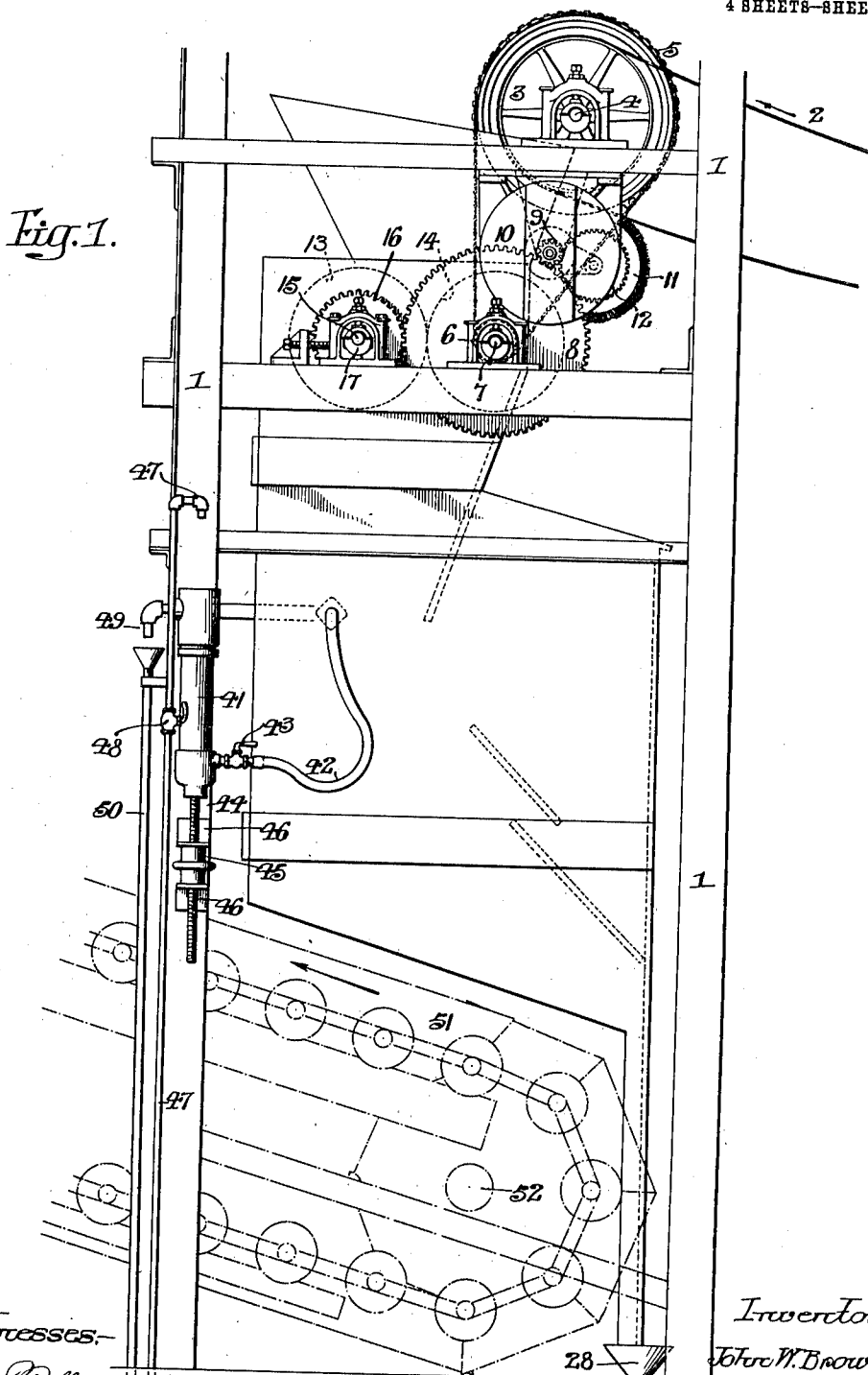


J. W. BROWN, JR.
SAND TEMPERING APPARATUS.
APPLICATION FILED MAY 4, 1910.

1,061,160.

