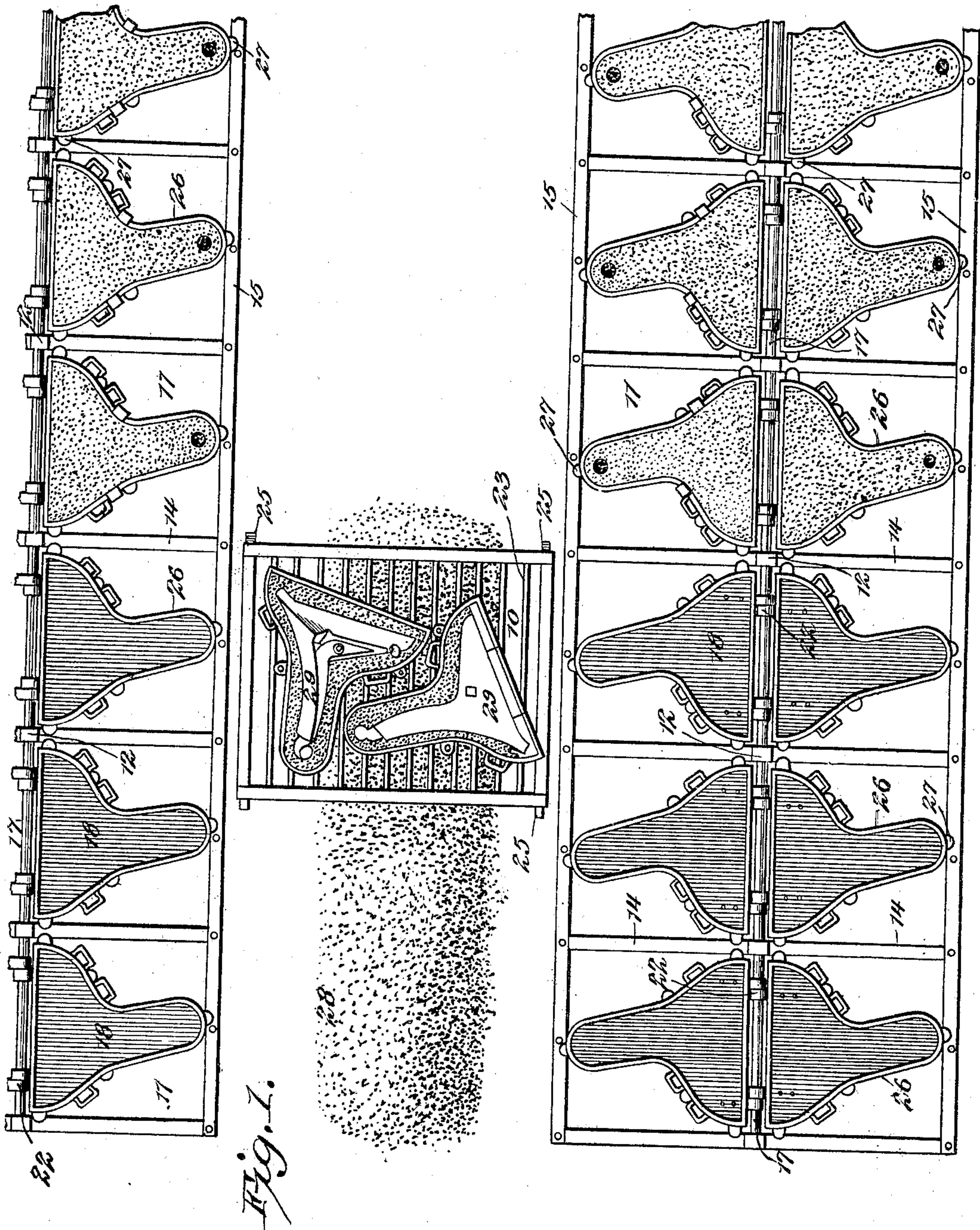
Patented Sept. 10, 1901.

J. R. McWANE.
MOLDING AND CASTING APPARATUS.

(Application filed Jan. 9, 1901.)

(No Model.)

