(No Model.)

4 Sheets—Sheet 1.

J. A. PEER.

PULVERIZING OR REDUCING MILL.

No. 462,277. Patented Nov. 3, 1891.

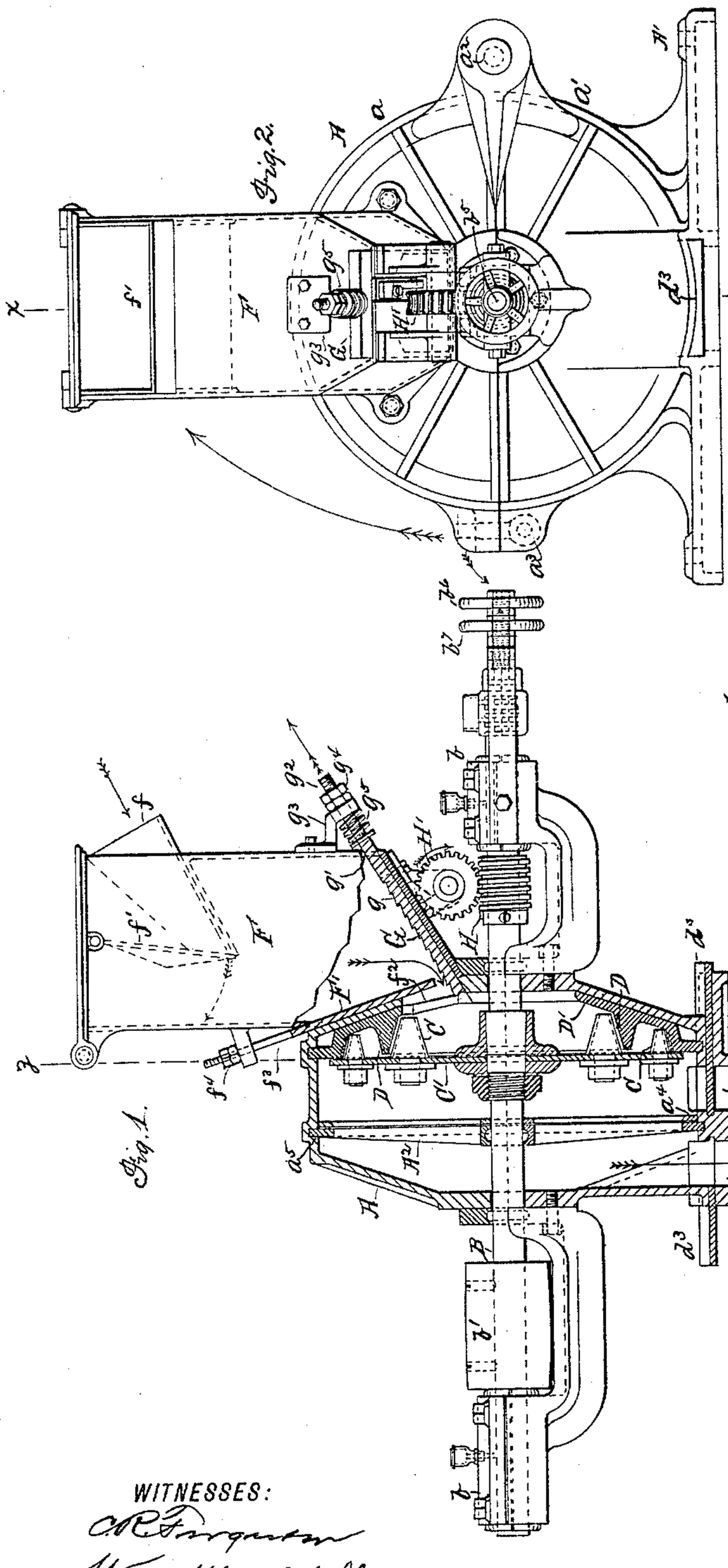

Fig. 1.

