(No Model.)

4 Sheets—Sheet 1.

J. A. BOYD & B. C. WHITE.

CLAY PULVERIZING MACHINE.

No. 440,537. Patented Nov. 11, 1890.

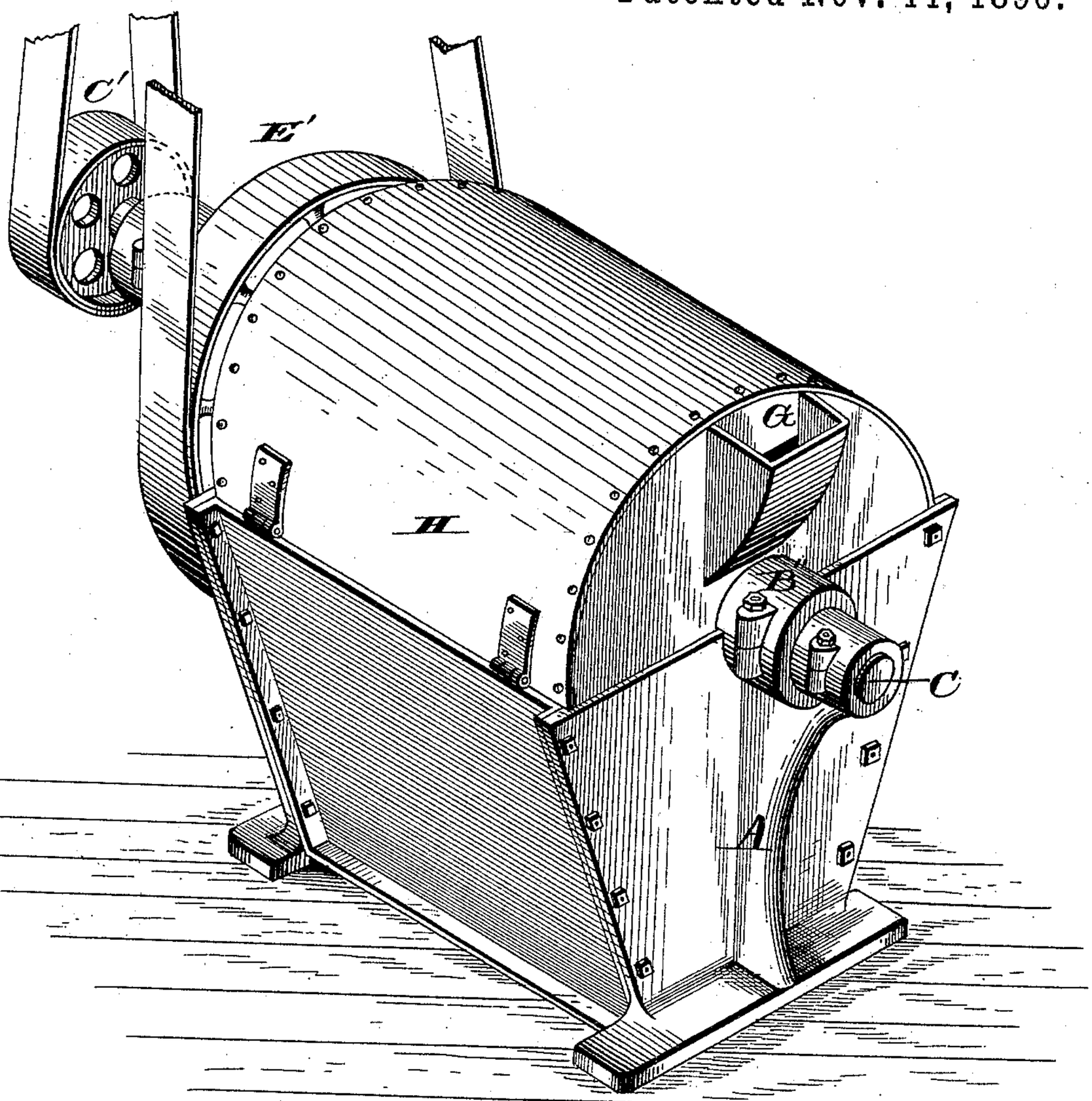

FIG. 1.