3 Sheets—Sheet 1.



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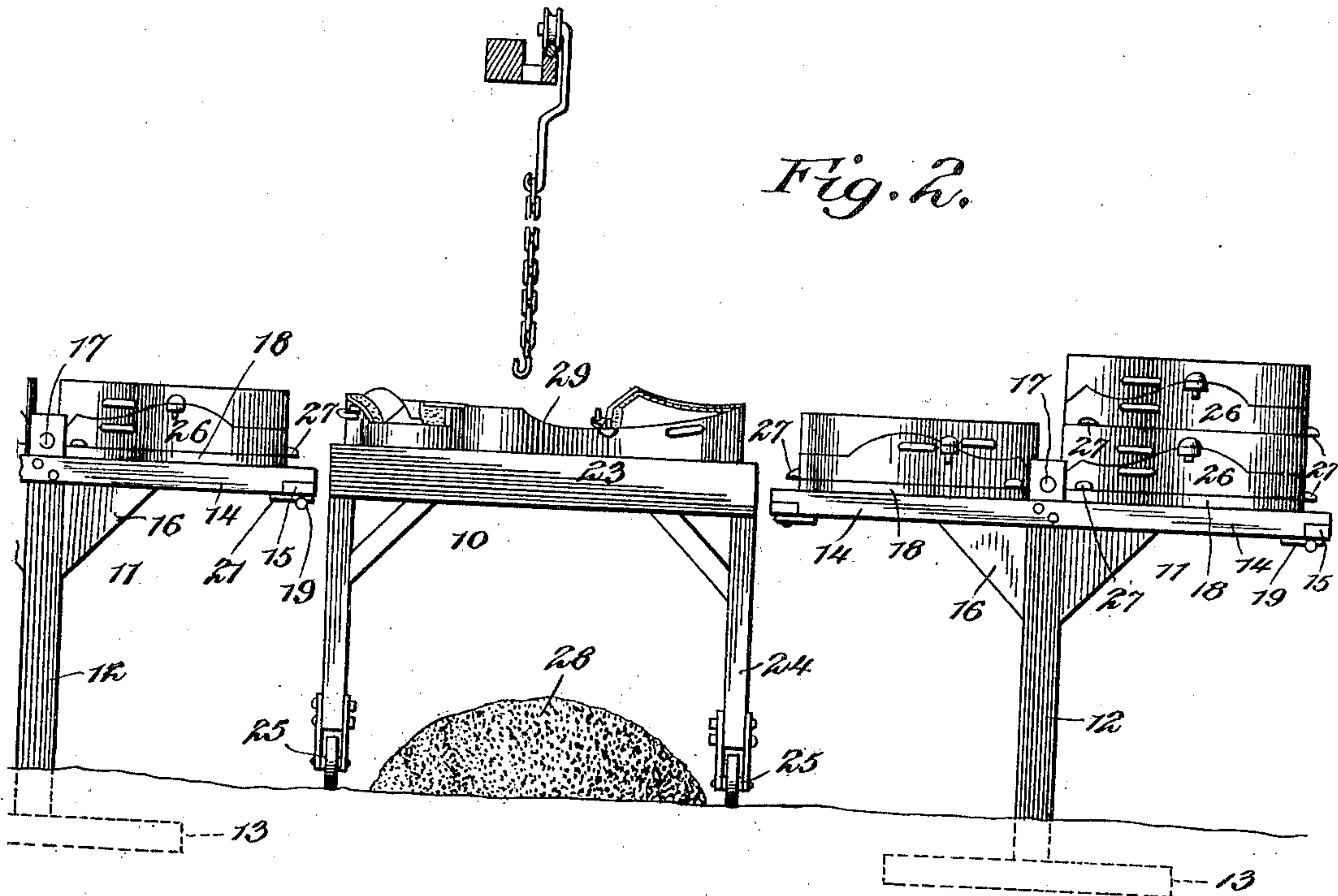
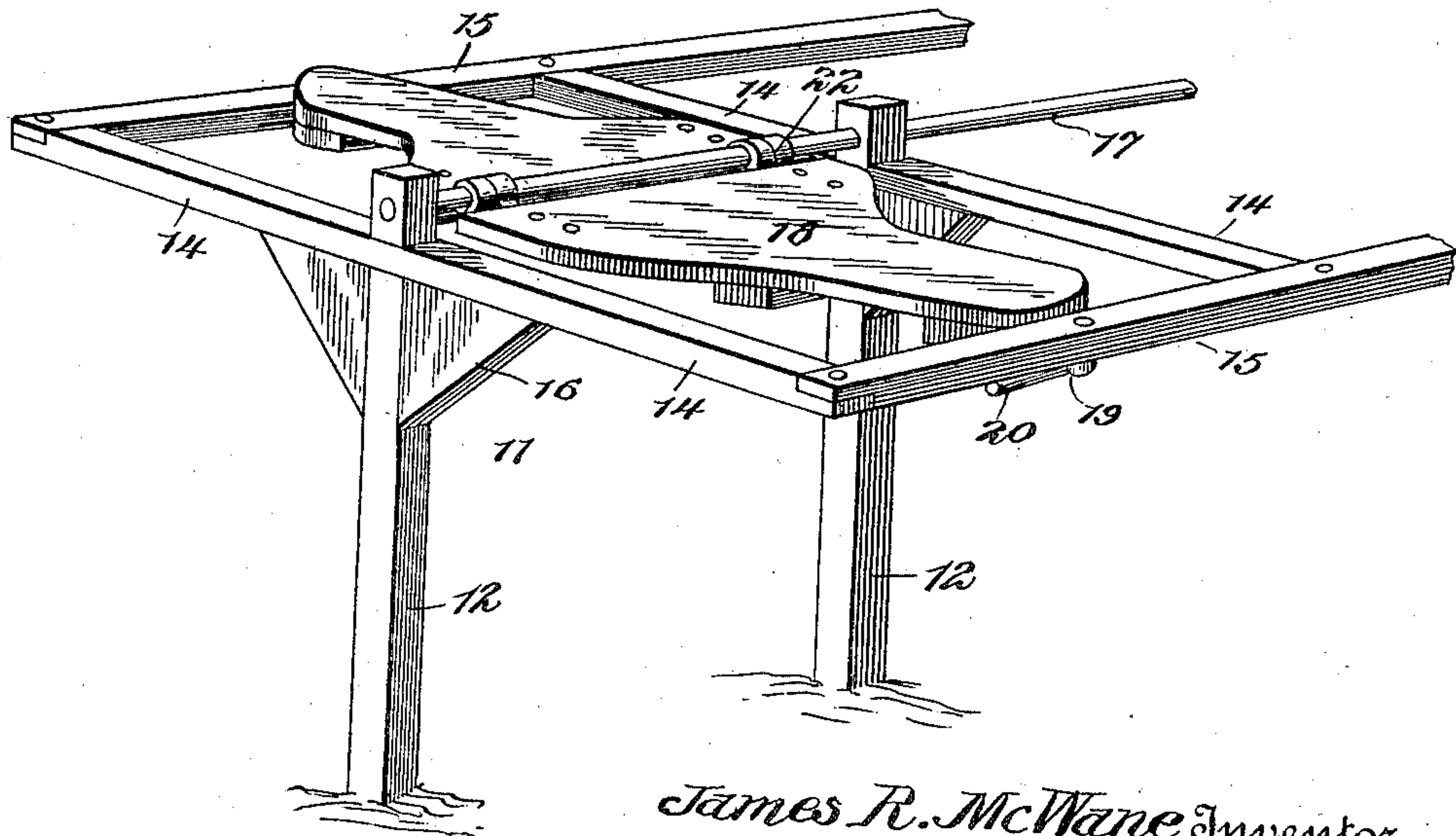


