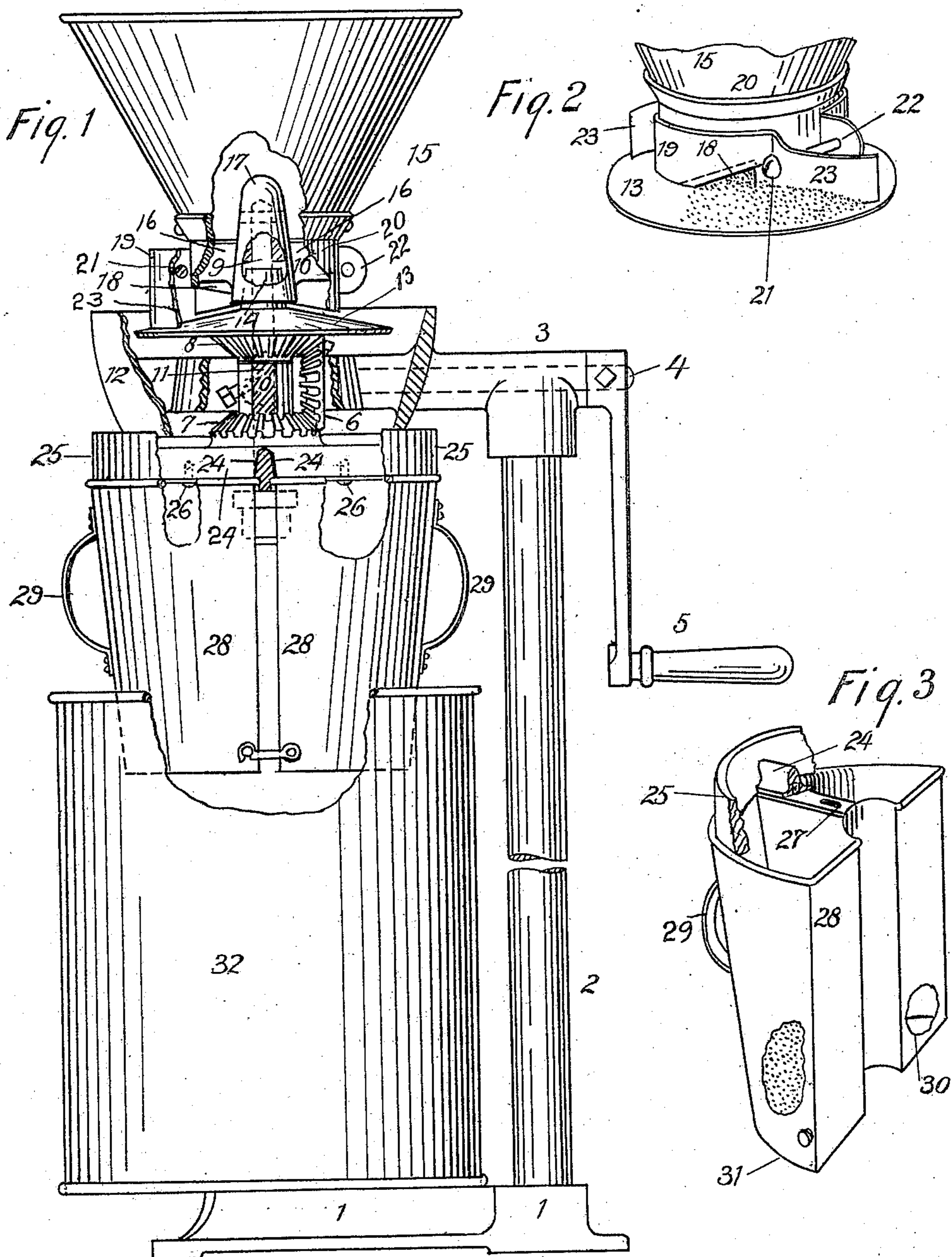


No. 850,293.

PATENTED APR. 16, 1907.

A. C. CALKINS,
APPARATUS FOR SEPARATING MATERIAL.

APPLICATION FILED DEC. 17, 1904.



Witnesses

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APPARATUS FOR SEPARATING MATERIAL.

No. 850,293.

Specification of Letters Patent.

Patented April 16, 1907.

