S. H. BROWN.

SEPARATOR.

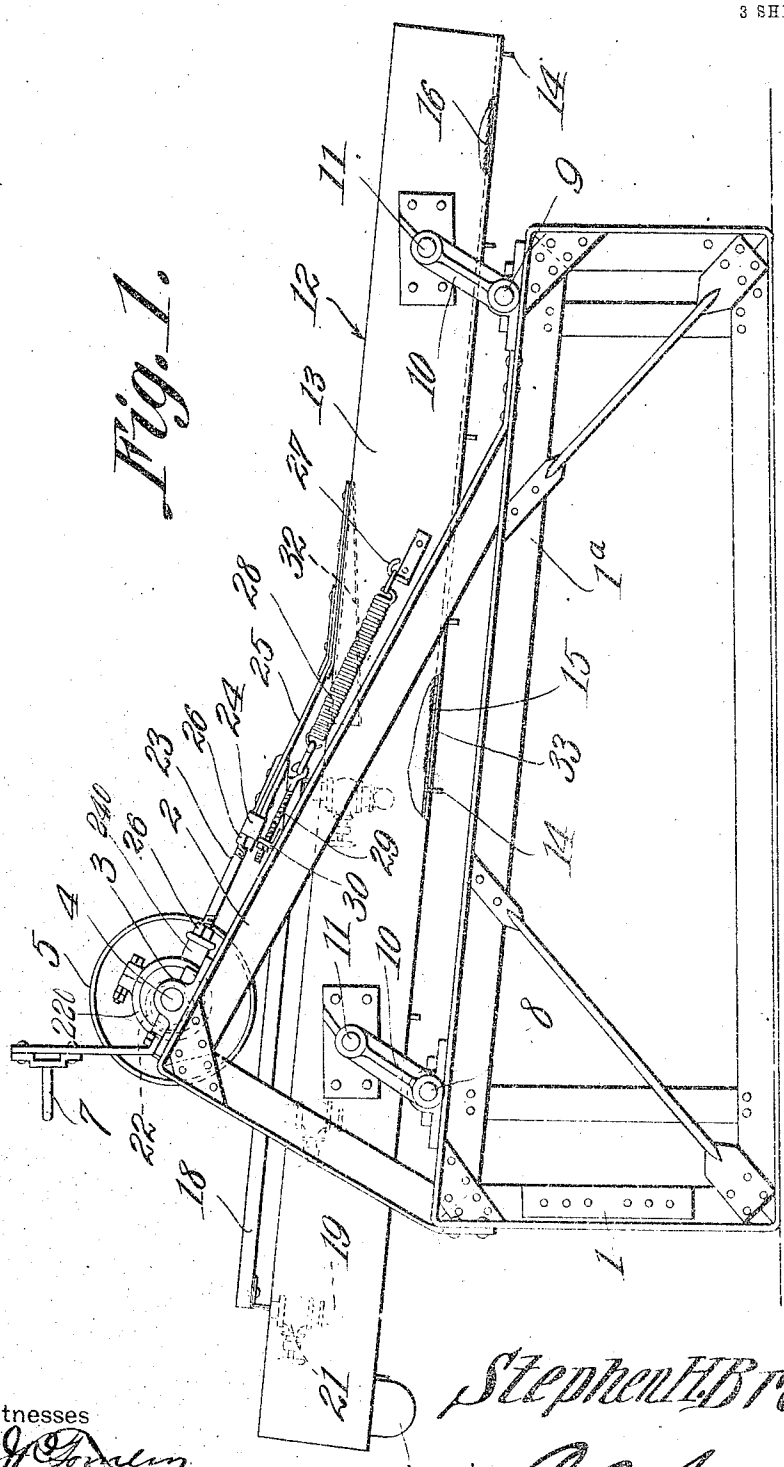
APPLICATION FILED JUNE 30, 1910.

990,954.

Patented May 2, 1911.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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3 SHEETS—SHEET 2.

