No. 827,439. PATENTED JULY 31, 1906.

C. W. GRIFFIN.

RAG SHREDDER.

APPLICATION FILED AUG. 25, 1904.

4 SHEETS—SHEET 1.

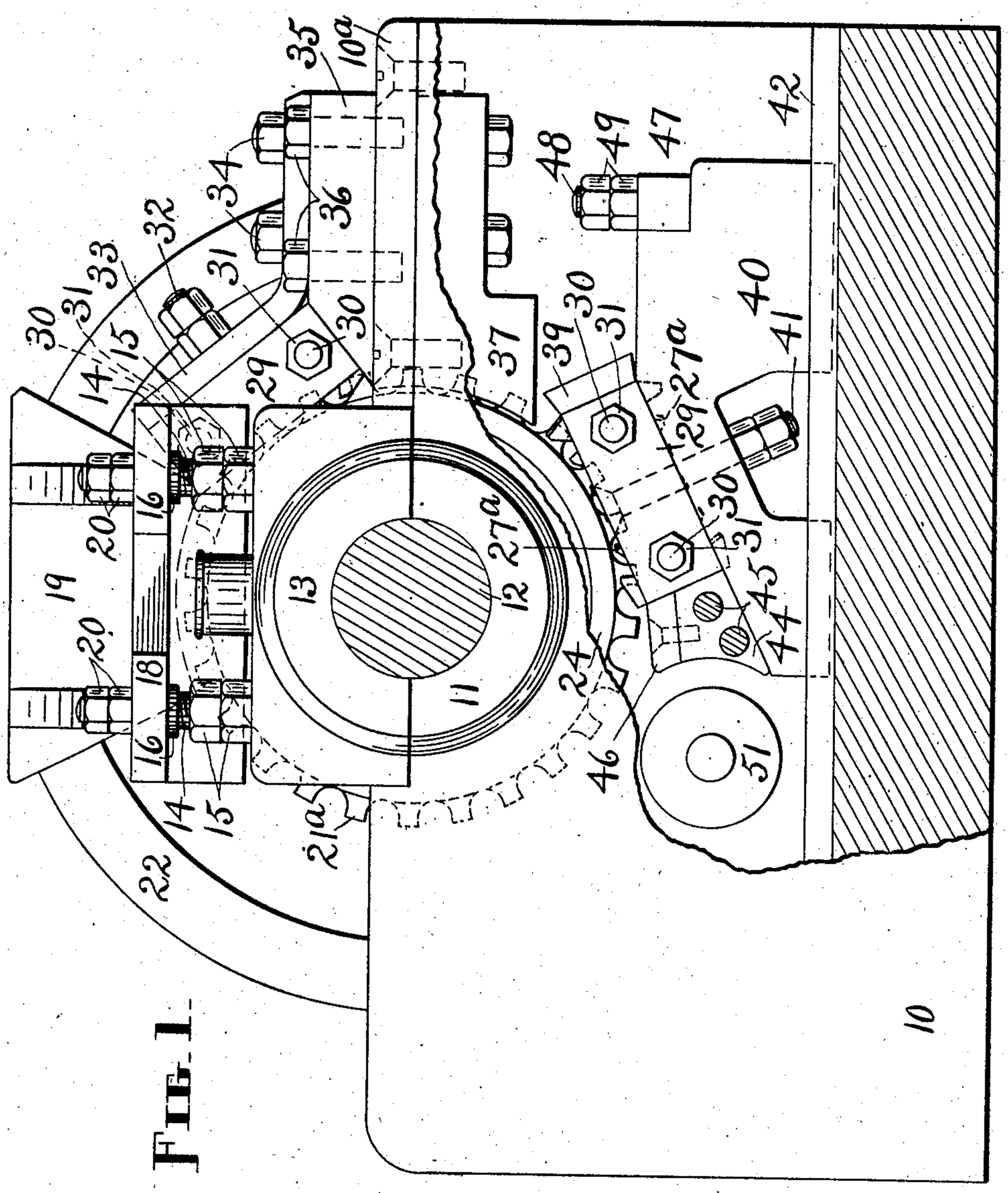

FIG. 1.