Patented May 6, 1913.

4 SHEETS—SHEET 1.



Witnesses—

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Horace Mann

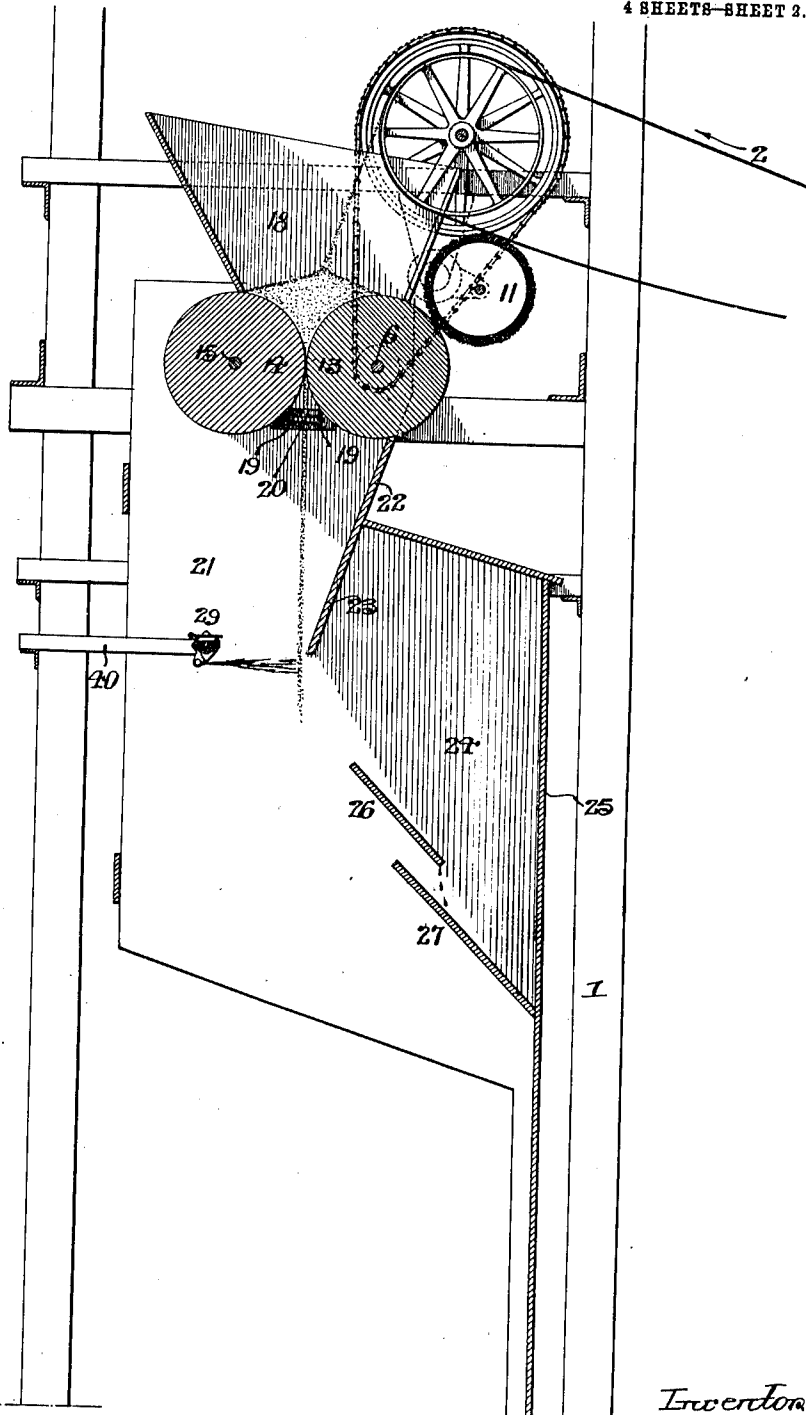
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4 SHEETS—SHEET 2.

Fig. 2.