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(No Model.) 4 Sheets—Sheet 2.

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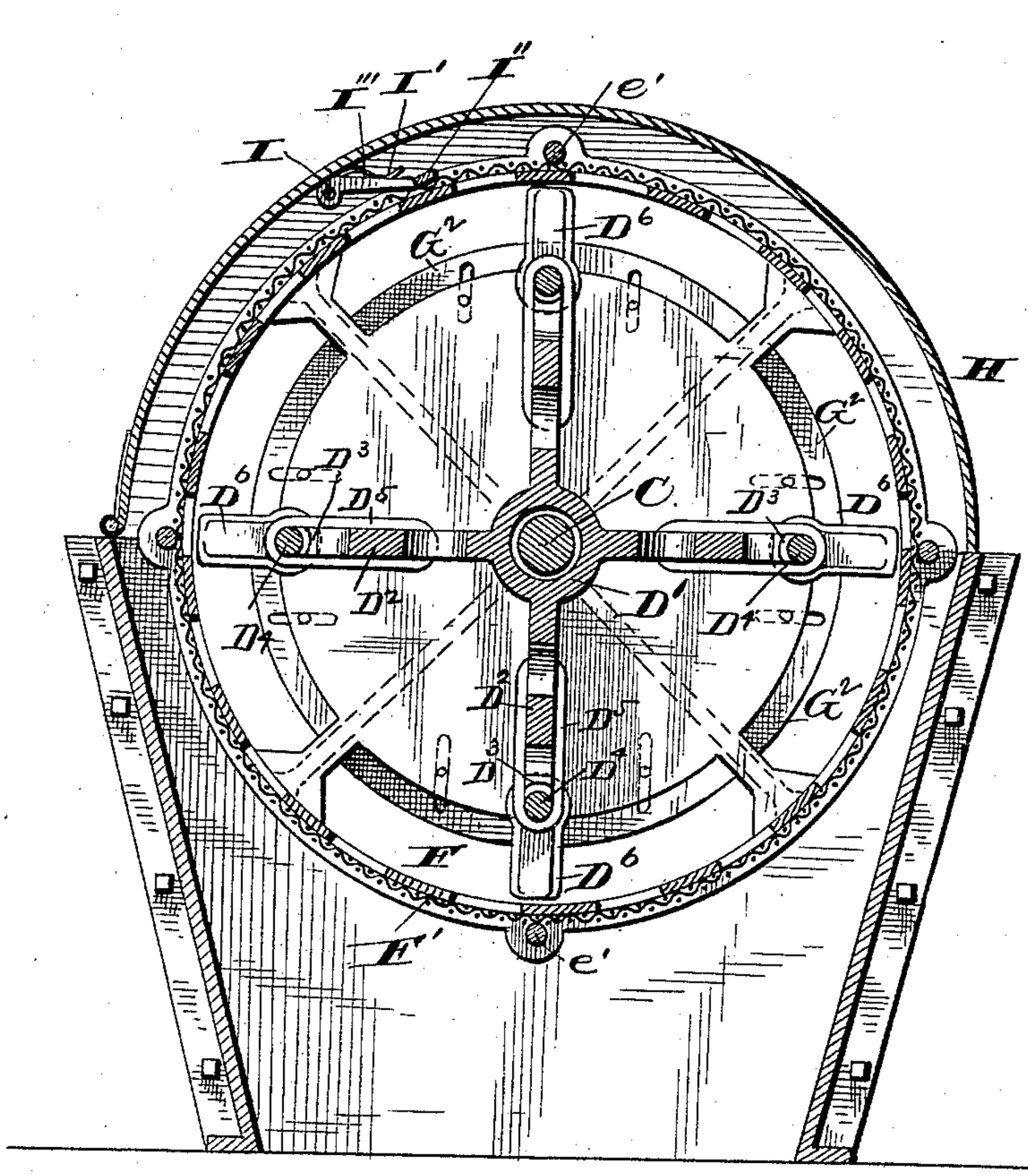

Fig. 2.

