J. J. MAHONEY.

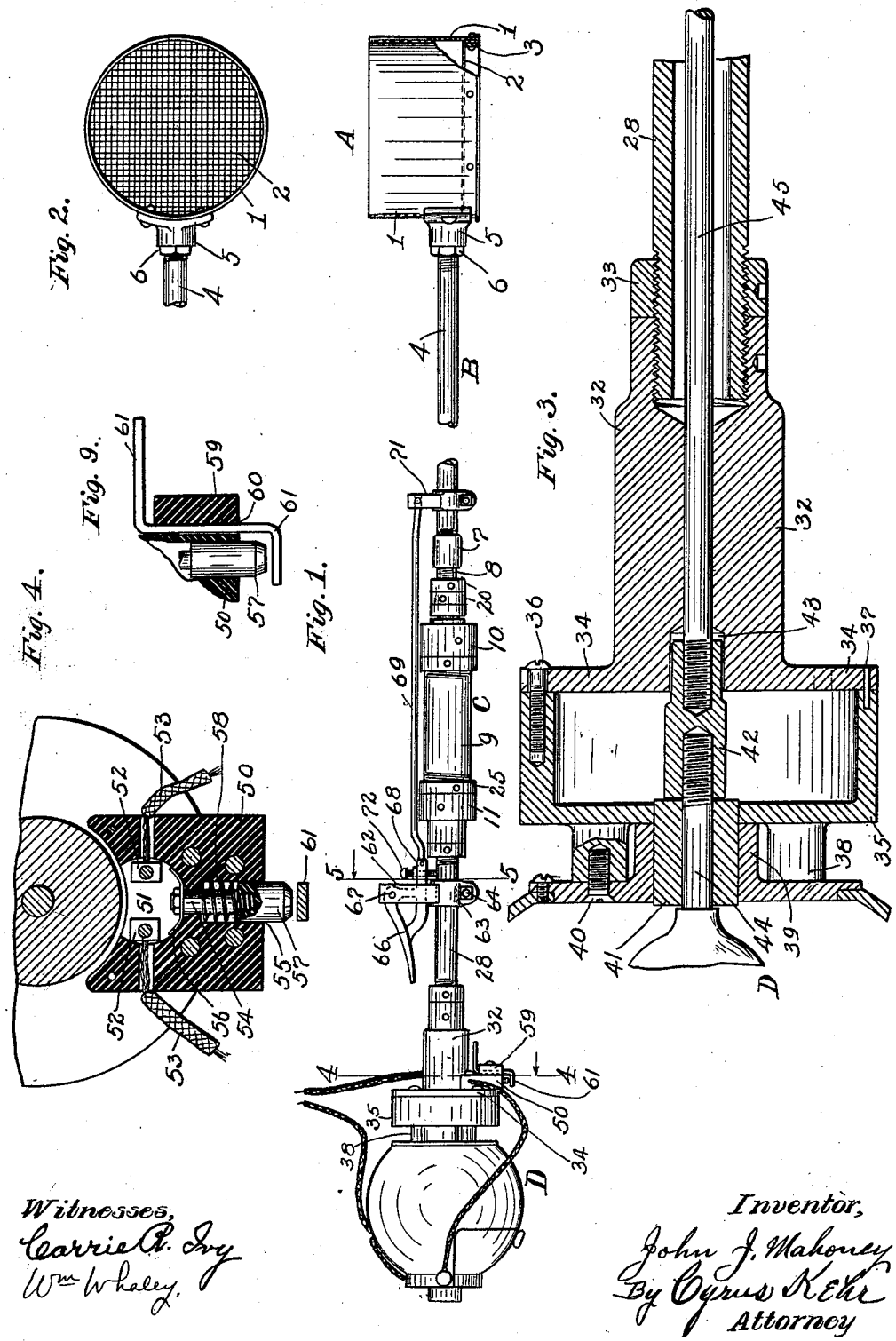
DREDGER FOR POWDER FORM MATERIAL.

APPLICATION FILED JULY 29, 1908.

1,000,830.

Patented Aug. 15, 1911.

