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G. W. PACKER, DEC'D.

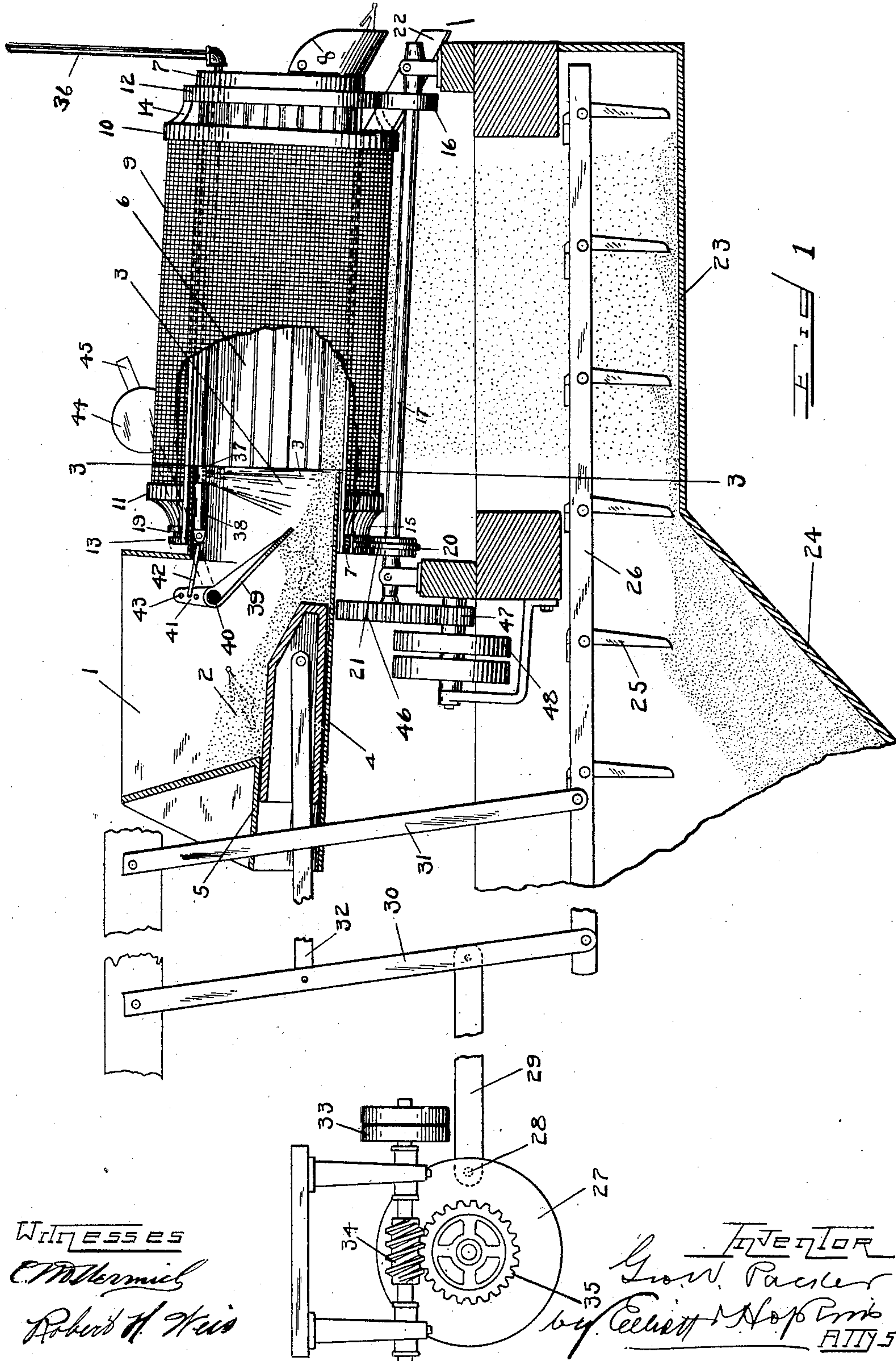
M. A. PACKER, ADMINISTRATRIX.

APPARATUS FOR TEMPERING MOLDERS' SAND.

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NO MODEL.

2 SHEETS—SHEET 1



WITNESSES

E. M. Herrick

Robert H. Weiss

INVENTOR

G. W. Packer

by E. M. Herrick, R. H. Weiss

ATTY-S

UNITED STATES PATENT OFFICE.

GEORGE W. PACKER, OF CHICAGO, ILLINOIS; MARGARET A. PACKER
ADMINISTRATRIX OF SAID GEORGE W. PACKER, DECEASED.

APPARATUS FOR TEMPERING MOLDERS' SAND.

SPECIFICATION forming part of Letters Patent No. 762,596, dated June 14, 1904.

Application filed October 4, 1901. Renewed October 21, 1903. Serial No. 177,945. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. PACKER, a citizen of the United States, residing in the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Apparatus for Tempering Molders' Sand, of which the following is a full, clear, and exact specification.

