No. 648,522. Patented May 1, 1900.

L. S. PFOUTS.

PULVERIZING MACHINE.

(Application filed Jan. 3, 1898.)

(No Model.) 5 Sheets—Sheet 1.

Fig. 1.

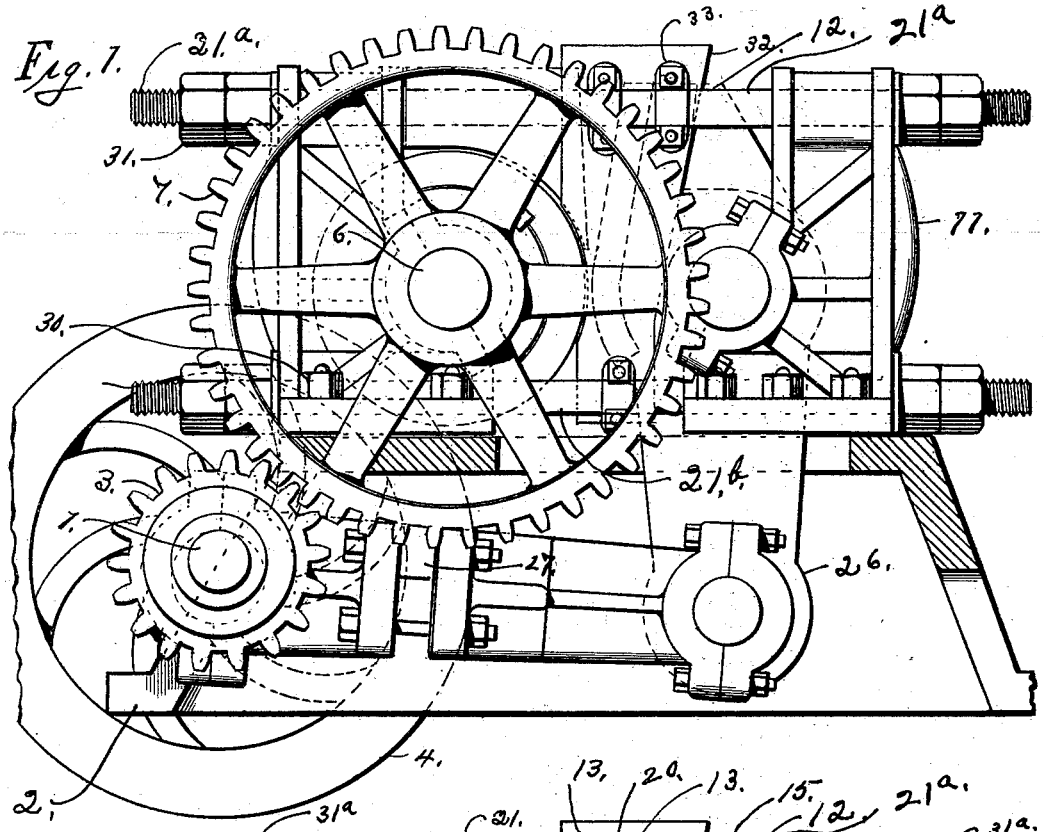

Fig. 2.