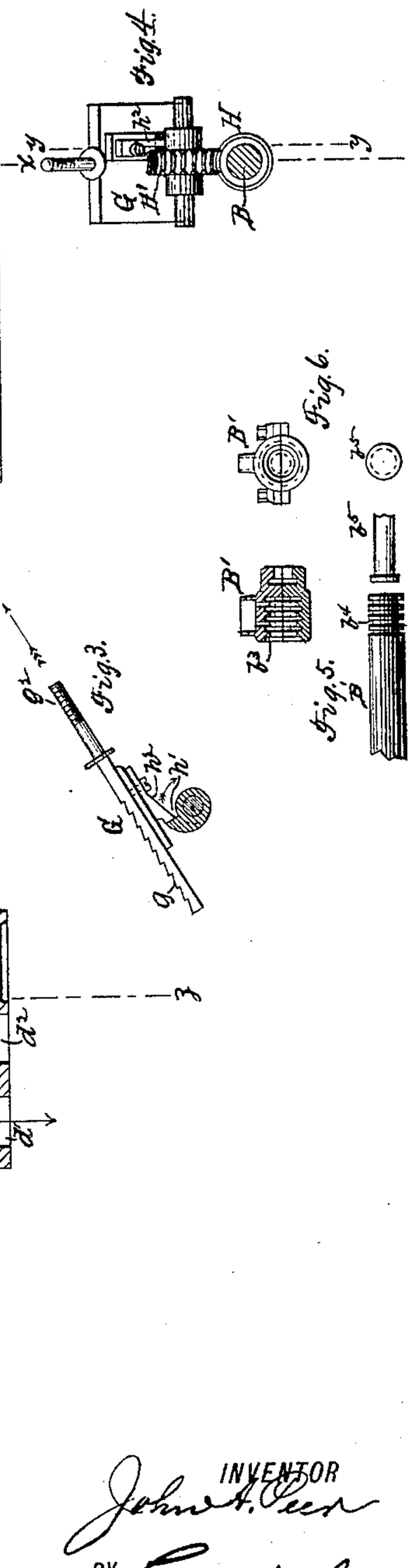

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

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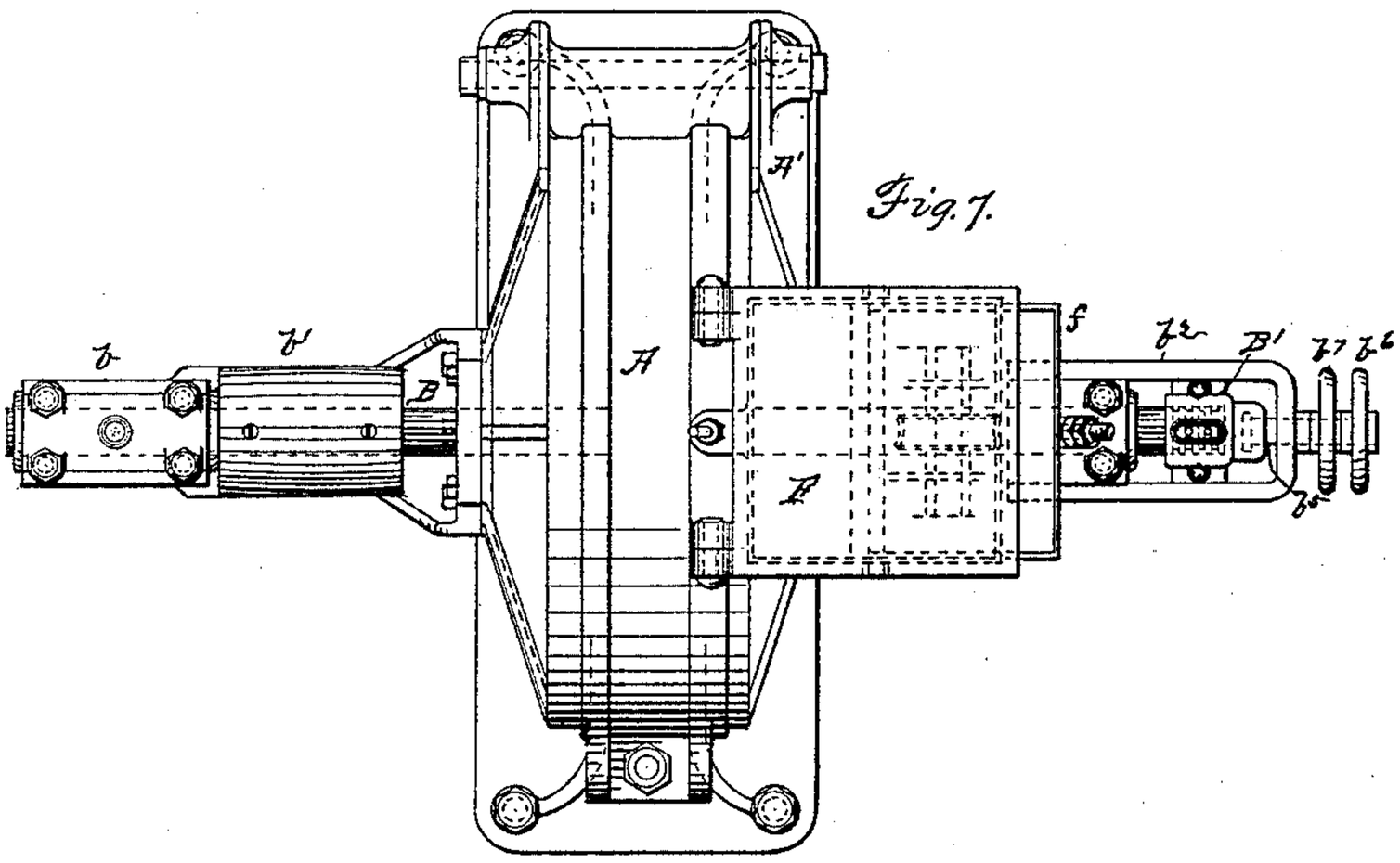

