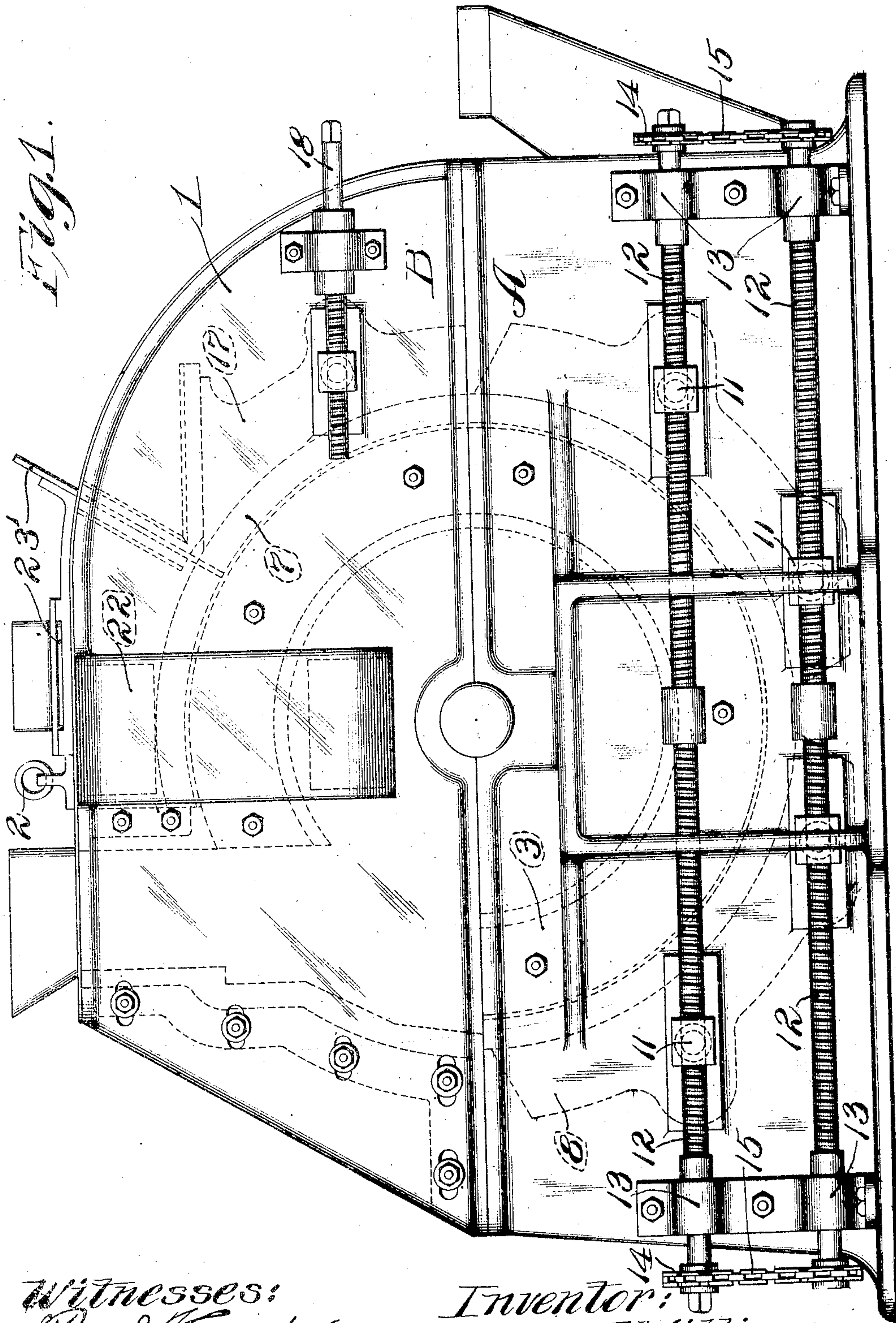


No. 877,689.

PATENTED JAN. 28, 1908.