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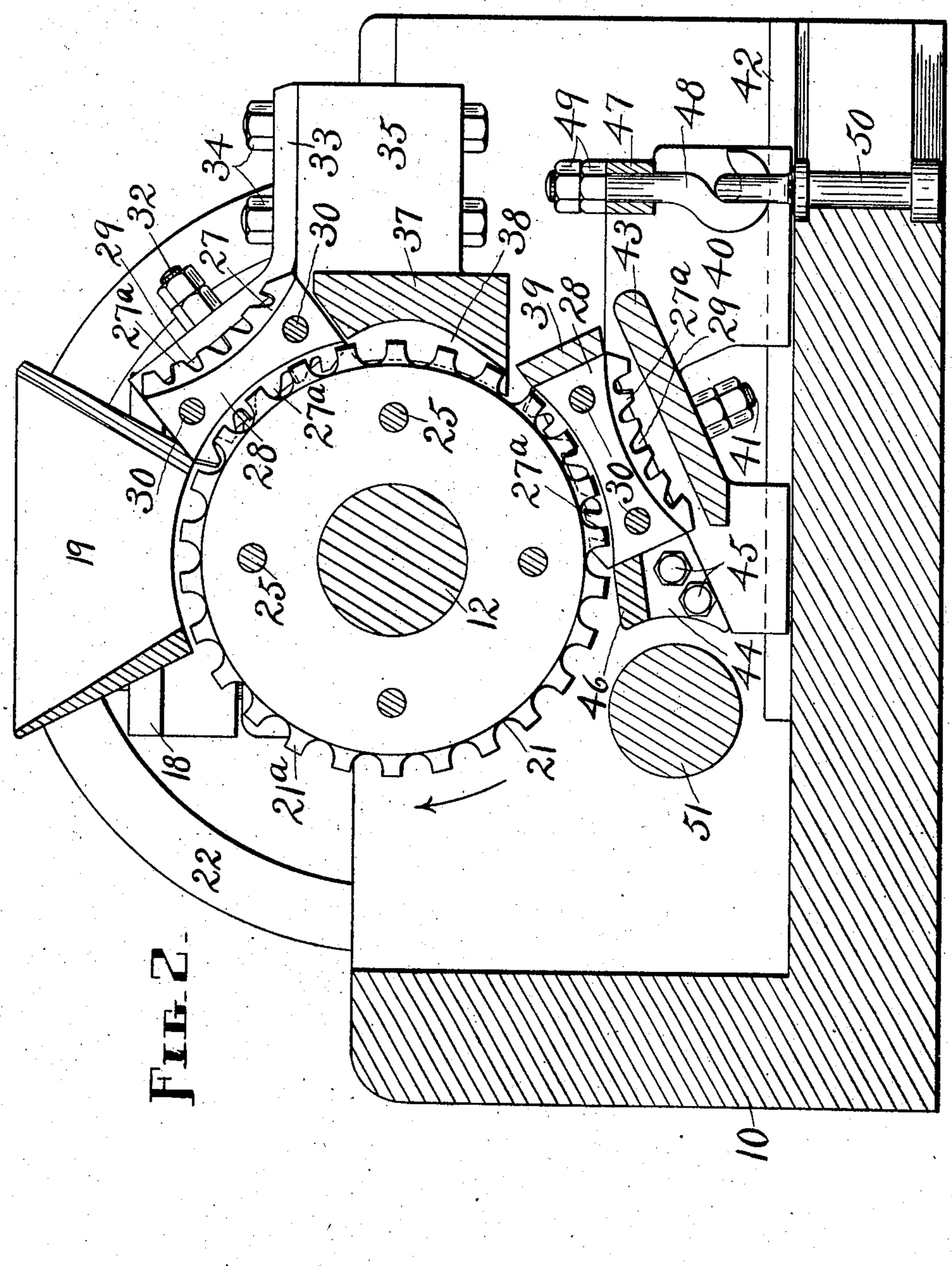

FIG. 2.

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4 SHEETS—SHEET 3.