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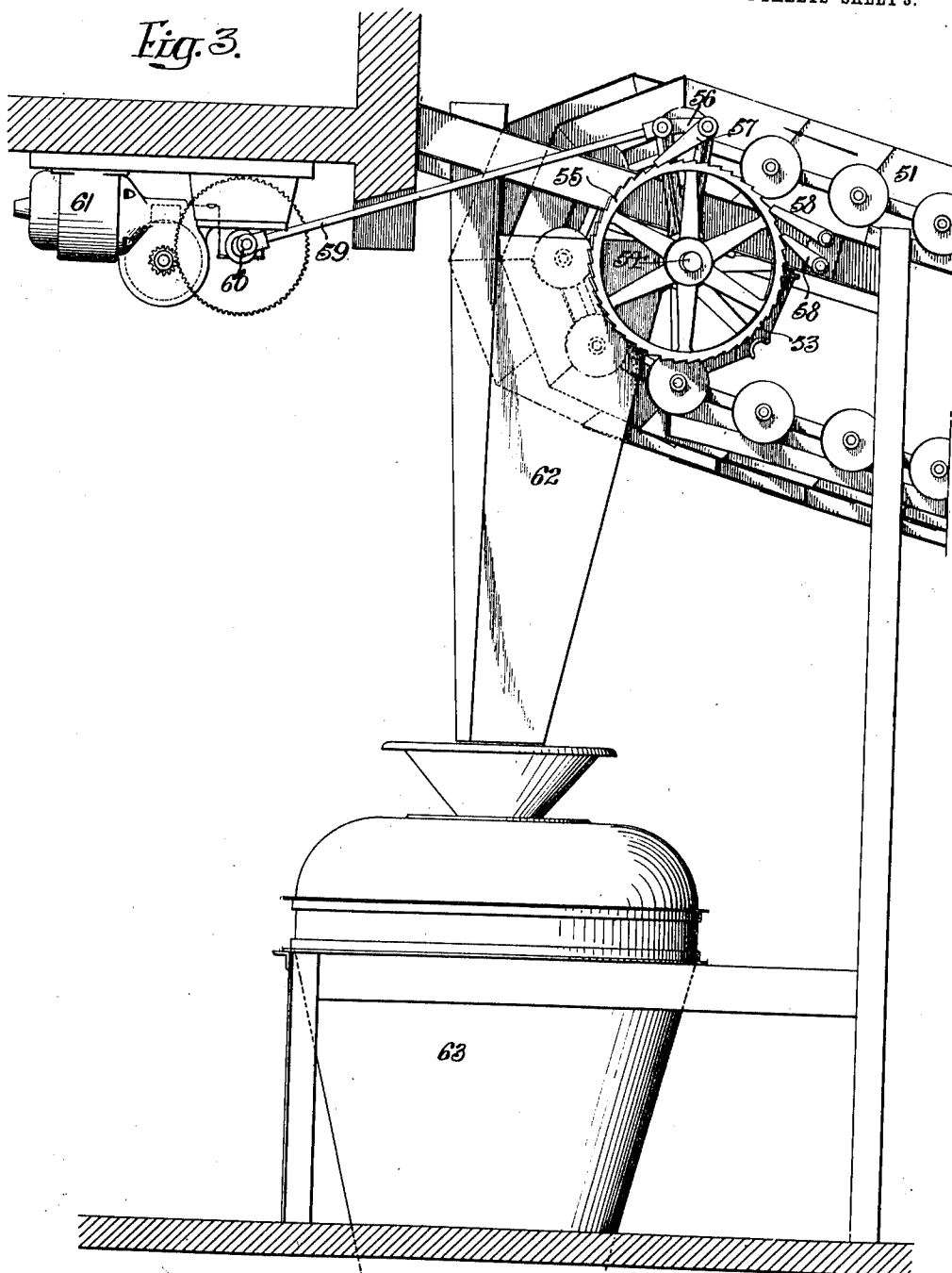
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4 SHEETS-SHEET 3.

Fig. 3.



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4 SHEETS-SHEET 4.

