

**July 10, 1928.**

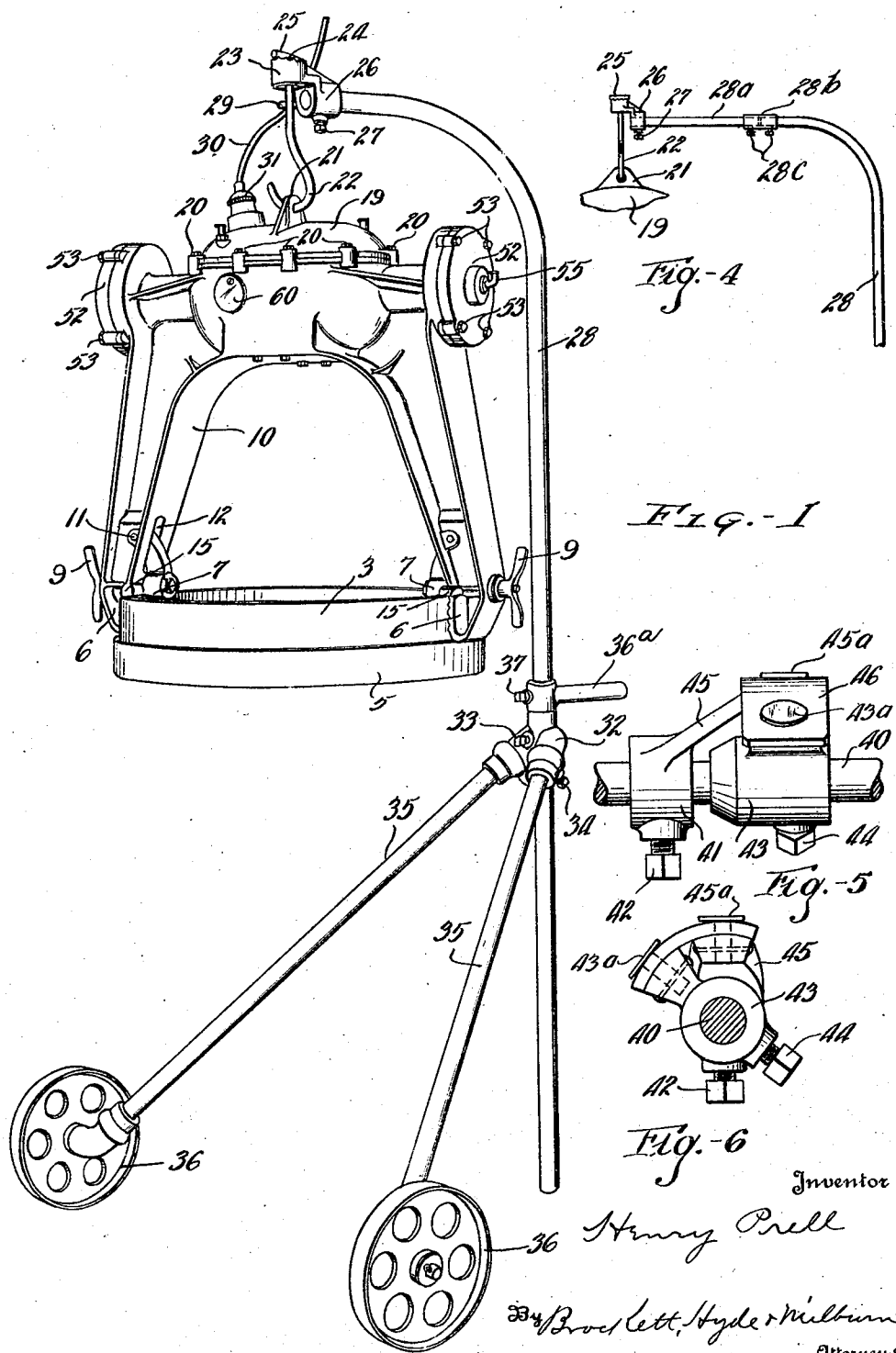
**1,676,285**

**H. PRELL**

## RIDDLE

Filed Dec. 31, 1923

3 Sheets-Sheet 1