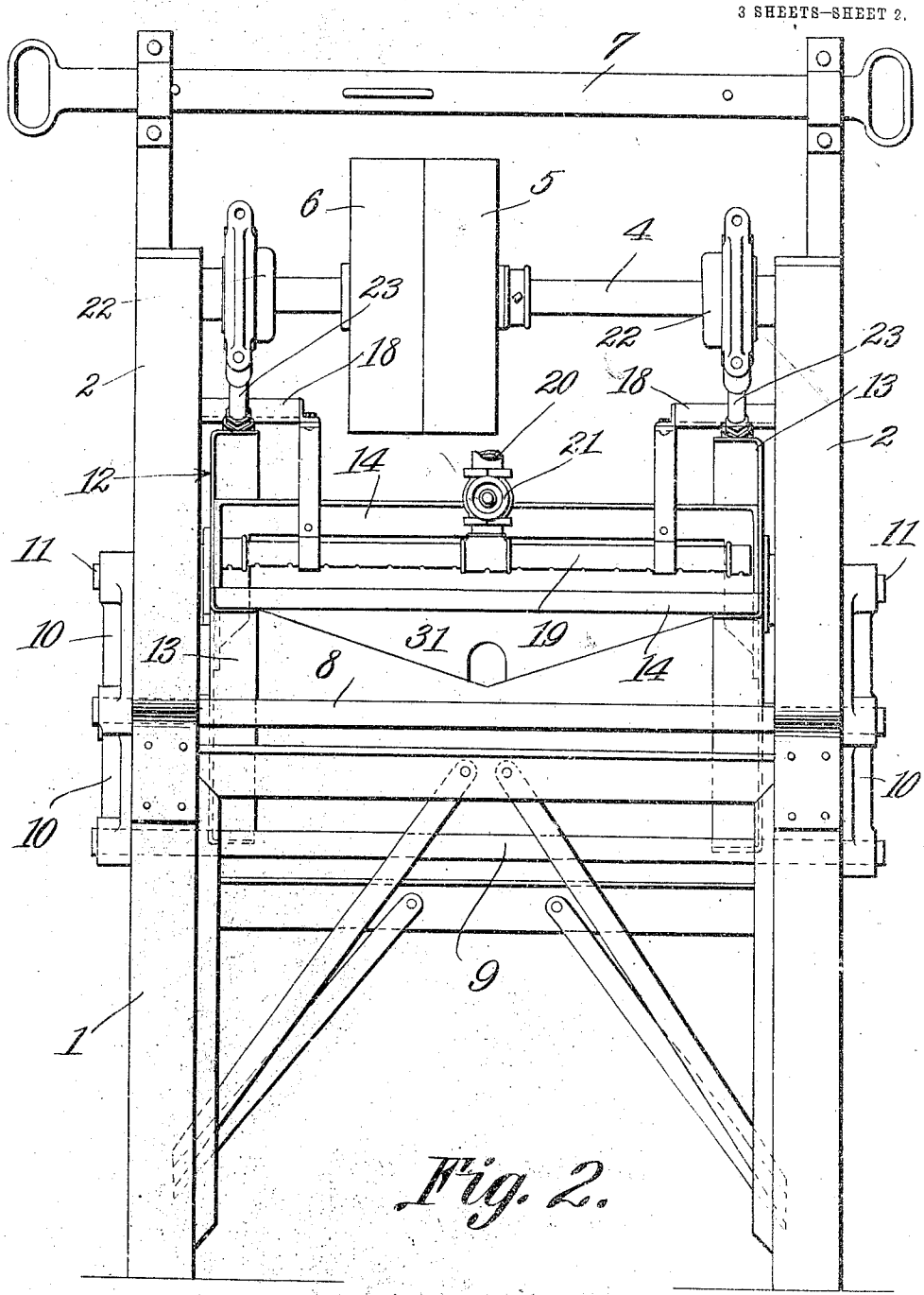

Fig. 2.

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3 SHEETS—SHEET 3.

