D. PARKS.

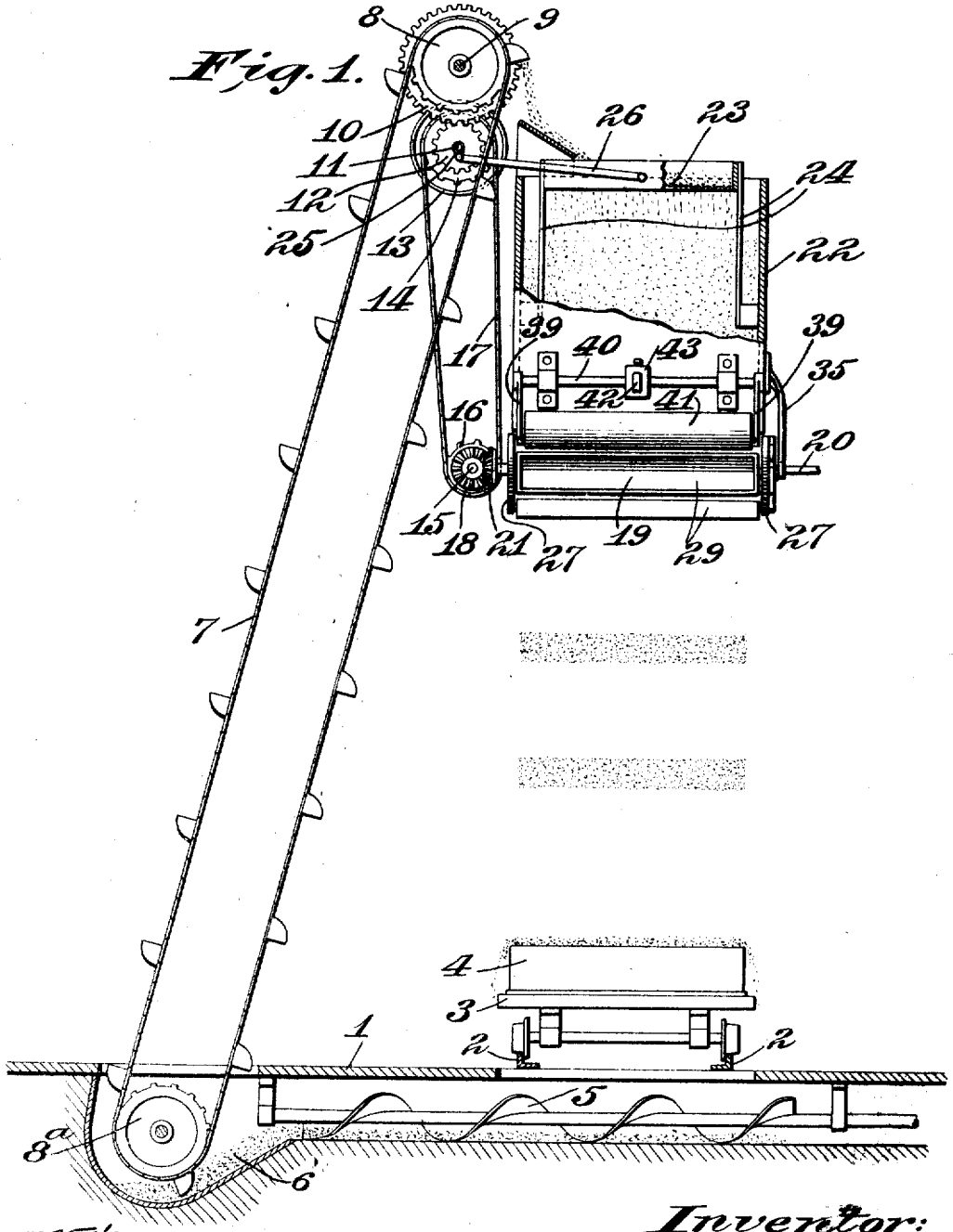
GRAVITY MOLDING APPARATUS.

APPLICATION FILED APR. 26, 1907.

910,718. Patented Jan. 26, 1909.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

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Inventor:

Dennis Parks,

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2 SHEETS—SHEET 2.