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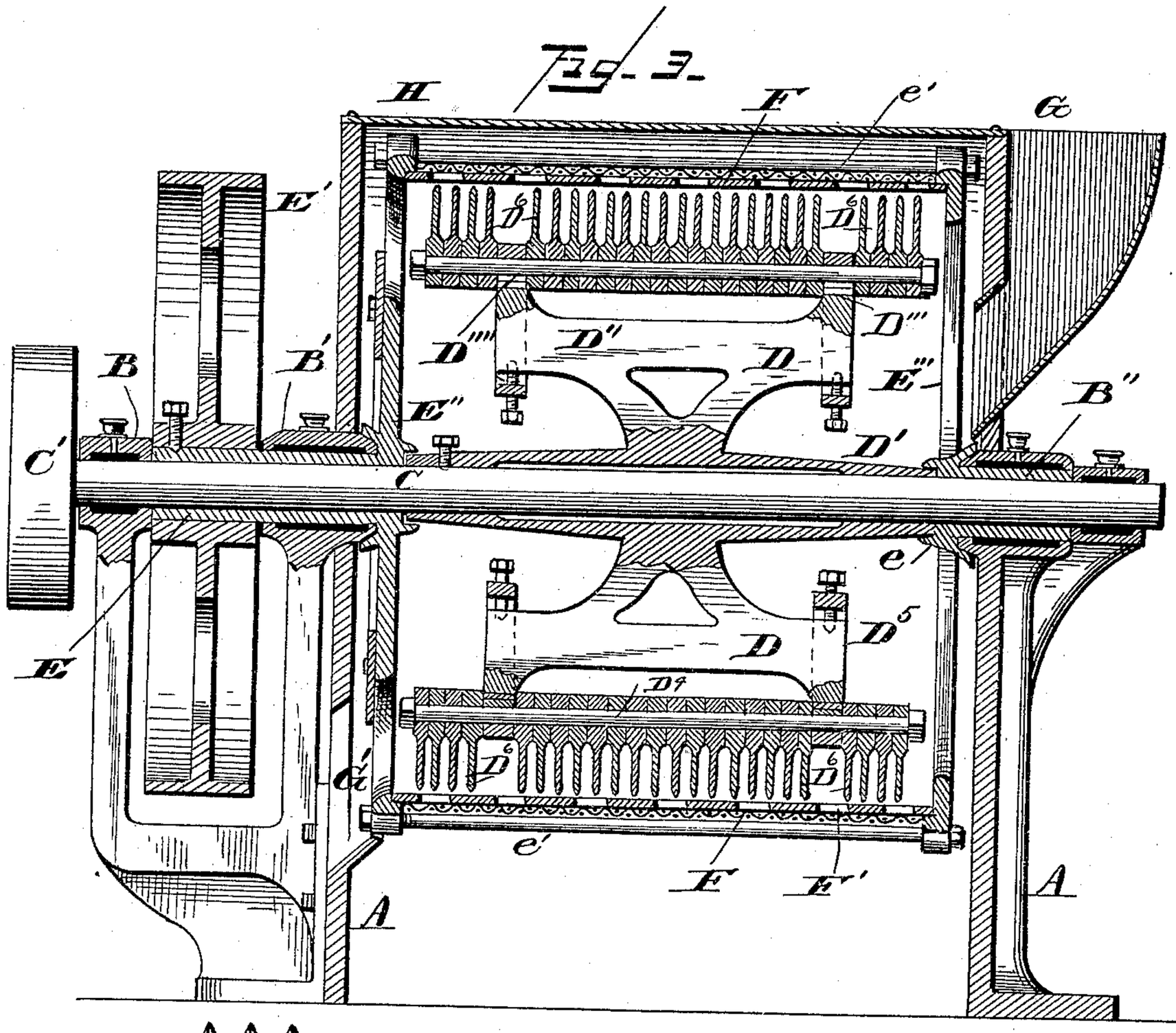
Fig. 3.