2 SHEETS—SHEET 1.



Witnesses,
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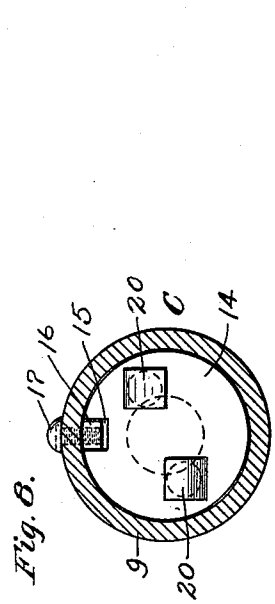

Fig. 8.

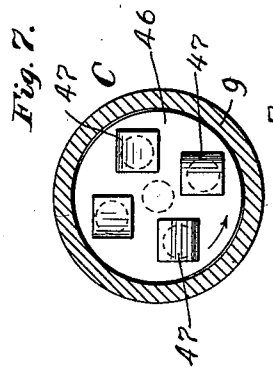

Fig. 7.

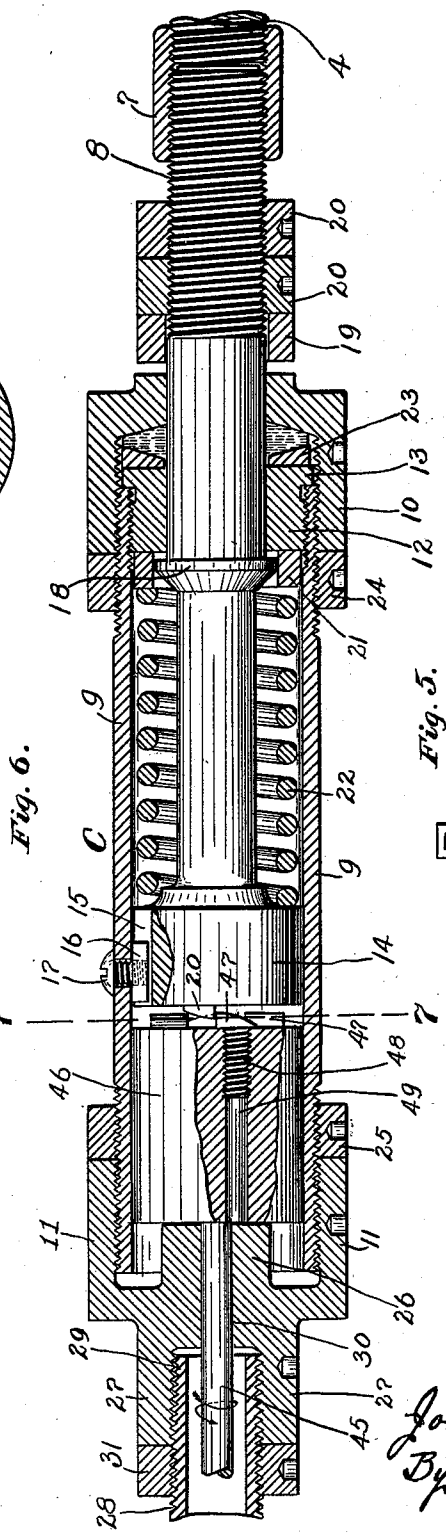

Fig. 6.

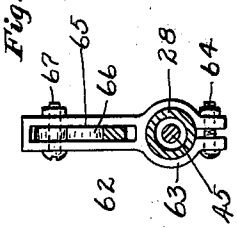

Fig. 5.

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UNITED STATES PATENT OFFICE.

JOHN J. MAHONEY, OF CHATTANOOGA, TENNESSEE, ASSIGNOR TO THE CAHILL IRON WORKS, OF CHATTANOOGA, TENNESSEE, A CORPORATION OF TENNESSEE.

DREDGER FOR POWDER-FORM MATERIAL.

1,000,830. Specification of Letters Patent. **Patented Aug. 15, 1911.**

Application filed July 29, 1908. Serial No. 445,923.

To all whom it may concern:

Be it known that I, JOHN J. MAHONEY, a citizen of the United States, residing at Chattanooga, in the county of Hamilton and State of Tennessee, have invented a new and useful Improvement in Dredgers for Powder-Form Material, of which the following is a specification, reference being had to the accompanying drawing.