Fig. 3.

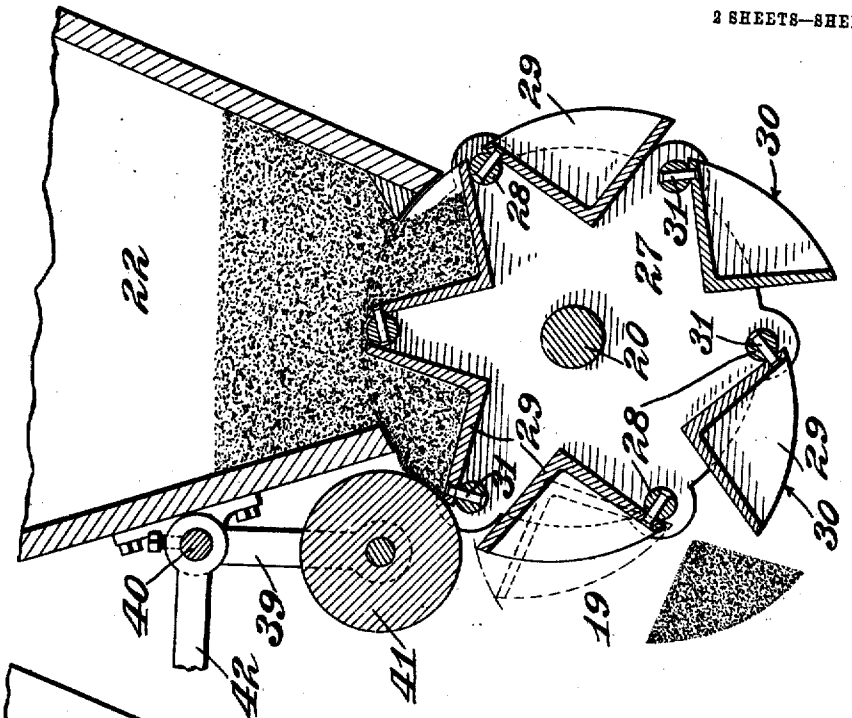
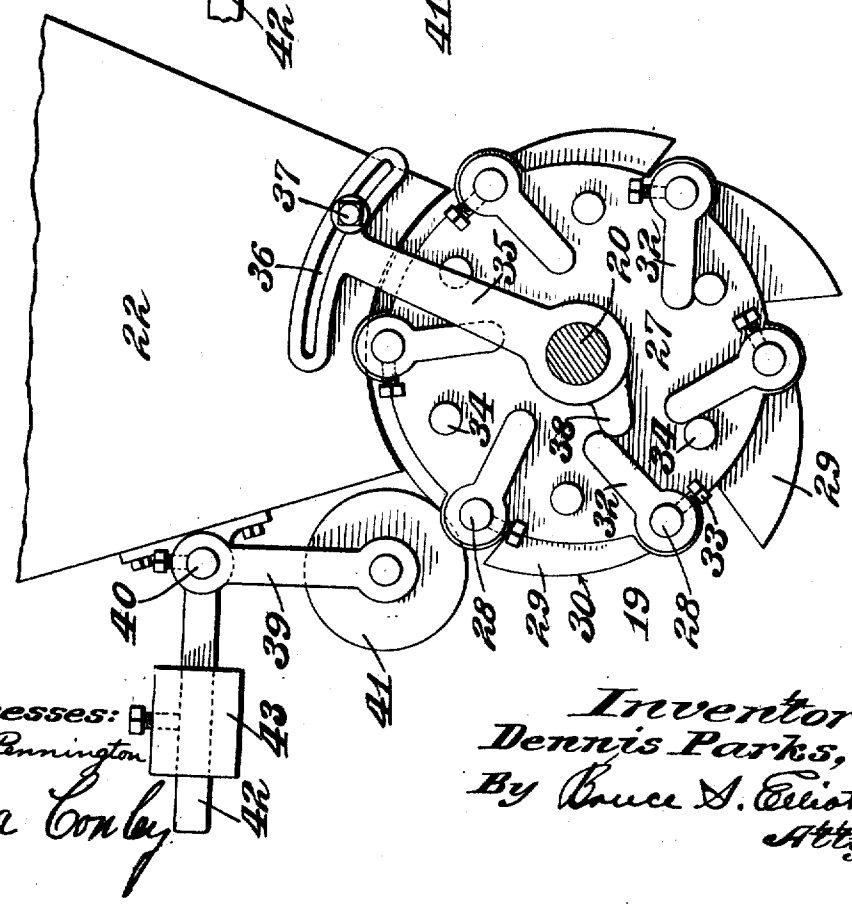


Fig. 2.