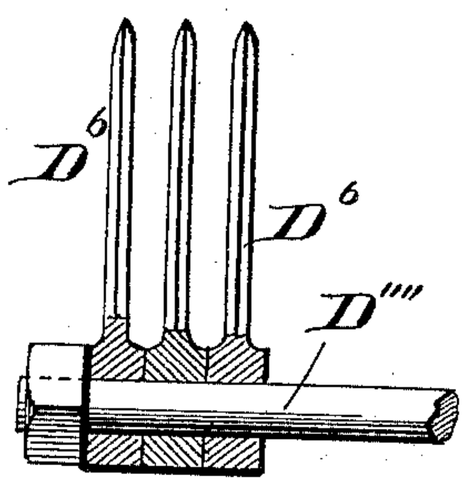


Fig. 4.

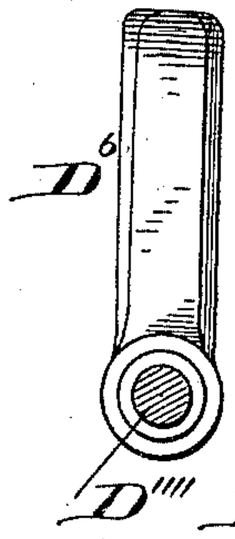


Fig. 5.

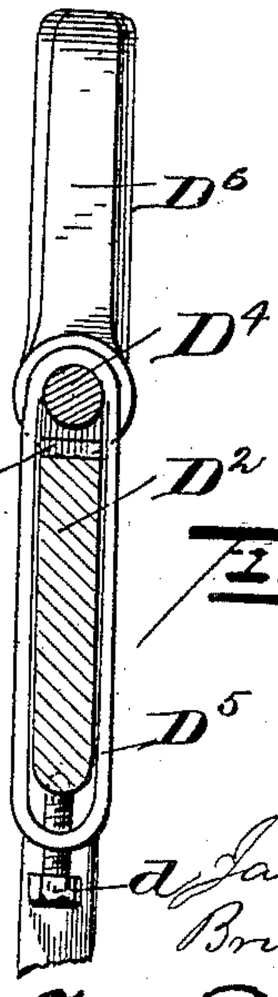


Fig. 6.

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Fig. 7.