Fig. 7.

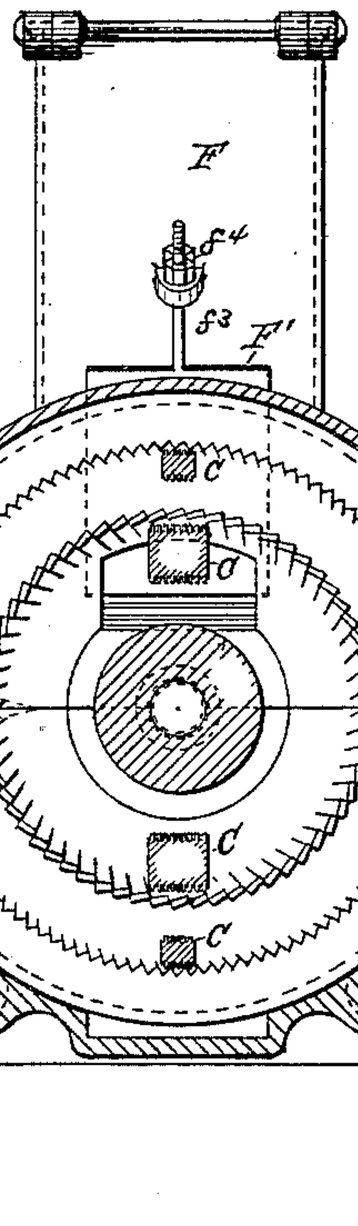

Fig. 8.

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PULVERIZING OR REDUCING MILL.

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Fig. 9.

