

SHREDDING MACHINE.

938,734.

3 SHEETS—SHEET 1.



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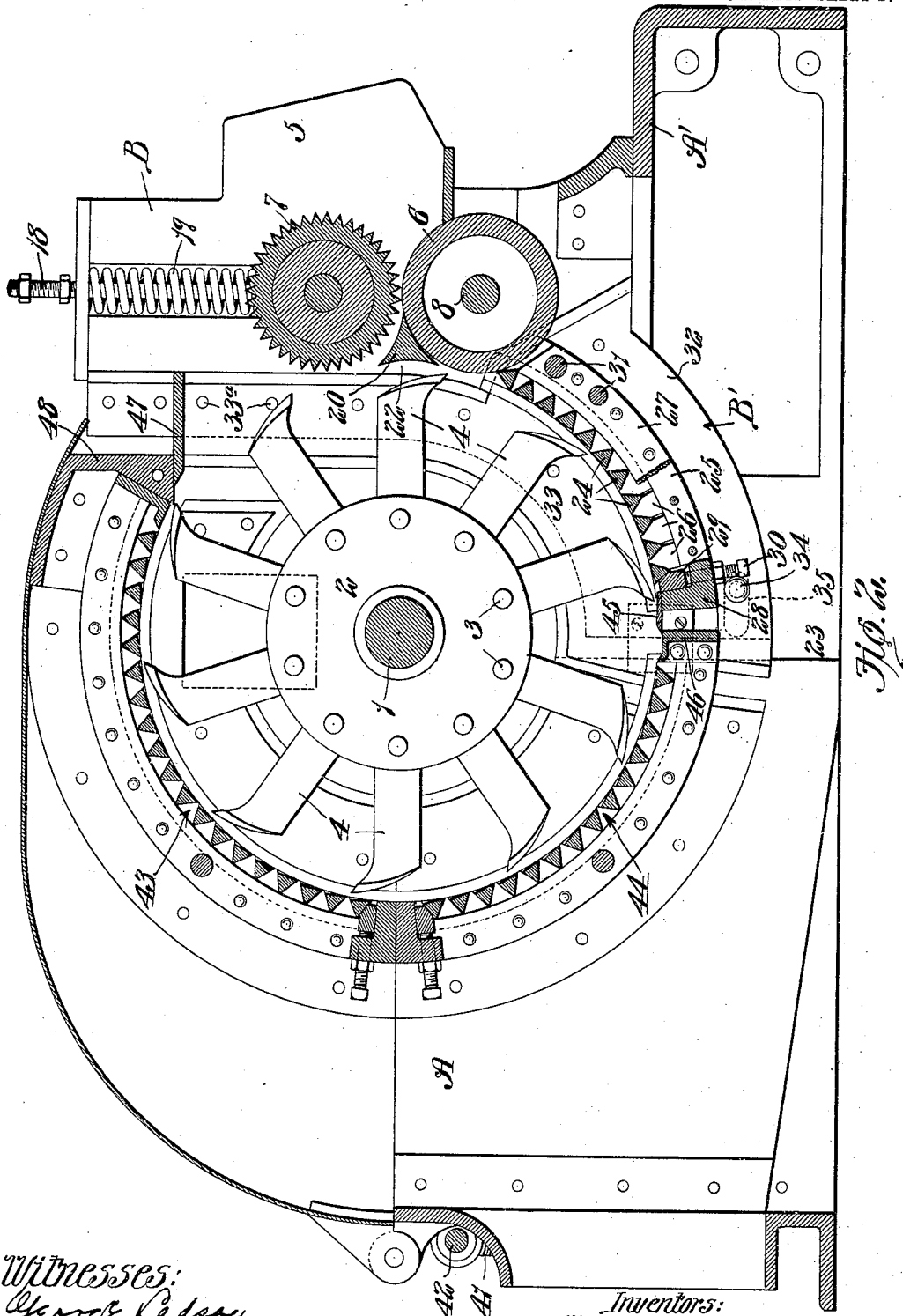
M. F. WILLIAMS & E. H. FRICKEY.
SHREDDING MACHINE.

APPLICATION FILED MAY 18, 1908.

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Patented Nov. 2, 1909.