M. F. WILLIAMS.
SHREDDING MACHINE.
APPLICATION FILED MAY 26, 1906.

3 SHEETS—SHEET 1.



Witnesses:
Fred Cooke
Wells L. Church

Inventor:
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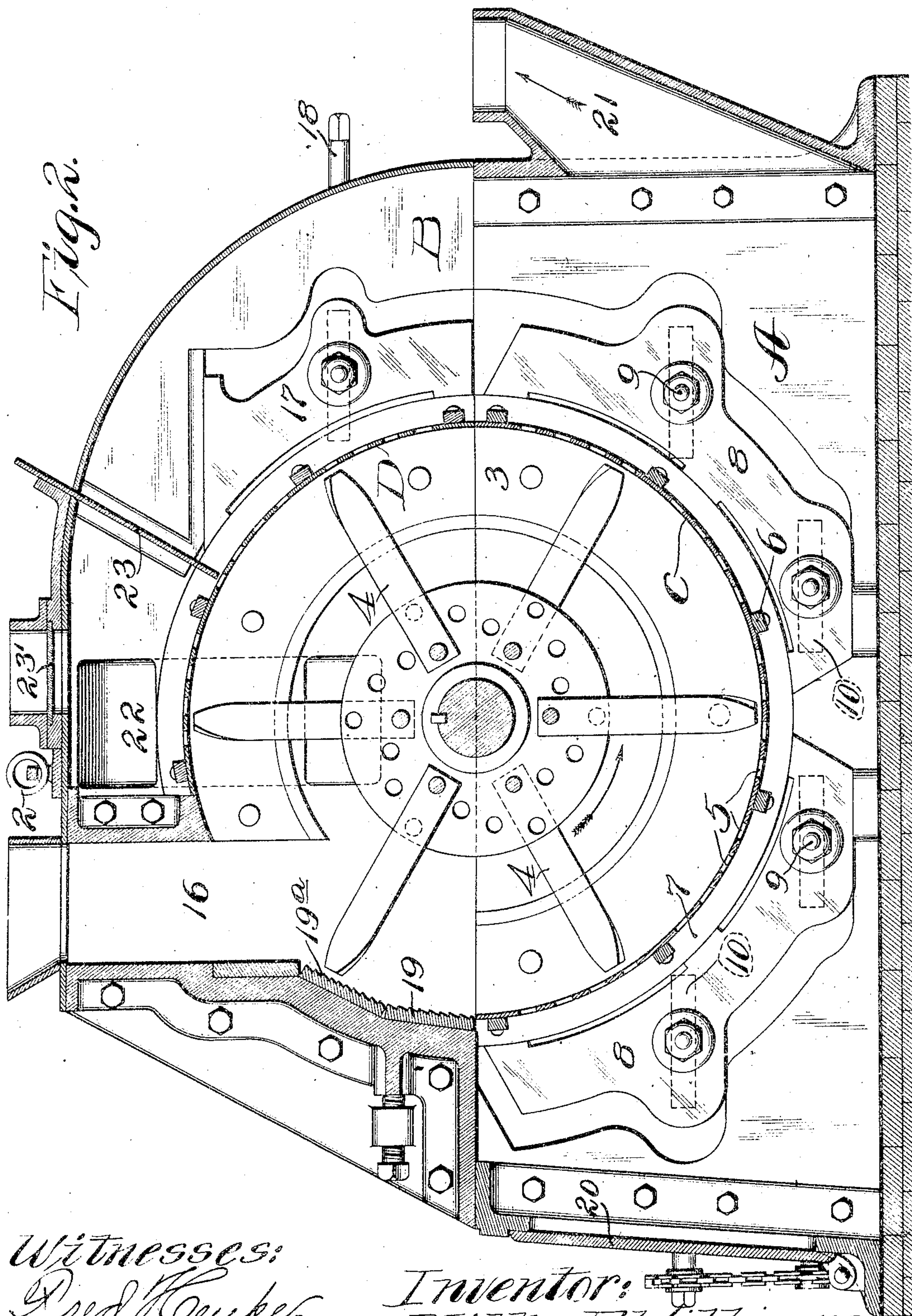
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3 SHEETS-SHEET 3.