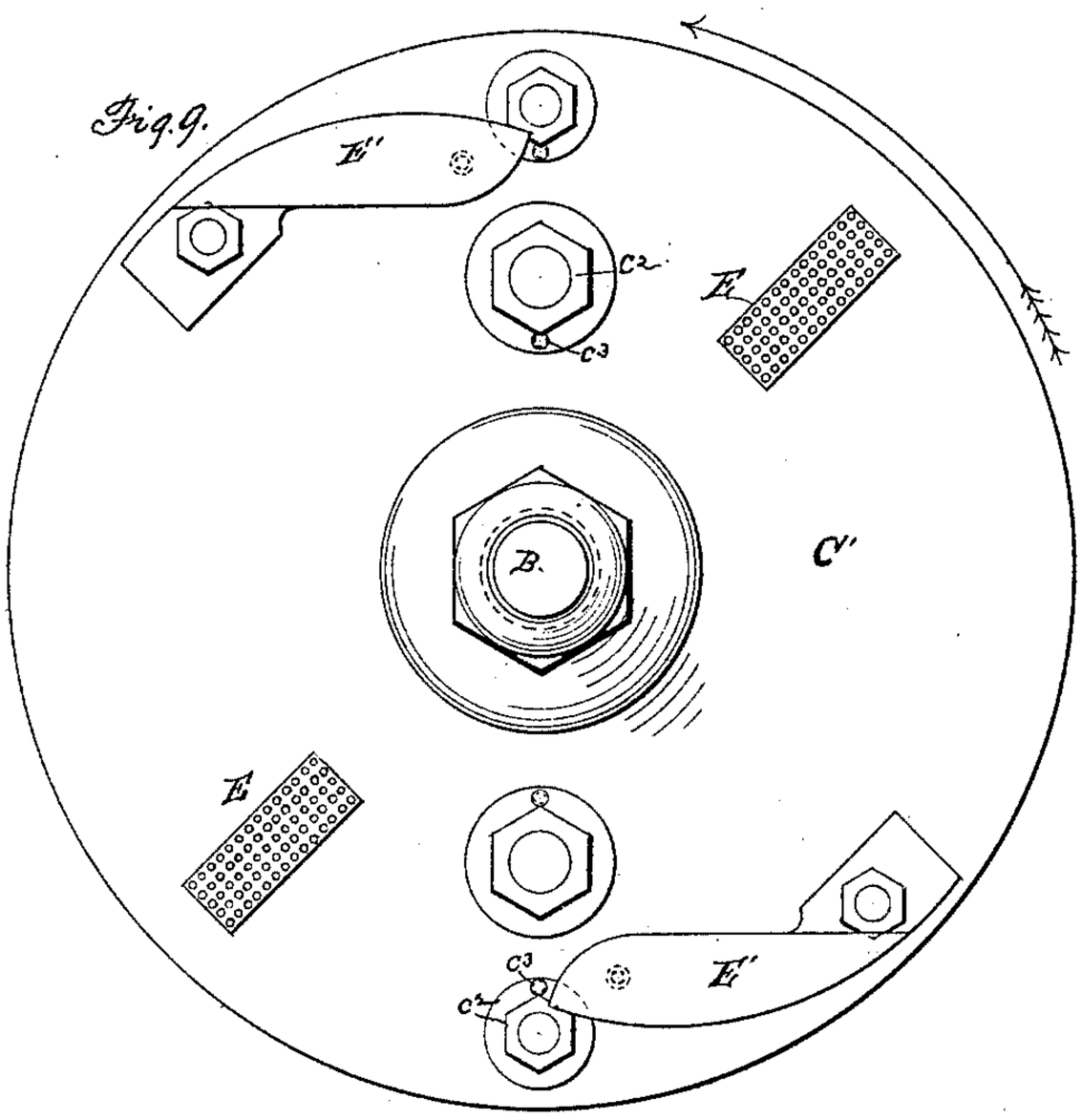

Fig. 10.

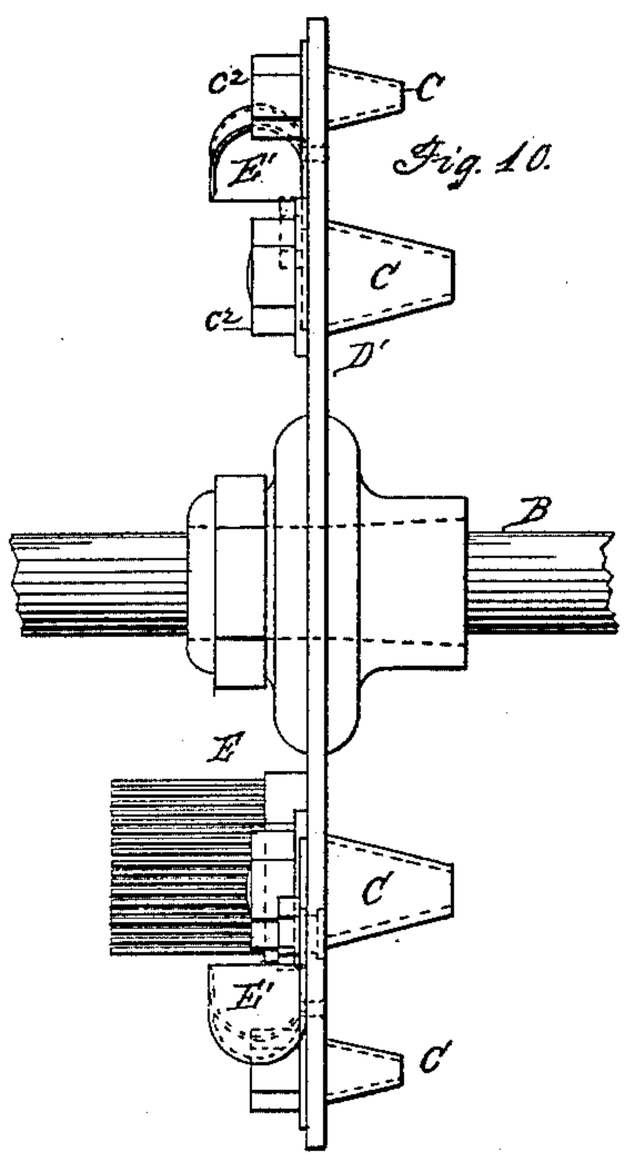

Fig. 10*.