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UNITED STATES PATENT OFFICE.

DENNIS PARKS, OF ST. LOUIS, MISSOURI.

GRAVITY MOLDING APPARATUS.

No. 910,718. Specification of Letters Patent. Patented Jan. 26, 1909.

Application filed April 26, 1907. Serial No. 370,356.

To all whom it may concern:

Be it known that I, DENNIS PARKS, a citizen of the United States, residing in the city of St. Louis and State of Missouri, have invented new and useful Improvements in Gravity Molding Apparatus, of which the following is a specification.

This invention relates to certain new and useful improvements in machines for use in the art of gravity molding and is especially directed to the production of novel apparatus for compressing the sand into unitary bodies or wads and discharging said wads successively from a suitable elevation directly over the flask to be packed, the rate of discharge of the wads or bodies of sand being controllable, and the discharge of said bodies, for any length of time, being continuous.

The invention presents two salient features; first mechanism for receiving and discharging unitary bodies of sand; and second, mechanism operating automatically to compress or compact the unitary bodies of sand in such first named mechanism.

The invention is illustrated in the accompanying drawings in which—

Figure 1 is a view in front elevation of a molding machine embodying my improvements; Fig. 2 is a view in side sectional elevation illustrating, on an enlarged scale, the apparatus for receiving and discharging the sand and the device for compressing or compacting the same; and Fig. 3 is a cross section, also on an enlarged scale, illustrating the operation of the sand receptacle, and the device for compressing the sand therein.

Referring now to these drawings, 1 indicates the floor of the foundry on which are secured rails 2, forming a track for a truck 3, adapted to support a flask 4. The floor 1 between and adjacent to the rails 2 is open to permit excess sand from the flask to fall therethrough as usual, and this sand may be forced by a suitable conveyer 5 into a sand pit 6, from which it is elevated by an endless bucket elevator 7. The elevator 7 is mounted on sprockets 8 and 8^a, the shaft 9 on which the upper sprocket 8 is mounted, also carrying a large gear 10.

11 indicates a counter-shaft on which is mounted a small gear 12, meshing with gear 10, and a band pulley 13, which may be driven by a belt in the usual manner. On the shaft 11 is also a sprocket-wheel 14. 15 indicates another counter-shaft located some distance below shaft 11, and to one side of the elevator, on which said counter-shaft is a sprocket-wheel 16, a sprocket-chain passing over the said sprocket-wheels 14 and 16. On an elevated counter-shaft 15 is mounted a bevel gear 18.

19 indicates the sand discharging apparatus having the sand receptacles mounted therein as hereinafter described and suspended above and overhanging a flask path, running parallel to the elevator 7, so that flasks of any desired length may be passed beneath the sand discharging apparatus to discharge the sand wads into and transversely of the flask from one end to the other end of the flask no matter what may be its length and located at a suitable packing distance above the flask, which distance, in practice, is about eight feet. The sand discharging device 19 is carried on a shaft 20, supported in suitable bearings, the inner end of said shaft having secured thereon a bevel gear 21, which is in mesh with the bevel gear 18.