Fig. 3.

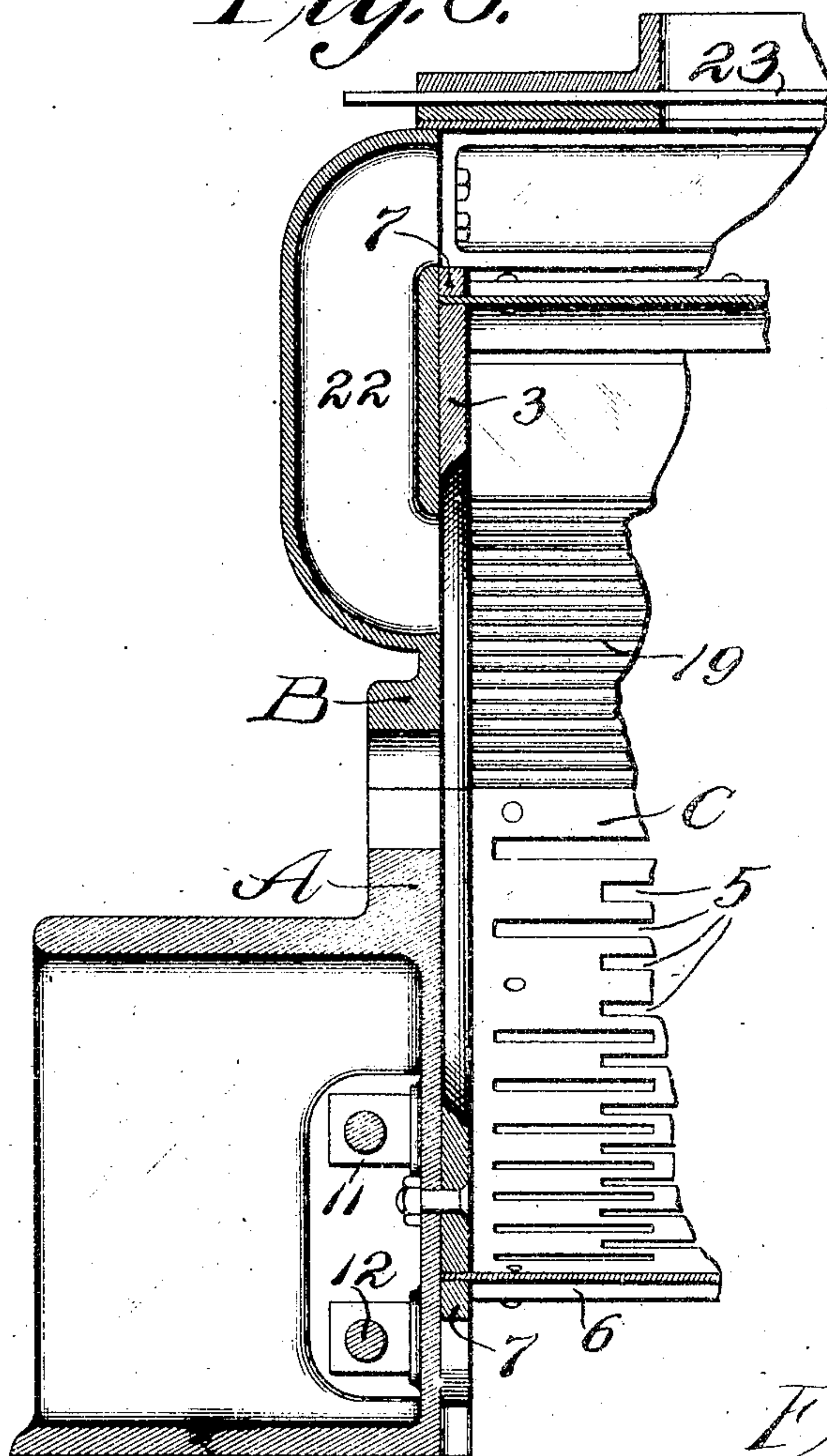


Fig. 4.