Fig. 6.

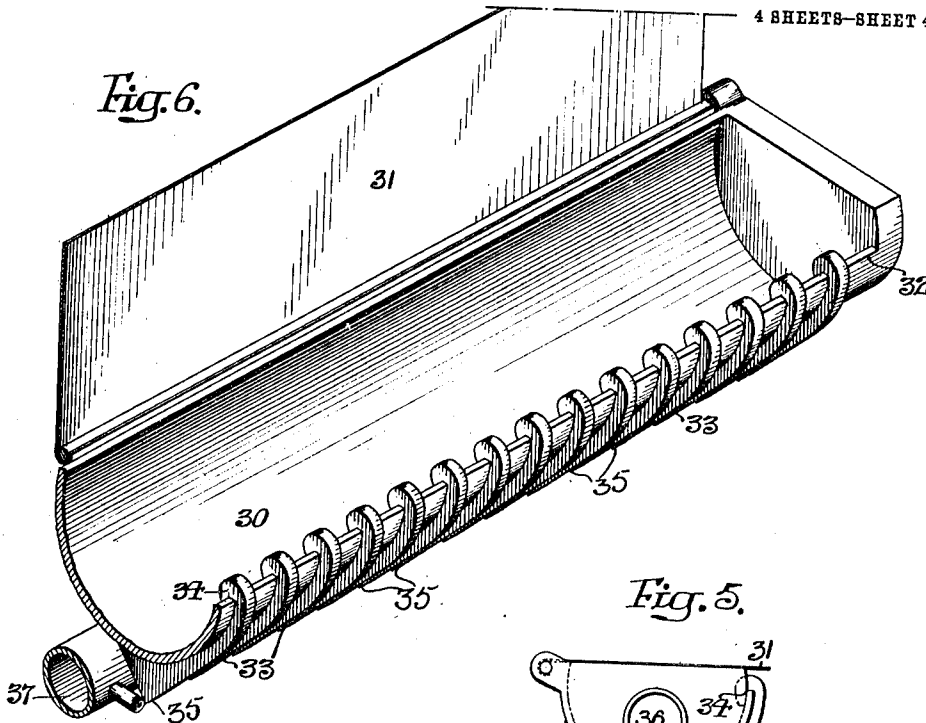


Fig. 5.

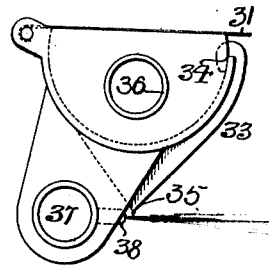


Fig. 7.

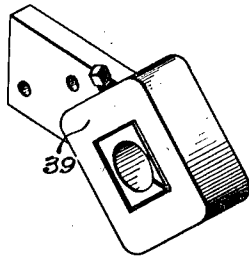
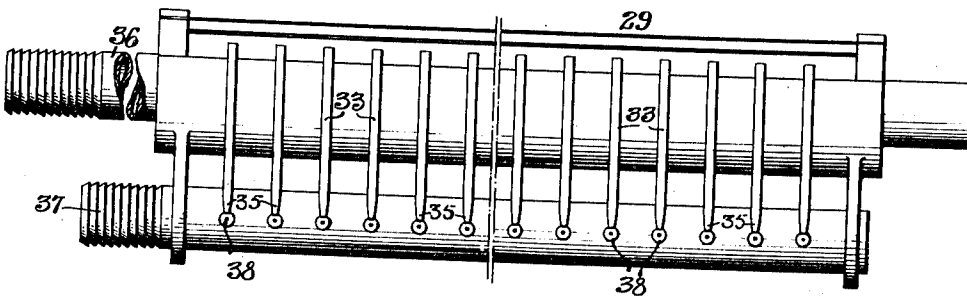


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN WILSON BROWN, JR., OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE ENTERPRISE MANUFACTURING COMPANY OF PENNSYLVANIA, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

SAND-TEMPERING APPARATUS.

1,061,160.

Specification of Letters Patent.

