No. 815,087. PATENTED MAR. 13, 1906.

E. H. FRICKEY.

FEEDING MECHANISM FOR SHREDDING MACHINES.

APPLICATION FILED APR. 29, 1905.

2 SHEETS—SHEET 1.

FIG. 1.

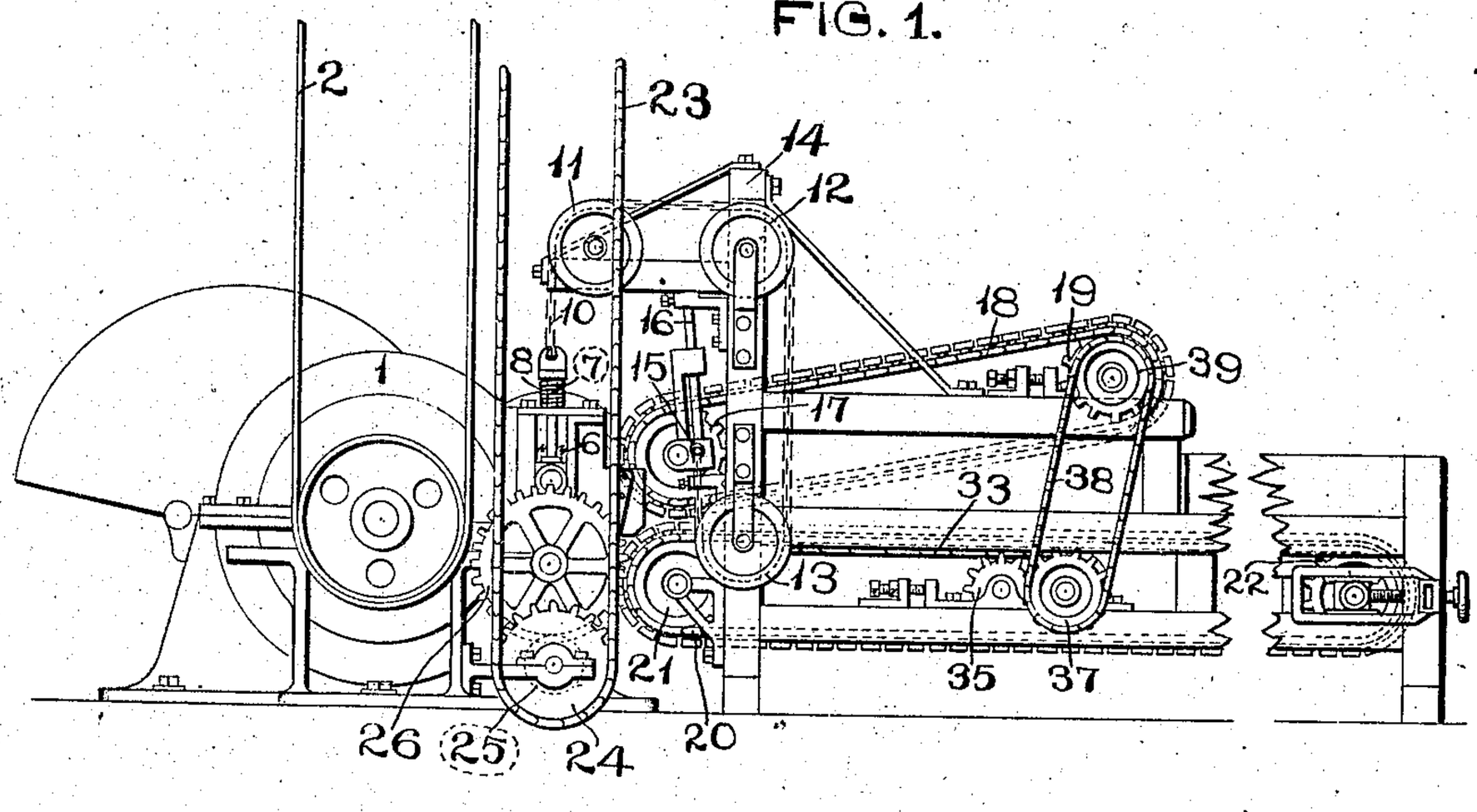
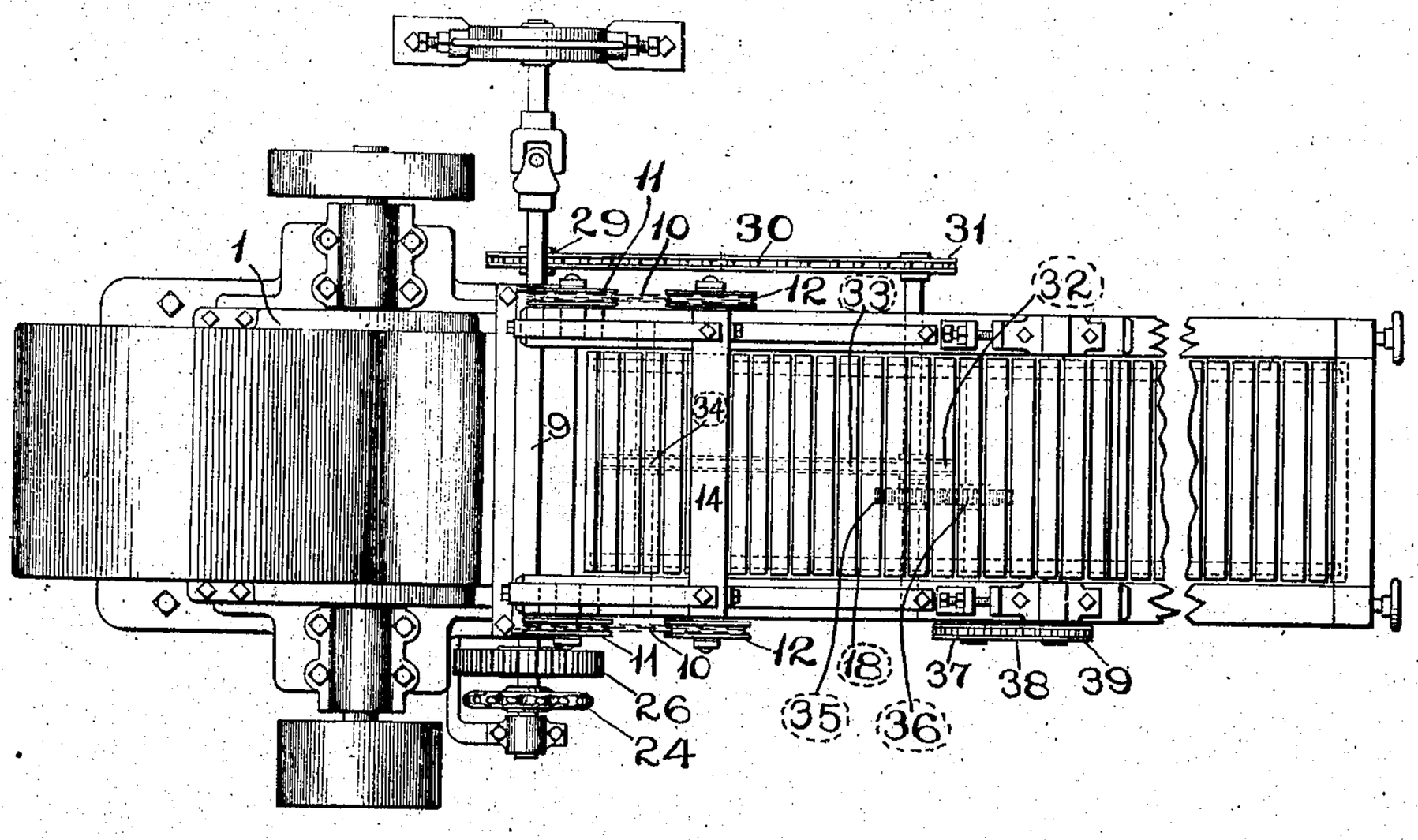


FIG. 2.



ATTEST.
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2 SHEETS—SHEET 2.

FIG. 3.