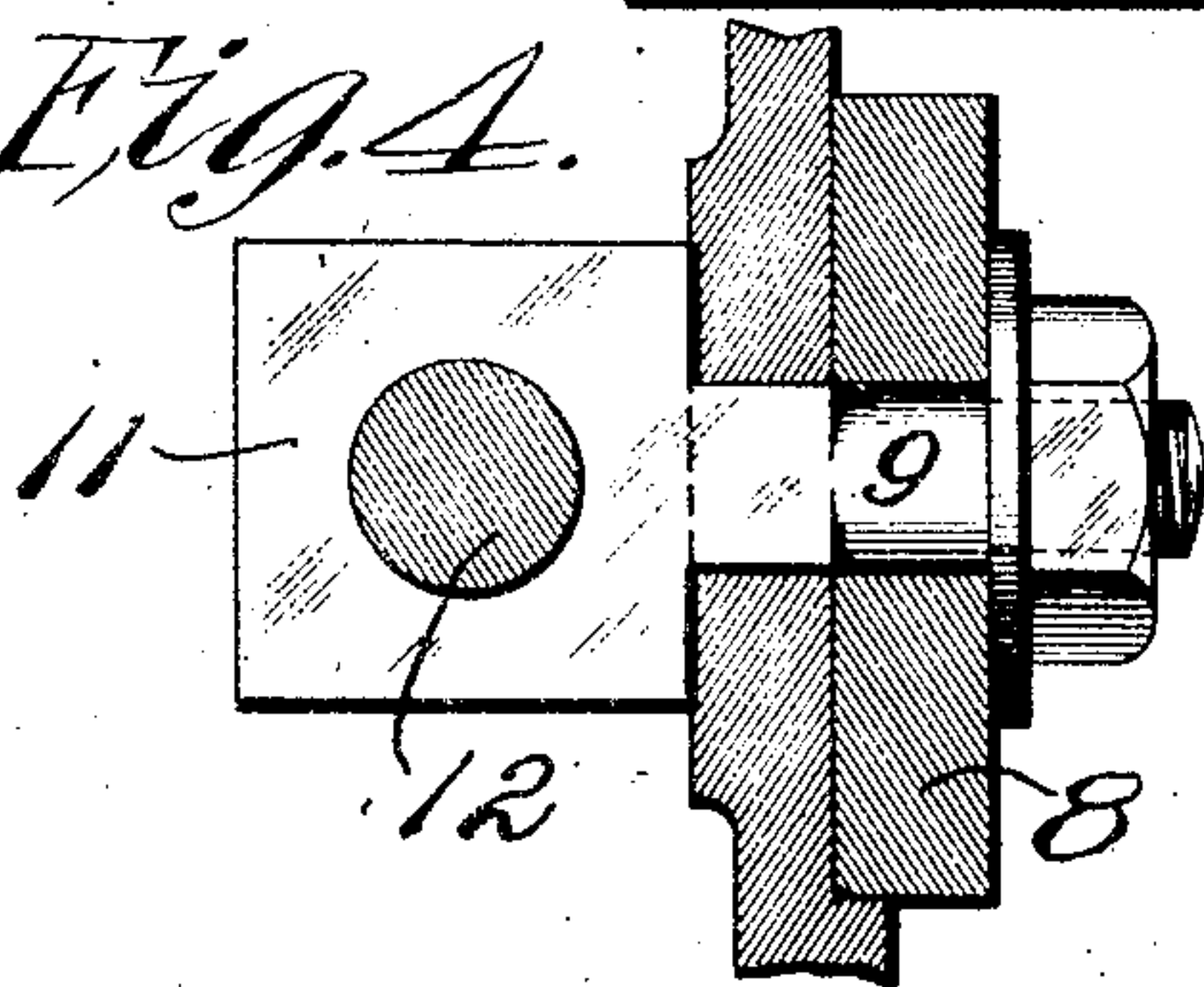