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To all whom it may concern:

Be it known that I, ALBERT C. CALKINS, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Apparatus for Separating Material; 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 metallurgical apparatus, and particularly to mechanical means for dividing or sampling ores; and some of the objects of the invention are to provide a device of this general character which will be simple and cheap in construction and operation and efficient for the purpose intended.

Another object of the invention is to provide an apparatus which will quickly and accurately divide material into equal and uniform portions and one wherein the material will be thoroughly mixed during the operation of dividing the same.

It is also an object of the invention to provide an apparatus of this general character which can be readily taken apart and reassembled and one wherein the parts can be readily cleaned and repaired.

A further object of the invention is to provide adjustability for the feed of the material.

With these and other objects in view the invention consists, essentially, in the construction, combination, and arrangement of parts substantially as more fully described in the following specification and as illustrated in the accompanying drawings, forming part of this application, in which—

Figure 1 is a side elevational view, partly broken away, illustrating the complete apparatus. Fig. 2 is a fragmental detail view illustrating the feeding device; and Fig. 3 is an enlarged detail view, partly broken away, illustrating one of the buckets employed.

Similar characters of reference designate corresponding parts throughout the several views.

Referring to the drawings, and particularly to the construction illustrated in Fig. 1 thereof, the reference character 1 designates a base or support, which may be of any suitable construction and material and with which is preferably connected an upright or standard 2, supporting a tubular arm or mem-

ber 3, wherein is preferably journaled a shaft 4, provided with a crank 5, by means of which the shaft may be rotated in the usual manner, and on the other end of the shaft 4 is preferably secured a bevel-gear 6, constructed to mesh with gears 7 and 8, fast to a vertical shaft 9, journaled in a bearing 10, connected with the arms 11 of a circular casing or spider 12, preferably connected with the arm 3, substantially as illustrated.

Formed on or connected with the bevel-gear 8 is a convex disk or rotatable plate 13, preferably provided with a frusto-conical extension 14, constructed to receive the vertical shaft 9, whereon said disk is adapted to rotate, substantially as hereinafter more fully explained, and the hopper 15 is preferably provided with radial arms 16, supporting a conical cap or bearing 17, constructed to receive the end of vertical shaft 9 and to extend over the frusto-conical extension 14, essentially as illustrated, and the hopper 15 may be provided with lateral discharge-openings 18 to admit of the lateral escape of the material from the hopper during the operation of the apparatus.

A collar or ring 19 may be removably secured upon or around the base or lower portion 20 of the hopper by means of bolts or other devices 21, passing through the deflected extensions or ears 22 of the collar, substantially as illustrated in Fig. 2 of the drawings, and by means of this construction the discharge of material from the hopper may be accurately regulated by the adjustment of the collar, which adjustment increases or diminishes the size of the discharge-openings, as will be readily understood, and curved deflecting wings or vanes 23 may be formed on or connected with the collar or ring 19, so as to bear upon the rotatable disk 13 and scrape off or deflect the material therefrom during the rotation of the disk.

Formed on or connected with the hub of the lower gear 7 are a plurality of radial arms 24, with the ends of which may be connected a ring or rim 25, and the arms may be provided with engaging lugs or screws 26 to removably enter bayonet slots or openings 27 in the upper portion of the detachment buckets or receptacles 28, desirably provided with handles 29; and the buckets are preferably constructed with alternately open and closed bottoms 30 and 31, respectively, Fig. 3, as will be subsequently explained, and a re-

ceiver 32 may be removably located beneath the buckets, substantially as illustrated.

It will be understood that any number of buckets may be employed; but only two are here illustrated, and half of the material will fall through the open bottoms 30 of the buckets into the receiver 32, so that the latter will contain exactly one-half of the quantity of material that was originally placed in the hopper for division or separation, and the buckets with the closed bottoms 31 will contain the remaining half of such material—that is, one-fourth in each bucket.

The operation of the apparatus will be readily understood from the foregoing description, when taken in connection with the accompanying drawings and the following explanation thereof. The material is first introduced into the hopper 15, which may be of any desired size, and the buckets are slid into position, preferably into the grooves or channels formed in the arms 24, and engage the lugs or screws 26, whereby the buckets are retained in operative position, and the receiver 32 is placed beneath the bucket, whereupon the apparatus is ready for operation. The crank or handle 5 is then turned by the operator, and the disk 13, rotating beneath the hopper, causes the material therein to pass or escape therefrom through the lateral discharge-openings 18, the size of which has been previously regulated by the adjustment of the collar 19, and the deflecting vanes or wings 23 scrape the material from the rotatable disk 13 into the buckets, which latter preferably rotate in the direction opposite to that of the disk, and one-half of the material passes through the open bottom of the buckets into the receiver 32 and the remaining one-half of the material is retained in the buckets, one-fourth of such remaining half being retained in each bucket, and the material has not only been divided accurately and mechanically, but it has been thoroughly mixed by centrifugal action, as will be readily understood.