Fig. 3.



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3 Sheets—Sheet 3.

Fig. 4.

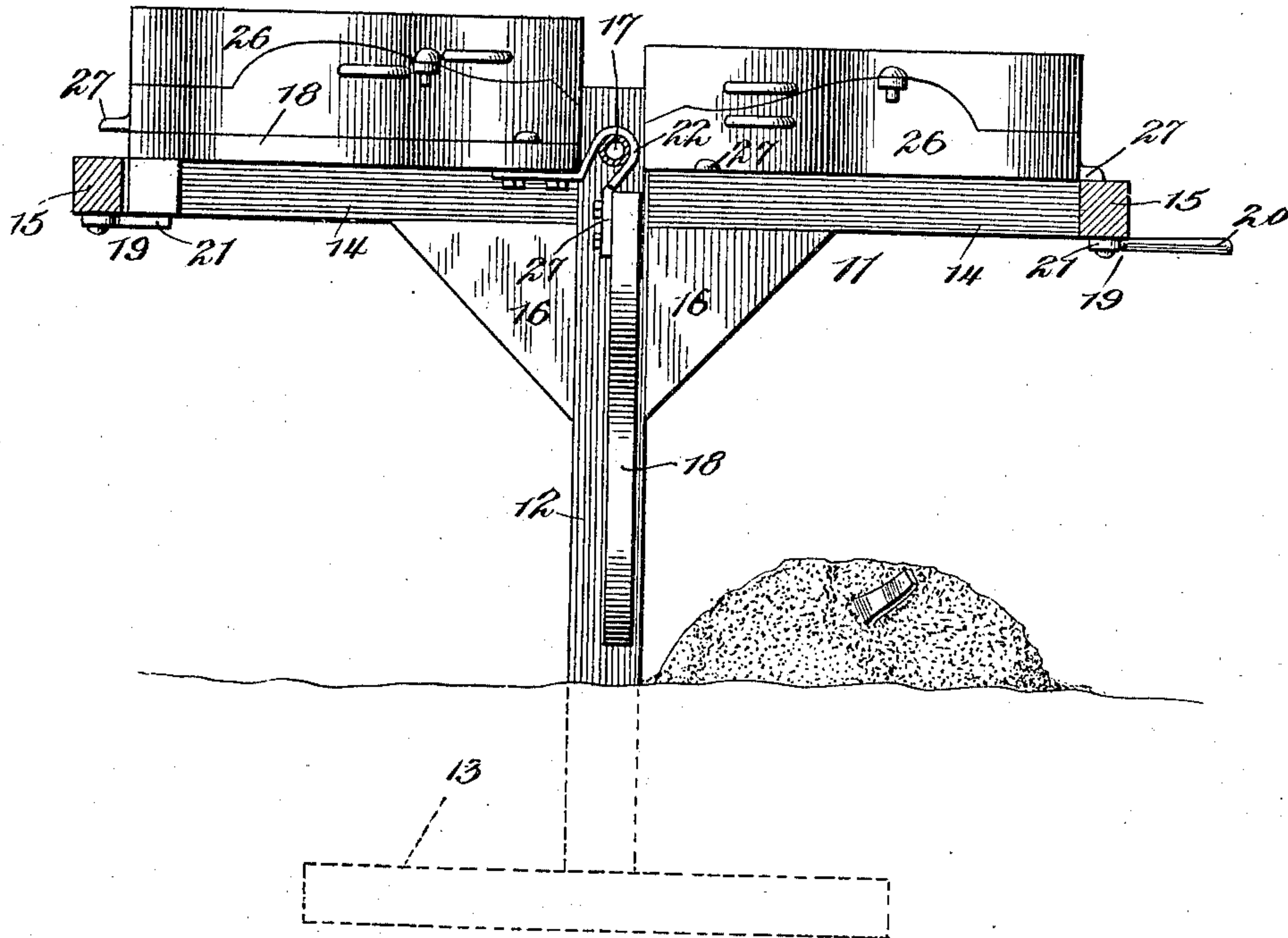