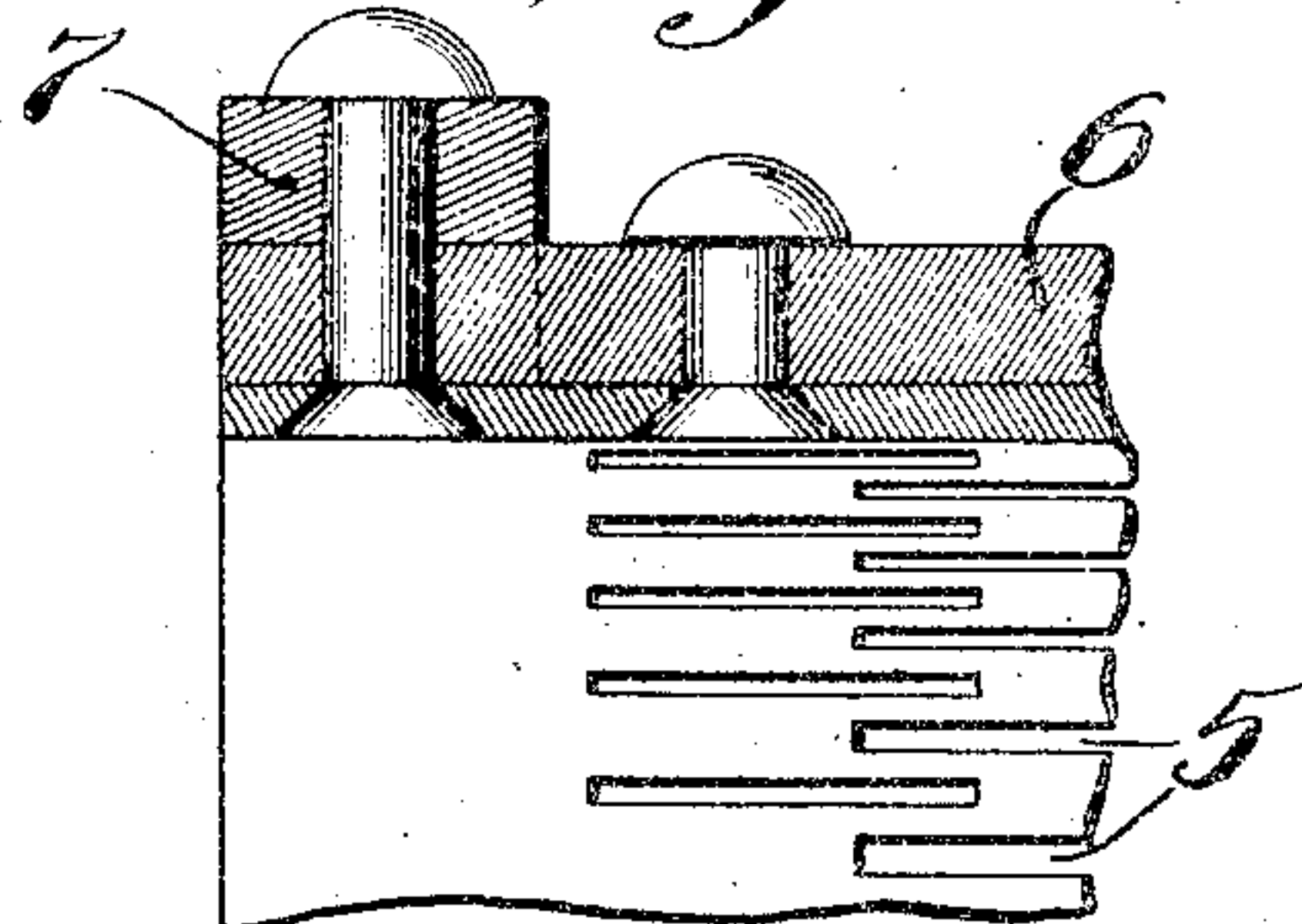