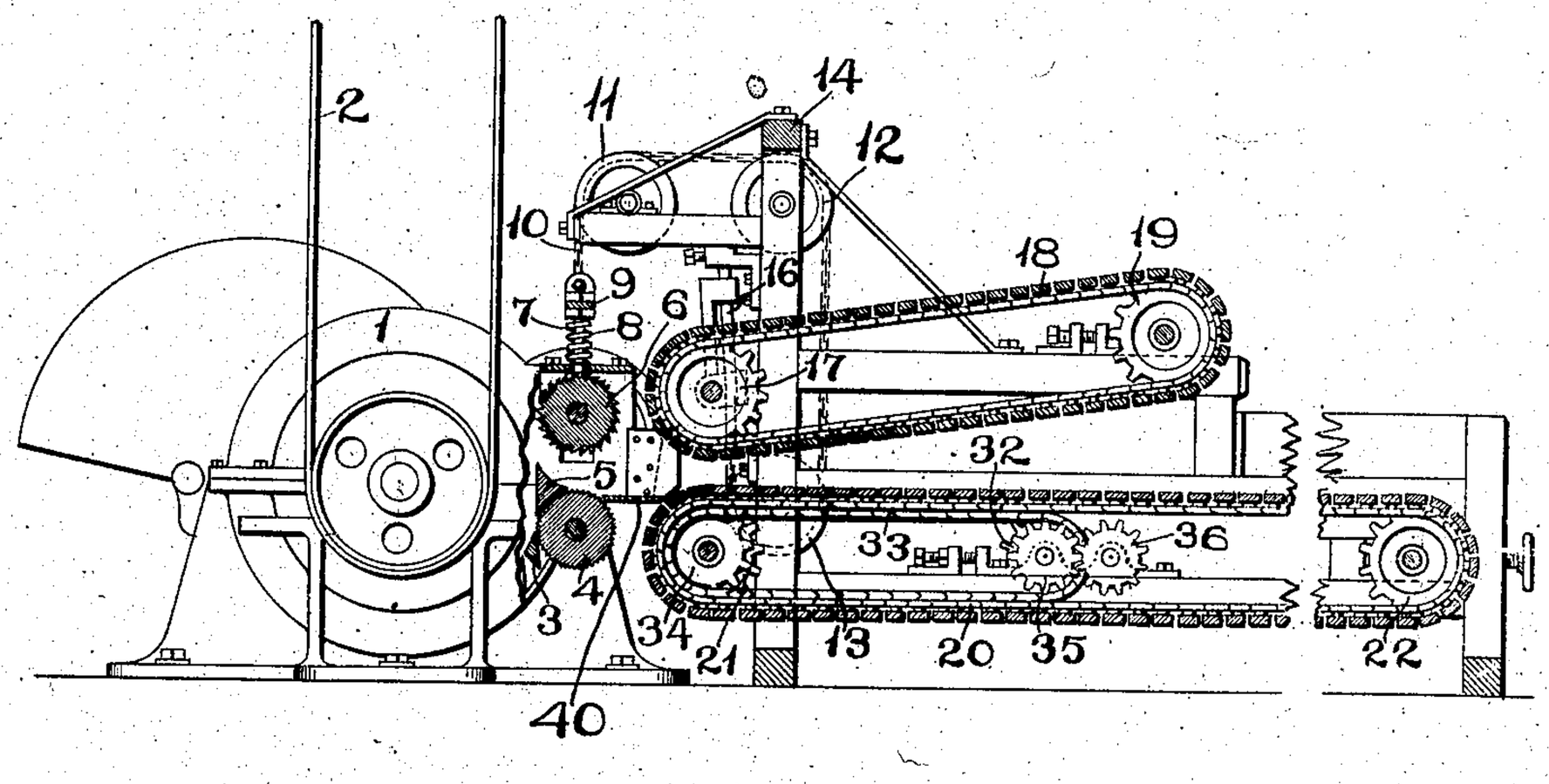