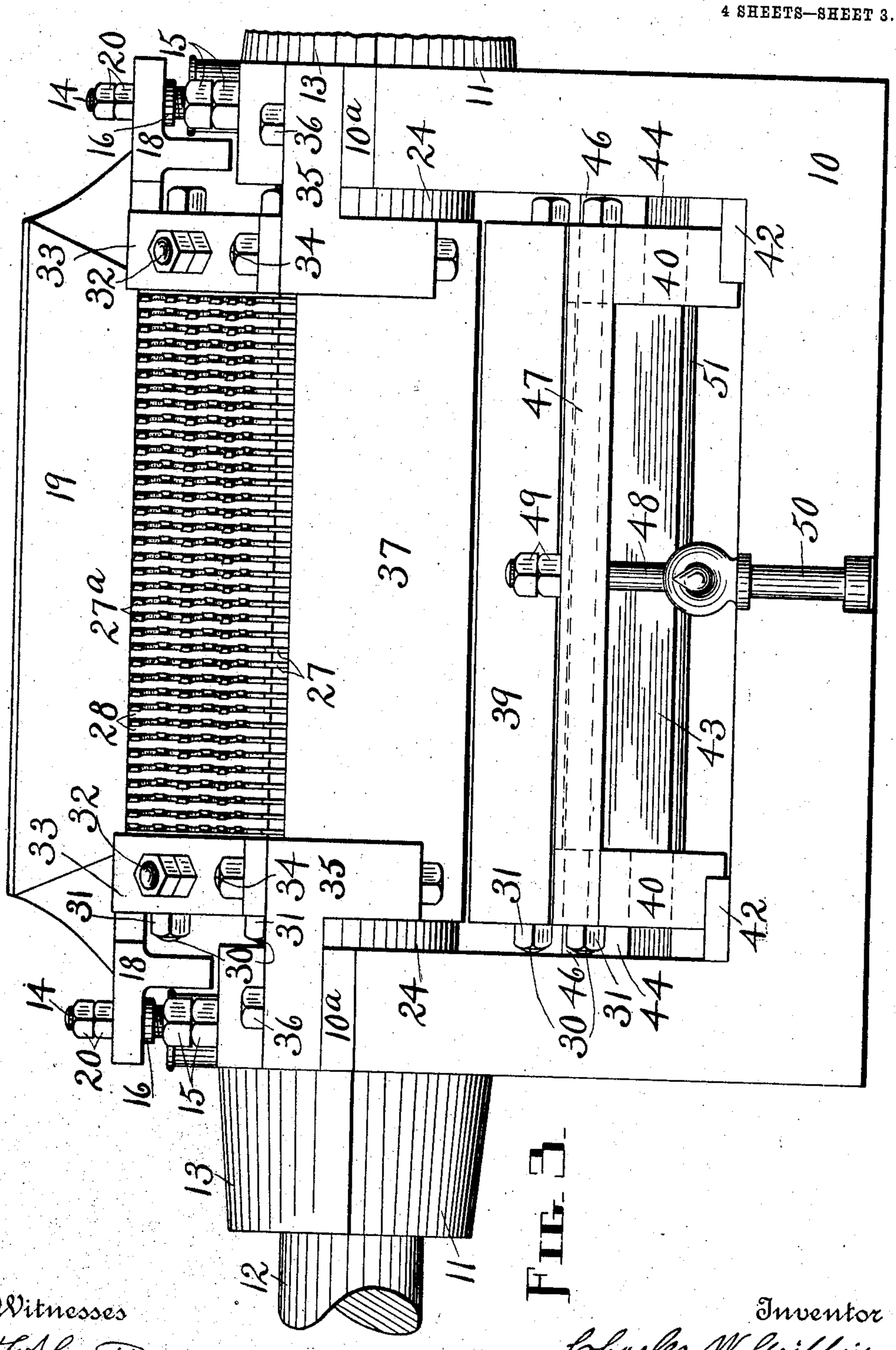

FIG. 3.