3 SHEETS—SHEET 2.



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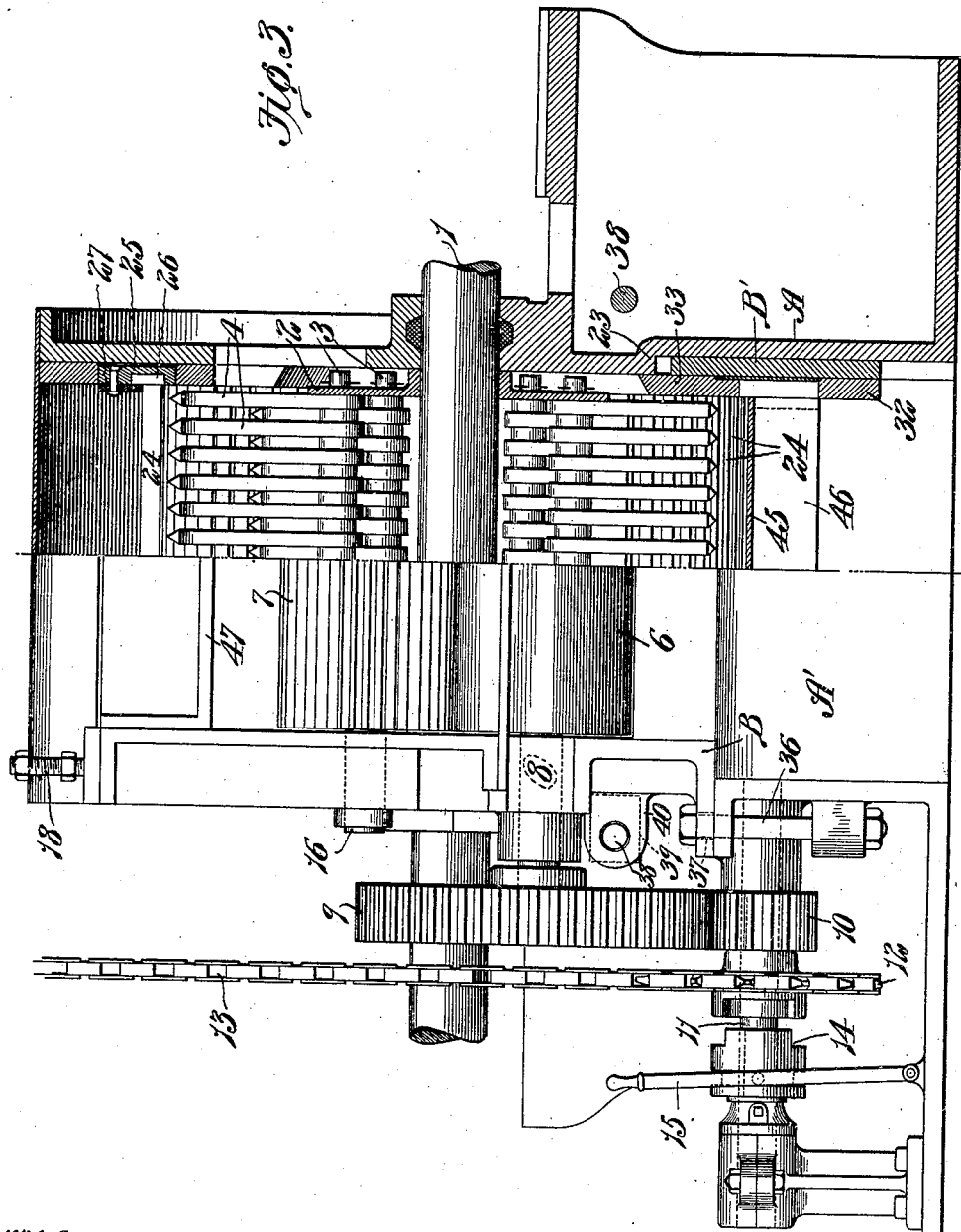
SHREDDING MACHINE.

APPLICATION FILED MAY 18, 1908.

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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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SHREDDING-MACHINE.

938,734.

Specification of Letters Patent.

Patented Nov. 2, 1909.

Application filed May 18, 1908. Serial No. 433,514.

To all whom it may concern:

Be it known that we, MILTON F. WILLIAMS and EDWARD H. FRICKEY, both citizens 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 constructed in accordance with our invention; Fig. 2 is a vertical longitudinal sectional view of said machine; and Fig. 3 is an elevation of the front end of the machine, the right hand half of said figure being a vertical transverse section of the machine.