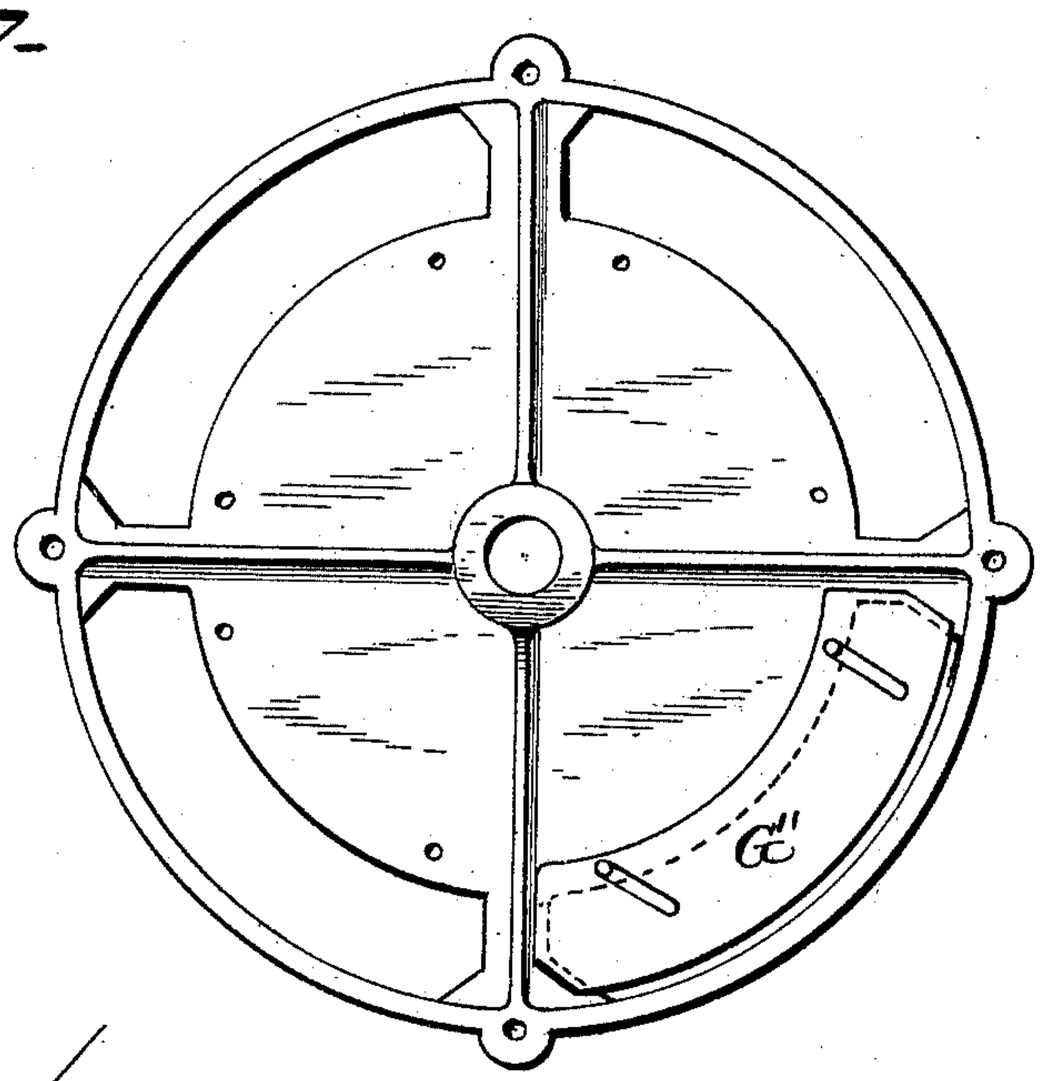
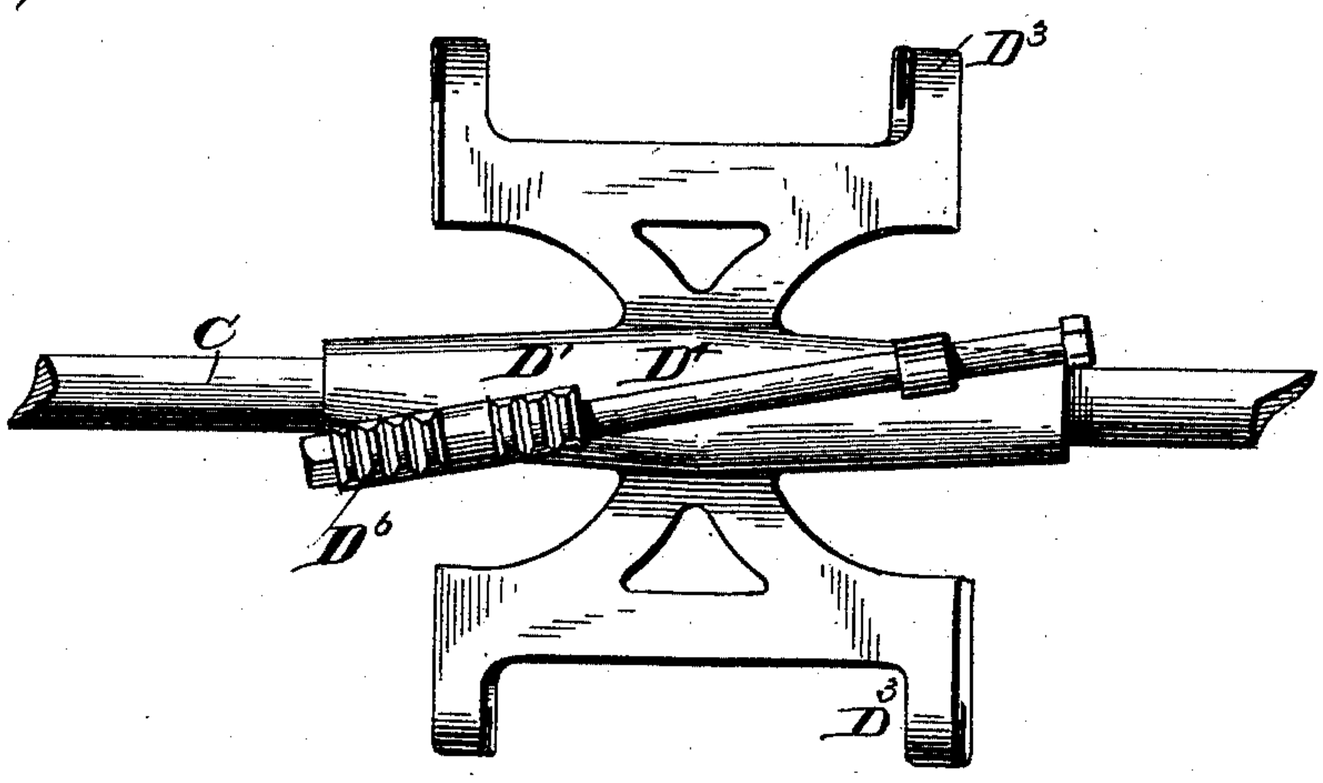