My improvement relates particularly to dredgers which comprise a receptacle in the bottom of which is a screen of small mesh through which powder-form material is sifted upon some surface to which said material is to be applied. One of the uses for such an apparatus is the showering of ground glass or other enameling material upon heated metal bath tubs, sinks, lavatories, etc., for enameling the surfaces of such articles.

The objects of the improvement are to provide a dredger receptacle adapted to be efficiently agitated or vibrated to cause the proper passing of the powder-form material through said screen, and to provide efficient and readily-controllable means for varying the agitation or vibration of said dredger receptacle.

In the accompanying drawings, Figure 1 is a side elevation of a dredger embodying my improvement, a portion of the stem and a portion of the dredger receptacle being broken away; Fig. 2 is a plan of the dredger receptacle with a portion of the stem attached thereto; Fig. 3 is a detail section taken transversely along the axis of the machine across the line 4—4 of Fig. 1; Fig. 4 is a detail section on the line 4—4 of Fig. 1, looking toward the right; Fig. 5 is a section on the line 5—5 of Fig. 1, looking toward the left; Fig. 6 is an enlarged detail section taken along the axis of the machine at the right of the line 5—5 of Fig. 1; Fig. 7 is a section on the line 7—7 of Fig. 6, looking toward the left; Fig. 8 is a section on the same line looking toward the right; Fig. 9 is a detail section of the circuit closing trigger.

Referring to said drawings, A is the receptacle. In the form shown, this is upright, cylindrical or drum-shape, and composed of a sheet metal wall, 1, a wire screen, 2, and a ring 3, between which the wall, 1, the exterior edge of the screen is clamped.

B is the stem. This consists of several pieces, numbered 4, 5, 6, 7, 8, and 14. One of these is a tubular piece 4, which is screwed into a block, 5, which latter is riveted to the receptacle, A. A jam-nut, 6, surrounds said piece, 4, and bears against said block to prevent the unscrewing of the piece, 4. The opposite end of the piece, 4, is threaded into a coupling sleeve, 7. Into the other end of said sleeve is threaded one end of a shaft, 8. Said shaft extends into a barrel, C. Said barrel comprises a horizontal tubular portion or body, 9, a cap piece, 10, threaded over the end of said barrel which is adjacent the sleeve, 7, and another cap piece, 11, extending across and threaded over the other end of said body, 9. A plug, 12, is threaded into the end of the body, 9, to which the cap, 10, is applied. Said plug is provided with an annular flange, 13, which bears against the end of the body, 9. Said plug and the cap, 10, fit closely around the shaft, 8, and form bearings therefor. At its ends within said body, said shaft has a head, 14, which is long enough to fit closely against the wall of said body, 9, whereby another bearing for said shaft is formed. Said head is provided with a longitudinal groove, 15, in which rests a small block, 16, which is held immovably by a screw, 17, extending from the outside through the wall of the body, 9, into said block. Said block serves as a key to prevent the rotation of the head, 14, and the shaft, 8; but said shaft is reciprocable lengthwise to the extent permitted by the annular shoulder, 18, located at the left of the plug, 12, and by the collar, 19, surrounding said shaft at the right of the cap, 10, and held adjustably by two jam-nuts, 20. By shifting and resecuring said jam-nuts and said collar, the range of reciprocation of said shaft may be increased and decreased.

Located equi-distant from each other in a circle concentric with the axis of the shaft, 8, the head, 14, has upon the face which is directed toward the cap, 11, two cams, 20. Adjoining the plug, 12, and surrounding the annular shoulder, 18, is a loose ring or collar, 21, and between said ring and the head, 14, an expanding coiled spring, 22, loosely surrounds the shaft, 8, and serves to press said shaft (and the entire stem, B, and receptacle, A) toward the left or toward the cap, 11. In Fig. 6 of the drawings, said shaft is shown as standing at approximately

the middle of its range of reciprocation, the annular shoulder, 18, being a short distance away from the plug, 12, and the collar, 19, being at a short distance from the cap, 10.