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RIDDLE

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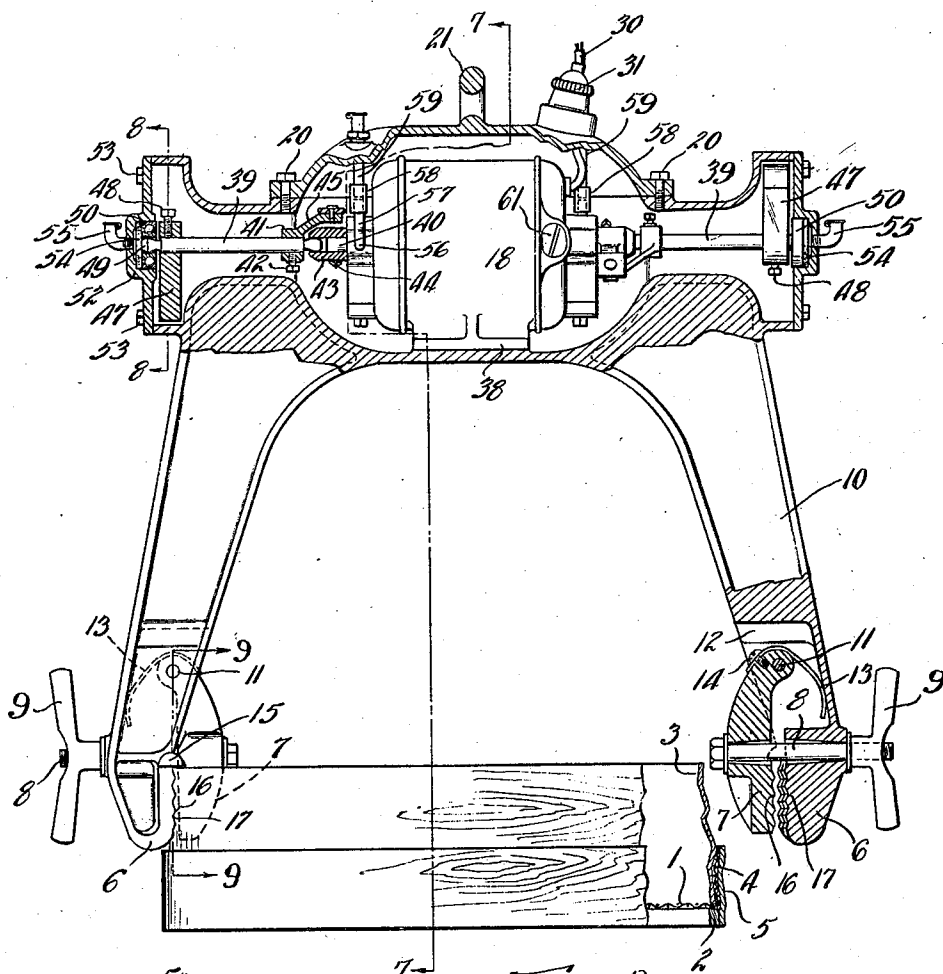