Fig. 5.

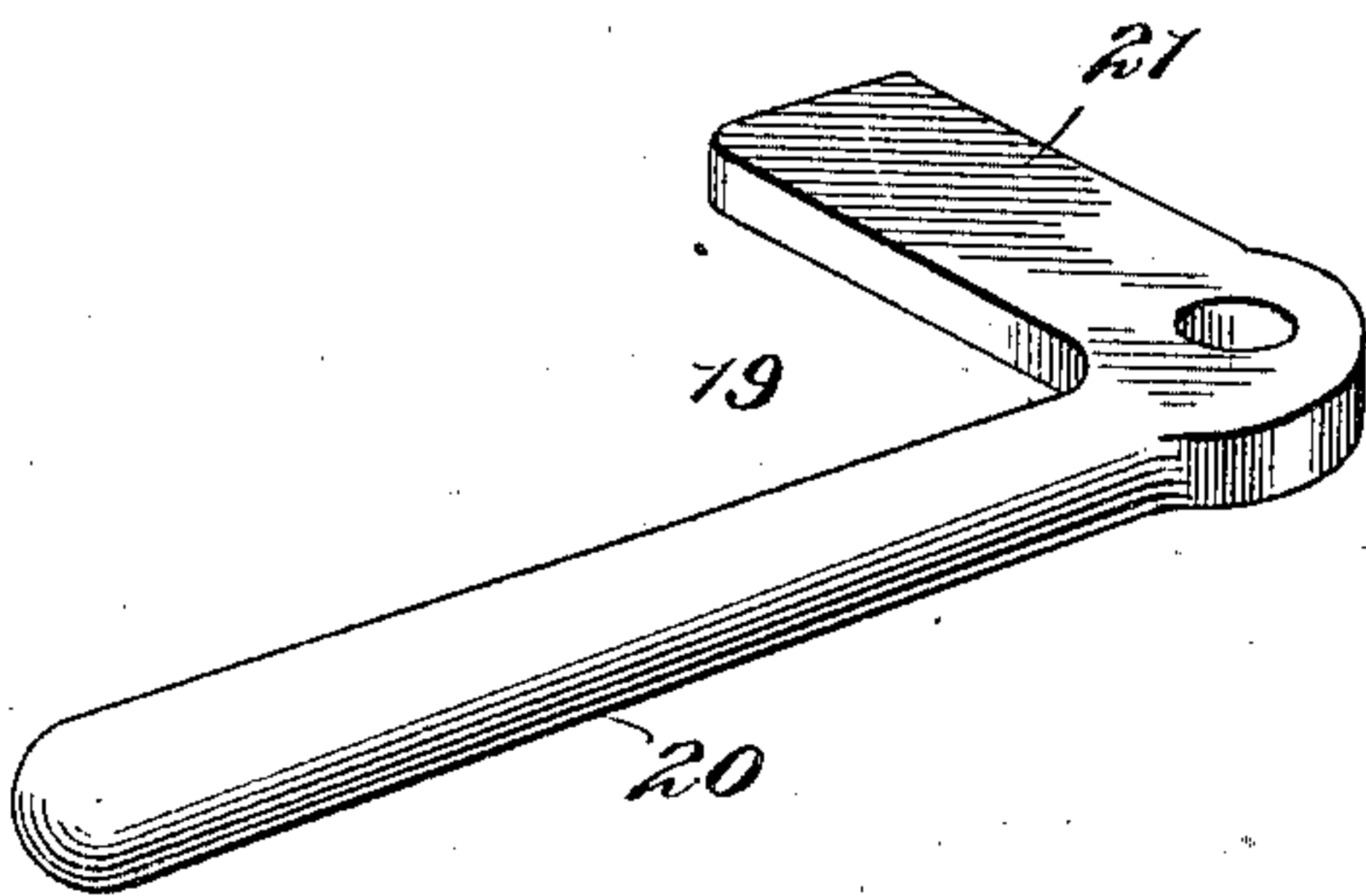
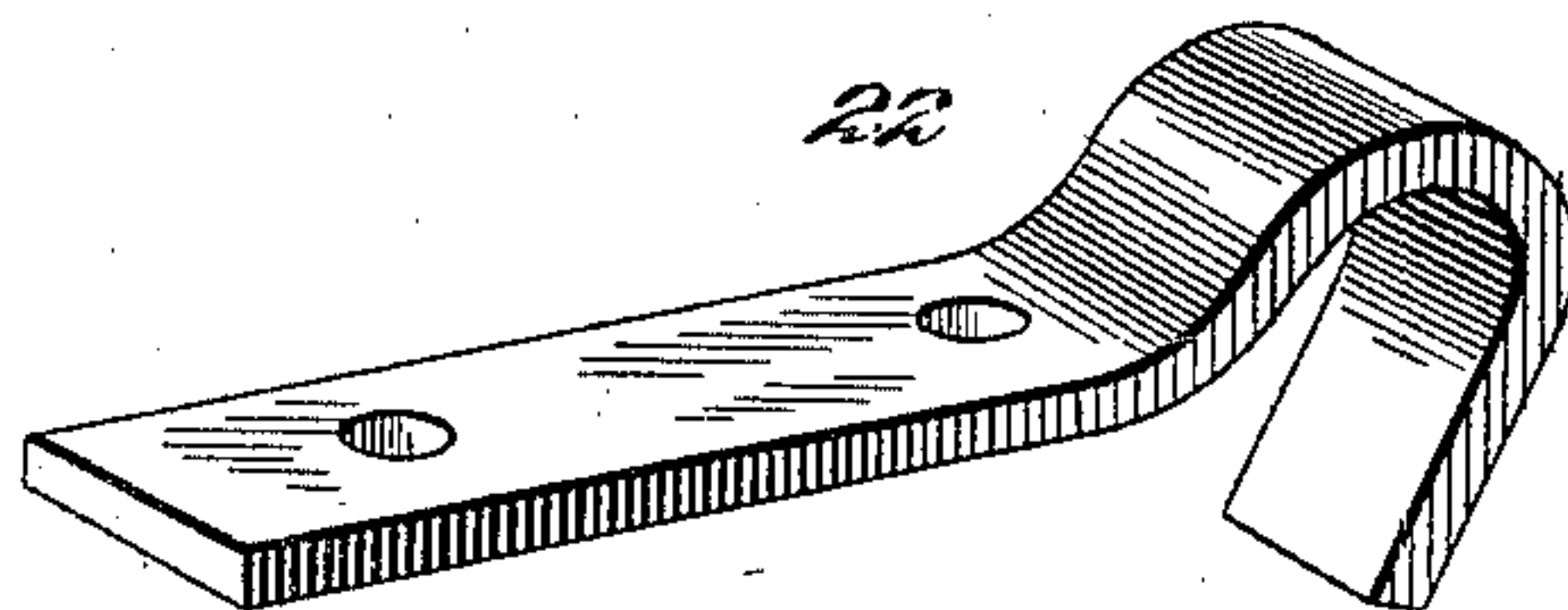