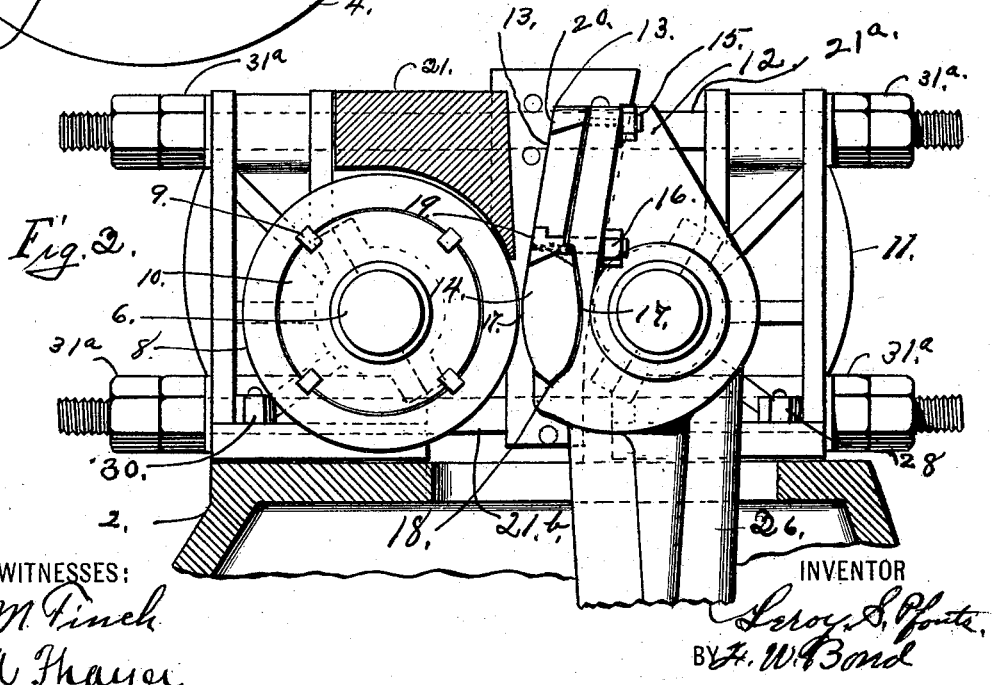

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Fig. 3.

