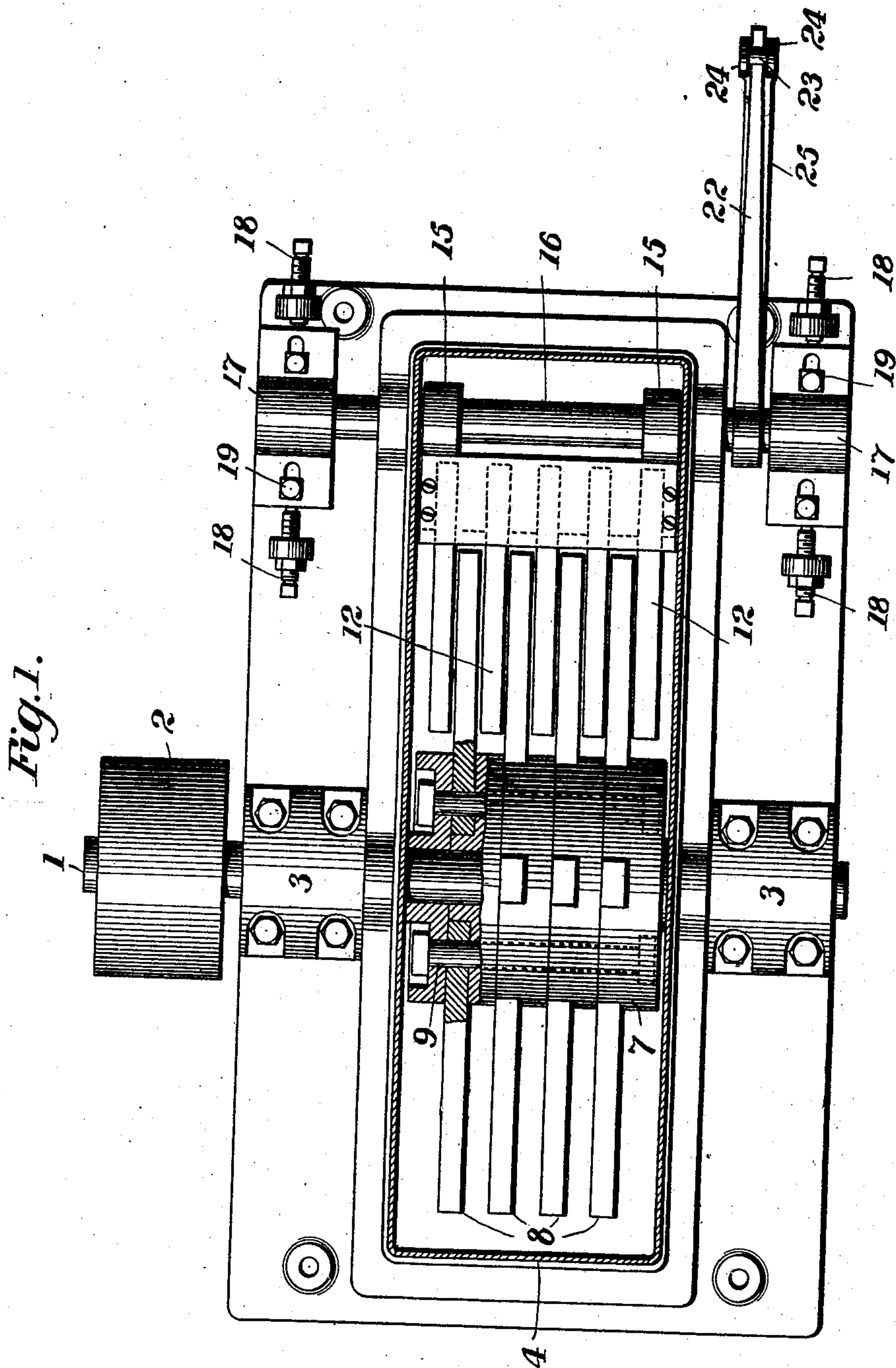


No. 889,555.

G. M. STEDMAN.  
GRINDING MACHINE.  
APPLICATION FILED JULY 3, 1907.

PATENTED JUNE 2, 1908.

