July 28, 1931. E. O. BEARDSLEY ET AL 1,815,999

PORTABLE MOLDING MACHINE

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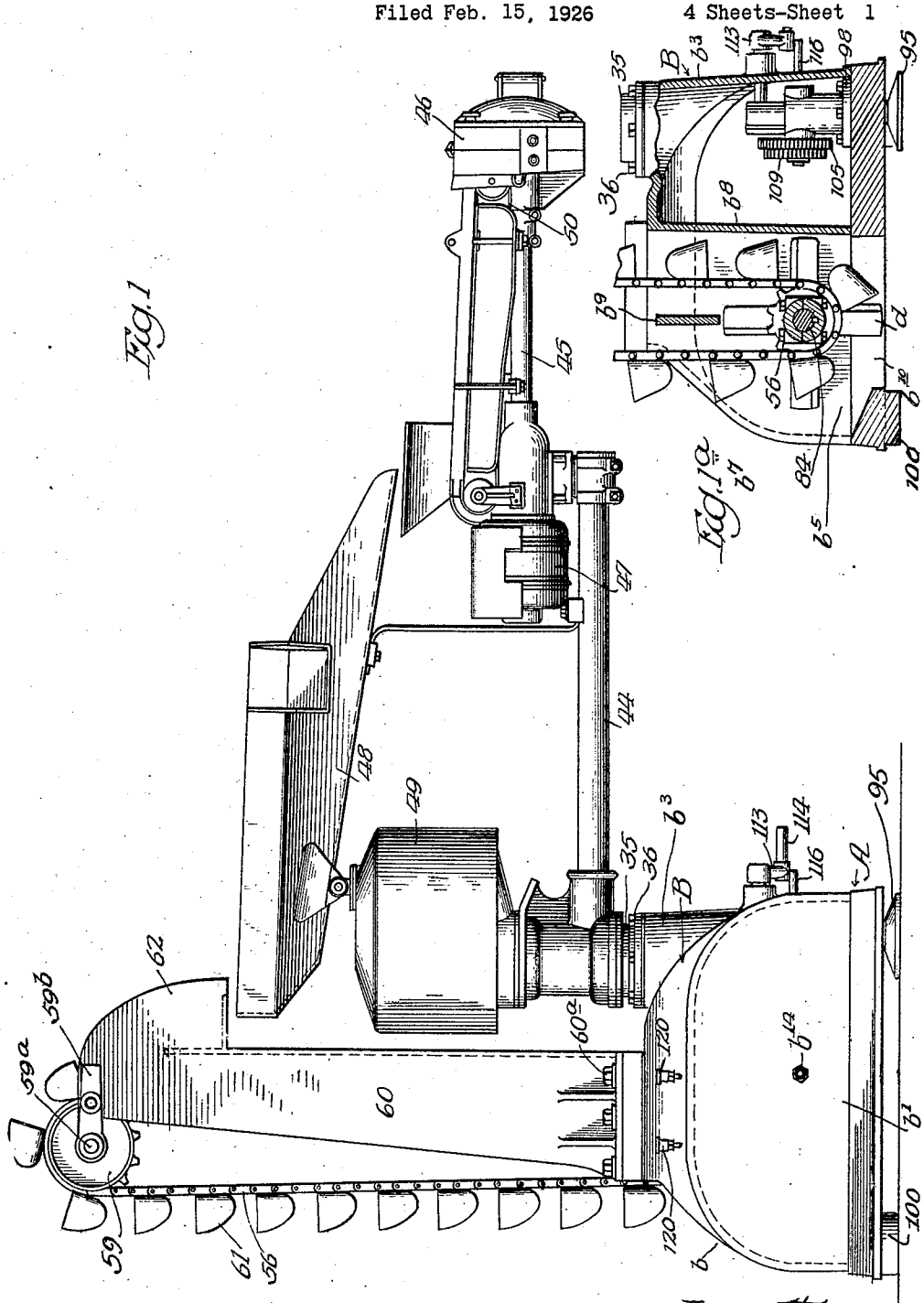