Fig. 6.



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MOLDING AND CASTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 682,484, dated September 10, 1901.

Application filed January 9, 1901. Serial No. 42,666. (No model.)

To all whom it may concern:

Be it known that I, JAMES R. MCWANE, a citizen of the United States, residing at Lynchburg, in the county of Campbell and State of Virginia, have invented a new and useful Molding and Casting Apparatus, of which the following is a specification.

In the ordinary manner of making sand molds for metal-casting the two usual methods employed are substantially as follows: In one the sand is heaped up in a long pile upon the molding-floor and the empty flasks are arranged upon either side thereof. The molder, beginning at one end with his patterns, works along the floor, using the sand and empty flasks at the side and leaving the finished molds in proper position for pouring behind him. In this method the entire work is done upon the same floor upon which the molder stands, and he must therefore do his work in a stooping and constrained position. In the other method a bench or table is provided at one end of the floor, and the sand and empty flasks are arranged adjacent to the same. In this method, therefore, the molder may work in an upright position; but as the molds are made they must be carried away from the bench and disposed along the floor in regular order and in proper position for pouring. As these molds are ordinarily of considerable weight, a large amount of time and energy is expended in thus carrying them. Furthermore, after the castings have been made the sand and empty flasks must be returned to the bench to be again used. Numerous machines have been devised for obviating the difficulties of both methods; but these machines are of such an expensive and intricate character that they are impracticable except for the largest foundries, and the smaller ones therefore almost universally employ the above-mentioned methods. Another drawback resides in the amount of time consumed waiting for the molds to cool sufficiently after the pouring has been made to permit the removal of the castings. As is well known, when the molten metal has been poured the mold becomes exceedingly hot and ordinarily must remain for some time before it can be handled. For this reason iron flasks, which are desirable for many reasons, have

proven unpopular and wooden flasks are used, the walls of which are protected by a thick intermediate body of sand. The objections to this will be evident. In the first place, the molds are bulky and unwieldy, and, secondly, a large amount of sand must be used.

