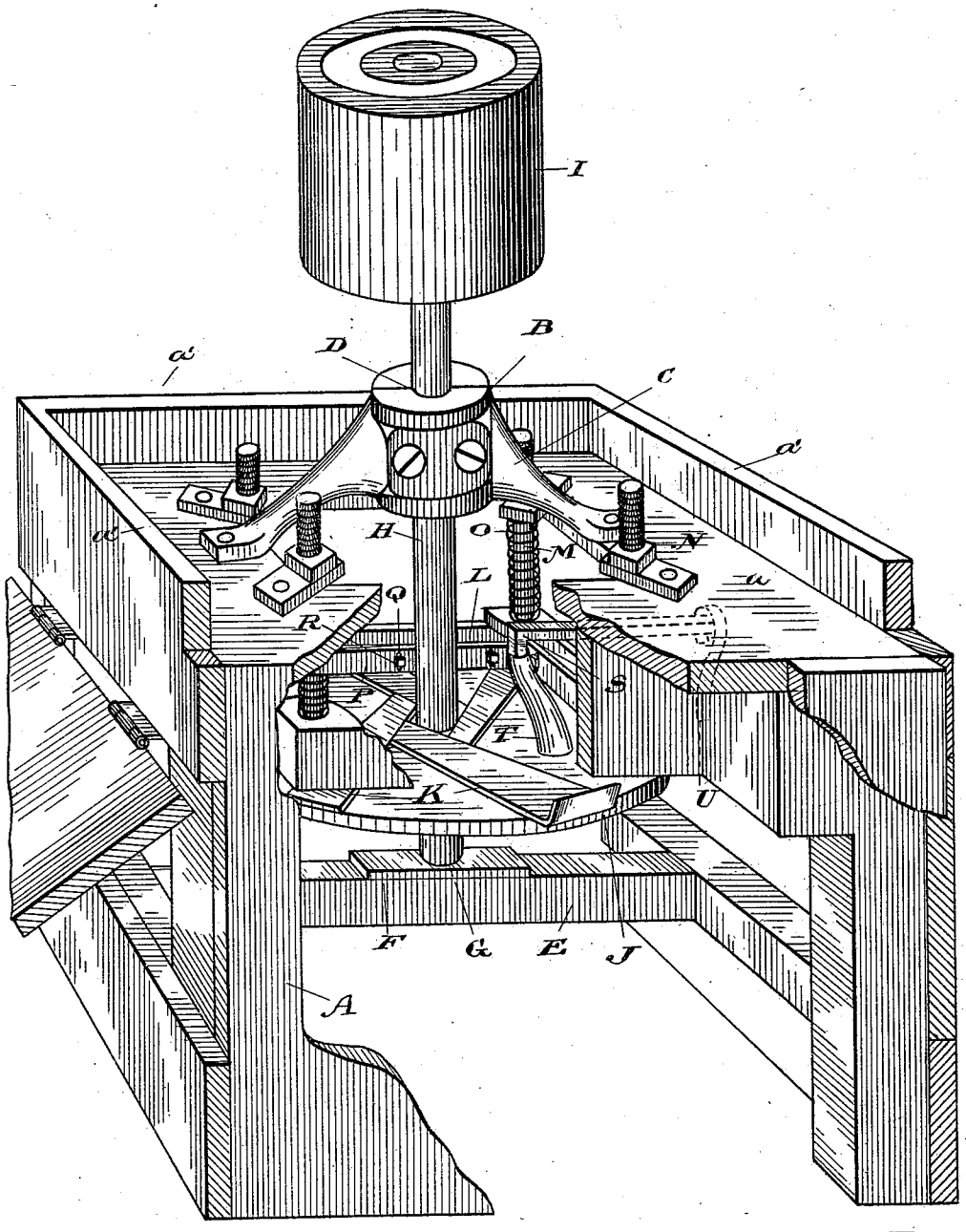
(No Model.)

B. E. BECHTEL.

CLAY DISINTEGRATOR AND STONE SEPARATOR.

No. 557,472. Patented Mar. 31, 1896.



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UNITED STATES PATENT OFFICE.

BYRON ERB BECHTEL, OF WATERLOO, CANADA.

CLAY-DISINTEGRATOR AND STONE-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 557,472, dated March 31, 1896.

Application filed May 6, 1895. Serial No. 548,350. (No model.)

To all whom it may concern:

Be it known that I, BYRON ERB BECHTEL, of the town of Waterloo, in the county of Waterloo and Province of Ontario, Canada, have invented certain new and useful Improvements in Clay-Disintegrators and Stone-Separators; and I hereby declare that the following is a full, clear, and exact description of the same.

This invention relates to certain new and useful improvements in clay-disintegrators and stone-separators; and the objects of this invention are to construct a clay-disintegrator having its knives so arranged as to cut up and temper the clay preparatory to its delivery to the grinding-frame, and to so arrange the cutting and tempering knives and the grinding-frame that the cutting up, tempering, and grinding of the clay will be one continuous operation, and to so arrange the grinding-frame that in the event of a stone or other hard substance becoming interposed between the knives or the knife-carrying disk and the grinding-frame that the grinding-frame can be temporarily displaced to permit of the removal of the stone or other hard substance; and the invention consists, essentially, of a suitable hopper, a spring-operated grinding-frame vertically movable within the hopper, a disk to which a series of clay-cutting knives are secured revolving within the hopper close to the under side of the grinding-frame, the whole device being hereinafter more fully set forth, and more particularly pointed out in the claims.