Fig. 1

Fig. 1a

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Fig. 2

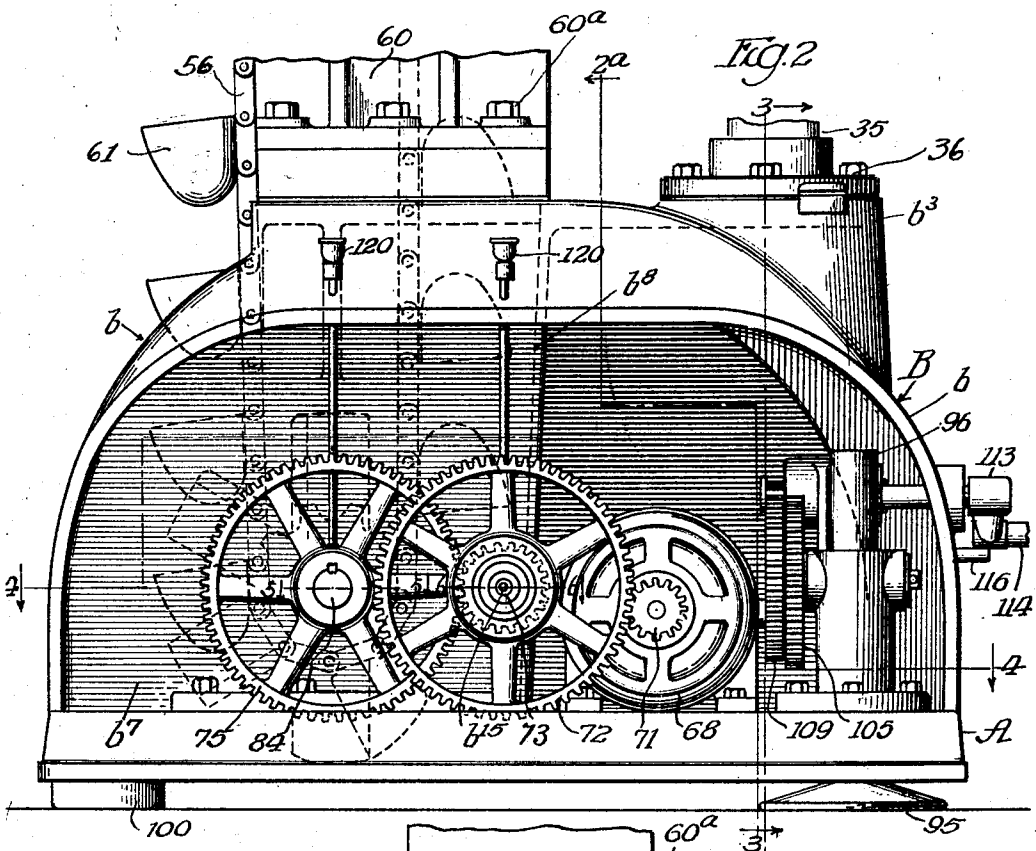
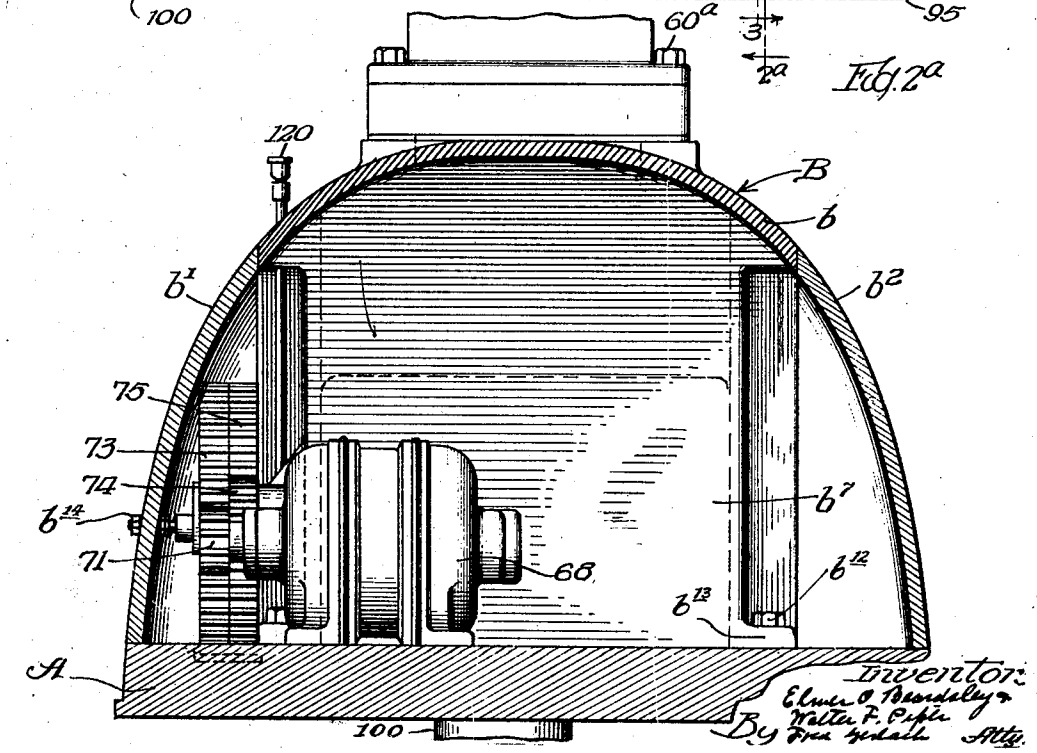