Between the plug, 12, and the cap, 10, the shaft, 8, is surrounded by a packing ring, 23, and the space between said ring and the head of said cap is to be filled with any suitable packing material. A jam-nut, 24, surrounds the body, 9, of the barrel and bears against the cap, 10, to bind the latter. A similar jam-nut, 25, surrounds said body at the other end and bears against the cap, 11, to bind the latter.

The barrel may be partially or entirely filled with lubricant by removing the cap, 10, or the cap, 11. The cap, 11, has an inward extension, 26, around the axis of the barrel and an outward extension, 27, around the same axis.

One end of a tube, 28, is threaded into a recess, 29, formed in the extension, 27, in line with the axis of the barrel. From said recess, 29, a cylindrical aperture extends through the cap toward the head, 14, on the axial line of the barrel. A jam-nut, 31, is threaded around the tube, 28, and bears against the extension, 27, of the cap, 11, to bind said tube and said cap to each other. The other end of the tube, 28, is threaded into a cylindrical body, 32, and a jam-nut, 33, surrounds the tube, 28, and bears against the end of said body and serves to bind the latter and said tube firmly to each other. The opposite end of said body has a flange, 34, standing at an angle of ninety degrees to the axis of said body. A cup-form member, 35, has a wall parallel to the flange, 34, and a circumferential flange bearing against said flange, 34, to form a drum-form chamber. Screws, 36, and dowels, 37, serve to join the member, 35, to the flange, 34, of the body, 32. On the outer face of the member, 35, are short posts or lugs, 38.

The casing of an electric motor, D, bears against said posts and has a tubular neck, 39, which bears against the main wall of the member, 35. Screws, 40, extend through said casing into said posts, 38, and bind the motor and the body, 35, firmly to each other. A bushing, 41, extends through the neck, 39, and through the adjacent wall of the member, 35, concentric with the axial line of the barrel, C. A rotary member, 42, extends from the bushing, 41, into a cavity, 43, in the adjacent end of the cylindrical body, 32, said cavity forming a bearing for said rotary member. The motor axle, 44, extends through the bushing, 41, and is threaded immovably into the rotary member, 42.

A shaft, 45, extends through the cylindrical body, 32, the tube, 28, and the cap, 11, and has one end threaded into the rotary member, 42, and has its other end rigidly secured in any manner to the cylindrical head, 46, which is to be regarded as a part of said shaft and which bears against the inward extension, 26, of the cap, 11. The head, 46, extends almost to the head, 14, and the face of the head, 46, which is adjacent the head, 14, has four cams, 47, arranged equi-distant from each other in a circle concentric to the barrel axis and of the same diameter as the circle in which the cams, 20, of the head, 14, are located. Each of said cams, 47, is preferably formed on one end of a screw shaft, 48, seated in a threaded chamber, 49, as shown in Fig. 6. And the cams, 20, may be similarly formed. When thus formed, said cams may be more readily tempered and they may be replaced when worn.

The relative dimensions of the various parts are such as to cause the cams, 20 and 47, to extend, when not opposite each other, a little way through a common plane which is transverse to the barrel axis, in order that said cams must engage each other during the rotation of the head, 46, and force the cams, 20, the head, 14, and the shafts, 8 and 4, (the stem) and the receptacle, A, away from the head, 46, against the action of the spring, 22, said parts being again pushed toward the head, 46, by the action of said spring, as soon as the cams, 47, have passed the cams, 20. Four reciprocations of the stem and receptacle occur during each rotation of the motor axle, 45, and head, 46. Thus the reciprocations of the receptacle are very rapid.

The barrel, C, the tube, 28, and the cylindrical body, 32, constitute the handle whereby the machine is held by the operator.