3 SHEETS—SHEET 1.



Witnesses  
*J. E. Stikel*  
*M. A. Wood*

Inventor  
by *G. M. Stedman,*  
*Howard A. Cooney,* his Attorney

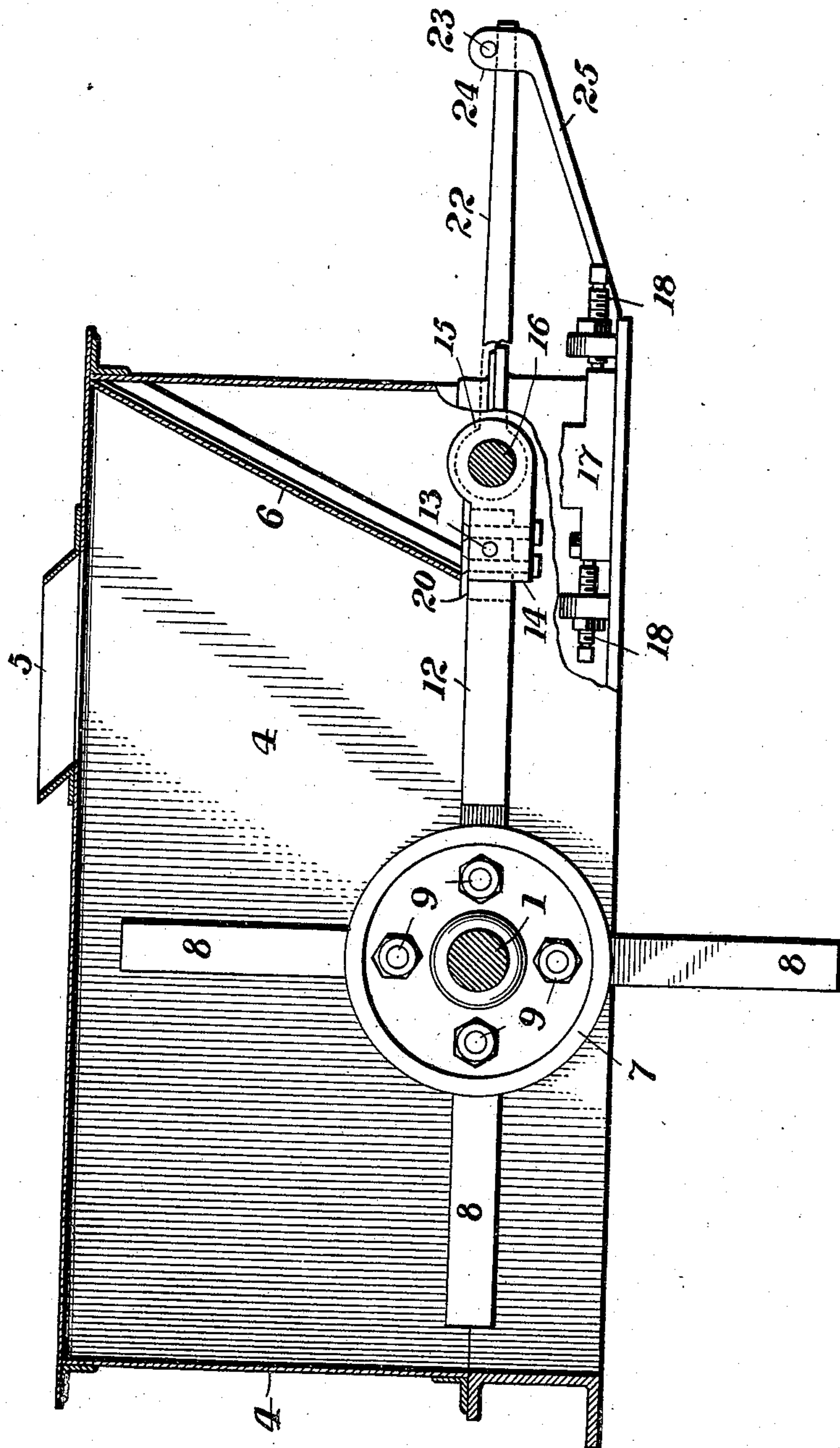
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3 SHEETS—SHEET 2.

Fig. 2.



Witnesses  
*J. G. Stinkel*  
*M. A. Wood*

Inventor  
by *G. M. Stedman*,  
*Howard A. Coombs* his Attorney

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3 SHEETS—SHEET 3.