Fig. 2a



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Fig. 3

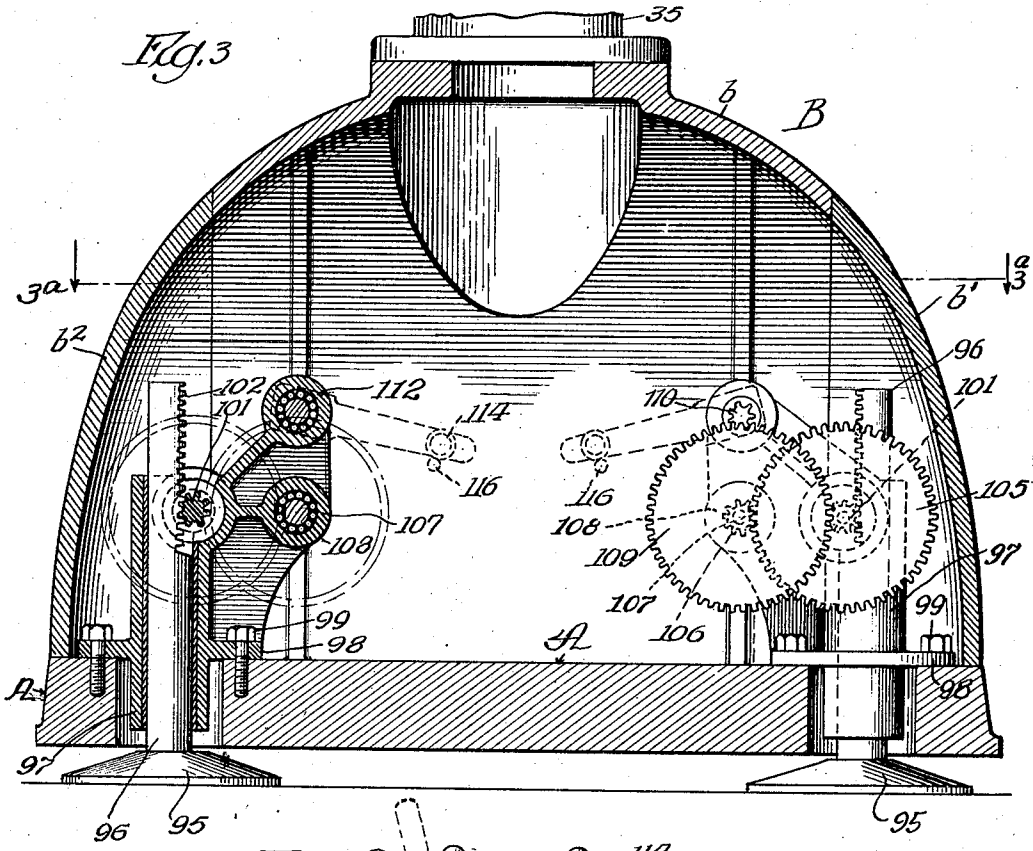


Fig. 3a

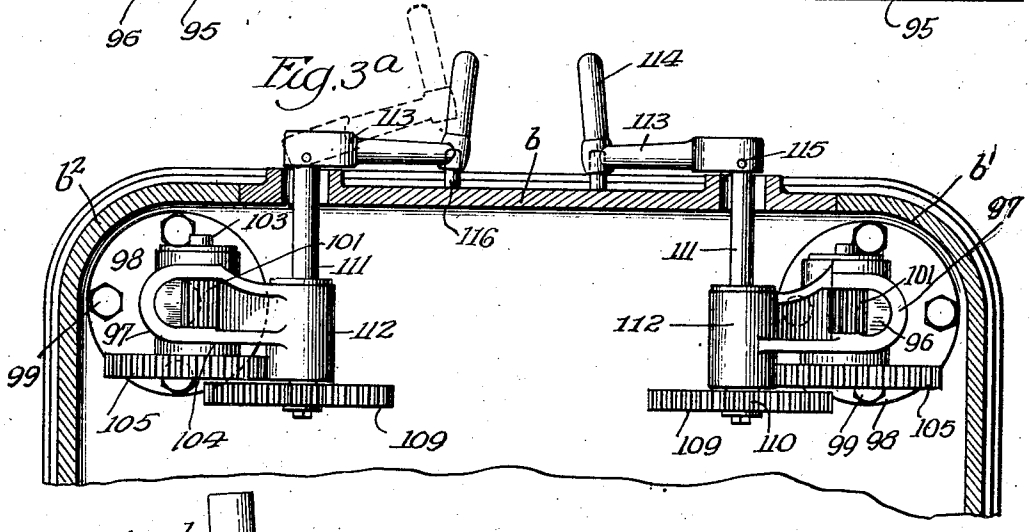
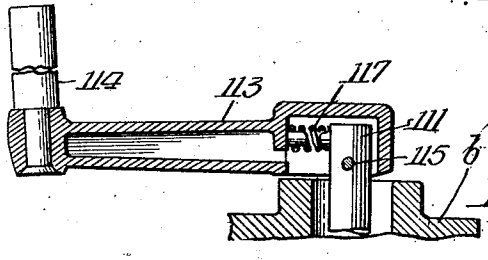


Fig. 3b



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Fig. 4.