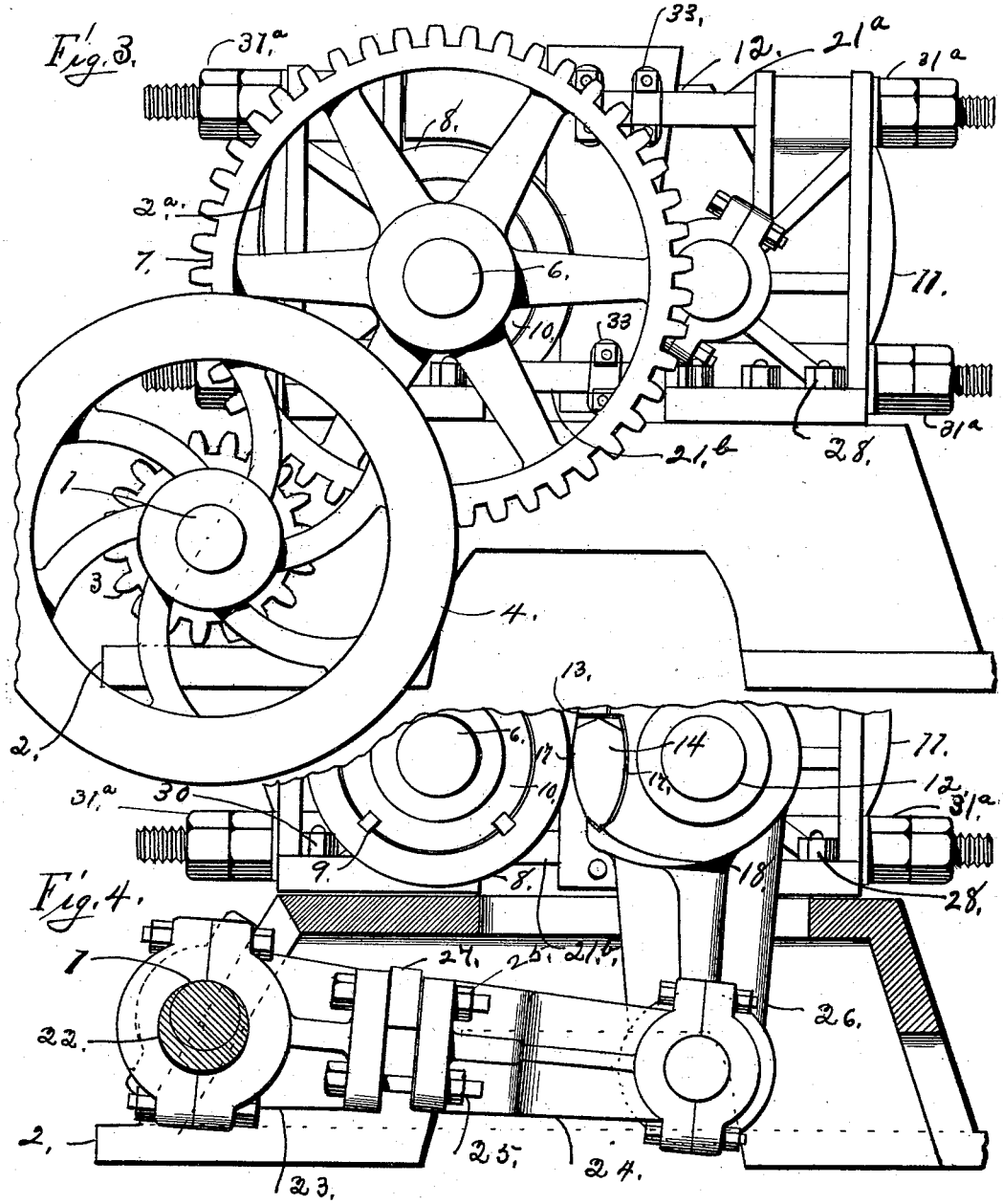

Fig. 4.

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Fig. 5.