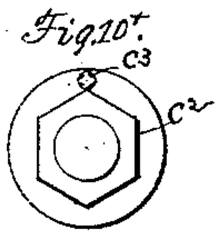

Fig. 17.

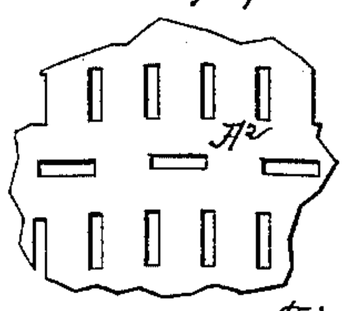

Fig. 11.

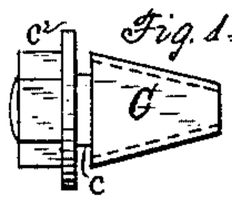

Fig. 12.

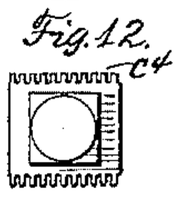

Fig. 13.

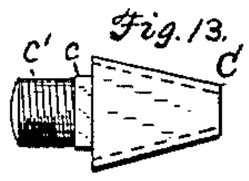

Fig. 14.

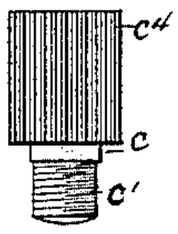

Fig. 16.

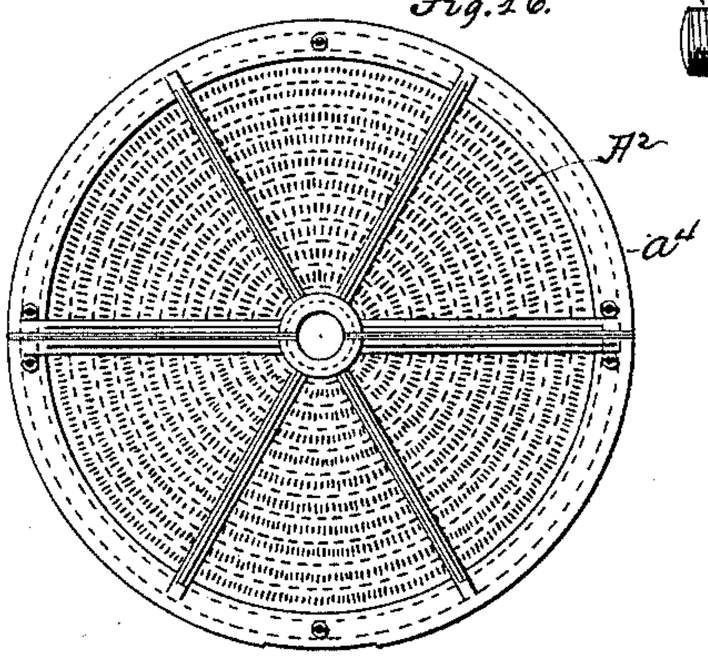

Fig. 15.