The drawing represents a perspective view, partially in section, of the clay-disintegrator and stone-separator.

Like letters of reference refer to like parts throughout the specification and drawing.

The invention consists of a suitable framework A, composed of a top *a* and four sides *a'*, respectively. Located above the top *a* is a collar B, which is supported by a series of arms C, bolted or otherwise secured to the upper side of the top *a*. Formed vertically through the collar B is a circular passage D, the center of which is vertically above the middle of the top *a*.

On the inside of the framework A is a cross-head E, which is connected to two opposite sides *a'* and extends horizontally across the middle of the inside of the said framework. Connected to the top of the cross-head E at or about the middle thereof is a metallic plate F, and formed in the metallic plate F is a circular recess G. The center of the circular recess G is vertically below the center of the passage D through the collar B. Passing through the passage D of the collar B is a vertical shaft H, the lower end of which is journaled in the recess G in the metallic plate F. The collar B and the metallic plate F serve as the bearings for the said shaft H.

Mounted on the upper end of the vertical shaft H is a pulley I, by means of which motion and power are transmitted to the said shaft. Rigidly fixed to the shaft H at or near its lower end is a circular metallic plate or disk J, preferably of cast-iron. Bolted on the top surface of the metallic plate or disk J are a series of steel knives K, which are so arranged as to cut up and temper the clay and to work it outwardly from the center toward the periphery of the said plate or disk. The knives K, it will be noticed by reference to the drawing, are arranged at a tangent to the center of the plate or disk.

Within the frame A and above the disk J is a square metallic frame L, provided at each of its corners with an upwardly-extending bolt M, which passes through the top *a* of the frame, and each of the bolts M is fitted on the outer side of the top with a nut N. Coiled on each of the bolts M between the top *a* and the frame L is a spring O, which holds the frame in its depressed position. The coiled springs O are of sufficient strength to resist the upward pressure of the frame L under normal conditions, but are of sufficient flexibility to permit a vertical movement on the part of the frame when a stone or other similar foreign substance gets jammed between the disk or knives and the under side of the said frame.

Connected to the inside of the frame L are a series of vertical adjustable steel wearing-strips P, each of which is provided with a series of vertical slots Q, and passing through each of the slots Q is a bolt R, which fastens

each wearing-strip to its respective side of the frame L, thus permitting the vertical adjustment of the said strip.

One of the knives K projects about two inches beyond the periphery of the plate or disk J, and the projecting part is turned at an angle of about thirty degrees to the surface of the disk, in order that the projecting portion will act as a scraper and prevent the clay from clogging around the outside of the plate or disk J or of the frame L.

The relative position of the frame L to the plate or disk J and the cutting-knives K is gaged by the nuts N on the bolts M—that is to say, by means of the said nuts on the said bolts the lower side of the frame can be moved to or away from the said disk to permit of the clay being discharged rapidly or slowly from the hopper, as the case may be. Passing through the side a' is a spindle S, and connected at right angles to the spindle S on the inside of the framework is an arm T, which is adapted to reduce the larger lumps of clay and assist the plate or disk and the knives in their work of disintegration. The arm T and spindle S are held in position by means of a flat curved spring U, connected to the spindle S and bearing against pins in the timbers in the inner side of the hopper to maintain the arm T normally in its proper relation to the disk A.

In the operation of the disintegrator the clay may be taken direct from the pit or bank and thrown upon the disk or plate J, which is rapidly revolved. The clay coming in contact with the knives K is cut and tempered and is forced outwardly toward the periphery of the plate or disk principally by the action of the knives and partly by the centrifugal force caused by the revolution of the plate or disk. The clay is forced between the lower edge of the grinding-frame L and the plate or disk J and the knives K. The frame L is so adjusted as to be in close contact with the plate or disk J and produce on the clay any required pressure, so that, in addition to the grinding of the clay, all stones and foreign substances will be retained in the hopper, where they can be readily removed with a shovel without stopping the machine. In the event of a stone happening to get between the under side of the frame L and the plate or disk J the frame will rise sufficiently to permit of the delivery of the stone.

By means of this machine stones or other hard or solid substances can be readily removed from the clay, and the clay can be cut up, tempered, ground, and attenuated in one continuous operation.

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

1. A clay-disintegrator and stone-separator, comprising a hopper, a revoluble disk within the hopper, a plurality of cutting and tempering knives secured on the disk, a vertically-adjustable and yielding grinding-frame located above the disk, vertically-adjustable wearing-strips connected to the grinding-frame, a spindle connected to the side of the hopper, and an arm projecting downward from the inner end of the spindle, substantially as shown and described.

2. A clay-disintegrator comprising a hopper, a revoluble disk within the hopper, a series of knives on the disk, a knife constituting one of said series having its end projected beyond the periphery of the disk and turned up to form a scraper, a vertically adjustable and yielding supported grinding-frame in the hopper above the disk, and a vertically-arranged arm T extending into the hopper, substantially as set forth.

3. A clay-disintegrator, comprising a hopper, a revoluble disk in the hopper, a plurality of cutting-knives secured on the surface of the disk and arranged tangentially to the axis thereof, an adjustable and yielding supporting grinding-frame, screw-threaded post-supports for the said frame, coiled springs on the posts to hold the grinding-frame to its lower limit, and a vertical stirring-arm secured in the hopper independently of the disk and grinding-frame, substantially as shown and described.

Waterloo, April 15, A. D. 1895.

BYRON ERB BECHTEL.

In presence of—
W. C. DELIORS,
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