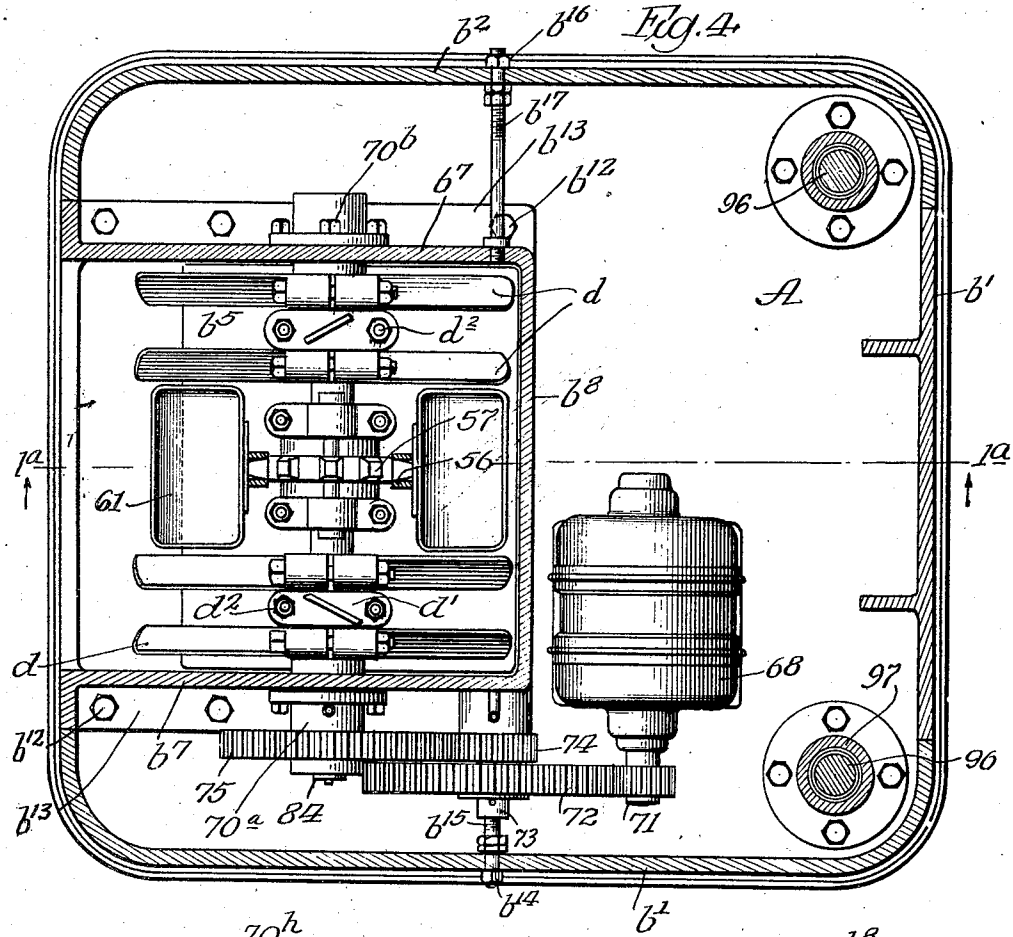


Fig. 4a

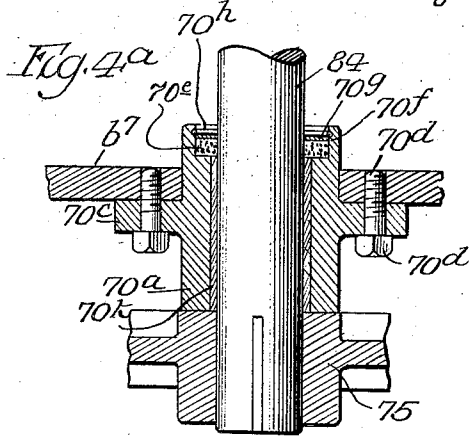
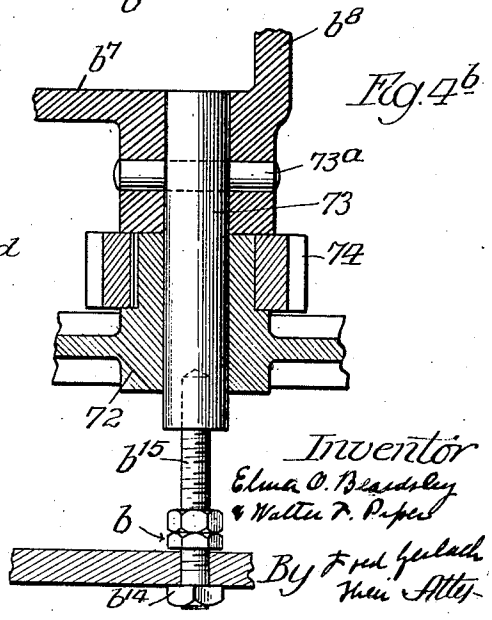


Fig. 4b



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Patented July 28, 1931

1,815,999

UNITED STATES PATENT OFFICE

ELMER O. BEARDSLEY AND WALTER F. PIPER, OF CHICAGO, ILLINOIS, ASSIGNORS TO THE BEARDSLEY & PIPER COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS

PORTABLE MOLDING MACHINE

Application filed February 15, 1926. Serial No. 88,180.

The invention relates to portable molding machines.

One object of the invention is to improve the construction of the portable molding machine set forth in Patent No. 1,472,784 granted Nov. 6, 1923 to Elmer O. Beardsley, and in which the sand elevating mechanism and molding machine are mounted on a portable base which is adapted to be moved from place to place in the foundry. Another object of the invention is to provide improved supporting means by which the elevator driving mechanism will be enclosed to exclude sand therefrom. Another object of the invention is to provide improved levelling mechanism for the portable base. Another object of the invention is to provide an improved base which also serves as a housing and which comprises removable sections to provide ready access to the mechanism in the housing. Another object of the invention is to provide an improved housing on the portable base which encloses the levelling devices. Another object of the invention is to provide a pocket in the base of increased capacity, from which the elevator-buckets are supplied with sand. Other objects of the invention will appear from the specification.