Witnesses

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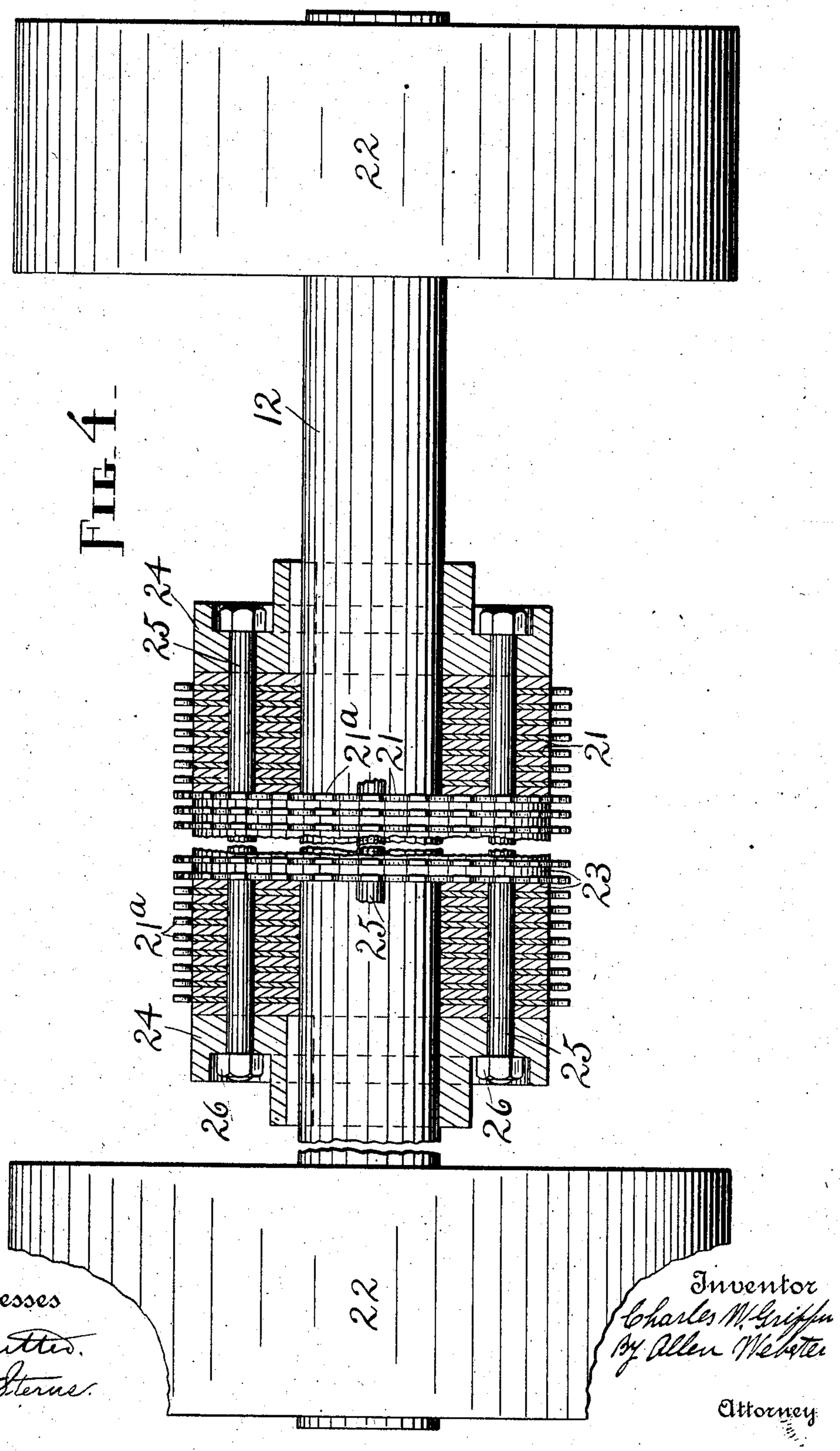
4 SHEETS—SHEET 4.

FIG. 4.



Witnesses
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UNITED STATES PATENT OFFICE.

CHARLES W. GRIFFIN, OF RIEGELSVILLE, NEW JERSEY, ASSIGNOR TO TAYLOR, STILES & COMPANY, OF RIEGELSVILLE, NEW JERSEY, A COPARTNERSHIP.

RAG-SHREDDER.

No. 827,439. Specification of Letters Patent. Patented July 31, 1906.

Application filed August 25, 1904. Serial No. 222,068.

To all whom it may concern:

Be it known that I, CHARLES W. GRIFFIN, a citizen of the United States of America, residing at Riegelsville, in the county of Warren and State of New Jersey, have invented a new and useful Rag-Shredder, of which the following is a specification.

My invention relates to improvements in machines for shredding or disintegrating rags, bagging, rope, grasses, &c., in which a rotary serrated feed-roll is employed in connection with one or more stationary cutters, the parts being so arranged that the teeth on the feed-roll are adapted to pass between the cutter-teeth as the feed-roll revolves, these, with certain other auxiliary and subsidiary parts, all as hereinafter set forth, constituting the said invention; and the objects of my invention are, first, to embody in a strong, durable, and compact machine practicable and efficient means for reducing rags and other stock to a minute degree of fineness while preserving the fiber, the stock handled by this machine having, as a rule, first passed through a rag-cutter; second, to provide means for prolonging the life and efficiency of the cutting members, and, third, to provide a comparatively simple construction adequate for the purpose of handling the stock operated upon by the cutting members.