The present invention relates to improvements in this art; and the object thereof is to provide an apparatus wherein all the above objections are obviated.

In the first place the invention aims to provide a construction whereby the molder will be able to work in an upright position and it will not be necessary for him to carry the molds from one place to another. Furthermore, after the casting has been made the empty flasks will be in a convenient position to be again filled, and the sand also will be readily accessible for reworking without the necessity of carrying it from one end of the floor to the other.

A further important feature of the invention resides in the construction of supporting means for the molds, whereby they are supported in proper position to be poured, and after the casting has been made the mold can be broken and said casting removed without the necessity of touching the heated flask or sand. It will therefore be seen that iron flasks can be employed the capacity of which is considerably less than the ordinary wooden flasks, and a consequent saving in sand is effected.

Furthermore, the aim of the invention is to provide apparatus of an inexpensive but durable nature which is adapted for use in the ordinary class of foundries.

In order that the invention may be readily understood by those skilled in this art, the preferred form of construction is described in the following specification and illustrated in the accompanying drawings. It will be understood, however, that the construction is open to various changes within the scope of the claims hereto appended.

In the drawings, Figure 1 is a top plan view of the preferred form of apparatus embodying the present invention. Fig. 2 is an end elevation of the same. Fig. 3 is a perspective view of a pair of the mold-supports. Fig.

4 is a vertical cross-sectional view of the same. Fig. 5 is a detail perspective view, on an enlarged scale, of one of the locking-latches. Fig. 6 is a detail perspective view, on an enlarged scale, of one of the hinge-hooks.

Similar numerals of reference designate corresponding parts in the several figures of the drawings.

In the construction shown in the accompanying drawings a movable molding-table 10 is arranged between two mold-receiving or casting benches, said benches being each designated as a whole by the numeral 11. Each of these benches 11 in the present instance comprises a plurality of mold-supports, which are preferably constructed in the following manner: Suitably-spaced standards 12 are secured rigidly in an upright position by means of sleepers 13, firmly embedded in the floor and secured to the lower ends of said standards. Secured to the upper portions of the standards a suitable distance above the floor is a horizontally-disposed open frame comprising outwardly-extending cross-arms 14, connected at their outer ends by means of a longitudinal beam 15 and braced by angle-brackets 16, secured, respectively, to the standards and horizontal arms.

Connecting the upper ends of the standards 12 is a horizontally-arranged rod 17, upon which are pivotally hung a plurality of mold-supporting platforms 18, one of said platforms being provided between each adjacent pair of standards, and thus surrounded by an open horizontal frame. These platforms are adapted to hang either in a vertical position, as shown upon one side of Fig. 4, or supported in a horizontal position with their upper surfaces arranged above the upper edge of the open frame, as clearly shown upon the opposite side of Fig. 4. For supporting them in their horizontal positions suitable means are provided, which in the present form are latches 19, pivoted to the under side of the longitudinal beam 15 and each comprising a handle portion 20 and an angular locking-shoulder 21. Each hinge is in the form of a hook 22, the shank of which is secured to the under side of the platform 18, said hook engaging over the hinge-rod 17. By this means it will be seen that the platforms are removably supported upon the frame of the casting-bench.

Each molder is provided with a pair of casting-benches separated a suitable distance to form an alley or aisle, in which the molding-table 10 moves, and as the molder's apparatus are arranged in parallel relation it will be evident that the two benches between adjacent molders will be contiguous to each other. It is therefore preferable, as shown in the accompanying drawings, to use the standards 12 as a common support for both benches and to form a double frame by extending the arms on both sides of said standards. The rod 17 will therefore be arranged

intermediate the frame and form a common hinge-section for both rows of mold-supports.

As above stated, the molding-table is arranged to be moved in the alley formed by the separated mold-receiving benches. This table preferably comprises a flat slatted or open-grate top 23, supported a suitable distance above the floor by means of legs 24, to the lower ends of which are secured casters 25, whereby the table can be readily moved from one end of the alley to the other. The top of the table is practically of the same height as the supporting-platforms of the mold-supporting platforms, so that there is no unnecessary lifting of the flasks or molds.

The flasks are designated by the numeral 26 and are arranged to rest upon the platforms 18 when said platforms are in raised position. When, however, the platforms are dropped, the flasks are supported upon the horizontal open frame, preferably by means of projecting lugs 27, arranged on the lower part of said flasks, which engage said frame.