The invention consists in the several novel features hereinafter set forth and more particularly defined by claims at the conclusion hereof.

In the drawings: Fig. 1 is a side elevation of a machine embodying the invention. Fig. 1^a is a vertical central section through the portable base. Fig. 2 is a side elevation of the portable base, one of the side plates being removed. Fig. 2^a is a section on line 2^a—2^a of Fig. 2. Fig. 3 is a section on line 3—3 of Fig. 2. Fig. 3^a is a section taken on line 3^a—3^a of Fig. 3. Fig. 3^b is a detail section of the crank handle for operating one of the levelling devices. Fig. 4 is a section on line 4—4 of Fig. 2. Fig. 4^a is a detail section, showing one of the dust-proof bearings for the elevator drive-shafts. Fig. 4^b is a detail of one of the studs for securing one of the housing sections to the main body thereof.

The invention is exemplified in a machine comprising a base A which is adapted to rest on a molding room floor and is of sufficient weight to stationarily support the machine so it can be operated without attachment or anchorage to some permanent structure. An arched housing B over the base comprises a body portion b which is integrally formed with the base and removable side plates b' and b^2 which are curved so that the entire housing will be arched longitudinally and transversely to form a structure which will shed sand, so that while the machine is being used, the sand will not accumulate thereon.

A molding machine is mounted upon the base, and that illustrated is of the general construction described in our patent No. 1,408,493 dated March 7, 1922, to which reference may be had for a more detailed description.

The housing B is formed with an extension b^3 on which is rigidly secured, by bolts 36, a supporting standard 35; a jib 44, pivoted to the standard so as to swing horizontally; an arm 45, pivoted to the outer end of jib 44 so as to swing horizontally relatively thereto; a sand projector 46 mounted on the end of arm 45 and containing a rotor for projecting wads of sand downwardly at high speed; an electric motor 47, mounted to swing with arm 45, and connected to drive the rotor; a vibratory chute 48, containing a riddle and mounted to swing with jib 44; an endless belt 50 mounted to swing with said arm and for feeding sand from said chute to the projector, and a case 49 containing mechanism, including an electric motor, for vibrating the chute. This exemplifies a molding machine which is carried by a portable base and which is movable laterally to discharge sand into all portions of flasks below the projector.

An elevator for sand comprises buckets 61 on an endless chain 56 which is driven by a lower sprocket 57 and passes around an idler sprocket 59. The buckets dump sand into a guide 62 which directs it into the conveyor chute 48. The upper end of the

elevator is supported by a channelled column 60 which is secured at its lower end by bolts 60^a to the top of the housing body b. The idler sprocket 59, which guides the upper portion of the elevator chain 56, is carried by a shaft 59^a which is supported by arms 59^b. The lower portion of elevator chain 56 passes around sprocket 57 which is fixed to a cross-shaft 84. A sand supply pocket b^5, open at one end, is formed in one end of the housing B to hold a supply of sand to feed the elevator buckets, and into which sand can be readily shovelled. Side walls b^7 and inner walls b^8, which form this pocket, are integral with the body b of the housing B. A bridge wall b^9 is integral with and extends between walls b^7. Shaft 84 (Fig. 4^a) is mounted in bearings 70^a and 70^b which are separately formed from walls b^7 and are provided with flanges 70^c, through which bolts 70^d pass to secure the bearings in the walls respectively. The inner end of each of said bearings is provided with a groove 70^e in which packing 70^f is held by a plate 70^g to prevent sand in the pocket b^5 from working into these bearings. Spring walls 70^h hold plates 70^g in said bearings respectively. Each bearing 70^a, 70^b is provided with a bushing 70^k. These bearings are removably secured in the pocket walls by bolts 70^d so they may be readily removed when refitting is necessary.

Pocket b^5 is preferably of considerable greater width than the elevator buckets, so it will have ample capacity to keep the elevator supplied with sand. Agitator and feed blades d, in staggered series and inclined to deliver sand transversely from the ends of pocket b^5 to the elevator buckets, are fixed to drive-shaft 84 between walls b^7 and the buckets. These blades are formed on sectional hubs which are clamped to shaft 84 by bolts d^2 and exemplify means for feeding sand laterally to the buckets and for preventing the sand from becoming packed in the corners of the sand pocket. The bottom of pocket b^5 is open, as at b^{10}, so that when the machine is lifted and moved from place to place, the sand will drop out of the pocket.