FIG. 2

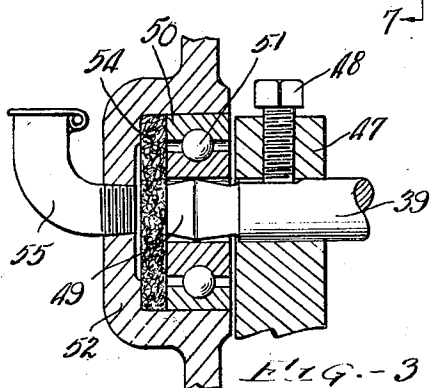


FIG. 3

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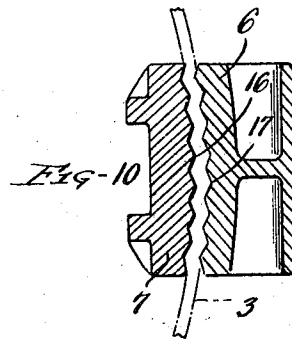
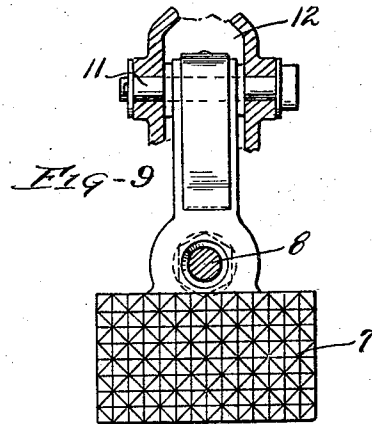
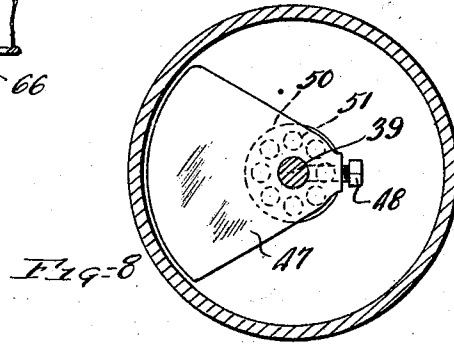
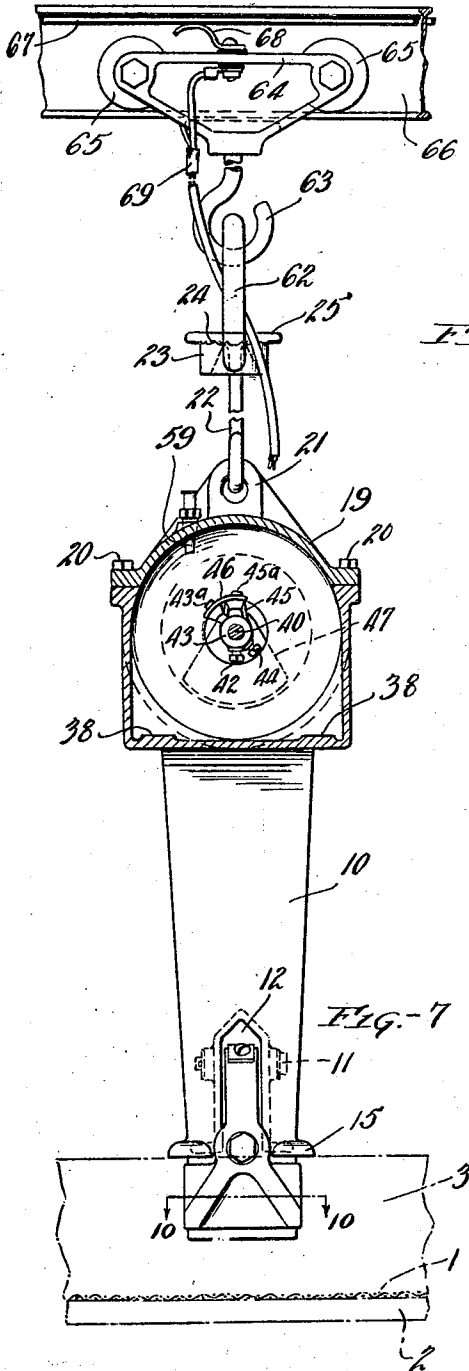
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3 Sheets-Sheet 3



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## UNITED STATES PATENT OFFICE.

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## RIDDLE.

Application filed December 31, 1923. Serial No. 683,658.

This invention relates to improvements in riddles for screening or sifting sand in foundries, in building and for other purposes.

The objects of this invention are to provide means for agitating a riddle by centrifugal force; to provide an improved means for suspending the riddle so as to produce an effective agitation or vibration thereof; to provide an improved means for freely supporting the riddle and a motor therefor; to provide an improved stand or support upon which the riddle is adapted to be suspended, such stand being readily movable by the operator; to provide an improved suspension connection of the riddle upon the stand or support therefor; to provide an improved means for clamping the riddle itself in the suspended frame.

Further objects of this invention are to provide an improved shaft connection between the centrifugal weights and the motor and to provide also an improved bearing for the ends of the shaft, so as to permit cocking of the same as may be necessary due to inaccuracies in the seating of the motor; to provide also an improved bearing with means for holding and screening lubricating oil for the bearing; and also to provide improved oiling connections for the motor which are so constructed and arranged as to permit ready removal of the cover of the motor casing and at the same time permit oiling of the motor without removing the casing cover.