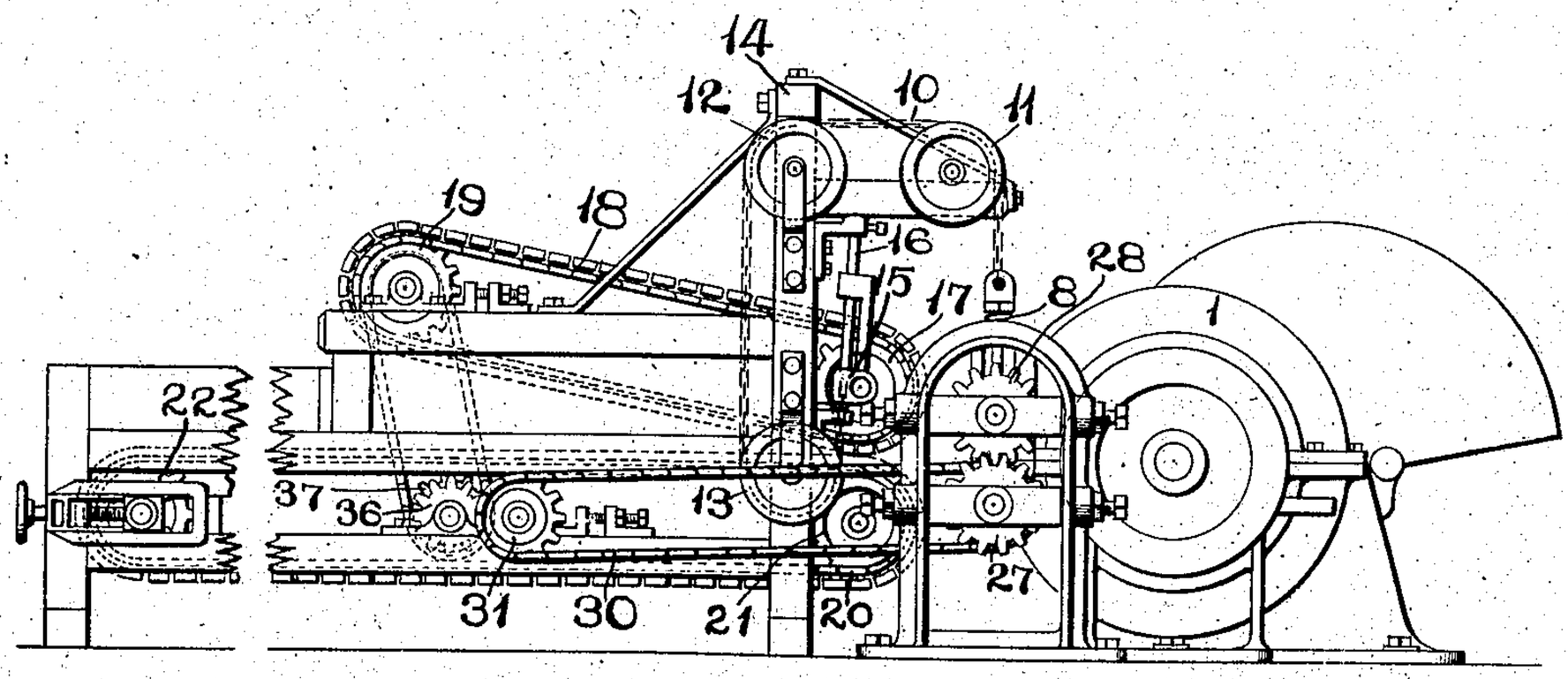