Fig. 5.



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UNITED STATES PATENT OFFICE.

MILTON F. WILLIAMS, OF ST. LOUIS, MISSOURI, ASSIGNOR TO WILLIAMS PATENT CRUSHER
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SHREDDING-MACHINE.

No. 877,689.

Specification of Letters Patent.

Patented Jan. 28, 1908.

Application filed May 26, 1906. Serial No. 318,935.

To all whom it may concern:

Be it known that I, MILTON F. WILLIAMS, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Shredding-Machines, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of a shredding machine embodying the features of my invention; Fig. 2 is a longitudinal sectional view through said machine; Fig. 3 is a partially transverse sectional view through the machine shown in Fig. 1; Fig. 4 is a detail sectional view showing the headed pins with which the grinding surface clamps are provided; and Fig. 5 is a sectional view of a portion of the grinding surface.

This invention relates to shredding machines, and particularly to machines for shredding or grinding up gummy fibrous material such, for example, as guayule. The machines which have heretofore been in use for grinding up material of this character have not proved entirely satisfactory due to the fact that soon after the machine had been in use a portion of the grinding surface became clogged with the material being operated on. Furthermore, said machines were so constructed that they could not be used during the time the grinding surface was being cleaned, and accordingly, a great deal of time was wasted.

One object of my invention is to provide a machine particularly adapted for shredding guayule and which is so constructed that no particular portion of the grinding surface will become clogged sooner than other portions of said grinding surface.

Another object of my invention is to provide a machine of the character described having a removable grinding surface so that when one grinding surface becomes clogged another can be substituted therefor and thus enable the machine to be used continuously.

Other desirable features of my invention will be hereinafter pointed out.

The machine herein shown which repre-

sents the preferred form of my invention, is provided with a perforated grinding surface with which a rotary winged beater coöperates, said beater being mounted in a closed casing. The beater coöperates with the edges of the openings in the grinding surface to shred the material which is forced through said openings, and to prevent the finished shredded material from lodging on the outer face of that portion of the grinding surface which extends over the beater and thus quickly clog up this portion of the grinding surface, I have arranged a closed chamber at this point and have provided an air conduit or passageway leading from this chamber to a point inside of the grinding surface adjacent the center of rotation of the beater. The action of the beater in its closed casing is substantially the same as that of a fan located in a casing in which an eye is formed so that the shredded material which passes through said grinding surface into said chamber will be drawn through the conduit or passageway to the interior of the grinding surface and thus prevent that portion of the grinding surface which extends over the beater from becoming clogged sooner than any other portion of the grinding surface, the rotation of the beater causing a suction to be created in this chamber and thus helping to draw the material through the grinding surface. This closed chamber is located adjacent the rear side of the opening through which the material is introduced into the machine so that in case there should be any tendency for the dust which rises from the material to pass out of the receiving opening, the suction in said closed chamber will draw the dust into same and thus prevent the dust from escaping through the receiving opening. The grinding surface is preferably formed in sections which enables the entire grinding surface or sections thereof to be replaced quickly when it becomes clogged and thus permit the machine to be used continuously.

The casing of the machine is spaced away some distance from the grinding surface so that a chamber is formed outside the lower portion of the grinding surface into which the finished material passes and for removing this finished material from the machine I have

provided the casing with a discharge opening which communicates with some means for creating a suction to draw away the material that passes through the grinding surface and lodges on the bottom of the casing.

While the machine herein shown is intended to be used principally for grinding gummy fibrous material it could also be used for grinding any other substance or material and although said machine is provided with a grinding surface formed from perforated sheet metal it should be understood that my invention is not limited to a machine having a grinding surface of this particular description, it being immaterial so far as my broad idea is concerned what type of grinding surface is used.