Other objects will be apparent from the following description and claims when considered in connection with the accompanying drawings.

Fig. 1, is a perspective view of my improved device in its entirety; Fig. 2 is a sectional detail view of the riddle without its support; Fig. 3 is a sectional detail view of my improved bearing for the ends of the shaft; Fig. 4 shows a modified form of support; Figs. 5 and 6 are detail views of the shaft connection between the motor and the weight; Fig. 7 is a sectional view taken on line 7—7 of Fig. 2 and shows a second form of support including a trolley; Fig. 8 is a view taken on line 8—8 of Fig. 2; Fig. 9 is a detail view taken on line 9—9 of Fig. 2; and Fig. 10 is a detail view taken on line 10—10 of Fig. 7.

The riddle itself, which may be of suitable construction, is here illustrated as com-

prising the wire mesh bottom 1 which is supported between the lower hoop member 2 of wood or any other suitable material and the upper hoop 3, the edge portion of the wire mesh being flanged upwardly as indicated at 4 and secured in position by means of the outer hoop 5. The outer hoop is riveted to the other two hoops 2 and 3. The wire mesh 1 may of course be of any grade or gauge desired. The hoop 3 is clamped at diametrically opposite points between the jaws 6 and 7 by means of the bolts 8 extending therethrough and the wing nuts 9 which are adapted to be screwed upon the bolts. The jaws 6 are provided upon the lower extreme end portions of the suspension frame indicated in a general way by reference numeral 10, while the jaws 7 are pivotally mounted at the points 11 within the cut-out portions 12 provided in the lower part of the frame 10. The leaf springs 13 are secured by means of the screws 14 to the upper part of the jaws 7 and bear at their other ends against the inside face of the recesses 12, the tendency of these springs being to normally force the jaws 7 into opened or released position so as to permit removal of the riddle from the suspension frame. There are provided also the projections 15 on opposite sides of the upper part of the jaws 6, as clearly shown in Figs. 2 and 7 for the purpose of limiting the upward insertion of the riddle between the jaws, thereby insuring proper clamping engagement of the hoop 3 between the jaws. The inner faces of the jaws 6 and 7 are formed in the manner as clearly illustrated in Figs. 9 and 10 so as to provide an efficient gripping action upon the riddle as the jaws are drawn together. It is to be observed that the crests or peaks 16 on the two jaws 6 and 7 are staggered so that a given crest on one jaw is located opposite a recess 17 on the other jaw. These projections on the faces of the jaws are of substantially pyramid form as illustrated in the drawing.

The upper part of the suspension frame, of which the legs 10 form the lower part, is enlarged so as to provide an integral casing for enclosure of the operating motor 18. The entire suspension frame including the motor casing is made as a single casting preferably of aluminum so as to keep the motor cool by rapid radiation of the heat developed. The aluminum cover 19 of the

motor casing is detachably secured by means of the screw bolts 20 and is provided with an apertured ear 21 for suspension upon the hook 22. The upper portion of the hook 22 extends through an apertured ring member 23 which is provided upon its upper marginal portion with radially extending grooves or serrations 24 to provide seating engagement for the cross bar 25 on the upper end of the hook 22. The annular ring member 23 forms part of a bracket 26 which is removably secured by means of set screw 27 on the overhanging end portion of the upright standard or support 28. An eye 29 is also provided upon the one side of the bracket 26, such eye serving as a means for threading the electric wire 30 which has the socket connection 31 through the casing cover to the electric motor 18. The lower end of the standard 28 is adapted to rest upon the floor or ground where the riddle is being used and a three arm single casting 32 is secured to the standard 28 by means of the set screw 33, while the other two arms of the casting have secured therein by means of the set screws 34 the angularly disposed and downwardly extending pipes or rods 35 upon the lower end of which are mounted the rollers 36. Thus there is provided a three point supporting means, with the riddle itself supported at a point between the rollers and the bottom of the standard 28. The handle 36<sup>a</sup> which is secured upon the standard 28 by means of the set screw 37 serves as a means of raising the standard from the floor so as to roll the entire device on the wheels or rollers 36 to the position desired, the riddle during this time being conveniently suspended at a point substantially above the rollers themselves. In this way the movement of the device from place to place is greatly facilitated. It will be seen also that by virtue of the free manner of suspension of the riddle upon its support, it can be readily swung about the hook 22 so as to dump the same without disturbing the rest of the device. Fig. 4 illustrates the connection of an extension rod 28<sup>a</sup> which may be connected to the support 28 by means of the sleeve 28<sup>b</sup> and set screws 28<sup>c</sup>, and upon the outer end of which the bracket 26 may be secured, so as to suspend the riddle over the workman's bench.