FIG. 4.



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UNITED STATES PATENT OFFICE.

EDWARD H. FRICKEY, OF ST. LOUIS, MISSOURI, ASSIGNOR, BY MENSE ASSIGNMENTS, TO WILLIAMS PATENT CRUSHER & PULVERIZER COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

FEEDING MECHANISM FOR SHREDDING-MACHINES.

No. 815,087. Specification of Letters Patent. Patented March 13, 1906.

Application filed April 29, 1905. Serial No. 258,112.

To all whom it may concern:

Be it known that I, EDWARD H. FRICKEY, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Feeding Mechanism for 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 elevational view of my improved feeding device. Fig. 2 is a top plan view. Fig. 3 is a longitudinal sectional view, and Fig. 4 is a side elevational view as seen from the side opposite to that shown in Fig. 1.

This invention relates to a new and useful improvement in feeding mechanism for shredding-machines, being designed particularly for use in connection with the well-known type of Williams machine.

The object of the present invention is to control the gap between the feed-rollers located at the mouth of the mill, so that said feed-rollers will be spaced apart the proper distance according to the thickness of the batch of material entering the machine. With this object in view the invention consists in the construction, arrangement, and combination of the several parts, all as will be hereinafter described and afterward pointed out in the claims.

In the drawings, 1 indicates a shredding-mill of usual construction, said mill being driven by a belt 2. As usual this mill is provided with cage-bars 3, with which coöperate pivoted revolving hammers. (Not shown.) At the feed end of the machine there is a corrugated feed-roller 4, a triangular bar 5, over which the material to be acted upon by the hammers is fed, and a superposed corrugated feed-roller 6. In an application filed by Milton F. Williams on or about July 9, 1904, and given Serial No. 215,936, he has shown this arrangement of feed-rollers 4 and 6 with the triangular bar 5, and therefore I do not claim the same here. The difference in the present invention and that forming the subject-matter of said application is that I prefer to corrugate the lower feed-roller 4 and to mount the upper feed-roller in vertically-movable bearing-boxes arranged in suitable guideways in the side frames of the machine, whereby the upper roller 6 may be raised or lowered by mechanism about to be described.

Secured to the boxes in which the upper roller 6 is mounted are rods 7, around which are arranged springs 8, serving to counterbalance the weight of the roller 6. The upper ends of the rods 7 are preferably connected by a bar 9, which serves to tie them together.

10 indicates chains or cables secured to the upper ends of the bars 7 and passing over sheaves 11 and 12 and under sheaves 13, all of said sheaves being mounted in suitable bearings on an appropriate framework 14, said chains or cables passing upwardly from the sheaves 13 to sliding boxes 15, mounted on guide-rods 16, positioned upon the frame 14. Boxes 15 support a shaft on which are mounted sprocket-wheels 17, said sprocket-wheels supporting a slotted endless belt 18. Belt 18 also passes over sprockets 19, located some distance in advance of the sprocket 17 and preferably above the horizontal plane of the sprocket 17, so that the belt 18 is slightly inclined, as shown. Under the belt 18 is another slotted endless belt 20, preferably arranged in a horizontal plane, said belt passing over sprockets 21 and 22, mounted on the shafts, bearing in suitable boxes arranged on side extensions of the frame 14. The boxes in which are mounted the shafts carrying the sprockets 19 and 22 are preferably made adjustable, so as to take up slack in both of the endless belts.

Power is imparted to the feed-rollers 4 and 6 and the feeding-belts 18 and 20 by means of a chain 23, driven from some suitable source of power and passing under a sprocket 24. The sprocket 24 has a pinion 25, which meshes with a gear 26, arranged on the axle of the lower feed-roller 4. Thus said lower feed-roller 4 is driven. The opposite end of the axle of feed-roller 4 is connected by a universal joint to a gear 27, in mesh with a gear 28, said gear 28 being connected by a universal joint to the axle of the upper feed-roller, whereby said feed-roller 6 is driven in all of its vertically-adjusted positions. The axle

of feed-roller 4 carries a sprocket 29, connected by a chain 30 to a sprocket 31, mounted on a suitable shaft, which shaft carries a sprocket 32, over which passes a chain 33, said chain contacting with the belt 20 and passing over a sprocket 34 on the shaft carrying the sprocket 21. The shaft carrying sprockets 31 and 32 also carries a gear 35, which meshes with a gear 36, arranged on a counter-shaft carrying a sprocket 37. Sprocket 37 carries a chain 38, passing over a sprocket 39 on the shaft carrying sprocket 19. Thus the belt 18 is driven.