Ordinary "rag-cutters," so called, are incapable of cutting stock fine enough for certain purposes; but with my machine any suitable stock can be reduced so fine as to meet any requirement, especially if the stock has been cut up, as by a rag-cutter, before being put through this machine.

I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side view of my machine, a portion of one of the side walls being broken away; Fig. 2, a longitudinal section through said machine; Fig. 3, an elevation of the front or feed end of the machine; and Fig. 4 a side view and partial section, portions being broken out, of the feed-roll and its appurtenances.

Similar figures refer to similar parts throughout the several views.

In general, the more essential working parts of my machine consist of a feed-roll made up, preferably, of a set, series, or gang of serrated feed-disks spaced apart and suitably mounted on a shaft, together with one or more stationary cutters—two being illustrated—each made up, preferably, of a set, series, or gang of serrated blades securely bolted together and properly mounted, such blades being spaced apart to receive the peripheral working portions of said feed-disks between them, the stock to be acted upon being carried between such blades by the feed-disks when revolved, whereby said stock is reduced to or shredded into fine particles. By preference the cutters are so constructed and arranged relative to the feed-roll that the points of the teeth on said cutters are concentric with said feed-roll. The major part of the work of shredding or cutting is done by the cutter-teeth, although the teeth on the feed-roll may be sharpened, so as to assist to a greater extent than when they are left dull or blunt in the work of reducing the material, if desired. I prefer to provide the cutters with teeth on both sides, so that they can be reversed; but they may be made with teeth on one side only.

Although I show a complete machine with practical details of construction, it is to be understood that different appliances may be used in positioning, arranging, and adjusting the cutters relative to each other and to the feed-roll and that various modifications, generally and particularly, may be resorted to without departing from the nature of my invention.

Referring now to the drawings, it will be seen that a suitable bed 10 is provided, having bearings 11 11 at each side for a shaft 12. Bearing-boxes 13 13 for the shaft 12 are held in place by bolts 14, rising from the bearings 11 through said boxes, and nuts 15 on said bolts above the boxes, said nuts permitting the boxes to be adjusted. The bolts 14 are provided above the nuts 15 with flanges 16, which support brackets 18 18 at opposite ends of a hopper 19, said brackets being held in place by nuts 20 on the upper terminals of said bolts, which pass through openings in the brackets. The arrangement just described for supporting the hopper 19 at the top of the machine above the shaft 12 and the feed-disks 21, carried thereby, provide for the adjustment of the bearing-boxes 13 without disturbing said hopper, although the latter is supported on the same bolts that are used to confine said boxes.

A driving-pulley 22 is tight on each end of the shaft 12, intermediate of which two pulleys are the feed-disks 21. There are as many feed-disks as spaces between the stationary blades presently to be described, and each of said disks is notched to provide teeth 21ª, which may be of any suitable shape, although that shown is believed to be entirely suitable for the purpose for which the teeth are intended. Plain disks or separators 23 are inserted between the disks 21 in order to separate them an equal distance one from the other, the space between any pair of disks 21 being a little greater than the width of one of the stationary blades. The radii of the disks 23 and of the indented portions of the disks 21 are preferably the same. The disks 21 and 23 are securely clamped together and held to the shaft 12, which passes through the centers of said disks, through the medium, of collars 24 24, mounted on and keyed or otherwise securely fastened to said shaft, and bolts 25, passing through all of the disks and said collars, each of said bolts being held in place by a nut 26. Four bolts 24 appear in the illustrations, but this number may be increased or decreased.

From the foregoing description of the feed-roll, made up as described in the preceding paragraph, it will be seen that upon removing the hopper 19 and the bearing-boxes 13 said roll can be lifted out of the machine, turned end for end and replaced, an operation which brings into play fresh portions of the teeth 21ª. By making this feed-roll reversible the life or efficiency, at least, of the disks 21 when the teeth are formed as shown is nearly if not quite doubled. The peculiar construction of the feed-roll also enables the old disks 21 to be conveniently removed and new ones incorporated in their place, since it is only necessary, after the feed-roll has been removed from the machine, to unscrew the nuts 26 and take off one of the pulleys 22 and the adjacent collar 24 to get at the disks for the purpose of making the desired change.