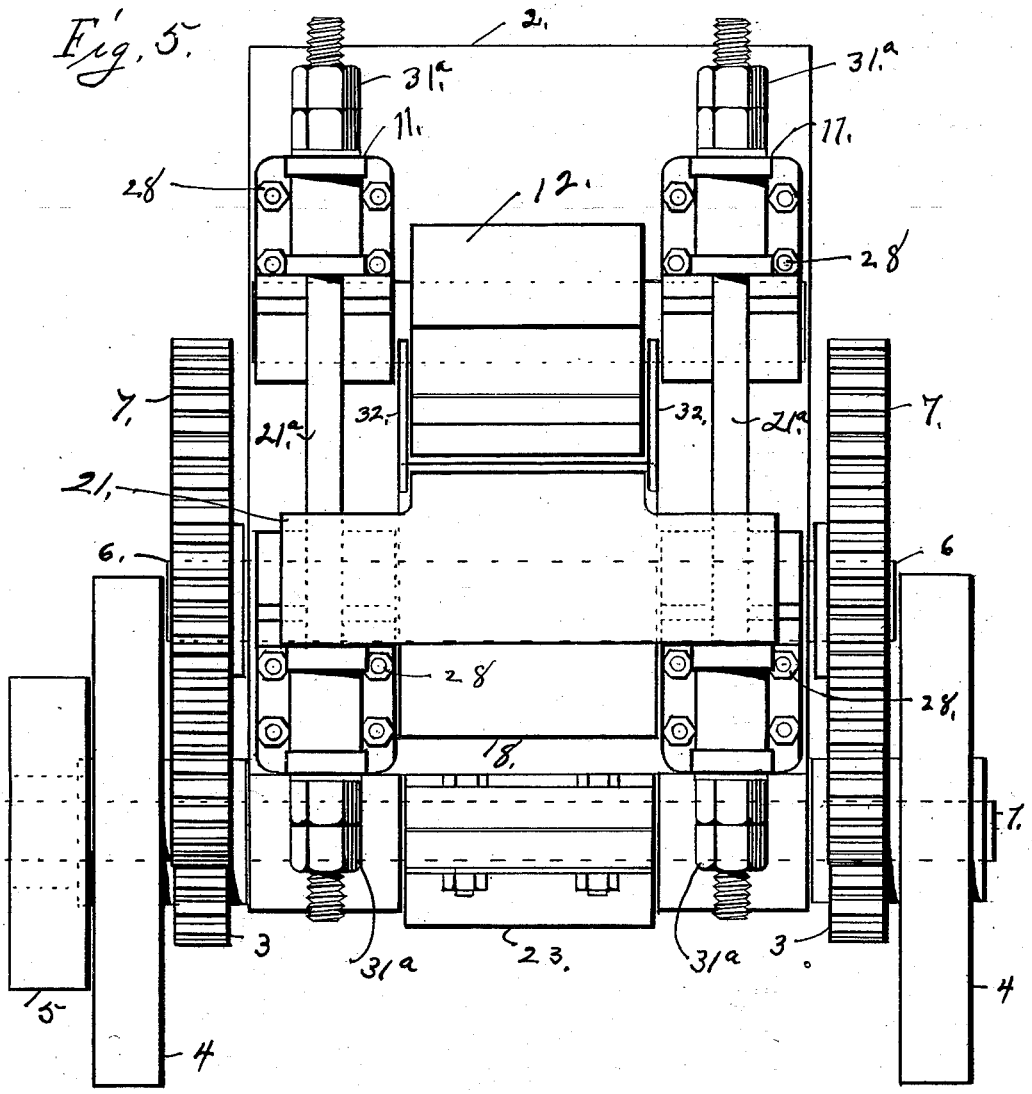

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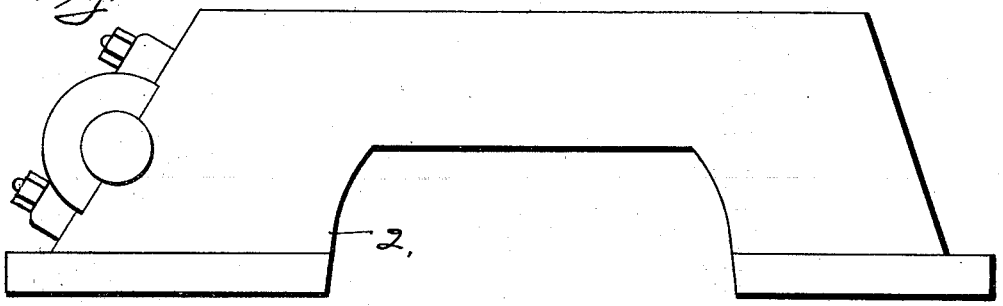
Fig. 6.