This invention relates to shredding machines, and particularly to machines of that type which comprise a plurality of rotating hammers or cutting members and a cooperating curved grinding surface.

The main object of our invention is to provide a machine of the type referred to which is provided with a breaker element and feeding rolls located at the mouth or hopper of the machine where the material to be operated on is introduced, and means for simultaneously adjusting said feeding rolls and breaker element relatively to the hammers or cutting members.

Another object of our invention is to provide a machine of the type referred to which is provided with an adjustable member that carries a portion of the grinding surface of the machine, a breaker element, and means for feeding material into the interior of the machine.

Other novel features of our improved machine will be hereinafter described.

Referring to the drawings which illustrate the preferred form of our invention, A designates the casing of the machine, 1 designates a rotatable shaft journaled in bearings in the side walls of said casing, and 2 designates disks on said shaft which carry transversely extending rods 3 to which hammers or cutting members 4 are pivotally connected, said hammers being provided at their outer ends with cutting edges that co-

operate with the breaker element and grinding surface of the machine to shred the material.

The machine is provided with an approximately circular grinding surface composed of a number of sections that will be hereinafter described.

At one end of the casing is a base portion A' on which a movable casing or member B is adjustably mounted. This adjustable casing B is provided with a hopper 5 into which the material to be operated on is introduced, and a pair of feed rolls 6 and 7 are journaled in said movable casing at the rear of said hopper, as shown in Fig. 2. The lower roll 6 has a smooth surface and is connected to a shaft 8 that is provided at one end with a gear 9 which meshes with a pinion 10 on a shaft 11 that is journaled in the base portion A' of the casing. A sprocket wheel 12 which is driven by a chain 13 is loosely mounted on the shaft 11 and the hub of said sprocket wheel is provided with a clutch that coöperates with a clutch member 14 splined to the shaft 11, said clutch member being moved into and out of engagement with the clutch on the sprocket wheel by means of a manually-operated lever 15. The upper roll 7 is corrugated and the shaft 16, to which said roll is connected, is journaled in boxes 17 mounted in slots or guideways in the side walls of the adjustable casing B.

A feeding mechanism of the type shown in United States Patent No. 815,087, to E. H. Frickey, March 13, 1906, is preferably used with the shredding machine herein shown, and we have therefore provided the boxes 17 in which the shaft of the roll 7 is journaled with rods 18 that are adapted to be connected to mechanism, not shown, which moves said rods upwardly so as to separate the rolls 6 and 7 to receive the material which the feeding mechanism moves into the hopper 5, the roll 7 being moved downwardly toward the roll 6 by means of springs 19 which surround the rods 18.

A breaker element which preferably consists of a triangular-shaped bar 20 is carried by the adjustable casing B and is arranged between the rolls 6 and 7, the upper edge of said breaker bar coöperating with the hammers or cutting members 4 to shred the material that the rolls feed into the machine.

The breaker bar 20 is mounted in openings in the sides of the adjustable casing B and is held in position by means of wedges 21 that bear against fillers 22 which contact with said bar, said wedges being slidably mounted in lugs 21^a on the sides of the casing B, as shown in Fig. 1. When the upper edge of said bar becomes worn the wedges 21 are removed and the bar is turned so as to bring one of its unused edges into operative position to cooperate with the hammers.

The side walls of the casing A are offset at 23, as shown in Figs. 1 and 3, to receive the side portions of the adjustable casing B, and said side portions have curved extensions B' which telescope inside of the side walls of the casing A. Said extensions carry one section of the grinding surface which is composed of triangular-shaped bars 24, the ends of which project into grooves formed on the inside faces of segmental-shaped plates 25. Blocks 26, provided with wedge-shaped ends, rest on the bottom of the groove in each of the plates 25 to form spacers for the bars 24 and also support said bars; the blocks being prevented from moving out of said groove by means of a keeper 27 that is connected to the inside face of the plate 25.