Fig. 3.

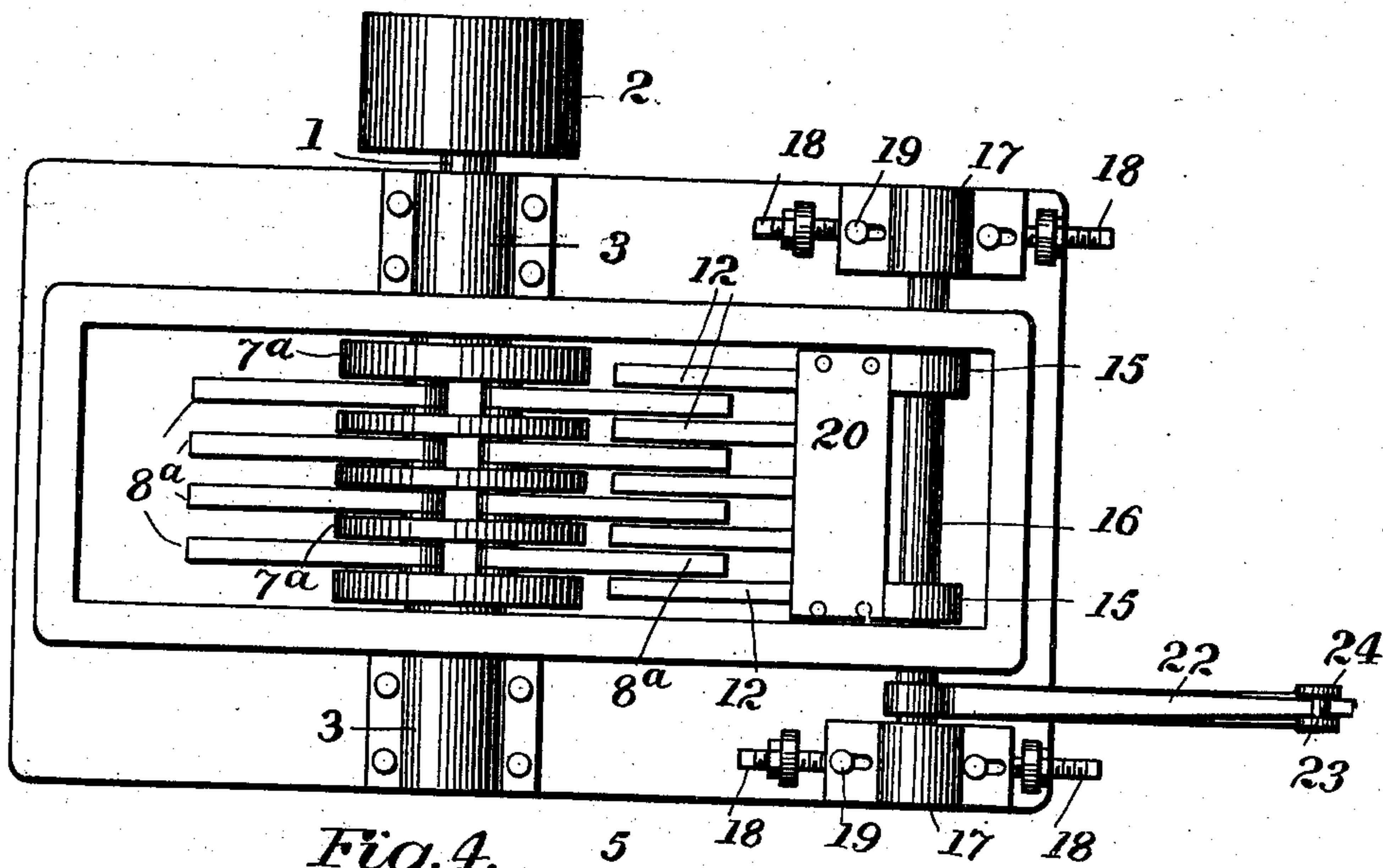