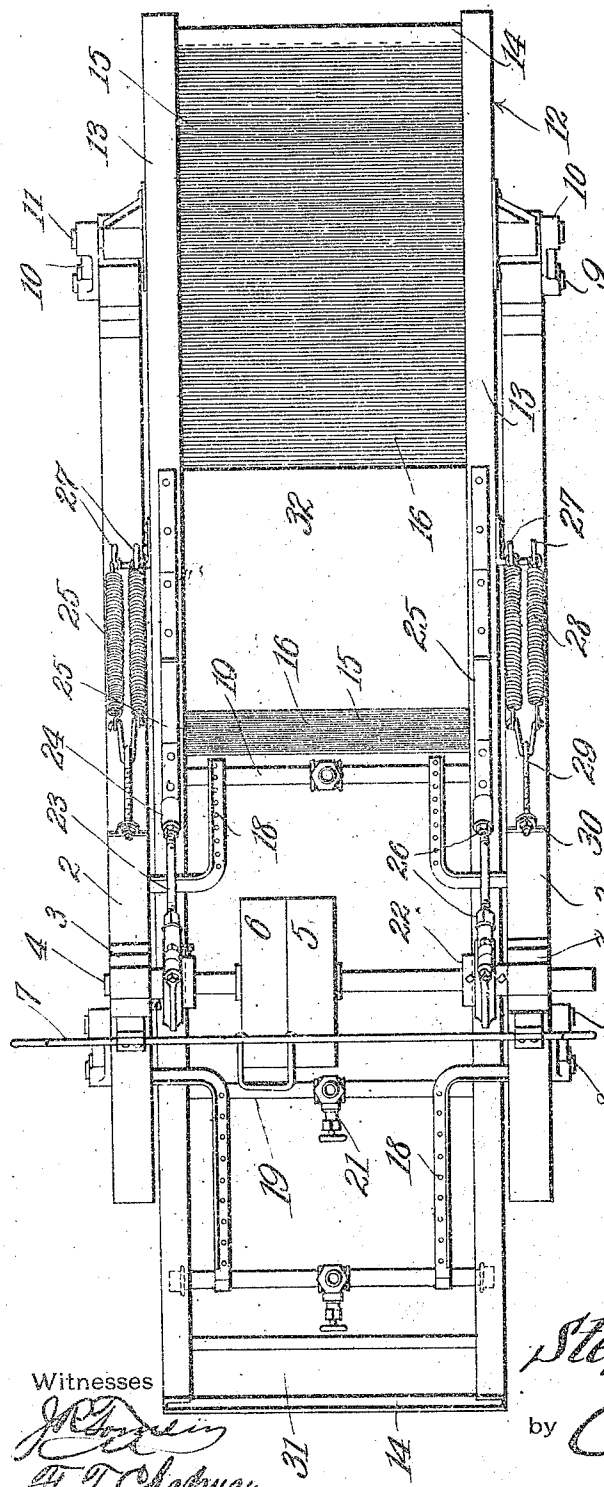

Fig. 3.

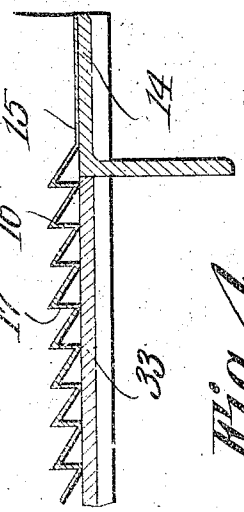

Fig. 4.

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UNITED STATES PATENT OFFICE.

STEPHEN HENRY BROWN, OF RUST, CALIFORNIA.

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Application filed June 30, 1910. Serial No. 569,814.

To all whom it may concern:

Be it known that I, STEPHEN H. BROWN, a citizen of the United States, residing at Rust, in the county of Contra Costa and State of California, have invented a new and useful Separator, of which the following is a specification.

This invention has reference to improvements in separators and its object is to provide a separator adapted for extracting metal from mixtures of metal with ashes or dirt or sand, especially such mixtures as accumulate in brass foundries and smelting works.

In accordance with the present invention there is provided an inclined separating table or receiving trough mounted on a rocking support and means whereby a reciprocatory movement is imparted to the table by an eccentric or an overhead shaft.

The invention will be best understood from a consideration of the following description taken in connection with the accompanying drawings forming a part of this specification, in which drawings,—

Figure 1 is a side elevation of the separator; Fig. 2 is an end elevation on a larger scale showing the upper end of the table; Fig. 3 is a plan view of the separator on substantially the same scale as Fig. 1; Fig. 4 is a detail sectional view of a portion of the bottom of the table on a larger scale than in the other views.

Referring to the drawings there is shown a frame 1 which may be of general rectangular shape and may be made of structural metal, suitably braced, and the top members *a* of this frame are inclined in the direction of the length thereof so that one end of the frame is higher than the other. Mounted on the frame 1 are substantially triangular side extensions 2 rising rather abruptly from the higher end of the frame 1 and sloping gradually toward the lower end thereof. At the higher end of each side extension 2 is a bearing 3 for a shaft 4 constituting the power shaft of the machine, and this shaft 4 carries tight and loose pulleys 5, 6. There is also mounted upon the extensions 2 a belt shifter 7 which, however, being of ordinary construction, needs no further description, it being designed to direct a suitable power belt to the pulleys 5 and 6.

Traversing the frame 1 above the top longitudinal members 1^a thereof near the two ends of the frame are rock shafts 8—9, each carrying at the ends upright arms 10 provided at their outer ends with bearings for pins 11 projecting from an inclined trough or table 12, the arms 10 constituting supporting means for the table 12 and causing the table when reciprocated in the manner to be described to travel in an up and down direction as well as a longitudinal direction, the up and down direction being determined by the length of the arms 10 and their travel about the axes of the shafts 8 and 9.

The table 12 comprises a rectangular frame formed of longitudinal side members 13 and cross beams 14, the latter being sufficient in number to make the structure rigid. The bottom of the table is in part formed of metal sheets 15 formed with a series of cross corrugations 16, each with an inclined face terminating in an abrupt face 17 where joining the next corrugation in order, the faces 17 being perpendicular to the plane of the bottom of the table and directed toward the upper end thereof. The corrugated plates 15 may extend substantially throughout the bottom of the table, or only partly thereover, part of the bottom of the table being formed of plane sheets or plates.