The bars 24 are set in such a position that one edge of each bar forms a cutting surface that cooperates with the beaters 4 to shred the material. The bars 24 are spaced apart slightly, as shown in Fig. 2, so that the shredded material can fall between them, and the blocks 26 are of such dimensions that they will not contact with each other. At the lower end of the grate section is a transversely extending bar 28 which is secured to the plates 25, and an adjustable wedge 29 is interposed between said bar 28 and the end bar 24 of said section, as shown in Fig. 2. Adjusting screws 30 are mounted in a flange on the bar 28 for forcing the wedge 29 upwardly so as to move the cage bars 24 and blocks 26 longitudinally of the grooves in the plates 25 and thus securely clamp said cage bars and blocks together. The bar 28 connects the lower ends of the two plates 25 together and said plates are connected at their upper ends by means of rods 31, as shown in Fig. 2, thus forming a removable frame for carrying the cage bars 24. Said frame is carried by the extensions B' on the sides of the adjustable casing B, the plates 25 of said frame being interposed between segmental-shaped plates 32 and 33 that are fastened to the inside faces of said extensions.

As shown in Fig. 2 the plates 33 that bear upon the plates 25 project beyond the upper edges of the extension B' so as to engage the inside faces of the side walls of the casing A and thus cover the space between the stationary casing and the adjustable casing B, said plates 33 extending up-

wardly and being connected to the sides of the adjustable casing B by means of fastening devices 33^a.

The extensions B' on the sides of the casing B carry clamping bolts 34 that project laterally through elongated slots 35 in the side walls of the casing A, and the base portion A' of the stationary casing carries clamping bolts 36 that extend through elongated slots 37 in the base portion of the movable casing B so as to lock said casing in adjusted position. The casing B is adapted to be moved toward and away from the stationary casing A to position the breaker bar 20 and grinding surface section relatively to the ends of the hammers 4, and the means herein shown for moving the casing B consists of a pair of shafts 38 journaled in bearings on the opposite sides of the casing A and having screw-threaded portions which pass through nuts 39 arranged between lugs 40 on the sides of the casing B, as shown in Fig. 1. Each of said shafts 38 is provided with a worm gear 41 that meshes with a worm on a countershaft 42 which is adapted to be rotated to impart movement to the shafts 38 and thus move the casing.

The stationary casing A is divided horizontally, as shown in Figs. 1 and 2, and the upper and lower portions are hinged together so as to enable the upper portion to be raised. The upper portion of the casing carries a grinding surface section 43 of similar construction to that carried by the adjustable casing B and the lower portion of the stationary casing also carries a grinding surface section 44 of similar construction. The meeting ends of the grinding surface sections on the lower portion of the casing and the casing B do not butt against each other so that we have provided the bar 28 on the grinding surface section of the casing B with a plate 45 which overlaps a bar 46 at the lower end of the grinding surface section 44, as shown in Fig. 2. We have also provided the casing B with a plate 47 that projects underneath a casting 48 that extends transversely of the upper portion of the stationary casing A, as shown in Fig. 2, so as to bridge the space between the stationary casing and the adjustable casing B.

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

1. A shredding machine comprising hammers, a breaker element cooperating with said hammers, feed rolls for delivering material to said hammers, a support which carries said breaker element and feed rolls, and adjustable means for retaining the support in position, said means being so constructed that the support can be moved to simultaneously adjust the breaker element and

feed rolls relatively to the hammers; substantially as described.

2. A shredding machine provided with hammers, an adjustable casing provided with a breaker element with which said hammers cooperate, rolls carried by said casing for feeding material to the hammers, a grinding surface carried by said casing and cooperating with said hammers, and means for moving said casing to simultaneously adjust the breaker element, feed rolls, and grinding surface relatively to the hammers; substantially as described.

3. A shredding machine provided with a stationary casing and rotatable hammers arranged inside of same, an adjustable casing or member located at the front end of the stationary casing and having portions that are in telescopic engagement therewith, a hopper on said member, feed rolls journaled in said member for delivering material to the hammers, and a breaker element carried by said member and cooperating with said hammers; substantially as described.

4. A shredding machine provided with a stationary casing and rotatable hammers arranged inside of same, an adjustable casing or member located at the front end of the stationary casing and having portions that are in telescopic engagement therewith, a hopper on said adjustable member, feed rolls journaled in said member, a breaker element carried by said member, a grinding surface section carried by said member, and means for moving said member relatively to the stationary casing to simultaneously adjust all of the devices thereon relatively to the hammers; substantially as described.

5. A shredding machine provided with a stationary casing open at its front end, rotatable hammers arranged inside of said casing, an adjustable casing or member having side portions which telescope inside of the side walls of the stationary casing, and a breaker element and feed rolls carried by said adjustable casing; substantially as described.