22 indicates an elevated sand supply shown as a hopper having its lower discharge opening lying closely adjacent to the outer surfaces of the sand receptacles hereinafter referred to, as indicated in Figs. 2 and 3, and having mounted in its upper end a shaking sifter or screen 23, mounted on spring arms 24, and agitated from an eccentric 25 on the counter-shaft 11 through the medium of an arm 26. The sand discharging apparatus 19 comprises cast iron heads 27, secured near the opposite ends of, and adapted to rotate with the shaft 20. Mounted near the peripheries of the heads 27, and extending between the same at equal distances apart around the said heads, are rock shafts 28, secured to each of which, and extending between the two heads 27, is a sand receptacle or bucket 29, which, as shown in Fig. 3, is practically triangular in shape in cross-section. The outer edges of the ends of these buckets are curved, as indicated at 30, so that when the bucket is in its normal position, said edges will be concentric with the heads 27. The discharge end of the hopper 22 is curved or concaved to correspond with the curvature of the heads 27 and the ends of the buckets, and in operation the buckets pass under said hopper in close relation thereto, so as to prevent the sand falling out through the space between the buckets and the bottom of the hopper. 31 indicates rivets, or bolts, or the like, for securing buckets

29 at one outer edge to the rock shafts 28. Secured to one end of each of the rock shafts 28, outside of the cast iron head is an arm 32, held in adjustable position on said rock shaft by means of a set screw 33. Projecting outwardly from the head 27 at this end of the apparatus, are a series of stops 34, which are arranged at equal distances apart around said head, and which are adapted to be engaged by the arms 32 to limit the outward throw of the buckets 29. The stops 34 may be, and preferably are, cast on the head 1.

35 indicates a tripping device which is mounted loosely on the shaft 20, and the outer end of this device is provided with a curved extension having a slot 36. By means of a bolt 37 passing into the side of the hopper 22, said tripping device may be secured in different adjusted positions. Extending from the hub of the tripping device 35, is a lug 38, which is adapted to be engaged in turn by each of the arms 32, as the shaft 20 with the heads 27 revolve, so as to upset each of the buckets 29 in turn, and cause it to discharge its sand. It will be understood that as the buckets pass under the hopper 22, they will be filled by the sand dropping thereinto. As the shaft 20 continues to revolve, the buckets are successively carried from beneath the sand hopper and eventually the arm 32, mounted on its rock shaft 28, will engage the lug 38, and cause the bucket 29 to be upset or thrown outward a slight distance, this action occurring somewhat in advance of the fall of the bucket, which would occur due to the action of gravity. The impact of the arm 32 with the lug 38, and the slight outward throw of the bucket thereby occasioned, causes the sand in the bucket to be suddenly discharged as a whole therefrom. As the rotation of the shaft 20 continues the action of gravity will cause said bucket to fall over or outward, such movement being limited by contact of the arm 32 with a stop 34. During the time the apparatus is in operation the elevator 7 is constantly delivering sand from the sand pit 6 to the sifter 23, whence it falls into the hopper in position to fall into the buckets as they pass beneath the same.

The invention herein described is, in some respects, an improvement over the construction of molding machine shown in Patent No. 840,789, granted January 8, 1907, to John E. Mitchell and myself, in that in said patented device the machine is limited to the use of flasks not exceeding a given length. If the flask should exceed this length it could not be moved inward a sufficient distance for packing purposes without coming in contact with the endless bucket conveyer. Furthermore, I have found in practice that it is sometimes impracticable to excavate in a foundry the depth necessary for installing that portion of the apparatus beneath the floor line, for the reason that water or solid rock is often encountered. These limitations to installation and operation of a gravity molding machine are obviated, for the reason that only a slight excavation, if any, is required, the sand supply being elevated; and the sand discharge device being suspended above and overhanging a flask path running parallel to the elevator, no obstruction is interposed in the path of movement of the flask and a flask of any length may be employed in connection therewith.

I have stated that one of the salient features of the invention consists of means for packing the sand in each of the buckets before the sand is discharged therefrom. This device comprises levers 39 mounted on opposite ends of a shaft 40, which is pivotally supported on the hopper 22. Supported in the lower ends of these arms 39 is a roller 41 which is approximately the width of the hopper, and therefore of the buckets 29, being capable, however, of entering said buckets. Mounted on the shaft 40, say centrally thereof is an arm 42, having adjustably mounted thereon a weight 43, whereby the pressure of the roller 41 upon the sand in the buckets 29 may be varied, as circumstances may require. It will be understood that as each of the buckets passes from under the hopper, it will be engaged by the roller 41 which will bear upon the sand therein with a greater or less pressure, and compress or compact the same so that the sand will be discharged from the buckets 29 in compact form and will fall as such through space into the flask to be packed. As the shaft 20 continues to revolve the buckets will gradually fall back into their normal position, in which position the outer edge portion of each bucket will rest upon the rock shaft 28 of the succeeding bucket, as clearly illustrated in Fig. 3. The engagement of the buckets with these rock shafts constitutes a closure and prevents sand falling except in minute quantities between the buckets.