Drive-shaft 84 for the elevator and feed blades d is driven by an electric motor 68 and speed reducing gearing which are enclosed in the housing B. Motor 68 is fixed to the base A adjacent wall b^8. This gearing comprises a pinion 71 on the motor shaft; a gear 72, meshing with pinion 71, and journalled on a stub-shaft 73 which is fixedly secured by a pin 73^a in one of the walls b^7; a pinion 74, fixed to rotate with gear 72; and a gear 75, meshing with pinion 74, and keyed to one end of shaft 84. This motor and driving mechanism are enclosed, so that sand from the pocket and elevator will be excluded therefrom. Cups 120, disposed on the outside of the housing, are connected by pipes to deliver lubricant to the bearings 70^e and stub-shaft 73, so they can be lubricated from the outside.

The body section b of the housing B is preferably formed separately from the base A, and is rigidly secured thereto by bolts b^{12} which extend through flanges b^{13} on the walls b^7. The side plates b' and b^2 of the housing are removable to provide convenient access to the parts enclosed by the housing. Side plate b' is removably secured and clamped in place by a nut b^{14} which is threaded to a bolt b^{15} which is fixed in the outer end of stub-shaft 72. Side plate b^2 is removably secured and clamped in place by a nut b^{16} which is threaded to a bolt b^{17} which has its inner end fixed in one of the walls b^7. To remove either of the side plates, it is only necessary to remove the retaining nut for it. These side plates extend around and form the lower corner portions of the housing to provide ready accessibility to all portions of the interior of the housing.

In the use of a self-retaining portable machine, it has been found that it is seldom that the floor is sufficiently level to cause the machine to be set in a true upright position, so that the line of projection of the sand by the projector will be vertical for efficient filling of the flasks. For this purpose, the base A is provided with levelling devices for adjustable feed, so that when the base is set where the floor is irregular, it can be properly and quickly levelled. A fixed foot 100 is provided on the rear of the base and an adjustable foot 95 is provided at each front corner of the base. In the present invention, the feet 95 are manually adjustable relatively to the base. Each levelling device comprises a vertical plunger 96 fixed to one of the feet 95 and slidably mounted in a socket 97, which is integrally formed with a frame or brackets for carrying the operating mechanism for the plunger, and is provided with a flange 98 which is secured by bolts 99 to the base A.

The operating mechanism for each plunger 96 comprises a pinion 101 which meshes with a rack 102 formed on one side of the upper end of the plunger, and is fixed to a shaft 103 which is mounted in anti-friction bearings 104 carried at the upper end of the socket 97; a gear 105, fixed to shaft 103, a pinion 106 meshing with gear 105 and fixed to a shaft 107, which is mounted in a hub 108 which is integrally formed with socket 97; a gear 109, rigid with pinion 106; a pinion 110, fixed to a crank-shaft 111, which is mounted in a bearing carried in a hub 112 which is also integrally formed with the socket 97, and a crank 113 which is provided with a handle 114 and is connected by a pivot-pin 115 to

the outer end of shaft 111. Each shaft 111 is extended through the housing body b, and its operating crank is attached to the outer end thereof, so that it will be accessible from the outside of the housing. A stop pin 116 is provided for each crank. The pivotal connection 115, between the shaft 111 and the crank permits the crank to be swung outwardly, as indicated by dotted lines in Fig. 3^a, to clear the stop pin when it is desired to rotate the crank to operate the levelling device. When the crank is swung inwardly into the position shown in full lines, the stop will act to prevent reverse rotation of the crank, so that after the levelling device has been adjusted into its desired position, the crank and pin will serve as an automatic lock to retain the gearing so that it will hold the base at the desired elevation. A spring 117 is provided in the hub of each crank 113 and is interposed between the shaft 111 and the hub, so that, when the crank-handle is released by the operator, it will be automatically thrown into position to be arrested by its stop pin. This construction exemplifies a levelling device which is manually operable by reducing gearings, which is enclosed in the housing, which is mounted in a unitary supporting structure, so that it may be placed into and removed from the base as an entity, and which will be automatically locked to prevent the base from dropping when the crank is released. When the side plates b', b^2 are removed, ready access may be had to the reducing gearing for lubrication or inspection.