The cutters consist of blades 27, provided on both edges with teeth 27ª, interposed separators or plates 28, end blocks 29, bolts 30, and nuts 31. The teeth 27ª are preferably set or staggered after the manner of saw-teeth, for the reason that when so arranged they cut better and are less liable to become overheated. The space between each pair of blades 27 or between the teeth on adjacent blades is a little greater than the width of one of the feed-disks. The teeth 27ª may be larger or smaller and greater or less in number, according to the degree of fineness of stock required. The bolts 30 pass through all of the blades 27 and separator-plates 28 and through the end blocks 29, the nuts 31 being screwed onto said bolts where they project beyond one of said blocks.

It is obvious that the stationary cutters and the feed-roll might each be made up of a less number of pieces or consist of a single member even—that is to say, the blades and separators in each cutter might be in one piece and the feed-disks and their separators in one piece—but it is not believed that this method of construction is practicable, and it is certainly not as practicable as where they are made up of separable parts. The blades or disks and their separators may, however, be integral—that is, each blade or disk may have a separator permanently united therewith, or alternate blades or disks may have two permanently-attached separators and the intervening blade or disk none.

It is necessary that the cutters be firmly attached to the machine in proximity to the feed-roll, the arrangement being such that the feed-disks can revolve between the stationary blades, and I will now describe the means employed for so locating said cutters and also for permitting them to be removed from operative relation with said feed-roll when occasion requires.

Considering first the upper gang of blades 27, it will be noticed that the end blocks 29 are bolted at 32 to the upwardly-extending portions of straps 33 33, which in turn are bolted at 34 to sliding members or brackets 35 35. Each bracket 35 is mounted on the top of the corresponding side of the bed near the front end and bolted thereto at 36, said side being preferably reinforced or built up at this point by a hardened plate or track-piece 10ª, which comes between the top of the side and the bracket. By taking out the bolts 36 the brackets 35 can be drawn forward to remove the upper gang of stationary blades from the feed-roll, and upon withdrawing the bolts 32 said gang can be reversed, so as to bring into operative position the opposite set of teeth 27ª. Either gang of blades 27 can be separated by removing the nuts 31 and bolts 30. The provision for double sets of teeth on the blades 27 reduces the frequency, of course, with which it is necessary to dismember the cutters.

The brackets 35 are connected by a cross-piece 37, which is hollowed out adjacent to the feed-roll to form a pocket 38, into which the material acted upon by the first or upper gang of blades is received and from which it is directed to the second or lower gang of blades.

The lower cutter is strengthened by a cross-bar 39, connecting the front ends of the blocks 29. The upper edge of the cross-bar 39 guides the material from the pocket 38 to the lower cutter. The lower blocks 29 are supported on slides 40 40, to which they are bolted at 41 41. Each slide 40 is mounted on a crank 42 on the bottom of the bed 10. A web 43 connects the two slides 40. The slides 40 are limited in their backward displacement or movement by stops 44 44, each

bolted at 45 to a side of the bed. The stops 44 are connected by a cross-bar 46. When the slides 40 are arranged to bring the associated gang of blades 27 into operative relation with the feed-disks 21, they are held in place by means of a bar 47, a hooked bolt 48, nuts 49, and an eyebolt 50. The eyebolt 50 is suitably fastened in the floor of the bed 10, and the hooked end of the bolt 48 engages the eye in said bolt 50, while the upper terminal of said bolt 48 extends through the bar 47 to receive the nuts 49 above said bar. The bar 47 rests against shoulders formed in the slides 40. In order to remove the lower cutter from operative position, it is simply necessary to unscrew the nuts 49, remove the bar 47, and draw the slides 40 forward. The lower cutter may be reversed by removing the bolts 41.

Assuming that the parts are in normal and operative position, the operation of the machine is, briefly, as follows: Stock placed in the hopper 19, which has an open bottom, falls onto the feed-disks 21, which revolve in the direction of the arrow in Fig. 2, is carried by said disks to and through the upper cutter, where it is greatly reduced, thence to the pocket 28 to permit the stock, which may have become somewhat matted together, to separate or fall apart, thence to and through the lower cutter, from which it finally passes to the cross-bar 46 and onto an apron (not shown) which passes over a roller 51 adjacent said cross-bar, by which the stock, now exceedingly fine, is conveyed away from the machine. The operation goes on as long as there is any stock left in the hopper.