The sand compressing device shown herein is not limited in its application to the particular sand discharging apparatus shown, but can equally well be used in other forms of gravity molding apparatus, such for instance as that shown in the patent to Mitchell and Parks, No. 840789, dated January 8th, 1907.

I claim.

1. Gravity molding apparatus comprising an elevated sand supply, an elevated sand discharge device communicating therewith, for discharging sand into a flask from a suitable packing height, and means for compacting the sand in said device before its discharge therefrom.

2. Gravity molding apparatus comprising an elevated sand supply, an elevated rotatable sand discharge device communicating

therewith, for discharging sand into a flask from a suitable packing height, and means for compacting the sand in said device before its discharge therefrom.

3. Gravity molding apparatus comprising an elevated sand supply, an elevated sand discharge device communicating therewith, for discharging sand into a flask from a suitable packing height, said device having a number of sand receptacles, and means for compacting the sand in said receptacles before its discharge therefrom.

4. Gravity molding apparatus comprising an elevated sand supply, and an elevated rotatable sand discharge device communicating therewith, for discharging sand into a flask from a suitable packing height, said device having a series of pivoted buckets.

5. Gravity molding apparatus comprising an elevated sand supply, and an elevated rotatable sand discharge device communicating therewith, for discharging sand into a flask from a suitable packing height, said device having a series of impact-operated, pivoted buckets.

6. Gravity molding apparatus comprising an elevated sand supply, and an elevated rotatable sand discharge device communicating therewith, for discharging sand into a flask from a suitable packing height, said device having a series of outwardly-swinging buckets.

7. Gravity molding apparatus comprising an elevated sand supply, an elevated sand discharge device communicating therewith, for discharging sand into a flask from a suitable packing height, said device having a series of pivoted buckets, and means for compacting the sand in said buckets before its discharge therefrom.

8. Gravity molding apparatus comprising an elevated sand supply, an elevated rotatable sand discharge device communicating therewith, for discharging sand into a flask from a suitable packing height, said device having a series of outwardly-swinging, impact operated buckets, and means for compacting the sand in said buckets before its discharge therefrom.

9. In gravity molding apparatus, in combination with an elevated sand discharge device, having a series of sand receptacles, a roller located adjacent to said device, each of said receptacles being adapted in the movement of said device to pass under and have its sand compressed by said roller.

10. In gravity molding apparatus, in combination with an elevated sand discharge device having a series of sand receptacles, a roller mounted to yieldably engage the sand in each receptacle in the movement of said device.

11. In gravity molding apparatus in combination with an elevated rotatable series of pivoted buckets, a roller pivotally mounted adjacent to said buckets and adapted to be engaged by the sand in each in turn, and means for varying the pressure of said roller upon the sand in said buckets.

12. In gravity molding apparatus, in combination with an elevated rotatable sand discharge device having a series of sand receptacles, a roller mounted to yieldably engage the sand in each receptacle in the movement of said device.

13. Gravity molding apparatus comprising an elevated rotating member, a series of buckets pivotally mounted in said member, each of which carries an arm, an adjustable tripping device adapted to be engaged by each of said arms in succession, and a sand supply coöperating with said buckets.

14. Gravity molding apparatus comprising an elevated sand supply, an elevated impact sand discharge device communicating therewith, for discharging sand into a flask from a suitable packing height, and impact means for compacting the sand in said device before its discharge therefrom.

15. Gravity molding apparatus comprising an elevated sand supply, and a rotatable sand discharge device coöperating therewith, for discharging sand into a flask from a suitable packing height, said device having a series of pivoted buckets adapted to be swung outward by impact with a fixed part of the machine.