The machine is designed to shred or disintegrate various kinds of material, such as bark, rags, rubber, hay, foodstuffs for cattle, &c. Assuming for the purpose of explanation that hay is to be ground or chopped, it is placed on the belt 20 and fed forward under the belt 18. The forward end of belt 18 normally lies close to the belt 20, and when the hay gets between these two belts, which are both driven in such direction that the slats in contact with the hay will feed the same forward, the forward end of belt 18 will be raised, as shown in Fig. 3, lifting with it the boxes 15. The flexible chains or cables 10 being connected to these boxes will by passing around the sheaves heretofore referred to lift the upper roller 6 in readiness to take in the hay, and thus prevent the machine from being choked at the feed-rollers. Between the belt 20 and the lower feed-roller 4 there is a transfer-table 40 to support the material and deliver it on top of the feed-roller 4.

As hay is now commonly baled for the market the advantage of this mechanism in operating upon baled hay will be apparent. Of course the bale is broken up and delivered to the belt 20 in flakes; but these flakes are of varying thicknesses. If, for instance, a flake of hay two inches thick is fed between the belts, the feed-roller 6 is raised a sufficient distance to take in the two-inch flake. If the two-inch flake is followed by a four-inch flake, the separation of the belts will cause a corresponding separation of the feed-rollers, so as to take in the four-inch flake. If the four-inch flake is followed by a flake one inch thick, the flexible chain 10 after the preceding four-inch flake has passed from between the belts will permit the belts to close in upon the one-inch flake, so that the same will be positively fed forward. The positive feed of the belts assists the positive feeding of the rollers 4 and 6, as the distance between the delivery end of the belts and the feed-rollers is comparatively short, so that with large flakes the belts and the feed-rollers act together on the same material, while with smaller flakes the belts positively feed each successively forward, so that there is practically no break in the movement of the material from the time it is received upon the belt 20 and until it is delivered to the machine and operated upon.

I am aware that changes in the construction, arrangement, and combination of the several parts of my device can be made and substituted for those herein shown and described without in the least departing from the nature and principle of my invention.

Having thus described the invention, what is new, and desired to be secured by Letters Patent, is—

1. In an apparatus of the class described, the combination of belts which are capable of being separated in their action of feeding material, feeding-rollers for receiving the material from between the belts, pulleys above and below one of the belts, and a flexible connection passing around said pulleys for connecting one of the feeding-rollers and one of the belts and for separating said feeding-rollers coincidently with the separation of the belts; substantially as described.

2. In an apparatus of the class described, the combination with a lower belt for advancing material to a position to be acted upon by feeding-rollers, of feeding-rollers capable of being separated, a belt above said feed-belt and coöperating therewith, pulleys above and below the top belt, and a flexible connection passing under the lower pulley and over the upper pulley and connected to the upper belt and the top feeding-roller; substantially as described.

3. In an apparatus of the character described, the combination with two feed-rollers, one of which is vertically adjustable away from and toward the other to receive different thicknesses of material, mechanism operated by material of different thicknesses, a flexible connection secured to the vertically-movable feed-roller and to said mechanism to control the position of the vertically-movable feed-roller according to the thickness of material to be received, and guide and supporting means whereby said flexible connection permits said feed-roller to move toward its companion irrespective of the position of its actuating means; substantially as described.

4. In an apparatus of the character described, the combination with two positively-driven feed-rollers capable of being separated, of two positively-driven belts capable of being separated, and a flexible connection between one of said belts and one of said feed-rollers whereby the rollers are separated a distance corresponding to the separation of the belts, said flexible connection permitting the belts to approach each other while the rollers remain separated, substantially as described.

5. In an apparatus of the character described, the combination with two positively-driven feed-rollers, of an upper and a lower belt, vertically-adjustable boxes in which one of said feed-rollers is mounted, counter-

balanced springs for said adjustable roller, flexible cables connected to the boxes thereof sheaves around which said cables pass, one of which sheaves is vertically movable with respect to the other, and a part movable with said upper belt and connected to said flexible cables; substantially as described.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 20th day of April, 1905.

EDWARD H. FRICKEY.

Witnesses:

MILTON F. WILLIAMS,

GEORGE BAKEWELL.