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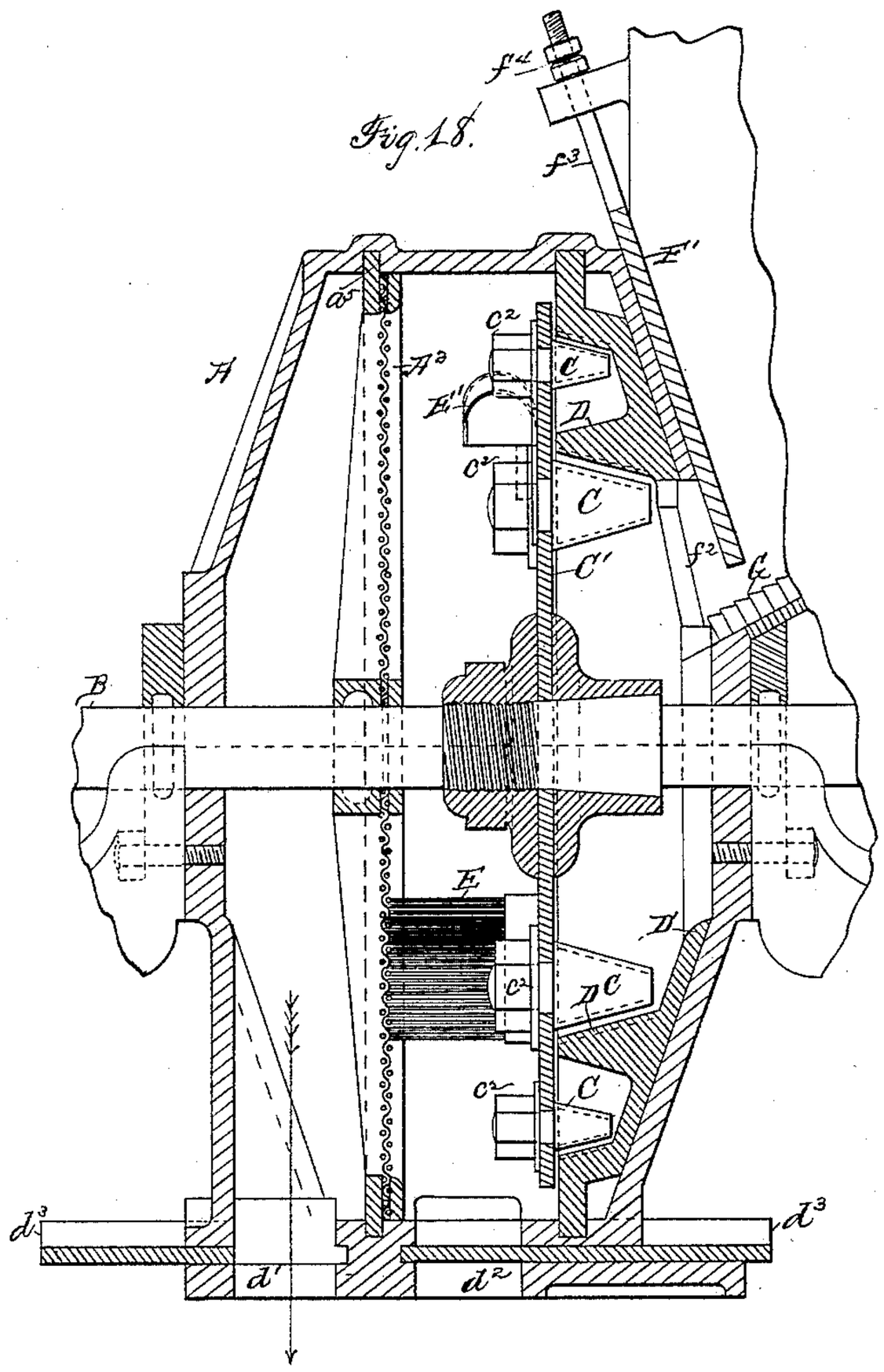
Fig. 18.



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UNITED STATES PATENT OFFICE.

JOHN A. PEER, OF BROOKLYN, ASSIGNOR OF ONE-HALF TO THEODORE W. BAYAUD, OF NEW YORK, N. Y.

PULVERIZING OR REDUCING MILL.

SPECIFICATION forming part of Letters Patent No. 462,277, dated November 3, 1891.

Application filed November 10, 1890. Serial No. 370,977. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. PEER, of Brooklyn, Kings county, and State of New York, have invented a certain new and useful Improvement in Pulverizing or Reducing Mills, of which the following is a specification.

This invention relates to machines for reducing barks, rosin, and similar material; and it consists in the construction and novel arrangement of parts, as hereinafter set forth.

I will describe a reducing-machine embodying my improvement, and then point out the novel features in the claims.

