No. 646,686. Patented Apr. 3, 1900.

J. W. DU BOIS.

SAND MIXER.

(No Model.) (Application filed Apr. 19, 1899.)

Fig. 1.

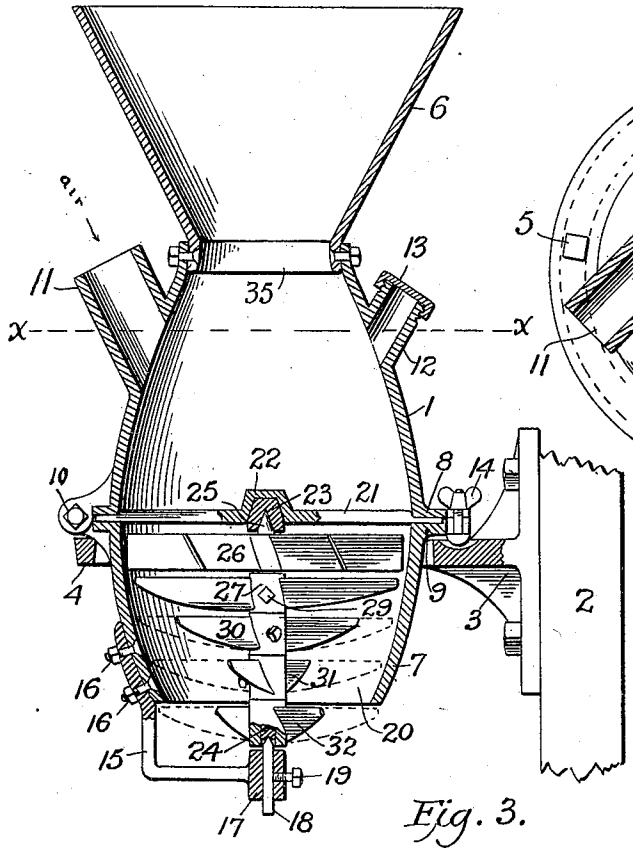


Fig. 2.

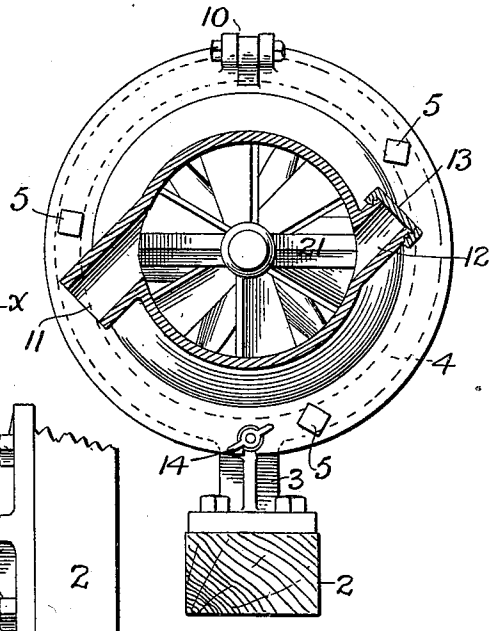
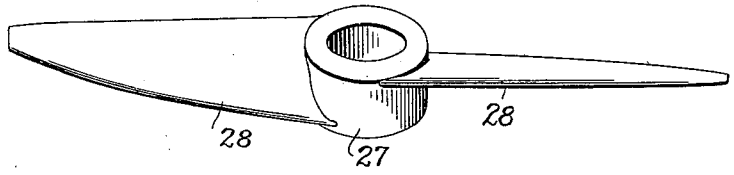


Fig. 3.



WITNESSES

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SAND-MIXER.

SPECIFICATION forming part of Letters Patent No. 646,686, dated April 3, 1900.

Application filed April 19, 1899. Serial No. 713,604. (No model.)

To all whom it may concern:

Be it known that I, JAMES W. DU BOIS, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Sand-Mixers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a mixing-machine for use in disintegrating, mixing, and evenly distributing the sand or similar material which is employed in making molds in iron foundries and other manufacturing plants, the object thereof being to provide a mechanical construction which will receive the sand, thoroughly mix the same, breaking up the lumps and commingling the various kinds and qualities of material therein, and more evenly distributing the same in a uniform style, so that it will serve more effectually for use in the making of the molds; and the invention consequently consists, essentially, in the construction, arrangement, and combination of the several mechanical parts and in numerous details and peculiarities thereof, substantially as will be hereinafter more fully pointed out, and succinctly stated in the claims.

In the accompanying drawings, illustrating my invention, Figure 1 is a vertical section of my improved sand-mixing device. Fig. 2 is a horizontal sectional plan view on the line $x\,x$ of Fig. 1. Fig. 3 is a large detail perspective view of one of the sand-breaking blades or rotary mixer-flights.

Like numerals of reference designate corresponding parts throughout the different figures of the drawings.

The body of the device consists, primarily, of a receptacle or chamber of suitable size and shape, being of the curved oblong form, as shown in the drawings, or any other design which may be of practical service, the chamber which is shown in the drawings consisting of the upper part 1 and the lower section 7, said upper part having on its lower end a flange 8 and said lower section having on its upper edge a flange 9, the two flanges 8 and 9 being in contact with each other. The two sections 1 and 7 are hinged together at 10, and they are located or clamped securely to each other by means of some suitable clamping device—as, for instance, the bolt or thumb-nut 14. (Shown in Fig. 1.) This main body 1 7 is open at its upper and lower ends, the lower end 20 being the mouth through which the sand is discharged after being mixed and the upper end 35 being the point at which the sand enters the main body and having mounted there some suitable flaring mouth or hopper 6, into which the sand may be shoveled or fed.