The mode of operation is substantially as follows: The molding-sand is arranged in a pile 28 longitudinally along the center of the alley or aisle between the two casting-benches. The mold-supporting platforms are secured in their raised position with the empty flasks placed thereon. The patterns, as 29, from which the molds are to be made are placed upon the molding-table, and said table is arranged at one end of the alley. The molder begins at the first flask, and removing it from the platform makes the mold, taking the sand from beneath the table, and replaces it upon the platform with the pouring or sprue hole nearest the alley or aisle. After finishing the first set of molds the table is moved to the next set, and the operation is thus repeated until the two rows are placed upon the horizontally-arranged supporting-platforms. In Fig. 1 the table is shown as moved part of the way up the alley with the completed molds behind the same. In order to save space, a plurality of molds may be stacked one upon the other, as shown in Fig. 2. The top of the molding-table is preferably slatted or open, so that the unused sand will drop directly back upon the pile without scraping it off, as would be necessary if the top were solid. When the molds are all completed, the molten metal is poured therein. This may be accomplished in any desirable manner; but in Fig. 2 is illustrated in full lines a preferred means for performing this operation. An overhead track is arranged directly above the center of the alley, and on this track runs a trolley, from which is movably suspended the ladle, that can be thus swung to either side of and moved along the alley, so that all the molds may be readily poured. After the castings have been made it is desirable to remove them from the flasks, which are in a highly-heated condition. It will be observed that the molds still rest upon the horizontal platforms and are

thus raised a slight distance above the horizontal frame, as shown on one side of Fig. 4. Upon drawing a latch 19, however, the platform supported thereby immediately drops to
 5 a vertical position, and the mold also drops until suddenly arrested by the lugs 27 of the flasks engaging the horizontal frame. The jar caused by this sudden stop disengages the sand and casting from the flask and they drop
 10 to the floor, as shown in Fig. 4, from whence the casting can be removed by means of the usual hook now employed. The flask, however, remains upon the bench ready to be again used when reached by the molder. The
 15 sand is also in a convenient location to be reworked into proper molding condition and moved out into the alley or aisle.

There are many important advantages in the construction as thus set forth. In the
 20 first place the molder does not assume a constrained position while working. Furthermore, neither the flask, sand, nor molds have to be carried; but, instead, the flasks are moved from the casting-benches to the pat-
 25 tern, which is placed upon the molding-table, the mold made, and replaced in proper position for pouring. A great saving in time is consequently effected. A further advantage resides in the construction of the mold-re-
 30 ceiving or casting benches. It will be seen that they are of practically the same height as the molding-table, so that the workman can readily move the flasks and molds from one to the other. Perhaps the most impor-
 35 tant feature, however, resides in the ease and despatch with which the castings may be removed while in a highly-heated condition. In the first place the sand body of the mold is properly supported during the pouring op-
 40 eration by means of the platform; but when said operation is completed and the casting has hardened sufficiently the support may be readily removed without the necessity of the operator touching the heated mold and the
 45 casting forced from the same. This movable support in the present instance has been shown as a swinging platform; but it will be evident that it may be constructed to operate in various ways. Furthermore, while
 50 means have been shown for automatically emptying the flasks it will be understood that this may be accomplished by other means—as, for instance, by first dropping the sup-
 55 porting-platform and then breaking the mold by hammering thereon, so that the sand and casting will be forced through the flask. Other features of a minor nature reside in the specific construction. By having the top of the molding-table slatted the unused sand
 60 from the mold drops through the same and falls upon the pile in position to be utilized and at the same time avoids the necessity of scraping it from the table. By having the supporting-platforms removable they are
 65 more easily repaired and replaced. A distinct advantage also resides in the manner

of supporting the mold-receiving or casting benches. It will be seen that the standards are arranged at the side remote from the aisle or alley, so that the space beneath is entirely
 70 open and unobstructed to permit ready access to the sand and castings beneath the same. Furthermore, by the use of the supporting-latch shown there are no portions of said
 75 latches projecting when the platforms are held in raised position, and there is therefore no danger of said platforms becoming acci-
 dentally unlatched and released.

From the foregoing it is thought that the construction, operation, and many advan-
 80 tages of the herein-described invention will be apparent to those skilled in the art without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construction
 85 may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

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

1. In apparatus of the class described, the combination with means for supporting a flask, of means independent of the flask for supporting the mold contained in said flask,
 95 said mold-supporting means being movable from beneath the mold.

2. In apparatus of the class described, the combination with stationary means for sup-
 100 porting a flask, of movable means independent of the flask for supporting the mold contained in the flask, said mold-supporting means being removable from beneath the mold.

3. In apparatus of the class described, the
 105 combination with a flask, of a supporting member for the flask having elements arranged to engage opposite portions thereof, a movable support for the mold contained in said flask and located below the flask when
 110 the latter is in place upon its support, said mold-support being in position to engage the under face of the mold but movable from beneath the same.