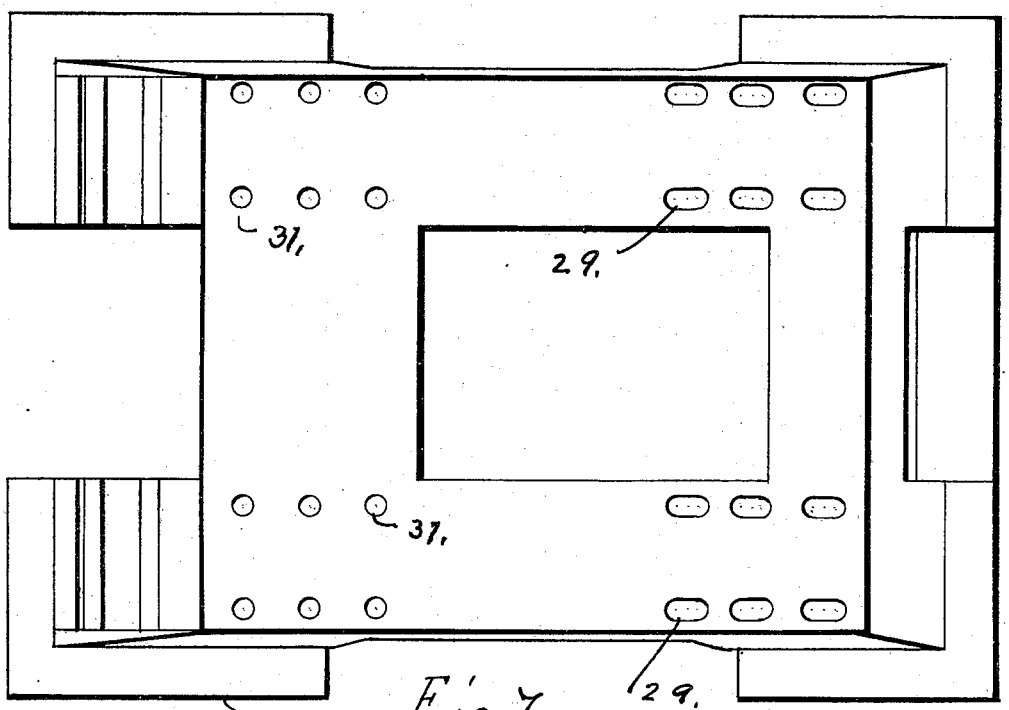


Fig. 7.

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(Application filed Jan. 3, 1898.)

(No Model.) 5 Sheets—Sheet 5.

Fig. 8.

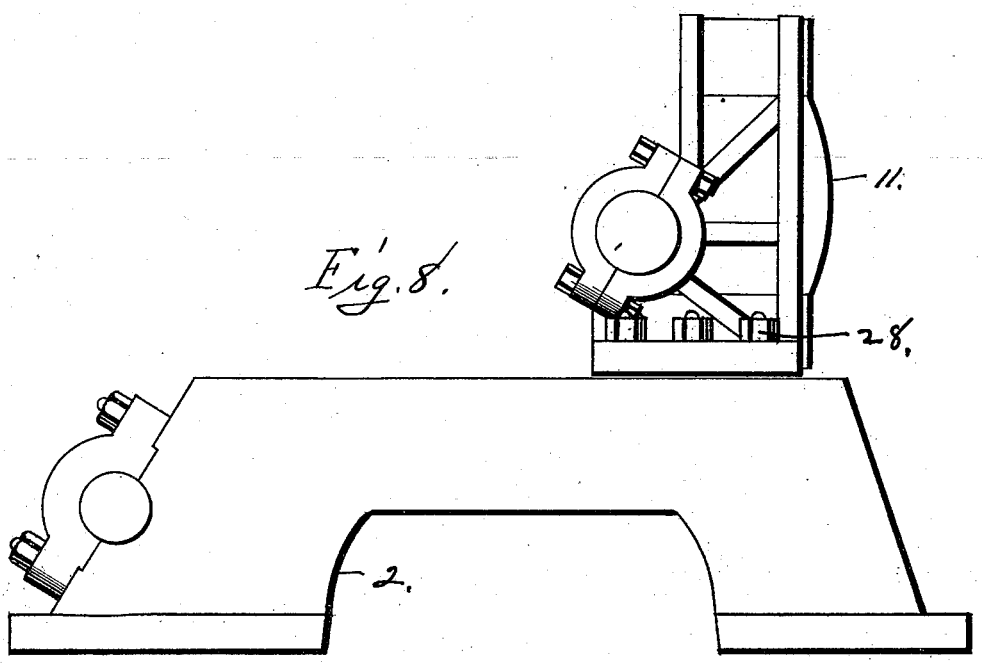


Fig. 9.