The invention exemplifies a portable molding machine of the self-retaining type, in which a housing encloses the operating mechanism for the sand-conveying mechanism and levelling devices; in which the housing is arched to shed sand; and in which readily removable sections or side plates are provided to provide ready access to said mechanism and the levelling devices. Also, a construction in which provision is made for preventing sand in the sand-pocket from working into the housing.

The invention is not to be understood as restricted to the details set forth, since these may be modified within the scope of the appended claims, without departing from the spirit and scope of the invention.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent, is:

1. The combination with a molding machine, of a portable base for said machine, adapted to retain itself and the machine thereon stationary on a floor, and a housing over and fixed to the base, the molding machine being mounted on the housing, and levelling mechanism mounted inside of the housing.

2. The combination with a molding machine, of a portable base for said machine, adapted to retain itself and the machine thereon stationary on a floor, a housing fixed to and extended over the base, the molding machine being mounted on the housing, levelling devices mounted inside of the housing, a sand-conveyor mounted on the housing and driving mechanism for the conveyor, mounted inside of the housing.

3. The combination with a molding machine comprising a sand projector, means to support the projector so it can be moved laterally to project sand into different portions of flasks, and mechanism for driving the projector, of a portable supporting base for said machine adapted to retain itself and the machine on a floor, and a housing fixed to and extending over the base, said means being mounted on the upper portion of the housing, and levelling devices mounted inside of the housing.

4. The combination with a molding machine, of a portable supporting base for said machine adapted to retain itself and the machine thereon stationary on a floor, a housing on which the machine is mounted, extending over the base and comprising a body portion on which the machine is mounted, extending over and fixed to the base, and removable side-plates, and levelling devices mounted inside of the housing and accessible when the side-plates are removed.

5. The combination with a molding machine, of a portable supporting base for said machine adapted to retain itself and the machine thereon stationary on a floor, a housing on which the machine is mounted, extending over the base, and comprising a body-portion fixed to the base, and removable side-plates, levelling devices inside of the housing, a sand conveyor, conveyor driving mechanism inside of the housing, said driving mechanism and devices being accessible when the side plates are removed.

6. The combination of a molding-machine, a base for the machine, a housing fixed to and extending over the base, and provided with walls forming a sand-pocket, a sand-elevator extended into said pocket, a drive-shaft for the elevator extending across said pocket, and blades on the shaft for directing sand to the elevator.

7. The combination of a molding-machine, a base for the machine, a housing fixed to and extending over the base, and provided with walls forming a sand-pocket, a sand elevator extended into said pocket, a drive shaft for the elevator extending across said pocket, driving mechanism for said shaft, disposed in the housing, and blades on the shafts for directing sand to the elevator.

8. The combination with a molding machine, of a self-retaining portable base for the machine, a housing over and fixed to the base, and a levelling device comprising

a plunger, a support on the base, inside of the housing and provided with a guide for the plunger, speed-reducing gearing carried by the support in the housing, and comprising a shaft extended through the housing to the outside thereof, and a crank on the outer end of said shaft.

9. The combination with a molding-machine, of a self-retaining portable base for the machine, a housing over and fixed to the base, and a levelling device comprising a plunger, a support on the base, inside of the housing and provided with a guide for the plunger, speed-reducing gearing carried by the support in the housing, and comprising a shaft extended through the housing to the outside thereof, a crank movably connected to the outer end of said shaft, and a stop for the crank.

10. The combination with a molding-machine, of a self-retaining portable base for the machine, a housing over and fixed to the base, and a levelling device comprising a plunger, a support separate from and removably secured to the base, inside of the housing and provided with a guide for the plunger, speed-reducing gearing carried by the support in the housing, and comprising a shaft extended through the housing to the outside thereof, a crank movably connected to the outer end of said shaft, and a stop for the crank.

Signed at Chicago, Illinois, this 2nd day of February, 1926.

ELMER O. BEARDSLEY.
WALTER F. PIPER.