4. In apparatus of the class described, the
 115 combination with means for supporting a flask, of a platform arranged to support the mold contained in said flask and movable from beneath the same, said platform being mounted independently of the flask.
 120

5. In apparatus of the class described, the combination with a frame arranged to sup-
 125 port a flask, of a hinged platform adapted to support the mold contained in said flask and movable from beneath the same, said plat-
 form being mounted independently of the flask, and means for holding the platform in operative position.

6. In apparatus of the class described, the combination with a frame arranged to sup-
 130 port a flask, of a platform hinged to the frame and adapted when in raised position to sup-

port the mold contained in the flask, said platform being movable from beneath the mold, and means carried by the frame and coacting with the platform to hold the latter in raised position.

7. In apparatus of the class described, the combination with a frame arranged to support a flask, of a platform hinged to the frame and adapted when in raised position to support the mold contained in the flask, said platform being movable from beneath the mold, and a latch secured to the frame and coacting with the platform to hold the latter in raised position.

8. In apparatus of the class described, the combination with an open frame forming a support for a flask, of a platform hinged within the frame and when in elevated position forming a support for the mold in the flask, and means arranged upon the frame for holding the platform in elevated position.

9. In apparatus of the class described, a mold-receiving bench having an open frame supported solely at one side and arranged to form a flask-support, and a platform hinged to said frame and forming when in elevated position, a support for the mold within the flask, and means for holding the platform in elevated position.

10. In apparatus of the class described, a mold-receiving bench having an open frame supported solely at one side, a platform hinged to said supported side, and locking means arranged upon the opposite side of the frame and adapted to engage said platform to hold it in elevated position.

11. In apparatus of the class described, a mold-receiving bench having a plurality of independently-hinged drop-platforms, and independent means for holding each of said platforms in elevated position.

12. In apparatus of the class described, a mold-receiving bench having an open frame and a plurality of oppositely-disposed supporting-platforms hinged to intermediate portions of said frame.

13. In apparatus of the class described, a mold-receiving bench comprising an open frame supported intermediate its side edges, a plurality of independent supporting-platforms hinged to the frame, and means for holding said platforms in elevated position.

14. In apparatus of the class described, a mold-receiving bench comprising an open frame having a longitudinal intermediate hinge-rod, and a plurality of oppositely-disposed supporting-platforms hinged to said rod.

15. In apparatus of the class described, a mold-receiving bench comprising an open frame supported intermediate its side edges and having an intermediate longitudinal hinge-rod, a plurality of oppositely-disposed supporting-platforms hinged to said rod, and means for holding said platforms in elevated position.

16. In apparatus of the class described, a mold-receiving bench comprising an open frame supported intermediate its side edges and having an intermediate hinge-rod, a plurality of oppositely-disposed supporting-platforms detachably hinged to said rod, and independent latches for holding each of said platforms in elevated position.

17. In apparatus of the class described, the combination with means for supporting both the flask, and the mold arranged therein, said means being removable from beneath the same, of a device arranged to engage the flask and support it, but release the mold, when said combined flask and mold support is removed.

18. In apparatus of the class described, the combination with a movably-mounted support arranged to hold both the flask and mold carried thereby and movable from beneath the same, of a stationary frame located adjacent to the support and arranged to engage the flask only when the combined flask and mold support is removed.

19. In apparatus of the class described, the combination with a frame, of a platform movably mounted on the frame, and means for supporting the platform with its upper face above the horizontal plane of the upper face of the frame.

20. In apparatus of the class described, the combination with an open frame, of a platform hinged within said frame, said platform when elevated having its upper face arranged above the horizontal plane of the upper face of the frame, and means for holding the platform in elevated position.

21. In apparatus of the class described, the combination with an open frame, of a drop-platform hinged at one side to the frame, and a latch arranged upon the opposite side of the frame and pivoted thereto intermediate its ends, one end of the latch forming a handle, the other end being adapted to engage the platform to hold it in elevated position.

22. In apparatus of the class described, the combination with an open frame, of a drop-platform hinged at one side to the frame, and a bell-crank lever arranged upon the opposite side of the frame and pivoted thereto at its elbow, one arm of said lever forming a handle portion, the other arm being adapted to engage the platform to hold it in elevated position.

23. In apparatus of the class described, the combination with an open frame, of a drop-platform substantially coextensive in size with a flask and adapted when in elevated position to support the same, said platform being hinged to one side of the open frame and means for holding the platform in elevated position.

24. In apparatus of the class described, the combination with an open frame, of a drop-platform hinged within said frame and when elevated having its upper face arranged above

the horizontal plane of the edge of the same,
means for holding the platform in elevated
position, said platform when in elevated po-
sition being adapted to support a flask and
5 the mold arranged therein, said flask being
adapted to engage the open frame when the
platform is dropped.

In testimony that I claim the foregoing as
my own I have hereto affixed my signature in
the presence of two witnesses.

JAMES R. MCWANE.

Witnesses:

S. G. STEVENS,

A. R. CARRINGTON.