The apparatus is provided with a motor circuit closer which is conveniently located for control by the hand of the operator who is holding the dredger for its work. Such circuit closer is illustrated in Figs. 1, 4, and 9. An insulation block, 50, is secured to the lower portion of the flange, 34, of the cylindrical body, 32, and within the upper portion of said block is a cavity, 51, in which are two binding or terminal posts, 52, to which the motor circuit wire, 53, leads. A shaft, 54, extends through an upright aperture, 55, into the cavity, 51, and bears on its inner end a metal cross plate, 56, adapted to make contact with said terminals when said shaft is pushed upward. From a short distance below the plate, 56, the aperture, 55, is enlarged, and the outer end of said shaft is surrounded by a cylindrical insulation body, 57, which rests slidably in said aperture. Between said body, 57, and the smaller portion of said aperture, 55, is an expanding coiled spring, 58, which normally presses said body, 57, and the shaft, 54, and the cross plate, 56, downward. On the face of the insulation block, 50, which is directed

toward the barrel, C, is a trigger block, 59, which has an upright passage, 60, through which extends the upright portion of a trigger, 61. Below said block, said trigger is bent laterally across the lower end of the body, 57, and above said block, 59, said trigger is bent toward the barrel, D, and parallel to the axis of the machine. Said horizontal portion of said trigger is in proper position to be engaged by the fourth finger of one hand of the operator while holding the dredger for its work. When it is desired to set the motor into action, said trigger is drawn upward, and when it is desired to throw the motor out of action, said trigger is released, whereupon the shaft, 54, and the cross plate, 56, are, by the action of said spring, moved downward and the circuit broken. This portion of the apparatus, it will be observed, is adapted for completely breaking the electric circuit and not for varying the current. In other words, when the motor runs at all, it does so under the action of a uniform current. But provision is made for varying the extent of the reciprocations imparted to the stem and the receptacle, A. Such a mechanism is illustrated in Figs. 1 and 5. A standard, 62, having a split sleeve, 63, surrounding the tube, 28, has a bolt, 64, for drawing the lips of the sleeve together to clamp the standard immovably to said tube. The upper portion of said standard has a slot, 65, which is parallel to the length of the machine and receives a lever, 66, hinged to the standard by a shaft, 67. Said lever extends toward the motor to form a hand piece and it has a lower horizontal portion, 68, extending through the slot in the direction of the barrel, C. To the end of said portion, 68, is hinged one end of a bar, 69, and the other end of said bar is hinged at 70 to a standard, 71, which is like the standard, 62, and is similarly clamped to the shaft, 4, adjacent the coupling sleeve, 7. It will be observed that the lever, 66, resembles a bell-crank, and that if the hand piece of said lever is pressed downward toward the tube, 28, the horizontal portion, 68, of the lever will move toward the barrel, C, and the shaft, 4, whereby the bar, 69, is pushed in the same direction and caused to move the standard, 71, away from the standard, 62, and the tube, 28, whereby the receptacle, A, the stem, and the cams, 20, supported by the head, 14, of said stem are moved away from the head, 46, against the action of the coiled spring, 22. The more the head, 14, and the cams, 20, are thus moved away from the head, 46, the less will be the engagement between the cams, 20, and the cams, 47, and consequently the less will be the range of reciprocation of the stem and the receptacle in response to the rotation of the head, 46. By this means, the horizontal reciprocations of the receptacle, A, and the consequent flow of powder-form material through the screen, 2, of said receptacle may be varied through fine gradations.

An adjustable means of limiting the movement of the bar, 69, toward the standard, 62, may be provided. For this purpose the drawings show a screw, 72, threaded downward through the horizontal portion, 68, of the lever, 66, and bearing against the tube, 28. By turning said screw downward, the movement of the bar, 69, toward the standard, 62, is made less. And adjustment of the relation of the various parts may also be made by moving the standards, 62, and 71, on the parts by which they are supported, which may be done after loosening the bolt, 64.

In operation, the forward hand of the operator grasps the barrel, D, while the other hand grasps the body, 32, and the tube, 28, the thumb being placed upon the lever, 66, and the fourth finger being placed beneath the trigger, 61. As the weight of the motor is considerable, the stem may be longer than the length of the apparatus beginning with the cap, 10, and ending with the motor. And it is to be noted that the spring, 22, which moves the stem toward the shaft, 45, may be omitted, and the stem drawn in that direction by one hand of the operator grasping any portion of said stem which is outside of the barrel, C.