Referring to the drawings which represent the preferred form of my invention, I designate the casing of the machine which is preferably formed in two sections, a lower section A and an upper section B provided with a member 2 which can be hooked onto a lifting device and thus bodily remove the upper section from the lower section. Connected to the side walls of each section of the casing are semi-circular plates 3 which constitute a ring when both sections of the casing are in position and act as a support for the grinding surface. The grinding surface, which is cylindrical and surrounds a winged beater 4, is preferably formed of sheet metal having slots 5 formed therein, and this grinding surface is also formed in two sections C and D which are riveted to frames formed by transversely extending bars 6 mortised into pieces 7 of semi-ring shape. The lower section C of the grinding surface is retained in operative position by means of clamps 8 which engage the outer edges of the semi-ring shaped pieces 7 and thus hold the grinding surface securely seated on the circular shaped plates 3 connected to the side walls of the casing, and these clamps are provided with laterally extending pins 9 which project through elongated slots 10 formed in the side walls of the casing. Each of the pins 9 is provided with an interiorly screw-threaded head 11 through which a screw-threaded actuating shaft 12 extends, said shafts being journaled in lugs 13 on the casing, and provided at their outer ends with sprocket wheels 14 which receive sprocket chains 15. As herein shown, four screw-threaded shafts are provided for each clamp, and the ends of the upper shafts are squared to receive a wrench or other suitable actuating device. A feed opening 16 is formed in the upper section of the casing, and the upper section of the grinding surface is held in position by a clamp 17 which is constructed and operated similarly to the clamps which hold the lower section of the grinding surface in position except, however, that only

two screw-threaded shafts 18 are provided for actuating this clamp.

The upper section of the casing is provided with an adjustable breaker plate 19 having an overhanging portion 19^a which cooperates with the rotary beater to break the material practically as soon as it enters the machine. The lower section of the casing is provided at its front end with a valve, preferably a hinged door 20, and at its rear end with an opening 21 which communicates with some device for creating a suction to exhaust the chamber outside the lower portion of the grinding surface and carry away the finished shredded material which has been thrown out through the slots in the grinding surface, this suction preferably being great enough to tend to draw the material through the openings in the grinding surface. By opening the door or valve at the front end of the casing air is admitted to the casing so as to get a direct draft through the machine.

As shown in Fig. 2 of the drawings, the grinding surface is arranged near the ends of the wings of the beater and the edges of the slots in said grinding surface cooperating with said wings act to shear the material being operated on and shred it into fine particles.

As previously stated, unless means were provided for carrying away the finished material which falls onto the outer face of that portion of the grinding surface which extends above the beater, said portion would soon get clogged and consequently, would be ineffective. For preventing material from lodging on this portion of the grinding surface I have arranged a chamber outside of the grinding surface and at the rear side of the feed opening 16, and a conduit or tube 22 extending from this chamber to a point adjacent the axis of the beater, as shown in Fig. 3, which point I have designated the eye of the machine. The chamber just referred to is formed by the walls of the casing and the partition 23 which extends inwardly from the casing, as shown in Fig. 2.

As previously stated, the beater being mounted in a closed casing acts as a fan, thus creating a suction in this chamber and conduit 22 to draw the shredded material from the outside of the upper portion of the grinding surface into the interior of the grinding surface, thereby operating to keep the upper portion of the grinding surface perfectly clean and prevent the shredded material from packing thereon. To prevent a vacuum from being created in the chamber over the upper portion of the grinding surface, the portion 23 is made in the form of a sliding valve and I have also provided an additional sliding valve 23', either of which

may be opened to permit the entrance of air into this chamber, see Fig. 2. Another advantage in providing a machine of this type with a closed chamber at the rear side of the feed opening and connecting this chamber with the eye of the machine by means of a conduit, is that it prevents any of the dust from the material from passing through the feed opening in case the discharge opening of the machine should become choked, the suction in said chamber drawing the dust into same before it reaches the feed opening and thus returning it to the interior of the grinding surface. When the entire grinding surface becomes clogged the upper section of the casing is lifted bodily from the lower section and the clamps which hold the grinding surface in position are loosened; the sections of the grinding surface being then replaced by ones which are clean. Accordingly, the machine is out of service for only a short time, instead of for an extended period as would be necessary if the grinding surfaces were cleaned without removing them from the machine. Another advantage of such a construction is that it permits different kinds of grinding surfaces to be applied to the machine with very little trouble.