6. A shredding machine provided with a stationary casing that is open at its front end, a base portion located at the front end of the casing, hammers arranged inside of said casing, an adjustable casing or member mounted on said base portion and being in telescopic engagement with the side walls of the stationary casing, means for moving said member relatively to the stationary casing, and a breaker element and feed rolls carried by said member; substantially as described.

7. A shredding machine provided with a stationary casing that is open at its front end, a base portion located at the front end of the casing, hammers arranged inside of said casing, an adjustable casing or member mounted on said base portion and being in

telescopic engagement with the side walls of the stationary casing, means for moving said member relatively to the stationary casing, and a hopper, feed rolls, a breaker element and a grinding surface section carried by said member; substantially as described. 70

8. A shredding machine provided with hammers, feed rolls located adjacent the hopper or mouth of the machine for delivering material to the hammers, a breaker element arranged adjacent to said feed rolls and cooperating with said hammers, and means for moving said feed rolls and breaker element simultaneously toward or away from said hammers; substantially as described. 80

9. A shredding machine provided with hammers, feed rolls located adjacent the hopper or mouth of the machine for delivering material to the hammers, a breaker element arranged adjacent to said feed rolls and cooperating with said hammers, a grinding surface section cooperating with the hammers, and means for simultaneously moving the feed rolls, breaker element and grinding surface section relatively to the hammers; substantially as described. 85

10. A shredding machine provided with a stationary casing that is open at its front end, a grinding surface and hammers arranged inside of said casing, an adjustable casing arranged at the front of the stationary casing and being in telescopic engagement with same, a grinding surface section mounted on said adjustable casing and being in telescopic engagement with the grinding surface inside of the stationary casing, and feed rolls and a breaker element carried by said adjustable casing; substantially as described. 100

11. A shredding machine provided with a stationary casing, an adjustable casing or member located at the front end of the stationary casing and provided with feed rolls and a breaker element, a shaft and cooperating means for moving said adjustable casing relatively to said stationary casing, and mechanical means for rotating said shaft; substantially as described. 105

12. A shredding machine provided with a stationary casing, an adjustable casing located at the front end of the stationary casing and provided with feed rolls and a breaker element, a pair of shafts having screw-threaded portions which pass through nuts carried by said adjustable casing, and means for rotating said shafts simultaneously to move said adjustable casing relatively to the stationary casing; substantially as described. 120

13. A shredding machine provided with a stationary casing that is open at its front ends, the side walls of said casing being offset, a base portion located at the front end of the casing, an adjustable casing or mem- 125 130

ber mounted on said base portion and having sides which telescope inside of the side walls of the stationary casing, means for locking said member in adjusted position, a curved grinding surface section carried by said member, and feed rolls and a breaker element carried by said member; substantially as described.

14. A shredding machine provided with a stationary casing open at its front end and a base portion located adjacent said open end, an adjustable casing mounted on said base portion and having sides that are provided with downwardly curved extensions which telescope inside of the side walls of the stationary casing, a curved grinding surface section carried by said curved extensions, a hopper on said adjustable casing, feed rolls journaled in said adjustable casing, and means for moving said adjustable casing relatively to the stationary casing; substantially as described.

15. In a shredding machine, a casing having sides provided with openings, an adjustable member arranged in said casing, a pair of feed rollers carried by said adjustable member, a breaker element carried by the adjustable casing between the feed roll-

ers, the ends of which breaker element pass through openings in the sides of the adjustable member and through the openings in the sides of the casing, lugs on the sides of the casing adjacent the openings therein, removable wedges engaging said lugs and the ends of the breaker element and a series of revolving hammers within the casing.

16. A shredding machine provided with a stationary casing and hammers arranged inside of same, an adjustable casing or member located at the front end of the stationary casing, a removable grinding surface section carried by said member, an adjustable breaker bar carried by said member, a pair of feeding rolls carried by said member, and yielding means for forcing said feeding rolls toward each other; substantially as described.

In testimony whereof, we hereunto affix our signatures, in the presence of two witnesses, this 13th day of May, 1908.

MILTON F. WILLIAMS.
EDWARD H. FRICKEY.

Witnesses:

F. R. CORNWALL,
GEORGE BAKEWELL.