In the accompanying drawings, Figure 1 is an end view of a machine embodying my invention, partly in section on the line $x\,x$ of Fig. 2. Fig. 2 is a side view. Fig. 3 is an edge view of a feeding-plate, partly in section on the line $y\,y$ of Fig. 4. Fig. 4 shows the lower side of the feeding-plate and its connections. Fig. 5 shows details of a swivel-joint employed. Fig. 6 is an end view thereof. Fig. 7 is a plan view of the mill. Fig. 8 is a section on the line $z\,z$ of Fig. 1. Fig. 9 is a side view of a disk employed in the mill. Figs. 10, 11, 12, 13, 14, 15, 16, and 17 are detail views of mechanism employed in the mill. Fig. 18 is a sectional view, on an enlarged scale, of a portion of the machine.

Similar letters of reference indicate like parts in all the figures of the drawings.

Referring by letter to the drawings, A designates a casing having its lower portion rigidly secured to a base A′. The casing A is circular in form and is preferably constructed in two sections $a\,a'$, hinged together at one side, as at a^2, and having a locking device a^3 at its opposite side. By constructing the casing in two parts or sections it may be readily opened for the purpose of cleaning it or for arranging its internal mechanism.

A^2 is a screen, here shown as formed in two semicircular sections and surrounded by a frame a^4 and held in position within the casing A by seating the edge of the frame a^4 into an annular groove a^5 in the wall of the casing. It is evident that the screen-sections may be removed when the casing is opened, as before described.

B is a horizontal rotary driving-shaft extending through openings in the casing A and the screen A^2 and having bearings b in brackets extending from the casing, to which they are attached by bolts or otherwise, and a band-pulley b' is secured to the shaft, as here shown, between one of the shaft-bearings and the casing. The shaft B is longitudinally adjustable in its bearings, and as a means for securing this longitudinal adjustment the shaft engages with a sliding block B′ in such manner that the shaft may rotate without imparting motion to the block. The sliding block B′ is made in two horizontal sections separably connected together by means of bolts or screws, and the said block slides in a yoke or way b^2, attached to a bearing-bracket b, as shown.

Fig. 5 shows a means for engaging the shaft with the sliding block, and by referring thereto it will be seen that the block has a series of annular ribs b^3, adapted to engage in annular grooves b^4 in the end of the shaft B. A pin b^5, threaded at its outer end, has a swivel engagement with the sliding block B′ and passes loosely through an opening in the end of the yoke b^2, where it is provided with a nut b^6 in the form of a hand-wheel. By rotating the nut b^6 it is obvious that the shaft B may be adjusted longitudinally, and a jam-nut b^7 may be operated to secure the shaft as adjusted.

C designates beaters rotated with the shaft B within the casing A. The beaters are mounted on a support or disk C′, which is rigidly mounted on the shaft A.

Referring to Figs. 11, 12, 13, and 14, it will be seen that the beaters C have an angular shank c, which engages in a corresponding opening through the disk C′, so that the beaters will not turn, and a threaded portion c' of the shank is engaged by a lock-nut c^2. By means of the nut the beater may be tightly held in place, and to lock the nut a pin c^3 may be driven through perforations in the nut and disk. The nuts project into the chamber between the disk C′ and the screen and serve as beaters to further reduce material in said chamber. It is preferable to removably secure the beaters to the disk, as described, as the beaters may then be turned to present a new surface should a surface become worn out by use. Two opposite sides of the beaters converge toward the free end and are pro-

vided with teeth or ribs c^4, which are here shown as extending longitudinally, and it will be observed that there are two pairs of these beaters, one pair being somewhat smaller than the other, although there may be a greater or less number of beaters without departing from the spirit of my invention.

Annular ribs D extend inwardly from a wall of the casing and project over and in line with the beaters C. I have shown these ribs as integral with a disk D′, which is made in two sections and has its edge seated in an annular groove in the wall of the casing, similar to the screen A^2. The inner surfaces of the ribs D are provided with transverse saw-shaped teeth or grinding-surfaces d, and the said ribs have a transverse pitch corresponding to the incline of the ribbed surface of the beaters. It will be observed that by a longitudinal adjustment of the shaft B, as before described, the distance between the ribs and the beaters may be increased or diminished to reduce materials to different degrees of fineness. The bottom of the casing A is provided with two outlet-openings d' d^2, arranged one d^2 between the beaters and the screen and the other d' at the opposite side of the screen. These openings are provided with closing-slides d^3. When it is desired not to reduce material to a fine powder or to screen it, the slide is withdrawn from the opening d^2 and the opening d' closed. If, however, material is to be finely ground and screened, the slide is withdrawn from the opening d' and the opening d^2 closed.