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

1. In a machine of the class described, a casing having a rotary beater mounted therein, a grinding surface surrounding a portion of the beater, a partition extending from the casing to the grinding surface, a wall extending from the casing to the grinding surface and cooperating with the partition to form a chamber outside of the grinding surface, a valve for admitting air to said chamber, and means for conveying the material which collects in said chamber back into the interior of the grinding surface; substantially as described.

2. A grinding machine comprising a casing having a rotary beater mounted therein and provided with a feed opening, a grinding surface inside of the casing, a closed chamber arranged adjacent the feed opening, and a conduit leading from said chamber to the interior of the grinding surface; substantially as described.

3. A grinding surface comprising a casing having a feed opening, a rotary beater and a grinding surface arranged inside of said casing, one end of said grinding surface terminating at the rear side of the feed opening, a closed chamber located at the rear side of the feed opening and having its bottom formed by a portion of the grinding surface, and a conduit leading from said chamber to a point adjacent the eye of the machine; substantially as described.

4. In a machine of the class described, a casing, a grinding surface, stationary abutments carried by the side walls of the casing with which said grinding surface contacts, and adjustable clamps for holding said grinding surface in intimate engagement with said abutments; substantially as described.

5. In a machine of the class described, a circular grinding surface formed of perforated sheet metal, curved abutments connected to the side walls of the casing of the machine and bearing against the inner face of the end portions of said grinding surface, a plurality of clamps conforming to the contour of the grinding surface and adapted to engage the outer face thereof, and means for actuating said clamps simultaneously; substantially as described.

6. In a machine of the class described, a casing, abutments connected to the side walls of said casing, a circular grinding surface adapted to bear against said abutments, removable clamps conforming to the contour of the grinding surface and engaging the outer face thereof, pins extending laterally from said clamps through openings in the side walls of the casing, said pins being provided with heads having interior screw threads, and screw-threaded shafts extending through said heads for actuating the clamps; substantially as described.

7. In a machine of the class described, a casing formed in two sections, the upper one of which is adapted to be lifted bodily from the lower section, a circular grinding surface constructed of perforated sheet metal and formed in two sections, a plurality of clamps for holding the sections of the grinding surface in operative position in the respective sections of the casing, and adjustable means mounted on each section of the casing for actuating the clamps carried thereby; substantially as described.

8. In a machine of the class described, a closed casing provided with an entrance opening and a door located at the front end of the casing in alinement with the discharge opening, a grinding surface removably held in place inside of the casing, an adjustable breaker plate located adjacent the entrance opening in the casing, a rotary winged beater arranged inside of the grinding surface and operating to force the material through the openings therein, a sliding partition extending from the casing to the exterior of the grinding surface to form a chamber at the upper portion of the casing, a slide valve mounted in the top of the casing for admitting air into this chamber, and a conduit extending from said chamber to the interior of the casing at a point adjacent the center of rotation of the beater; substantially as described.

9. A grinding machine comprising a casing provided at its upper front end with a feed opening and at its rear end with a discharge opening through which the material is drawn
5 by suction, a grinding surface and a rotary heater arranged inside of said casing and an adjustable valve located in the front wall of the casing below the grinding surface and in alinement with the discharge opening for ad-

mitting air to said casing; substantially as 10 described.

In testimony whereof, I hereunto affix my signature, in the presence of two witnesses, this twenty third day of May 1906.

MILTON F. WILLIAMS.

Witnesses:

F. R. CORNWALL,
GEORGE BAKEWELL.