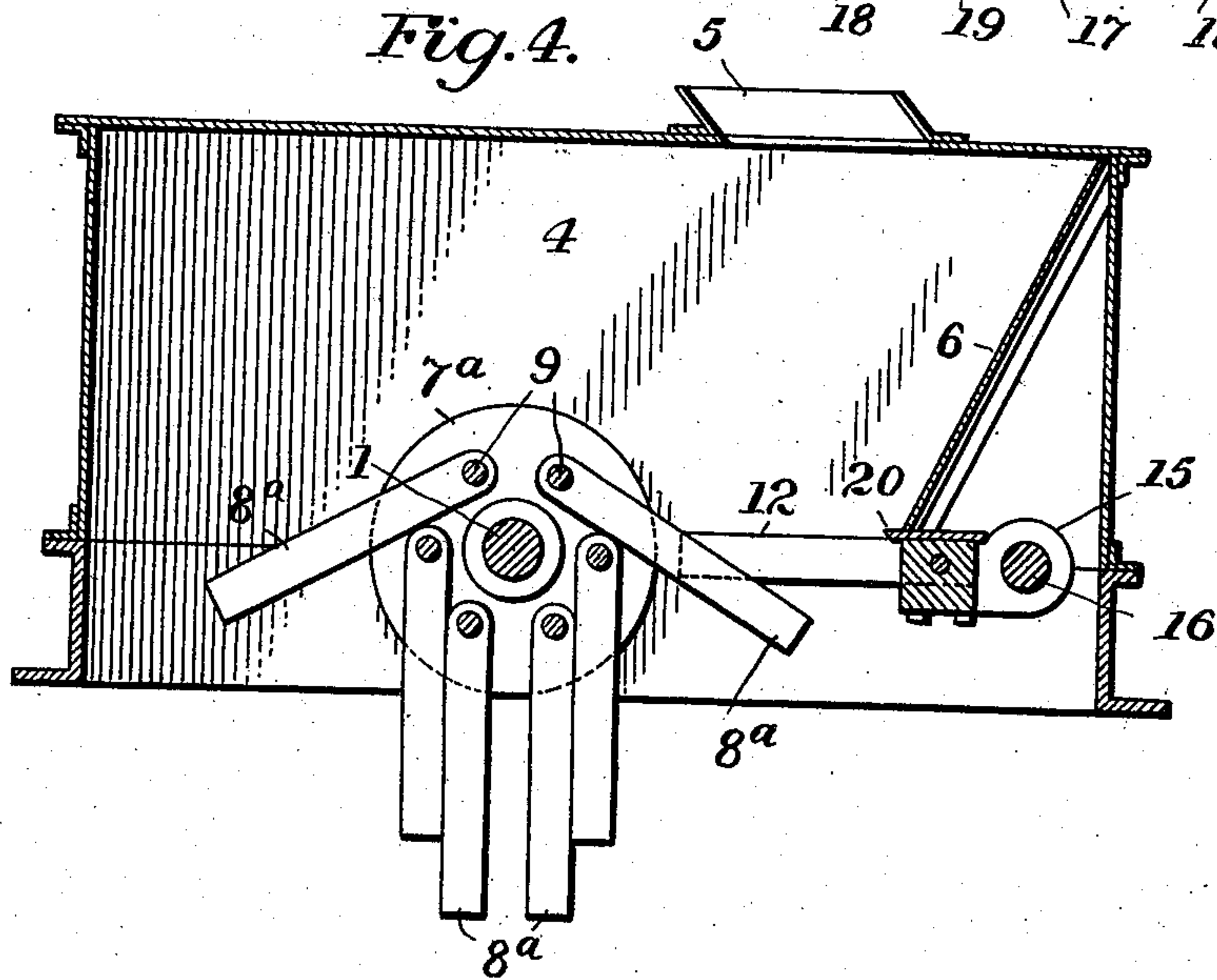