Brushes E are secured to the rear surface of the disk D′. These brushes are preferably of steel wires so arranged as to bear upon the surface of the screen A^2 in such manner as to force material through the screen. Scoops E′ are also secured to the disk D′ and serve to scoop or scrape material from the bottom of the casing and return it to the beaters.

I have not shown the brushes and scoops in Fig. 1, as they would tend to confuse the figure; but they are plainly shown in Figs. 9 and 10.

Having described the reducing mechanism, I will now describe the automatic feed mechanism employed therewith.

F designates a hopper secured by bolts or otherwise to the casing A and provided with a chute f near its upper end. The outlet of the chute has an automatic closure in the form of a swinging door or plate f'. I have shown the plate as swinging in bearings in the top of the hopper; but it may be connected directly to the chute, if so desired. After material is placed in the hopper the closure, by closing against the chute-outlet, prevents the escape of powder or dust. An outlet f^2 from the lower portion of the hopper communicates with an opening through the casing A, and the outlet f^2 is provided with a slide F′ to regulate the degree of opening. The slide F′ has a shank f^3 passing through a perforation in a lug extending from the hopper, and a nut f^4 on the threaded end of the shank f^3 above the lug serves to raise or lower the slide.

G is an automatic feeder in the bottom of the hopper. This is shown as inclined and provided with transverse serrations g and as extending through a slot g' in the wall of the hopper. A shank or bolt g^2 projects from the feeder G through an opening in a bracket g^3, where its threaded end is provided with a regulating-nut g^4, and a coiled spring g^5 surrounds the shank g^2 between the bracket and the hopper, as shown.

H is a worm on the shaft B, engaging with a worm-wheel H′, having trunnions h, having bearings in brackets extending from the bottom of the hopper, and one of the trunnions is provided with a radial lug or striker h', which at every revolution of the worm-wheel H′ contacts with a boss h^2, secured to the feeder G and extended through an opening in the bottom of the hopper. By this mechanism it is obvious that the feeder G will be forced backward by the rotation of the shaft B and returned or forced forward by the spring g^5 when the striker h' shall have released or passed the boss h^2.

Having described my invention, what I desire to secure by Letters Patent is—

1. In a reducing-mill, the combination, with a casing having grinding-ribs, and a rotary shaft, of a disk mounted on said shaft and carrying beaters and brushes, a screen upon which the brushes bear, the said casing having an outlet-opening between the beaters and the screen and another outlet-opening at the opposite side of the screen, and closures for said outlets, substantially as specified.

2. In a reducing-mill, the combination, with a casing having grinding-ribs, and a rotary shaft, of a disk mounted on said shaft, beaters carried by the disk, brushes and scoops carried by the disk, a screen upon which the brushes bear, the said casing having an outlet-opening arranged between the disk and the screen and another outlet-opening at the opposite side of the screen, and closures for said outlets, substantially as specified.

3. In a reducing-mill, the combination, with a casing made in two sections and having an annular groove, and a rotary shaft carrying beaters and brushes, of a screen consisting of two parts, having a frame removably seated in the annular groove of the casing, substantially as specified.

4. In a reducing-mill, the combination, with a casing, a screen therein, and a rotary shaft carrying a disk, of beaters having shank portions extended through openings in the disk, and nuts on said shank portions locked to the disk and serving as beaters for material in a chamber between the disk and screen, substantially as specified.

5. In a reducing-mill, the combination, with a rotary shaft and a casing, of beaters there-

in, carried by the rotary shaft, a hopper having an outlet communicating with an opening in the casing, a feeder in the hopper, a boss on the lower side of the feeder, a worm-wheel having a striker on its shaft, a worm on the rotary shaft engaging with said worm-wheel for moving the feeder in one direction, and means for moving it in the opposite direction, substantially as specified.

6. In a reducing-mill, the combination, with a rotary shaft carrying beaters, and a casing made in two parts, of a screen consisting of two sections, having a frame seated in an annular groove in the casing, and a disk having projecting grinding-ribs and made in two sections and having its edge removably seated in an annular groove in the wall of the casing, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN A. PEER.

Witnesses:
C. R. FERGUSON,
ANTHONY GREF.