The electric motor 18 is mounted upon the pads 38 provided in the bottom of the casing and the wire connection 30 to the motor is shown in Fig. 2. The auxiliary shafts 39 extend in alignment with the stub shaft ends 40 of the rotor of the electric motor and a yieldable connection is provided between the adjacent ends of the auxiliary shafts and rotor shaft ends so as to permit cocking or universal movement of the auxiliary shafts 39 as may be necessary due to inaccurate seating of the motor. Such yieldable con-

nection comprises the collar 41 which is fixed upon the shaft 39 by means of the set screw 42, and the collar 43 which is fixed upon the end of the rotor shaft by means of the set screw 44, these parts being so arranged that the extreme end portions of the auxiliary shafts 39 project into the collars 43 as clearly indicated in Fig. 2. There is also a slight clearance at all times between the adjacent ends of the shafts 39 and the shaft ends of the rotor. The collar 41 is provided with the arm 45 to which is secured at 45<sup>a</sup> one end of the strap 46 of leather or other suitable flexible material, the other end of which is secured at 43<sup>a</sup> to the collar 43. The leather connection 46 extends circumferentially of the axis of the shaft connection and there is a certain degree of pivotal movement permitted at the points 43<sup>a</sup> and 45<sup>a</sup>, so that the necessary degree of automatic adjustment is permitted without any noise. The motor shaft rotates in such direction that it pulls the auxiliary shafts with it. Upon the outer ends of the auxiliary shafts 39 are mounted the centrifugal weights 47 by means of the set screws 48, these two weights being placed at substantially 180° with respect to each other upon the main operating axis of the motor. Proper clearance is allowed between the weights and the ends of the casing so as to avoid chattering. These weights are preferably of substantially the same size, as illustrated in Fig. 2 of the drawing, although they may vary. The extreme end portions of the auxiliary shaft 39 are formed with a double bevel as indicated at 49 and are provided with the ball bearing 50, the crest of the bevel end portions being on the center line of the balls 51 of the bearing, this being clearly indicated in Fig. 3. The ball bearing is supported within the suitably formed cap 52 which is clamped onto the ends of the casing by means of the screw bolts 53 so as to permit ready removal thereof. Between the ball bearing and the cap itself there is provided the felt packing 54 which is adapted not only to hold the oil for the bearing but also to serve as a screen for keeping dirt and other foreign matter out of the bearing, the oil being supplied through the oil cup 55 which is threaded into the center portion of the cap 52.

The oil wells 56 on the ends of the motor are provided with the upwardly extending tubes 57 upon which are provided the enlarged collar members 58. These enlarged portions 58 are adapted to receive by telescopic engagement the lower ends of the oil feed pipes 59 which are screwed into the casing cover 19 and extend therethrough to the outside as clearly indicated in the drawings. In this way it is possible to oil the motor without removing the casing cover while at the same time it is possible also to

remove the casing cover whenever desired due to the readily separable connection provided in the oil feed means. Such oil connections are provided upon opposite sides at the two ends of the motor. The motor casing is provided also with the pivoted closure 60 over an opening in the casing, which opening permits ready access therethrough for the purpose of adjusting the brushes, indicated in a general way at 61, for a direct current motor. In this way it is possible to open the closure 60 and adjust the brushes without otherwise disturbing the motor or its enclosing casing.

The form of suspension shown in Fig. 7 is especially adapted for use upon a trolley track where it is desired to have the riddle moved overhead and over a considerable distance. In this case the annular serrated ring member 23 instead of being provided as part of a bracket on an upright standard is provided as part of a closed loop member 62, the upper restricted portion being supported in the hook 63 which in turn is carried upon the bracket 64 having the rollers 65 for rolling engagement with the overhead track 66. The electric rail 67 supplies current to the wiping contact member 68 which is carried by the bracket contact 64 and which is in circuit with the electric line 69. The wire 69 is threaded through the loop member 62 and thence through the motor casing to the motor in the same manner as before described.