Patented May 6, 1913.

Application filed May 4, 1910. Serial No. 559,291.

To all whom it may concern:

Be it known that I, JOHN WILSON BROWN, Jr., a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Sand-Tempering Apparatus, of which the following is a specification.

This invention relates to certain improvements in apparatus for tempering or moistening sand after it has been used in a casting apparatus.

This application is a companion of the application filed by me on the eighth day of January, 1910, under Serial No. 537,076.

In the machine of the above mentioned application the sand is preferably used over and over again. The sand, after it is discharged from the casting, is passed through a magnetic separator, which separates any particles of metal from the sand, and then it is conveyed to a point to be delivered to the molding machine, but sand which has been used is dry, owing to the fact that it has been subjected to the heat of the molten metal, so that it is not in condition to be used without moistening and the great difficulty in moistening sand in a continuous apparatus is to provide means for giving the sand the proper amount of moisture.

The object of my invention is to provide an apparatus which will moisten the sand to the degree required and which can be regulated so as to increase or diminish the amount of moisture, as circumstances require.

In the accompanying drawings:—Figure 1, is a view in elevation illustrating my improved sand moistening apparatus; Fig. 2, is a vertical sectional view of the same; Fig. 3, is a side view showing the driving end of the conveyer illustrated in Fig. 1, and also the centrifugal mixer; Fig. 4, is a front view of the atomizer; Fig. 5, is an end view of the atomizer illustrated in Fig. 4; Fig. 6, is a sectional perspective view showing the atomizer with the lid raised; and Fig. 7, is a perspective view of one of the bearings carrying the atomizer.

1 is the framework of the apparatus, 2 is the belt conveyer in the present instance leading from a magnetic separator or the sand discharge of the casting machine. This belt passes around wheels 3, mounted on a shaft 4, adapted to suitable bearings

on the frame of the machine. 5 is a sprocket wheel on said shaft 4 from which passes a belt which is driven by a sprocket pinion 6 on a shaft 7 having a gear wheel 8 which meshes with a pinion 9 on the shaft of the electric motor 10, which is secured to the frame of the apparatus. In order to cleanse the belt I provide a brush 11 which contacts with the belt on the return run, as illustrated in Fig. 1, and this brush is driven by a gear 12 which meshes with the pinion on the motor shaft.

13 and 14 are crushing rolls, one roll being mounted on the shaft 7 and the other on the shaft 15, and on the shaft 15 is a gear wheel 16 which meshes with the gear wheel 8 before mentioned, and the bearing 17 for the shaft 15 is adjustable so that the space between the two crushing rolls can be regulated at will.

18 is a hopper into which the sand is discharged from the belt 2, and the lower portion of the hopper is closed by the crushing rolls 13 and 14. Bearing against the underside of the crushing rolls are scrapers 19 held against the rolls by springs 20. These scrapers rest upon bearings at each side of the frame and scrape off any particles of sand which may adhere to the rolls.

21, 21 are the side walls of the casing and 22 is the front wall extending preferably at an angle for a given distance and this wall is continued by a deflector 23 which terminates just above the point where the sand is subjected to the spray. Back of this deflector 23 is a space 24 closed by the front plate 25.

26 and 27 are inclined deflectors for carrying off any water of condensation which may accumulate in the space 24 in the event of spray being blown through the sand or which may accumulate due to the stoppage of the flow of sand for any cause. The water as it accumulates will pass either down the front wall 25 or onto the deflectors 26, 27 and into a suitable outlet 28, Fig. 1.

29 is the atomizer from which the spray is projected onto the sand as it falls from the rolls, as illustrated in Fig. 2. This atomizer is illustrated in detail in Figs. 4 to 6, both inclusive. In the present instance the atomizer consists of a trough 30 having a hinged cover 31 and the front edge 32 of this trough is lower than the back edge, as

clearly shown in Fig. 6, and along the front of the trough are a series of ribs 33 and these ribs extend over the edge 32 of the trough and into the trough, as indicated at 5 34, Fig. 6. The lower ends of these ribs terminate in a point 35.