16. Gravity molding apparatus comprising an elevated sand supply, a rotatable sand discharge device coöperating therewith, for discharging sand into a flask from a suitable packing height, said device having a series of sand receptacles, and means for compacting the sand in said receptacles before its discharge therefrom, the construction presenting an unobstructed space in the line of movement of the flask.

17. Gravity molding apparatus comprising an elevated sand supply, a rotatable sand discharge device coöperating therewith, for discharging sand into a flask from a suitable packing height, said device having a series of outwardly-swinging sand receptacles, and means for compacting the sand in said receptacles before its discharge therefrom, the construction presenting an unobstructed space in the line of movement of the flask.

18. Gravity molding apparatus comprising an elevated sand supply, a rotatable sand discharge device coöperating therewith, for discharging sand into a flask from a suitable packing height, said device having a series of sand receptacles, and automatic means for compacting the sand in said receptacles before its discharge therefrom, the construction presenting an unobstructed space in the line of movement of the flask.

19. Gravity molding apparatus comprising an elevated sand supply, a rotatable sand discharge device coöperating therewith, for

discharging sand into a flask from a suitable packing height, said device having a series of pivoted buckets, and means for compacting the sand in said buckets before its discharge therefrom, the construction presenting an unobstructed space in the line of movement of the flask.

20. Gravity molding apparatus comprising an elevated sand supply, a rotatable sand discharge device coöperating therewith, for discharging sand into a flask from a suitable packing height, said device having a series of outwardly-swinging buckets, and means for compacting the sand in said buckets before its discharge therefrom, the construction presenting an unobstructed space in the line of movement of the flask.

21. Gravity molding apparatus comprising an elevated sand supply, a rotatable sand discharge device coöperating therewith, for discharging sand into a flask from a suitable packing height, said device having a series of outwardly-swinging, impact-operated buckets, and means for compacting the sand in said buckets before its discharge therefrom.

22. Gravity molding apparatus comprising a rotating member, a series of buckets pivotally mounted in said member, each of which carries an arm, a tripping device adapted to be engaged by each of said arms in succession, and a sand supply coöperating with said buckets.

23. Gravity molding apparatus comprising a rotating member, a series of buckets pivotally mounted in said member, each of which carries an arm, an adjustable tripping device adapted to be engaged by each of said arms in succession, and a sand supply coöperating with said buckets.

24. Gravity molding apparatus comprising a rotating member, carrying stops, a series of buckets pivotally mounted in said member, each of which carries an arm adapted to engage one of said stops, a tripping device adapted to be engaged by each of said arms in succession, and means for supplying sand to said buckets.

25. Gravity molding apparatus comprising a hopper, a shaft having heads secured thereon near its opposite ends, a series of buckets pivotally secured in and extending between said heads, each of said buckets carrying an arm, a series of stops on one of said heads, one stop being provided for and adapted to be engaged by each of said arms, and an adjustable tripping device supported on said shaft and adapted to be engaged by each of said arms in succession.

26. In gravity molding apparatus, in combination with a movable sand discharge device, having a series of sand receptacles, a pressure-exerting, displaceable roller located adjacent to said device and insertible in said receptacles each of said receptacles being adapted in the movement of said device to pass under and have its sand compressed by said roller.

27. In gravity molding apparatus, in combination with a movable sand discharge device having a series of sand receptacles, a roller insertible in said receptacles and mounted to yieldably engage the sand in each receptacle in the movement of said device.

28. In gravity molding apparatus, in combination with a rotatable series of pivoted buckets, a yieldably mounted roller insertible in and adapted to coöperate with each of said buckets.

29. In gravity molding apparatus in combination with a rotatable series of pivoted buckets, a roller pivotally mounted adjacent to and insertible in said buckets and adapted to be engaged by the sand in each in turn, and means for varying the pressure of said roller upon the sand in said buckets.

30. In gravity molding apparatus, in combination with a rotatable sand discharge device having a series of sand receptacles, a roller insertible in said receptacles and mounted to yieldably engage the sand in each receptacle in the movement of said device.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

DENNIS PARKS.

Witnesses:
BRUCE S. ELLIOTT,
CLARA CONLEY.