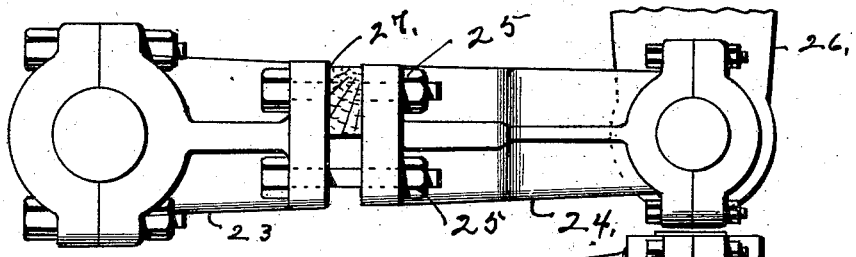
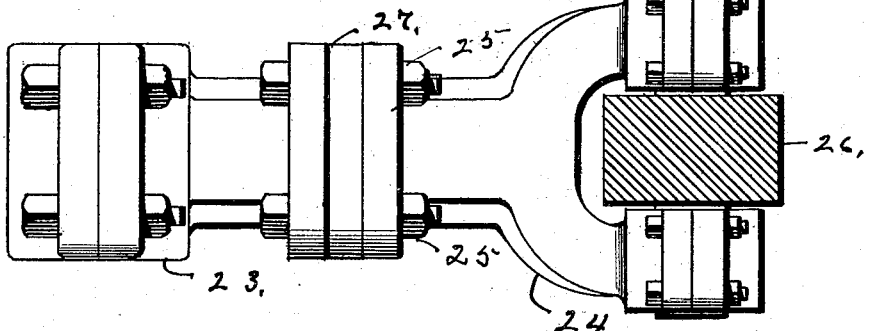


Fig. 10.



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UNITED STATES PATENT OFFICE.

LEROY S. PFOUTS, OF CANTON, OHIO.

PULVERIZING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 648,522, dated May 1, 1900.

Application filed January 3, 1898. Serial No. 665,365. (No model.)

To all whom it may concern:

Be it known that I, LEROY S. PFOUTS, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Pulverizing-Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, and to the figures of reference marked thereon, in which—

Figure 1 is a side elevation showing the base in section. Fig. 2 is a vertical section showing the ends of the crushing-cylinder and oscillating jaw. Fig. 3 is a side elevation showing the position of the different parts in relation to each other with reference to the gear. Fig. 4 is a view showing the lower portion of the machine, its pitman connection, and the lower portion of the oscillating crushing-jaw. Fig. 5 is a top view. Fig. 6 is a side view of the base. Fig. 7 is a top view of the base. Fig. 8 is a side view of the base, showing the adjustable block or head located thereon. Fig. 9 is a side view of the pitman. Fig. 10 is a top view of the pitman.

The present invention has relation to pulverizing-machines; and it consists in the different parts and combination of parts hereinafter described, and particularly pointed out in the claims.

Similar numbers of reference indicate corresponding parts in all the figures of the drawings.

In the accompanying drawings, 1 represents the power-shaft, which power-shaft is properly journaled to the bed or base 2, which bed or base is formed of sufficient size and strength to carry out the objects and purposes hereinafter described.

Upon the power-shaft 1 are mounted the pinions 3, which pinions are securely attached to the power-shaft 1 in any convenient and well-known manner. To the power-shaft 1 are also mounted and securely attached the fly-wheels 4, said fly-wheels being located and arranged substantially as shown in the drawings, and should be of sufficient weight to give the desired amount of momentum to the machine.

When it is desired to communicate power to the machine by belt connection, the belt-wheel 5 is to be mounted and securely attached to the power-shaft 1; but if in the event it is desired to make direct connection with an engine a wrist-pin, wheel, or crank may take the place of the belt-wheel 5 and the engine-pitman be connected directly with the wrist-pin or crank.

The cross-shaft 6 is journaled to the fixed bearing blocks or heads 2^a, to which cross-shaft are attached in any convenient and well-known manner the wheels 7, which mesh with the pinions 3, as illustrated in the drawings. Upon the cross-shaft 6 is mounted the crushing-roll 8, which crushing-roll is formed of any desired diameter, reference being had to the size and capacity of the machine designed to be constructed.

In the drawings I have illustrated the roll proper, formed with a solid center and a removable shell connected together by feathers or keys 9, which feathers or keys connect the crushing shell or roll 8 and the hub 10 together, so as to produce a complete crushing-roll. It will, however, be understood that I do not desire to be confined to the above-described style or kind of crushing-roll, inasmuch as the object and purposes hereinafter described can be successfully carried out by the use of a solid or integral roll. Directly opposite and upon the other end of the frame or bed 1 is located the bearing blocks or supports 11, to which bearing blocks or supports is properly journaled the oscillating crushing-jaw 12, which oscillating jaw is located substantially as shown in the drawings.