By means of this apparatus the two falling streams of material are centrifugally mixed before they fall into the bucket, which is immediately under the feed of the hopper, the closed buckets being arranged diagonally opposite each other, as also are the two open buckets, thus insuring a perfect admixture of the two opposite streams of material falling into the bucket, and the diagonally opposite quarters are retained in the closed buckets in absolutely uniform volume, weight, and value.

It is not desired to limit or confine this invention to the specific construction, combination, and arrangement of parts herein shown and described, and the right is reserved to make all such changes in and modifications of the same as come within the spirit and scope of this invention.

I claim.—

1. An apparatus provided with a discharging-disk, respectively open and closed receiving devices therebelow and means for simultaneously imparting a rotary motion to said disk and devices in opposite directions, whereby the material will be separated in predetermined portions.

2. An apparatus provided with a discharging-disk, dividing-receptacles having respectively open and closed bottoms and means for imparting rotary motion to said disk and receptacles in opposite directions, whereby a predetermined quantity of material will pass through some of said receptacles, and a predetermined quantity thereof will be retained in the other receptacle.

3. An apparatus provided with a hopper, a rotatable disk therebelow to discharge the material therefrom, dividing-receptacles having open and closed bottoms respectively, and means for imparting motion in opposite directions to said disk and receptacles to effect the predetermined division of material introduced into the hopper.

4. An apparatus provided with a discharging device, means for regulating the quantity of material passing thereover, dividing-receptacles and mechanism for imparting rotary motion in opposite directions to said device and receptacles, to effect a predetermined division of material.

5. An apparatus provided with a hopper, an adjustable collar thereon having deflecting portions, a discharging-disk below said hopper, dividing-buckets and means for imparting a rotary motion in opposite directions to said disk and buckets respectively, whereby the material will be divided into predetermined quantities.

6. An apparatus provided with means for supplying material, a device therebelow for discharging material received by said means, an adjustable feed-regulator to control the passage of the material from said means, buckets to receive the material, and mechanism for imparting rotary motion to the discharging device and the buckets.

7. An apparatus provided with means for supplying material having lateral discharge-openings, a device adjustably mounted upon said means to regulate the passage of material through said openings, a discharging-disk below said device constructed to receive and discharge the material received from said means and buckets to receive the material, mechanism for imparting rotary motion to the discharging device and the buckets.

8. An apparatus provided with means for supplying material thereto having discharge-openings, a discharge-disk rotatably mounted below said means, a ring adjustably mounted on said means contiguous to said disk to regulate the passage of material

through said openings and carrying deflecting portions, and mechanism for operating the parts.

9. An apparatus provided with a support, 5 a, discharging device mounted therebelow means for supplying material to said device, receptacles connected with said support and mechanism for imparting rotary motion in opposite directions to the discharging device 10 and receptacles.

10. An apparatus provided with a support, a tubular arm supported from the same, a shaft mounted within the tubular arm, a discharging-disk upon said shaft having an extension, a hopper above said disk having a 15 central supporting portion upon said shaft inclosing said extension and means for operating the parts.

11. An apparatus provided with a supporting portion, a shaft mounted therein, a 20 hopper having a supporting portion upon said shaft, a discharging device upon said shaft partially inclosed by said portion of

said hopper, receptacles carried by said support below said device and means for moving 25 said device and receptacles.

12. An apparatus provided with a supporting portion, a shaft mounted therein, a hopper having a supporting portion upon said shaft, an adjustable ring upon said hopper having deflecting portions, a discharging 30 device upon said shaft partially inclosed by said portion of said hopper, receptacles carried by said support below said device and means for moving said device and receptacles. 35

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, at Los Angeles, in the county of Los Angeles, State of California, this 30th day of November, 1904. 40

ALBERT C. CALKINS.

Witnesses:

CHARLES STEPHEN ROGERS,
MIGNON FORD.