I claim as my invention:

1. In a hand tool, the combination of a sieve, a handle, vibratory means for shaking the sieve including a rod extending longitudinally of the handle, an electric motor operatively associated with said vibratory means the axis of which is coincident with the axis of said rod, means for mounting the motor so that the same is carried with the sieve, and means carried with the tool for controlling the operation of the vibrating means.

2. In a hand tool, the combination of a sieve, a handle, vibratory means including a rod arranged longitudinally of the handle for shaking the sieve, an electric motor having its axis coincident with the axis of said rod operatively associated with said vibratory means for actuating the same, means for mounting the motor at the end of the tool opposite the sieve, the handle being arranged between said motor and the sieve whereby the motor balances the sieve, and means carried with the tool for controlling the operation of the vibrating means.

3. In a hand tool, the combination of a sieve, a handle, vibratory means for shaking the sieve, an electric motor operatively associated with said vibratory means for actuating the same, means for mounting the motor so that the same is carried with the sieve, means for controlling the actuation of

the motor and auxiliary means for regulating the vibratory means, said controlling and regulating means being mounted to be carried with the tool, and arranged for either independent or simultaneous operation.

4. In a hand tool, the combination of a sieve, a handle, vibratory means for shaking the sieve, an electric motor operatively associated with said vibratory means for actuating the same, means for mounting the motor so that the same is carried with the sieve, means for controlling the actuation of the motor, and auxiliary means for regulating the vibratory means, said controlling and regulating means being mounted to be carried with the tool, and arranged for either independent or simultaneous operation, one above the vibrating means and the other below the same.

5. In a hand tool, the combination of a sieve, means for actuating the sieve to cause the material to be fed therefrom, means for supplying an operating medium operatively associated with said actuating means for operating the same mounted to be carried with the tool, and means for regulating the action of the actuating means independently of the means for supplying the operating medium, while said last mentioned means continues its operation.

6. In a hand tool, the combination of a sieve, a handle, vibratory means for shaking the sieve including cam members, means for actuating the same, and means carried with the tool for adjusting the relation of the cam members to regulate the shaking operation.

7. In a hand tool, the combination of a sieve, a handle, vibratory means for shaking the sieve including cam members, means for actuating the same, and means carried with the tool for adjusting the relation of the cam members to regulate the shaking operation, comprising a hand lever mounted adjacent to the handle and connections between said hand lever and one of the cam members for adjusting the same toward and from the other cam member.

8. In a hand tool, the combination of a sieve, a handle, vibratory means for shaking the sieve including cam members, means for actuating the same, and means carried with the tool for adjusting the relation of the cam members to regulate the shaking operation, comprising a hand lever mounted adjacent to the handle, connections between said hand lever and one of the cam members for adjusting the same toward and from the other cam member, and an adjustable device for limiting the movement of the hand lever in one direction.

9. In a hand tool, the combination of a sieve, a handle, vibratory means for shaking the sieve including opposing cam members, and means carried with the tool for actuating the cam members, the cam members comprising alined heads one rotatable with reference to the other and oppositely arranged cams detachably carried by said heads.

10. In a hand tool, the combination of a sieve, a handle, vibratory means for shaking the sieve including opposing cam members, and means carried with the tool for actuating the cam members, the cam members comprising alined heads one rotatable with reference to the other and oppositely arranged cams having detachable threaded engagement with said heads.

11. In a hand tool, the combination of a sieve, a handle means for securing the actuation of the sieve including a rod directly connected to the sieve to support the latter at one end of the rod independently of the handle said rod constituting the means operatively connecting the handle to the sieve.

12. A hand tool of the character described comprising a handle, a stem slidably supported by said handle, a sieve supported by said stem, a shaft rotatably supported by said handle and in operative relation with said stem for pressing the latter endwise, means for rotating said shaft, and means carried with the tool for governing the sifting action of the sieve.

13. A hand tool of the character described comprising a handle, a stem slidably supported by said handle, a sieve supported by said stem, a shaft rotatably supported by said handle and in operative relation with said stem for pressing the latter endwise, means for rotating said shaft, means for moving said stem endwise in the other direction, and means carried with the tool for governing the sifting action of the sieve.