Fig. 4.



Witnesses  
J. J. Stinkel  
M. A. Wood

Inventor  
by G. M. Stedman  
Howard A. Conner, his  
Attorney



# UNITED STATES PATENT OFFICE.

GEORGE M. STEDMAN, OF AURORA, INDIANA.

## GRINDING-MACHINE.

No. 889,555.

Specification of Letters Patent.

Patented June 2, 1908.

Application filed July 3, 1907. Serial No. 381,987.

*To all whom it may concern:*

Be it known that I, GEORGE M. STEDMAN, a citizen of the United States, residing at Aurora, in the county of Dearborn and State of Indiana, have invented certain new and useful Improvements in Grinding-Machines, of which the following is a specification.

My invention relates to grinding, crushing or pulverizing machines, such as are used, for example, to pulverize fertilizer material, such as bones, tankage, lime, clay, etc., and consists more particularly in certain improvements in said class of machines, whereby their efficiency and durability are enhanced.

My invention is applicable to machines which have a series of rotating blades, rigidly secured to the carrying-shaft, and also to machines of the "hammer" type, in which the blades are loosely pivoted to their carrying member, and are thrown out into their operative position by centrifugal force.

The invention is illustrated in the accompanying three sheets of drawings, in which,

Figure 1 is a top plan view of my improvements applied to a crushing or grinding machine, of the rigid blade type, the casing and a portion of the mechanism being shown in section; Fig. 2 is a side elevation of the same machine, the casing and shafts being shown in section; Fig. 3 is a view similar to Fig. 1 of a machine of the hammer type, having my invention applied thereto, and, Fig. 4 is a view, similar to Fig. 2 of the machine shown in Fig. 3.

The machines in both cases comprise a rotating shaft 1, driven, for example, from the pulley 2 and mounted in journal bearings 3, 3. Inside said bearings, the shaft 1 passes transversely through the casing 4, which, as shown, is a rectangular metal box, having a hopper, or inlet-spout 5 in its top and an inclined wall 6 at one end.

In the machine of Figs. 1 and 2 there are keyed to the shaft 1 a series of cast-iron disks 7, between each pair of which are mounted a plurality (in the drawings four are shown) of radially extending arms or blades 8, the disks and blades, being securely clamped together by the bolts 9.

In the form illustrated in Figs. 3 and 4, the blades 8<sup>a</sup> are loosely pivoted upon the bolts 9, which pass through the series of disks 7<sup>a</sup>, between each pair of which the blades swing on said bolts, and are thrown out into radial position by centrifugal force, when the shaft

is rotated; this is a well known construction in the art, and is shown here merely to illustrate the applicability of my invention to that form of machine.

In operation, the blades 8 pass between a series of relatively stationary arms or blades 12, which are secured by a bolt 13 in sockets in a cast-iron member 14, provided with ears 15, keyed to a shaft 16, which passes transversely through slots in the casing 4 and is journaled in bearings 17, adjustable longitudinally of the machine by set-screws 18 and secured in adjusted position by bolts 19 passing through slots in the bearings. To the upper side of the member 14, over the ends of the blades 12, is secured a flat knife 20, the edge of which extends nearly to the periphery of the circle in which the ends of the blades 8 travel. By loosening the holding-down bolts, 19, of the bearings 17, the position thereof, and consequently of the knife 20, can be adjusted as desired by the set screws 18, as will be obvious. Outside one of the walls of the casing 4, the shaft 16 carries an arm 22, which extends rearwardly and has its end normally in engagement with the underside of a pin 23, made of wood or other breakable material, and held in ears 24 formed on a bracket 25, projecting from the base of the casing.

In operation, the knife 20 and blades 12 coöperate with the traveling blades 8 to break, cut up and pulverize the material fed into the casing through hopper 5, and should a piece of iron or other over-hard material come between the blades, the pin 23 will be broken, releasing arm 22, which flies upward, blades 12 and knife 18 being consequently free to fall down, thus preventing any breaking of or damage to the grinding parts.

Having thus described my invention, what I claim is—

1. In a machine of the class described, a series of revolving blades, a coöperating series of relatively stationary blades, a knife secured immediately above said stationary blades with its edge adjacent to the path of travel of the ends of said revolving blades, means to adjust said knife and stationary blades towards and away from said revolving blades, and means to yieldingly hold said knife and stationary blades in operative position.

2. In a machine of the class described, a rotating shaft, a series of disks secured thereon, a plurality of hammer blades, loosely piv-

oted between each pair of said disks, a second shaft parallel to said rotating shaft, a series of relatively stationary blades secured thereto and projecting between the paths of travel  
5 of said hammer blades, a knife secured immediately above said stationary blades with its edge adjacent to the paths of travel of the ends of said hammer blades, means to adjust said second shaft towards and away from

said rotating shaft, and breakable means to normally hold said second shaft from turning.

In testimony whereof I have affixed my signature, in presence of two witnesses.

GEORGE M. STEDMAN

Witnesses:

SILAS D. DEAN,  
JOHN DEAN.