The operation of the means employed to locate the cutters having been hereinbefore described, it is not deemed necessary to further enlarge upon the same.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, in a rag-shredder, with two stationary cutters each comprising sets of teeth arranged at intervals, and a removable pocket member between said cutters, of a rotary feed-roll provided with teeth adapted to operate in the intervals or spaces between said sets of cutter-teeth.

2. The combination, in a rag-shredder, of a normally stationary cutter comprising sets of teeth arranged at intervals, the teeth in all of the sets being in straight and regular rows, a rotary feed-roll provided with teeth adapted to operate in the intervals or spaces between said sets of cutter-teeth and arranged in regular rows like the cutter-teeth, the points of the cutter-teeth being uniformly concentric with the teeth on the feed roll, and means adapted to secure said cutter in operative position and to release the same and permit it to be removed from such position.

3. The combination, in a rag-shredder, of a normally stationary cutter comprising sets of teeth arranged at intervals, the teeth in all of the sets being in straight and regular rows and said teeth being offset laterally in opposite directions, a rotary feed-roll provided with teeth adapted to operate in the intervals or spaces between said staggered teeth and arranged in regular rows like the latter, and means adapted to secure said cutter in operative position and to release the same and permit it to be removed from such position.

4. The combination, in a rag-shredder, with a reversible cutter comprising sets of similar teeth arranged at intervals on opposite sides, of a rotary feed-roll provided with teeth adapted to operate in the intervals or spaces between the adjacent sets of cutter-teeth.

5. The combination, in a rag-shredder, of a normally stationary cutter comprising sets of teeth arranged at intervals and so formed as to permit the cutter to be reversed either way, the teeth in all of the sets being in straight and regular rows, a rotary feed-roll provided with teeth adapted to operate in the intervals or spaces between said sets of cutter-teeth and arranged in regular rows like the cutter-teeth, the feed-roll teeth also being so formed as to permit the feed-roll to be reversed, and means adapted to secure the cutter in operative position and to release the same and permit it to be removed from such position.

6. The combination, in a rag-shredder, with a stationary cutter comprising sets of teeth arranged at intervals on opposite sides, of a reversible rotary feed-roll provided with teeth adapted to operate in the intervals or spaces between the adjacent sets of cutter-teeth.

7. The combination in a rag-shredder, with two cutters each comprising a gang of spaced serrated blades, and a pocket between said cutters, of a rotary feed-roll comprising a gang of spaced serrated disks, said disks being adapted to operate between said blades.

8. The combination, in a rag-shredder, with a reversible cutter or cutters each comprising a gang of stationary spaced blades provided on opposite edges with teeth, of a rotary feed-roll comprising a gang of serrated disks, said disks being adapted to operate between the adjacent cutter-teeth.

9. The combination, in a rag-shredder, with a reversible cutter or cutters each comprising a gang of stationary spaced blades provided on opposite edges with teeth, of a reversible rotary feed-roll comprising a gang of serrated disks, said disks being adapted to operate between the adjacent cutter-teeth.

10. A cutter, for a rag-shredder, comprising a normally stationary gang of serrated blades, a series of separators between said blades, end blocks, and means to connect or bind together the blocks, blades and separators, the teeth formed by the serrations in the blades extending beyond the separators

and having their points arranged on an inwardly-directed arc of a circle.

11. The combination, in a rag-shredder, with a suitable bed, a feed-roll shaft mounted in or an said bed, bearing-boxes for said shaft, and bolts and nuts adapted to adjustably hold said bearing-boxes in place, of a hopper supported by said bolts.

12. The combination, in a rag-shredder, with a rotary feed-roll, of a cutter adapted to be positioned in operative relation with said feed-roll, said cutter being provided with end blocks, members slidingly mounted, and means to connect said end blocks with said members.

13. The combination, in a rag-shredder, with a rotary feed-roll, of a cutter adapted to be positioned in operative relation with said feed-roll, said cutter being provided with end blocks, members slidingly mounted, means to connect said end blocks with said members, and a cross-piece located between said members and provided with a pocket adjacent to said feed-roll.

14. The combination, in a rag-shredder, with a rotary feed-roll, of a cutter adapted to be positioned in operative relation with said feed-roll, said cutter being provided with end blocks, members slidingly mounted, means to connect said end blocks with said members, and means to secure said members in place or release the same.

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

CHARLES W. GRIFFIN.

Witnesses:

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EDWARD H. APGAR.