The whole machine is preferably supported in an upright position on some convenient standard—as, for instance, a post 2—having bolted thereto a bracket 3, which is provided with a circular ring 4, which surrounds and embraces the main body and on which the interclamped flanges 8 and 9 rest, as shown in Fig. 1, a suitable number of bolts 5 passing through the ring 4 and the body-flanges, holding the same firmly together.

My improved sand-mixing device is intended to be operated by pneumatic means, and to this end I so construct the main body 1 7 that it may have one or more inlet or induction points where air under pressure can enter the interior of the main body, said points being preferably near the upper end of the body, but below the receiving-mouth 6. In the particular example of invention set forth in the drawings the main body is provided with an inlet branch pipe 11 on one side and another similar, but smaller, branch pipe 12 on the other side, one or both of these inlets being provided with a removable screw-threaded cap 13. The smaller inlet-nozzle 12 is intended to be coupled with a pipe leading from an air-compressor, whereby air under pressure may be introduced into the main body, while the inlet 11 may receive pressure coming from any suitable supply. When other means of compression are used, of course either or both of the nozzles 11 and 12 may be closed by their caps. A cross-bar 21 is located in a horizontal position within the main body crosswise of the same, with its ends clamped between the body-flanges 8 and 9, there being at the center of the cross-bar 21 a bearing 22, in which is placed a bearing-block 23, of hard metal. Below the cross-bar 21 is a vertical shaft 24, having a pointed upper end 25, that enters

the block 23, as shown in Fig. 1, while the lower end of the rotary shaft 24 is centrally recessed to be engaged by the pointed upper end of an adjustable rod 18, held by means of a set-screw 19 in a bearing 17 on the end of an arm 15, that is secured by means of bolts 16 16 to the lower section 7 of the main body of the machine. Securely fastened to the rotary shaft 24 near its upper end is a fan 26, consisting of any suitable number of inclined or curved blades and readily operable by means of a blast passing downwardly through the main body from the source of air-supply. Furthermore, on the same rotary shaft 24 is a series of horizontal rotary mixer flights, cutters, or blades of any suitable and preferred construction. One of these rotary mixers is shown in detail in Fig. 3, where it is seen to consist of a hub 27, having a couple of oppositely-projecting horizontally-inclined blades 28 28, which taper toward the ends. The hub 27 is adjustably secured to the shaft 24 by means of a set-screw 29. Immediately below the rotary mixer 27 28 is a similar mixer 30, below that another mixer 31, and below that another 32. Thus it will be seen that below the actuating-fan 26 I have delineated four of these rotary mixers. It will be obvious that the effect of the rotation of the fan 26 will be to actuate the shaft 24 and propel the several rotary mixers just described. Preferably in the construction and arrangement of these mixing-blades they decrease in length as you pass successively downward in order to correspond with the curved form of the lower body-section 7; but it must also be remarked that I prefer to construct the lowermost mixing device 32 with blades slightly longer than those of the next upper mixing device 31, as is shown in dotted lines in Fig. 1, in order that the sand or material when it is discharged from the mouth 20 may be scattered more thoroughly and extensively over the surface on which the material is being deposited, thereby preventing a piling up or accumulation of the material in such a heap as to fill the mouth 20 and obstruct the easy and correct working of the device.

In the operation of my device air-pressure will have ingress into the main body through the nozzles 11 and 12, one or both, as the case may be, and the current of air thus introduced will act first on the blades of the rotary wheel 26, causing the same to rotate, and thus driving the shaft 24 and the mixing blades or arms affixed thereto. The introduction of a strong current of air into the body 1 7 at a point below the sand-receiving hopper 6 will have the effect of producing a vacuum at or below the opening 35, which will cause the sand to be drawn into the main body by the force of suction, which will supplement the action of gravity in conveying the material into the disintegrating-chamber, where the rotary mixers are located. Furthermore, it will be observed that the falling sand will first be struck by the air-blast, after which the sand will strike against the wheel 26, whose blades will thus (after the air-blast) produce the first breaking action upon the sand to crumble its lumps and begin the work of securing uniformity in its texture, while after leaving the wheel 26 the sand will be successively acted upon by the blades or arms beneath the said wheel.

Many changes may be made in the precise construction and arrangement of the mechanism as embodied in the present construction without departing from my present invention.

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

1. In a device of the character described, the combination with the main body formed of sectional sides, of a cross-bar supported between the sides of the same, a bracket extending from the main body beneath the device, a vertical shaft supported upon said bracket and the cross-bar in the main body, a fan supported upon the vertical shaft, mixing-blades also supported upon the shaft beneath the fan, and a branch pipe leading into the main receptacle, by means of which a blast of air or the like may be introduced into the same to operate the device, substantially as described.

2. In a device of the character described, the combination with the main body formed of sectional sides, a hopper leading to the same, a cross-bar supported between the sides of the main body, a bracket extending from the body of the device beneath the same, an adjustable rod supported upon the end of the same, a vertical shaft supported upon said adjustable rod and the cross-bar in the main body, a fan supported upon the vertical shaft, mixing-blades also supported upon the shaft beneath the fan, said blades decreasing in diameter from the top to the bottom of the same, and a branch pipe leading into the main receptacle, by means of which a blast of air or the like may be introduced into and operate the device.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES W. DU BOIS.

Witnesses:
FRED E. TASKER,
ROBERT A. MORGAN.