Secured to the higher ends of the extensions 2 are brackets 18 designed to carry perforated pipes 19 near the upper end of the table and overhanging the bottom of the table with the perforations of the pipes directed toward the said bottom of the table. These pipes are fed by other pipes 20 with interposed valves 21 so that water may be directed through the pipes 19 onto the surface of the table or cut off therefrom at the will of the operator. The pipes are located near the upper end of the table so that water may be there directed to flow down the inclined table by gravity and finally discharge from the lower or tail end thereof.

The shaft 4 carries eccentrics 22 near opposite sides of the table at points substantially over its edges and the bands 220 of these eccentrics have screw sockets 240 which are connected by rods 23 to screw sockets 24 each connected by a spring plate or strip 25 to the top of the respective side member 13 of the table 12 at a point between the pins or studs 11 connecting the table to the arms 10. The rods 23 are threaded right and left at the ends so that they may be utilized as takeups for adjusting the relation of the eccentrics 22 to the table 12, the distance between the eccentrics and the elastic strips 25 being shortened by turning the rods 23 in one direction and lengthened by turning

them in the other direction while lock nuts 26 on the rods 23 serve to lock these rods in adjusted positions.

On the outer side of each side member 13 at a point between the pins 11 is a hook 27 to which is attached one end of a spring 28 preferably in the form of a dual spring, while the other end of the spring is connected by a screw rod 29 to a bracket 30 on the corresponding portion of the frame member 2. The screw rod 29 provides a means whereby the normal tension of the spring 28 may be adjusted at will. The springs 25 tend to move the table toward the lower end of the frame 1 against the action of the springs 28.

At the upper end of the table 12 there is formed a pocket 31 designed to receive the cleaned material and direct it to a suitable point of deposit. On top the side members 13 and extending between the same is a plate 32 upon which the material to be cleaned may be deposited and from which the material may be fed onto the table surface 15.

Let it be assumed that the machine is in operation by power applied to the pulley 5 by a suitable belt and that the shaft 4 is rotating at an appropriate speed, which speed in practice may approach five hundred revolutions per minute thus imparting to the table 12 a reciprocatory rocking movement in an arc about the axes of the shafts 8 and 9, motion being transmitted to the table from the shaft 4 through the eccentrics 22, rods 23 and spring strips 25, the latter compensating for the changing relation of the table 12 to the eccentrics and shaft due to the supporting arms 10. The weight of the table 12 and its tendency to move toward the lower end of the frame 1 is resisted by the springs 28 so that the movement of the table is practically uniform in both directions.

The mixture of metal with waste material such as dirt or ashes or sand is deposited on the plate 32 and falls therefrom onto the bottom of the table where it comes into engagement with the corrugations 16. At the same time water is admitted by way of the pipes 19 and gravitates down the bottom of the table toward the tail end thereof. All floatable material is at once carried off by the water while the lighter materials are eventually propelled by the water toward the lower end of the table. The heavier materials consisting of metal particles, which may range from metal pieces weighing a pound or more to emery grindings, lodge in the corrugations 16 against the shoulders 17. The movement of the table in a direction toward the upper end thereof will carry the heavy metal particles with it, while the return movement will cause the relative movement of these metal particles along the inclined faces of the corrugations 16 due to the inertia of the metal particles, and the extent of movement with relation to the length of the corrugations in the direction of travel is such that these particles will move from corrugation to corrugation toward the upper end of the table to be ultimately brought into the pocket 31 and from thence discharged into a suitable receptacle by gravity.

The particles of waste material are lighter than the metal to be saved and these particles even though comparatively heavy have insufficient inertia to prevent them when the return movement of the table occurs from being carried toward the tail end of the table by the down rush of water. In this manner the metal is very thoroughly cleansed as has been demonstrated in actual practice with a machine constructed as illustrated in the drawings, and it is found that large quantities of metal such as found in brass foundries and smelting works may be cleansed from ashes and dirt and sand and the metal thereby recovered, the process taking but little power and proving very economical.

The speed of the table and the relation thereof to the drive shaft may be readily adjusted and determined as the character of the material to be cleansed warrants, and the flow of water is also readily controllable by a proper manipulation of the valves 21.

The plates 15 may be of suitable non-corrodible metal such as galvanized iron and may be supported directly each upon a rubber belt 33.

What is claimed is:—

In a separator, a frame having inclined side bars, triangular frame extensions secured thereon with their higher ends adjacent the high ends of said bars, transverse rock shafts on the frame near each end and each provided with upstanding arms, an inclined table carried by the upper ends of the arms, springs connected at their upper ends to the side bars of the frame and at their lower ends to the table to oppose gravitating movements of the table, a drive shaft journaled across the high ends of said extensions above the table, eccentrics on the drive shaft, bands on said extensions, and connections between said bands and points on the sides of said table lower than the position of said drive shaft.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

STEPHEN HENRY BROWN.

Witnesses:

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W. B. RINEHART.