Operation of the motor sets up a centrifugal force due to the opposed arrangement of the weights on the ends of the motor axis and such force will be transmitted through the freely suspended frame to the riddle. As this centrifugal force is effective throughout the full 360° of rotation of the motor shaft, there will be continuous vibration or agitation of the supporting frame and the riddle in continuously changing directions. The center of such vibratory motion of the motor shaft will correspond approximately with the central point of the motor itself. In other words, referring to the position shown in Fig. 2 of the drawing, there will be a downward motion of the left hand end of the motor shaft and at the same time an upward motion of the right hand end of the motor shaft; then when the shaft has turned through 180° there will be opposite motions from the two ends of the shaft respectively and the directions of the motions of the two ends of the motor shaft will change continuously in such manner throughout the entire 360° of travel. Thus the effect of the centrifugal force is at one instant to vibrate the supporting frame and the riddle through a vertical plane, at another instant to cause such vibration through a horizontal plane, and at other intervening instants to cause vibration

through the many intervening planes. Thus there may be said to set up somewhat of a gyrating motion.

By virtue of the free manner of suspension of the supporting frame the vibratory motion is effectively transmitted to the riddle and at the same time the motor itself which is likewise freely suspended does not suffer any detrimental shock from such motion. Moreover, the freely suspended weight of the motor assists the vibrating movement by virtue of its momentum. Furthermore, with the present arrangement in which the motor and other parts are so suspended that the motor vibrates about its center, a minimum amount of power is required to produce the desired vibration of the riddle itself which is suspended at the other end of the suspension frame 10.

What I claim is:

1. Apparatus of the character described, comprising a casing, a motor centrally disposed therein and having a horizontal shaft, auxiliary shafts on either end of said motor shaft in substantially aligned driven relation therewith and having bearings in said casing, a weight carried by each of said auxiliary shafts and unbalanced therefrom, depending arms on said casing adapted to support an element to be vibrated in unison with said casing, and means for suspending said casing.

2. Apparatus of the character described, comprising a casing, a motor centrally disposed therein and having a horizontal shaft, auxiliary shafts on either end of said motor shaft in substantially aligned driven relation therewith and having bearings in said casing, a weight carried by each auxiliary shaft adjacent its casing bearing and unbalanced from said shaft, depending arms on said casing adapted to support an element to be vibrated in unison with said casing, and means for suspending said casing.

3. Apparatus of the character described, comprising a casing, a motor centrally disposed therein and having a horizontal shaft, auxiliary shafts on either end of said motor shaft in substantially aligned driven relation therewith and having bearings in the ends of said casing, a weight carried by each auxiliary shaft and unbalanced therefrom, depending arms on said casing adapted to support an element to be vibrated in unison with said casing, said auxiliary shafts and said arms lying in substantially the same general plane, and means for suspending said casing.

4. Apparatus of the character described, comprising a casing, a motor centrally disposed therein and having a horizontal shaft, auxiliary shafts on either end of said motor shaft in substantially aligned driven relation therewith, each auxiliary shaft being in supporting engagement at its inner end with

an end of said motor shaft and bearing at its outer end in said casing, a weight on each auxiliary shaft adjacent the bearing thereof in the casing and unbalanced on the shaft, depending arms on said casing adapted to support an element to be vibrated in unison with said casing, and means for suspending said casing.

5. Apparatus of the character described, comprising a casing, a motor centrally disposed therein and having a horizontal shaft, auxiliary shafts on either end of said motor shaft in substantially aligned driven relation therewith, each auxiliary shaft being in

supporting engagement at its inner end with but angularly movable with respect to an end of said motor shaft and at its outer end bearing in said casing, a weight on each auxiliary shaft adjacent the bearing thereof in the casing and unbalanced on the shaft, depending arms on said casing adapted to support an element to be vibrated in unison with said casing, and means for suspending said casing.

In testimony whereof I hereby affix my signature.

HENRY PRELL.