My invention relates to means for imparting to the sand or loam or other like granular substance used by foundrymen for forming molds the requisite amount of moisture to render it of the proper consistency or plasticity; and my invention has for its primary object to automatically regulate the amount of the tempering-water by the bulk or amount of the sand to be tempered, whereby the proper relative proportion of water and sand may be maintained and both overwetting and underwetting avoided without necessarily working or mixing the sand with the water by hand.

With these ends in view my invention consists in certain features of novelty in the construction, combination, and arrangement of parts by which the said objects and certain other objects hereinafter appearing are attained, all as fully described with reference to the accompanying drawings and more particularly pointed out in the claims.

In the said drawings, Figure 1 is a general view of my improved apparatus, showing the same partly in vertical longitudinal section and partly broken away. Fig. 2 is a plan view of the mold-receiving hopper and screen with connected parts partly broken away. Fig. 3 is a transverse section taken on the line 3 3, Fig. 1. Fig. 4 is a detail side elevation of the mold-receiving hopper. Fig. 5 is an end view thereof. Fig. 6 is a detail side elevation of a plunger, hereinafter described. Fig. 7 is an end view thereof. Fig. 8 is a longitudinal sectional view of the water-regulating valve; and Fig. 9 is a transverse section thereof on the line 9 9, Fig. 8.

In carrying out my invention I employ a hopper or box 1 for receiving the mold with the castings, core, and core-wires therein, if any be employed. In Fig. 1 the mold is shown as having been deposited and is represented

by the shapeless mass of sand and castings 2, the mold having been conveyed to the hopper and deposited therein by hand or by any suitable mechanism. (Not necessary to explain or to employ in connection with my present invention.) At one end of this hopper 1 is an outlet constituted by a horizontal neck 3, through which the sand, castings, and other particles entering the hopper with the mold are ejected. The bottom of the hopper and this neck 3 are arranged on a slight incline, as shown in Fig. 1, so as to enable gravity to slightly aid the sand and any free water that may be in the neck in finding their way therefrom; but as each mold is deposited its mass is positively forced toward and through the outlet-neck 3 by means of a plunger or ejector 4, arranged in the bottom of the hopper and partaking of the round or semicylindrical form thereof, as better shown in Figs. 5 and 7, so as to fit snugly against the bottom of the hopper. This plunger 4 is shown in the form of a hollow member, guided in the hopper 1 by a horizontal plate 5, extending across the lower side of the hopper, adjacent to the rear wall thereof, and fitting closely to the flat top of the plunger, so as to constitute a way for the same to slide in. The neck 3 of the hopper is extended into the upper end of a slightly-inclined tumbler composed of a number of parallel bars 6, secured to end rings 7, which hold the bars in the form of a cylinder with slight spaces between them to permit the sand and core-wires to fall through while the castings work out at the lower end of the tumbler over a chute 8, supported independently thereof in any suitable way. Surrounding the tumbler 6 7 is a cylindrical screen 9, secured to end rings 10 11, which are in turn connected with rims 12 13, respectively. The ring 10 is thus connected with rim 12 by arms 14 and the ring 11 with rim 13 by a web 15, or, in other words, made integrally therewith. The rim 12 rests upon two plain rollers 16, mounted upon the lower ends of shafts 17 18, respectively, thus supporting the screen 9 with capability of rotating in axial alinement with the neck 3, and as the rims 12 13 are secured to the end rings 7

the tumbler is also revolubly supported within and turns with the screen 9, a considerable space being left between the tumbler and the screen, so that the core-wires which fall between the bars or slats 6 of the tumbler work out at the lower end of the screen and pass off over a chute 22, supported in any suitable way independently of the screen and tumbler. The sand, however, falls straight through the screen after being more or less carried up with and tumbled about by the bars 6 and is caught below the screen in a suitable box or receptacle 23, from which it is gradually worked into a main storing-hopper 24 by pivoted pushers 25, carried on a horizontal support 26, which is worked back and forth in the box 23 by means of a crank-disk 27, whose crank-pin 28, is connected by pitman 29 with one of a pair of swinging arms 30 31, which are arranged a considerable distance apart and constitute the means for both supporting and swinging the bar 26. To one of these arms is pivoted a pitman 32, which reciprocates the plunger 4. The crank-disk 27 may be driven from any suitable source of power by means of pulley 33 on the shaft of a worm 34, which engages with worm-wheel 35, connected with disk 27.