Fig. 8.



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UNITED STATES PATENT OFFICE.

JAMES A. BOYD AND BRUCE CLARK WHITE, OF CHICAGO, ILLINOIS, ASSIGNORS TO CHISHOLM, BOYD & WHITE, OF SAME PLACE.

CLAY-PULVERIZING MACHINE.

SPECIFICATION forming part of Letters Patent No. 440,537, dated November 11, 1890.

Application filed December 20, 1889. Serial No. 334,394. (No model.)

To all whom it may concern:

Be it known that we, JAMES A. BOYD and BRUCE CLARK WHITE, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Devices for Pulverizing Clay; and we do hereby declare the following to be a full, clear, and exact description of said invention, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The invention relates to improvements in machines for pulverizing clay and removing the stones, roots, or pebbles therefrom.

The invention consists, first, in mounting the pulverizing blades or cutters in a revolving case, the blades and case arranged to revolve in the same direction in acting on the clay.

It further consists in certain novel features in the construction and arrangement of parts, all as hereinafter explained.

In the accompanying drawings, Figure 1 is a perspective view of the apparatus. Fig. 2 is a vertical transverse section. Fig. 3 is a longitudinal section. Fig. 4 is a view of a short section of the shaft on which the blades are mounted, showing three blades. Fig. 5 is a side view of one blade. Fig. 6 is also a side view showing the manner of connecting the blade-rods to its head. Fig. 7 is a side view of the case, showing the side openings therein for the escape or passage of the tailings. Fig. 8 is a side view of a modification in the form of head or spider, to which the blades are connected, wherein the blade-rod on which the blades are mounted is arranged at an angle.

A suitable frame A, of cast metal, has a series of bearings B B′ B″ for the shaft carrying the head, to which the blades are connected, and also for the hollow shaft, to which the casing is secured, and through which it is revolved. The main shaft C, to which the blade-head or spider is secured and upon which the other operating parts are mounted, extends from end to end of the machine and is provided near one end with a band-wheel C′, and mounted upon it with the casing is the blade-head or spider D, consisiting of the hub portion D′ and the arms D″, in the outer end of which are formed half-bearings D‴ for the rods D⁗, carrying the blades, which are constructed and arranged in the following manner: The blades D^6 consist of a hub portion and the flat arm or beater, having its working or operating face made sharp, so as to cut the clay, and these blades are mounted on a rod D⁗, as shown. This rod fits the half-bearings D‴ and is secured to the head or arms of the spider by means of a strap D^5, which embraces the arms of the spider, and being secured thereto by set-screw *d* to provide for the adjustment of the blades nearer to or farther from the casing, and the parts being held in proper position by means of suitable shims in a well-known manner.

The several blades in each row are mounted loosely and independently of the others on the rods, and in the revolution of the spider they are thrown out by the centrifugal action toward the inner face of the casing, and, while serving to cut and pulverize the clay in their path, are each adapted to yield independently of the other to permit any one or more to pass by or over any stones, pebbles, or other extraneous or foreign matter that should not be pulverized or broken, while the others of the series continue to act on the clay in their path to bring it to the proper condition for use.