To the working face of the jaw 12 are attached the crushing-plates 13 and 14, the plate 13 being connected to the upper portion of the jaw 12 and is securely clamped to said upper portion by means of the clamping-bolts 15 and 16. Directly below the crushing-plate 13 is located the plate 14, which plate is seated in the jaw 12, as illustrated in the drawings, and is provided with the two convex surfaces 17, which convex surfaces constitute the segment of a circle the diameter of which is substantially the same as the diameter of the pulverizing-roll; but it will be understood that the objects and purposes hereinafter described may be carried out with a pulverizing-plate, such as 14, having a con-

vex surface of greater or less curvature than the periphery of the pulverizing-roll; but I prefer to have the curvature of the roll and the plate 14 substantially the same.

For the purpose of holding the bottom or lower end of the pulverizing-plate 14 in proper position the jaw 12 is provided with the V-shaped recess 18, in which V-shaped recess is seated the lower end or portion of the pulverizing-plate 14, which pulverizing-plate is shaped to correspond with the shape of the recess. The upper end of the pulverizing-plate 14 is beveled and is so formed for the purpose of connecting the plates 13 and 14 by means of bolts, such as 16, which bolts are provided with the heads 19, one side of said head being inclined or beveled to correspond with the beveled portion of the plate 14, and the plate 13 being notched to receive the upper side of the head 19, thereby connecting the two plates together. The upper end of the plate 13 is securely held by means of the inclined or beveled head 20.

It will be understood that by forming the pulverizing-plate of the same curvature upon both of its sides said plate can be reversed after one face has been worn, by which arrangement double service is obtained.

Directly above the crushing or pulverizing roll 8 is located the stationary jaw or block 21, which jaw is supported and held in position by means of the tension bolts or bars 21^a, through which block or jaw the bolts 21^a pass. The working face of the stationary jaw or block is provided with a straight face, as illustrated in the drawings, which face is located directly opposite the straight-faced plate 13, said block and straight-faced plate 13 being for the purpose of partially pulverizing the material before it passes between the surfaces of the pulverizing-roll 8 and the convex surface of the plate 14.

The power-shaft 1 is provided with the eccentric 22, upon which eccentric is journaled the pitman-section 23, to which pitman-section is connected the section 24, said pitman-sections being connected together by means of the clamping-bolts 25, and when so connected produce a continuous pitman, which is connected to the bottom or lower end of the arm 26, which arm is formed integral with the oscillating jaw 12. The pitman-section 24 is bifurcated and the arm 26 located between the arms of said pitman-section, as illustrated in Fig. 10.

For the purpose of providing a safety connection the block of wood 27 is placed between the ends of the pitman-sections and is located to one side of the longitudinal center, so that a pry will be brought against said wood block in case any article not designed to be pulverized should accidentally come between the pulverizing-cylinder and the plates, thereby protecting the different metal parts of the machine proper.

For the purpose of providing a means for setting the oscillating jaw 12 and the different parts connected to and moving with said jaw to or from the pulverizing-roller 8 the bearing blocks or supports 11 are adjustably connected to the bed or base 2 by means of the clamping-bolts 28, which clamping-bolts are passed through the slots 29, which slots are formed in the upper plate or portion of the bed or base 2. It will be understood that the bearing blocks or supports 2^a are to be securely and firmly connected to the base or bed 2 by means of the clamping-bolts 30, which clamping-bolts are passed through the apertures 31.

For the purpose of assisting in holding the blocks or supports 2^a and 11 in a firm position the tension-bolts 21^a and 21^b are provided, said bolts being located and arranged substantially as shown in the drawings and are screw-threaded to receive the screw-threaded nuts 31^a, which screw-threaded nuts are located upon the screw-threaded portions of the bolts 21^a and 21^b.