36 is a water-pipe which projects into the tumbler 9 and terminates within the neck 3, where it is provided with a spray-nozzle 37, having a number of fine perforations on its lower side only, said spray-nozzle being of elongated or cylindrical form, and over this nozzle is fitted a cup-shaped valve 38, which is capable of closing all or any number of the perforations in the nozzle when pushed endwise thereon. When the valve is open, the water falls in a fine shower upon the sand in the neck 3 just prior to its introduction upon the bar 6 of the tumbler, and in order that the amount of water thus showering onto the sand may be governed automatically in proportion to the amount of sand passing through the neck 3 the valve 38 is connected to some suitable mechanism adapted to be actuated by the sand passing it. For this purpose I have shown a door or gate 39 pivoted at 40 in the hopper 1 and projecting sufficiently near to the bottom thereof to be deflected by the sand as it is pushed inward by the plunger 4. This door is secured to an arm 41, which is connected by means of link 42 to the valve 38, the arm 41 having a series of perforations 43, whereby the position of the link 42 thereon may be changed for varying the stroke or extent of movement of the valve. In the absence of sand or a sufficient quantity of sand in the neck or outlet of the hopper to hold the gate or door open it will be thrown downwardly and the valve closed by a counterweight 44, adjustably supported upon arm 45, which is secured to the pivot or shaft 40 of the gate. The inner end of the plunger 4 is beveled, as shown in Figs. 1 and 6, so as to

be able to impart the requisite advancing motion to the sand, castings, &c., without danger of crowding the castings against the door or gate with such violence as to be likely to result in damage.

In order that the screen and tumbler may be given the desired rotation for shaking out the core-wires, castings, and sand and at the same time mixing the sand with the water, the shaft 17 is provided with a gear 46, meshing with pinion 47, secured to drive-pulley 48, which may be driven from any suitable source of power.

If desired, this apparatus may be used in combination with an automatic mold-carrying system and the means for reciprocating the plunger 4 operatively connected thereto in such a manner that as each mold is deposited in the hopper 1 the plunger will make one or a given number of reciprocations.

With a machine thus constructed it will be seen that the amount of water sprayed upon the sand entering the tumbler through the neck 3 of the hopper is governed automatically in proportion of the quantity of sand passing through, it being understood that the larger the bulk of sand the farther the valve will be open and when no sand at all is present under the gate or door 39, or in any event when there is not sufficient under it to raise the weight 44, the valve will be entirely closed and if no appreciable amount of sand is passing into the tumbler it will remain closed even though the plunger 44 continue to reciprocate.

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

1. In an apparatus for tempering sand the combination of means for setting the sand in motion, means for supplying moisture to the sand, means for controlling said supply and means arranged to be acted on by the sand to be tempered for actuating said controlling means, substantially as set forth.

2. In an apparatus for tempering sand, the combination of means whereby the sand to be tempered is caused to move, means for supplying moisture to the sand, means for controlling the supply and means for operating the controlling means arranged in the line of movement of the sand and adapted to be impinged and actuated thereby, substantially as set forth.

3. In an apparatus for tempering sand the combination of means whereby the sand to be tempered is caused to move, means for supplying moisture to the sand, means for controlling said supply and a deflectable gate or member arranged in the line of movement of the sand and adapted to be impinged and deflected thereby, and means operatively relating said gate or member to said supply-controlling means, substantially as set forth.

4. In an apparatus for tempering sand the combination of means for supplying moisture

to the sand, means for controlling the supply, means arranged in the line of movement of the sand for operating said controlling means, and means for working the sand past the second said means, substantially as set forth.

5 5. In an apparatus for tempering sand the combination of means for supplying moisture to the sand, means for controlling the supply, means for operating said controlling means by
10 the sand and a reciprocatory plunger moving toward and from the last said means for working the sand thereagainst, substantially as set forth.

15 6. In an apparatus for tempering sand the combination of means whereby the sand to be tempered is caused to move, means for supplying moisture thereto, a deflectable member normally in the line of movement of the sand, means for yieldingly holding said deflectable
20 member normally in the line of movement of the sand and means for controlling the supply operatively connected with said deflectable member, substantially as set forth.

25 7. In an apparatus for tempering sand the combination of means whereby the sand to be tempered is caused to move, a supply-pipe for moisture, a perforated valve-seat communicating therewith, a valve inserted over said seat for closing all or any number of said per-
30 forations and means actuated by the movement of the sand for opening said valve, substantially as set forth.

8. In an apparatus for tempering sand the combination of a hopper for receiving the

sand, an outlet-neck on said hopper, means for 35 working the sand through said neck, a pivoted gate in said outlet-neck adapted to be deflected by the sand passing therethrough, a spray-pipe projecting into said neck, means for controlling the spray emitted by said pipe and
40 means operatively connecting said controlling means with said pivoted gate, substantially as set forth.

9. In an apparatus for tempering sand the combination of a hopper for receiving the 45 sand, a plunger in said hopper for working the sand therefrom, said hopper having an outlet arranged opposite said plunger, a deflectable member arranged in the path of the sand between said plunger and outlet, means 50 for supplying moisture to the sand, means for controlling said supply and an operative connection between said controlling means and deflectable member, substantially as set forth.

10. In an apparatus for tempering sand the 55 combination of a hopper for receiving the sand, a plunger for engaging the sand in the hopper, having its forward end beveled on the upper side, a deflectable gate arranged adjacent to the forward end of said plunger in the 60 line of movement of the sand, means for supplying moisture to the sand, and means for controlling said supply operatively connected with said gate, substantially as set forth.

GEORGE W. PACKER.

Witnesses:

F. A. HOPKINS,
W. D. CROSS.