14. A hand tool of the character described, comprising a handle, a stem slidably supported by said handle, a sieve supported by said stem, a shaft rotatably supported by said handle and in operative relation with said stem for pressing the latter endwise, a motor mounted to be carried with the tool for rotating said shaft, and means carried with the tool for controlling the action of the motor.

15. A hand tool of the character described, comprising a handle, a stem slidably supported by said handle, a sieve supported by said stem, a shaft rotatably supported by said handle and in operative relation with said stem for pressing the latter endwise, a motor mounted to be carried with the tool for rotating said shaft, means for moving said stem endwise in the other direction, and means carried with the tool for governing the sifting action of the sieve.

16. A hand tool of the character described, comprising a handle, a stem slidably supported by said handle, a sieve supported by said stem, a shaft rotatably supported by

said handle and in operative relation with said stem for pressing the latter endwise, an electric motor mounted to be carried with the tool for rotating said shaft, and means carried with the tool for controlling the action of the electric motor.

17. A hand tool of the character described, comprising a handle, a stem slidably supported by said handle, a sieve supported by said stem, a shaft rotatably supported by said handle and in operative relation with said stem for pressing the latter endwise, an electric motor mounted to be carried with the tool for rotating said shaft, means for moving said stem endwise in the other direction, and means carried with the tool for governing the sifting action of the sieve.

18. A hand tool of the character described comprising a handle, a stem slidably supported by said handle, a sieve supported by said stem, a shaft rotatably supported by said handle and in operative relation with said stem for pressing the latter endwise, means for rotating said shaft, and means operable independently of said rotating means carried with the tool for varying the engagement between said shaft and said stem.

19. A hand tool of the character described comprising a handle, a stem slidably supported by said handle, a sieve supported by said stem, a shaft rotatably supported by said handle and in operative relation with said stem for pressing the latter endwise, means for rotating said shaft, and means carried with the tool operable independently of said rotating means and while the same continues its operation for varying the engagement between said shaft and said stem.

20. A hand tool of the character described comprising a handle, a stem slidably supported by said handle, a sieve supported by said stem, a shaft rotatably supported by said handle and in operative relation with said stem for pressing the latter endwise, means for rotating said shaft, means operable independently of said rotating means carried with the tool for varying the engagement between said shaft and said stem, and means for moving said stem endwise in the other direction.

21. A hand tool of the character described comprising a handle, a stem slidably supported by said handle, a sieve supported by said stem, a shaft rotatably supported by said handle and in operative relation with said stem for pressing the latter endwise, a motor carried with the tool for rotating said shaft, hand controlled mechanism carried with the tool for putting said motor into and out of action, and hand controlled mechanism also carried with the tool for varying the engagement between said shaft and said stem.

22. A hand tool of the character described comprising a handle, a stem slidably supported by said handle, a sieve supported by said stem, a shaft rotatably supported by said handle and in operative relation with said stem for pressing the latter endwise, a motor carried with the tool for rotating said shaft, hand controlled mechanism carried with the tool for putting the said motor into and out of action, and other hand controlled mechanism for varying the engagement between said shaft and said stem, said hand controlled mechanisms being arranged respectively one above and the other below the handle, substantially as and for the purpose described.

23. A hand tool of the character described comprising a handle, a sieve, and means for actuating the sieve including two members, one a stem slidably supported by said handle and the other a rotary shaft supported by said handle, one of said members supporting a cam engaging the other of said members, an operating motor having a shaft, and a detachable coupling between an extended portion of the motor shaft and the rotary shaft.

24. A hand tool of the character described comprising a handle, a sieve, and means for actuating the sieve including two members, one a stem slidably supported by said handle and the other a rotary shaft supported by said handle, one of said members supporting a cam engaging the other of said members, an operating motor, and a coupling between an extended portion of the motor shaft and the rotary shaft.

25. The combination with a sieve, of a handle, and means for effecting discharge of material from the sieve including a rotary electrically operated device mounted to be carried by the sieve, the axis of rotation being lengthwise of the implement.

In testimony whereof I have signed my name, in presence of two witnesses, this 23rd day of July, in the year one thousand nine hundred and eight.

JOHN J. MAHONEY.

Witnesses:
F. R. FORSTNER,
OLEVIA MALONE.