It will be understood that all material passed between the pulverizing-roll 8 and the pulverizing-plate 14 will be brought or reduced to a degree of fineness equal to the space between the pulverizing-roll and the plate 14 and that by adjusting the distance between the pulverizing-roll and the plate 14 I am enabled to regulate the fineness of material pulverized.

For the purpose of guiding the material designed to be pulverized the hopper 32 is provided and may be attached to the tension-bolts 21^a and 21^b in any convenient and well-known manner, and, as shown, the hopper 32 consists of the side members, which side members are held by the straps and rods 33, said straps being riveted to the side members composing the hopper proper.

It will be understood that the crushing-roll 8 should be rotated in such a direction that the side or portion adjacent to the jaw 12 will be moved downward, which movement forces the material between the periphery of the crushing-roll and the working face of the crushing jaw or plate 14, inasmuch as the plate 14 is fixed to the oscillating jaw 12, which jaw is mounted upon a fixed shaft or center, which fixed center causes the plate 14 to be oscillated, the oscillation of which describes an arc of a circle having a common center with that of the crushing-roll, and that the greatest distance from the center of the crushing-roll and the jaw 12, taken with the plate 14, should be alike in both instances, or, in other words, the two radii should be the same, thereby holding and maintaining at all times the same distance between the working faces of the crushing-roll and the plate 14 at their nearest meeting points, which distance is maintained throughout the oscillatory movement of the plate 14. It will be understood that as the plate 14 is oscillated in an upward direction the portion of said plate above a horizontal center of the crushing-roll and the crushing-plate will be

carried away from the crushing-roll, and the portion below the horizontal center will be brought toward the crushing-roll in just the proportion the upper portion is carried away, by which arrangement the space between the plate 14 and the periphery of the crushing-roll above the horizontal line is increased, and when the plate 14 is oscillated in the opposite direction and moves downward with the crushing-roll the space above the horizontal line is decreased; but the space at the horizontal center remains unchanged at all times and under all circumstances, thereby bringing all the material passed between the crushing-roll and the plate 14 to a fixed degree of fineness, thereby pulverizing or crushing the material to a uniform fineness.

It will be understood that a differentiated movement is imparted between the crushing-roll and the jaw or plate 14 when the plate 14 moves in the same direction as that of the crushing-roll, by which arrangement a grinding of the material is brought about, and inasmuch as the downward movement of the plate 14 closes or reduces the space above a horizontal center the material will be crowded or forced between the crushing-roll and plate. It will also be understood that I am enabled to so adjust the oscillating jaw to or from the crushing-roll that any degree of fineness may be given to the material passed between the crushing-roll and the plate.

It will be understood that the shaft upon which the crushing-roll 8 is mounted and the shaft to which the pitman is connected do not rotate in unison; but a more rapid rotation is given to the eccentric-shaft than is given to the roll-shaft, thereby assisting in passing the material between the plate 14 and the roll 8.

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

1. In a pulverizing-machine, a bed or base provided with blocks or standards adjustably attached to said base, a power-shaft provided with pinions, a pulverizing-roll provided with a smooth face or periphery and geared with said pinions, an oscillating pulverizing-jaw provided with crushing-plates one of said crushing-plates provided with convexed surfaces, and one of said convexed surfaces located adjacent to the crushing-roll and a fixed jaw located over the crushing-roll, and means for oscillating the pulverizing-jaw and rotating the roll, substantially as and for the purpose specified.

2. The combination of a bed or base, a power-shaft provided with pinions, a smooth-faced crushing-roll mounted upon a shaft, and rotatably connected with the power-shaft, an oscillating jaw journaled at a point horizontal with the shaft of the crushing-roll, and provided with a convexed crushing-plate, substantially as set forth.

3. The combination of a bed or base, a shaft journaled thereto, and having mounted thereon a continuously-rotating crushing-roll, an oscillating jaw centered horizontal with the center of the shaft upon which the crushing-roll is mounted, and provided with a convexed crushing-plate, substantially as and for the purpose set forth.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

LEROY S. PFOUTS.

Witnesses:
B. M. FINCH,
F. W. BOND.