Mounted on the shaft C between the bearings B B′ is a short hollow shaft E, having connected thereto a band-wheel E′, and has mounted on its inner end within the casing a disk or head E″, and which head is in turn connected to a second head or disk E‴, mounted in a journal *e* at the opposite side of the machine, the two heads being connected together by means of the rods or bolts *e*′, and secured to these heads to form a cylindrical case is a sheet-metal covering F, and which is in turn covered by a wire gauze or cloth F′, the whole being connected together to revolve with the hollow shaft by means of the band-wheel E′, the metal covering serving to protect the gauze covering from the action of the stones, pebbles, or other extraneous matter, while permitting the cleaned clay to escape through the openings in the gauze, the blade-head or spider and the casing both

revolving in the same direction, as indicated by the arrows, the relative speed of each being regulated in accordance with the nature or condition of the material acted upon.

Each of the heads is provided with side openings for receiving the material and discharging the stones or tailings, one communicating with a feed-hopper G and the others with a discharge-outlet G′ at the opposite side of the machine. The discharge-openings are covered by sliding doors G″ to regulate the size of the openings to hold the material for a greater or less time in the casing and to the action of the blades, the pulverized and properly-treated material escaping through the perforated casing and gauze covering.

In Fig. 8 is shown a modification in the manner of arranging the blades, wherein its rod is arranged at an angle inclining from the feed-hopper side toward the discharge, by means of which it will be seen that the blades act not only to pulverize the material, but also to act on the stones and tailings to carry them toward and force them out at the discharge-opening.

The machine is inclosed in a suitable box H of any preferred form and material as shall be found most desirable.

Mounted on a rod I, having its bearings in the ends of the inclosing-box H, are rocking arms I′, carrying on their outer ends a knocker-bar I″, to engage the face of the wire gauze or covering F′, and in the path of the rods or bolts *e*′, extending between the heads to hold the same together and in the revolution of the case, said knocker-bar being engaged by said rods to raise the bar and cause said bar after being freed from the rod to come in contact with the wire-gauze and free it of any clay or other matter which may adhere thereto, the power or force with which the knocker-bar engages the gauze being regulated by means of a spring or springs I‴. Any number of these knocker-bars may be employed, arranged at different points in the box H and acting in a similar manner, and said bars may be weighted to act by gravity on the case instead of by the spring, as shall be found most desirable.

Having now described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a device for pulverizing clay and freeing the same of stones, pebbles, and other extraneous matter, a revolving case having mounted therein a spider to revolve in the same direction, and said spider provided with series or rows of blades or beaters at its outer ends mounted to revolve and swing loosely independently of each other, substantially as described.

2. In a device for pulverizing clay and freeing the same from stones, pebbles, and other extraneous matter, a revolving case having a revolving spider mounted therein, provided with a series or rows of blades or beaters at its ends, mounted to revolve and swing loosely independently of each other around their shafts, substantially as described.

3. In a device for pulverizing clay and freeing the same from stones, pebbles, and other extraneous matter, a spider adapted to have a revolving motion imparted thereto, carrying rods arranged at an angle to the face thereof, with a series of blades or beaters mounted on said rod, each blade or beater adapted to swing loosely and independently of the other, substantially as and for the purpose set forth.

4. In a machine for pulverizing clay and freeing the same from stones, pebbles, and other extraneous matter, a perforated case adapted to have a revolving motion imparted thereto, a perforated covering or gauze for said case, blades or pulverizers arranged within the case to act on the material, and a knocker arranged to act on the outer face of the gauze or covering, substantially as set forth.

5. In a machine for pulverizing clay and freeing the same from stones, pebbles, and other extraneous matter, a perforated case having a perforated gauze-covering adapted to have a revolving motion imparted thereto, blades or pulverizers arranged to revolve within the case to act on the material therein, a knocker arranged to act on the outer face of the case, and mechanism acting automatically in the revolution of the case to actuate the knocker, whereby the screen is kept free from accumulations, substantially as set forth.

In testimony whereof we affix our signatures in the presence of two witnesses.

JAMES A. BOYD.
BRUCE CLARK WHITE.

Witnesses:
L. W. SINSABAUGH,
H. M. STERLING.