36 is a water inlet pipe and 37 is an air pipe having a series of nozzles 38 which terminate below the points 35 of the ribs 33. 10 After the edges of the ribs are moistened and the air under pressure is projected in close proximity to the lower ends of the ribs, water is drawn from the trough over the face of the ribs 33 by capillary attraction, 15 consequently there is a thin film of water traveling on each of the ribs from the trough to the point 35, where it drops off into the path of the jet of air. The air breaks up this drop and projects it in a fine spray 20 against the thin sheet of sand, moistening the particles of sand sufficiently to give it temper. The atomizer is mounted in suitable bearings 39 secured to the supporting bars 40 forming a part of the frame of the 25 apparatus.

In order to keep the water in the trough 30 always at the same level, I provide a vertically adjustable reservoir 41 which is connected to the trough through a flexible pipe 30 42 provided with a valve 43, and this reservoir is mounted on a screw 44 adapted to a nut 45 mounted between bearings 46 on the frame of the apparatus so that it can be adjusted vertically to regulate the height of 35 the water in the trough.

47 is a water supply pipe which has a nozzle directly above the reservoir and is provided with a valve 48.

49 is an overflow pipe from the reservoir 40 which discharges into a waste pipe 50. By vertically adjusting the reservoir so that the overflow will be on a line substantially with the edge of the trough 30, an even discharge of water from the trough is assured.

45 The sand, as it falls through the tempering apparatus, drops onto an endless conveyer 51 which is arranged at an incline, passing around a sprocket wheel 52 at the base and around a driven sprocket wheel 50 53 at the upper end, as shown in Fig. 3, and on the shaft 54 carrying this sprocket wheel is a ratchet wheel 55 which is driven by a reciprocating arm 56 having a pawl 57 so as to feed the conveyer forward, in the direction of the arrow, at a slow speed. 55 58 are detent pawls which prevent the ratchet wheel returning with the driving belt. The arm 56 is connected by a rod 59 to the crank of a shaft 60 driven by a motor 60 61 through a train of gears, as clearly shown in Fig. 3. The sand discharges from the

conveyer 51 through a chute 62 into a centrifugal mixer 63 and from this mixer it is conveyed to the hopper of the molding machine. 65

While my invention is particularly adapted for moistening or tempering sand for use in molding machines, it will be understood that the invention can be used for moistening sand or other material for other purposes 70 without departing from the essential features thereof.

The operation of the machine is as follows:—The sand in the present instance, 75 after it leaves the flask of the molding machine, passes through a magnetic separator for removing any particles of metal from the sand, after which it is conveyed to the tempering apparatus, either alone or with the addition of fresh sand, as circumstances 80 require, as there is always a certain percentage of loss where sand is used over and over again. The sand is then discharged into the hopper 18 and passes between the crushing rolls 13 and 14 and falls in a thin film past 85 the atomizer and the fine sprays of water are projected against the film of sand and moisten it to the degree desired. The sand which falls onto the endless conveyer is carried by the conveyer and discharged into a 90 centrifugal mixer, where it is thoroughly mixed before it is conveyed to the hopper of the molding machine.

The water in the trough of the atomizer is kept at a given level by the device de- 95 scribed and the water is drawn from the trough by capillary attraction, as stated above.

The atomizer described and illustrated in this application forms the subject of a sep- 100 arate application which has resulted in Patent No. 1,051,846, Jan. 28, 1913.

I claim:

The combination in an apparatus for tempering or moistening sand or other granular 105 material, of an endless belt conveyer for carrying the sand, a hopper in which the sand is discharged from the conveyer, a pair of crushing rolls at the base of the hopper for crushing and discharging the sand in a thin 110 film, an endless conveyer on which the sand is discharged, and an atomizer for spraying water onto the sand as it passes from the hopper to the last mentioned conveyer so as to moisten the sand to the degree required. 115

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

JOHN WILSON BROWN, JR.

Witnesses:

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WM. A. BARR.