No. 822,765. PATENTED JUNE 5, 1906.

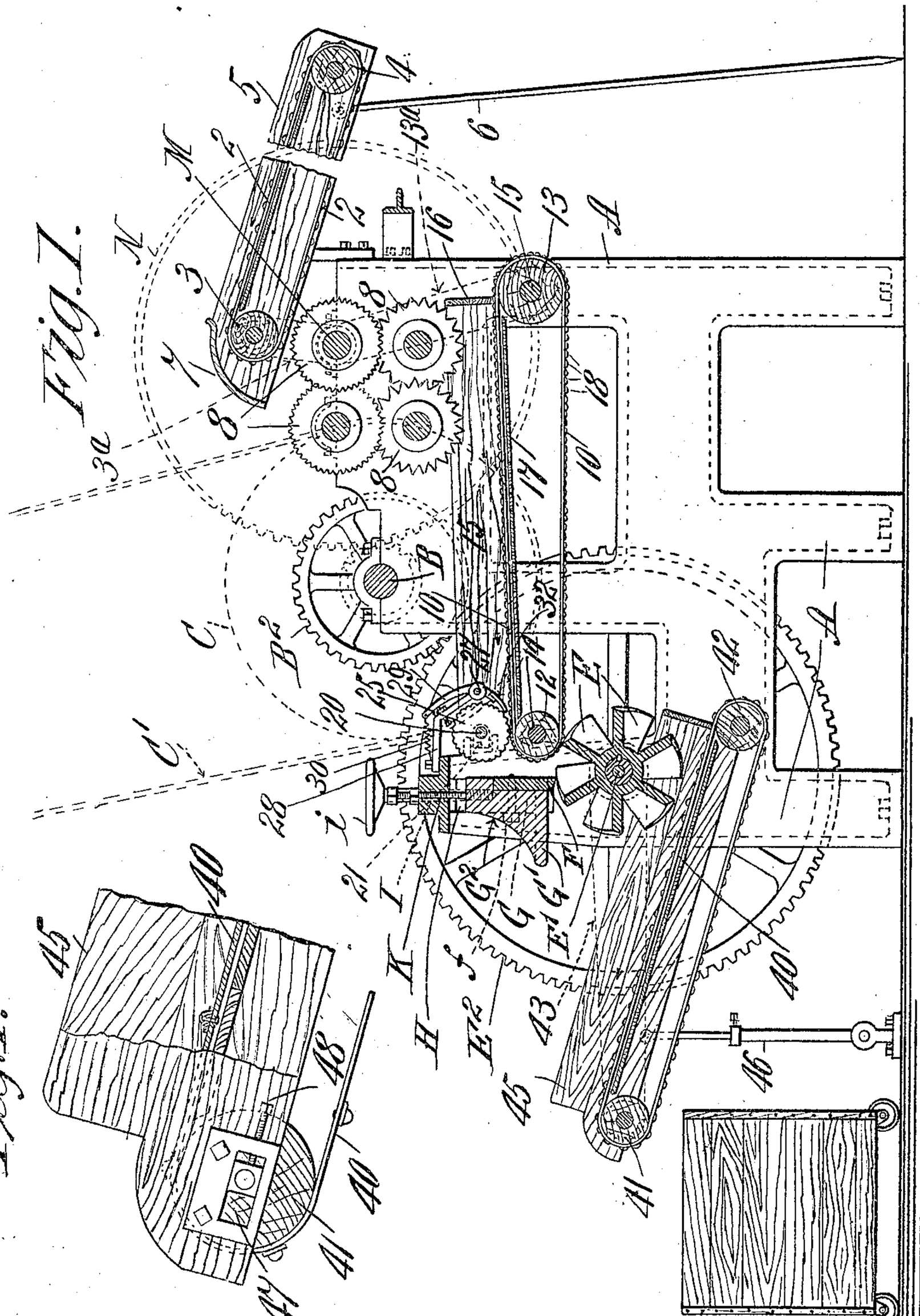
J. L. PERKINS.

MACHINE FOR REDUCING RAGS FOR PAPER STOCK.

APPLICATION FILED MAR. 6, 1905.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS-SHEET 2.

Fig. 2

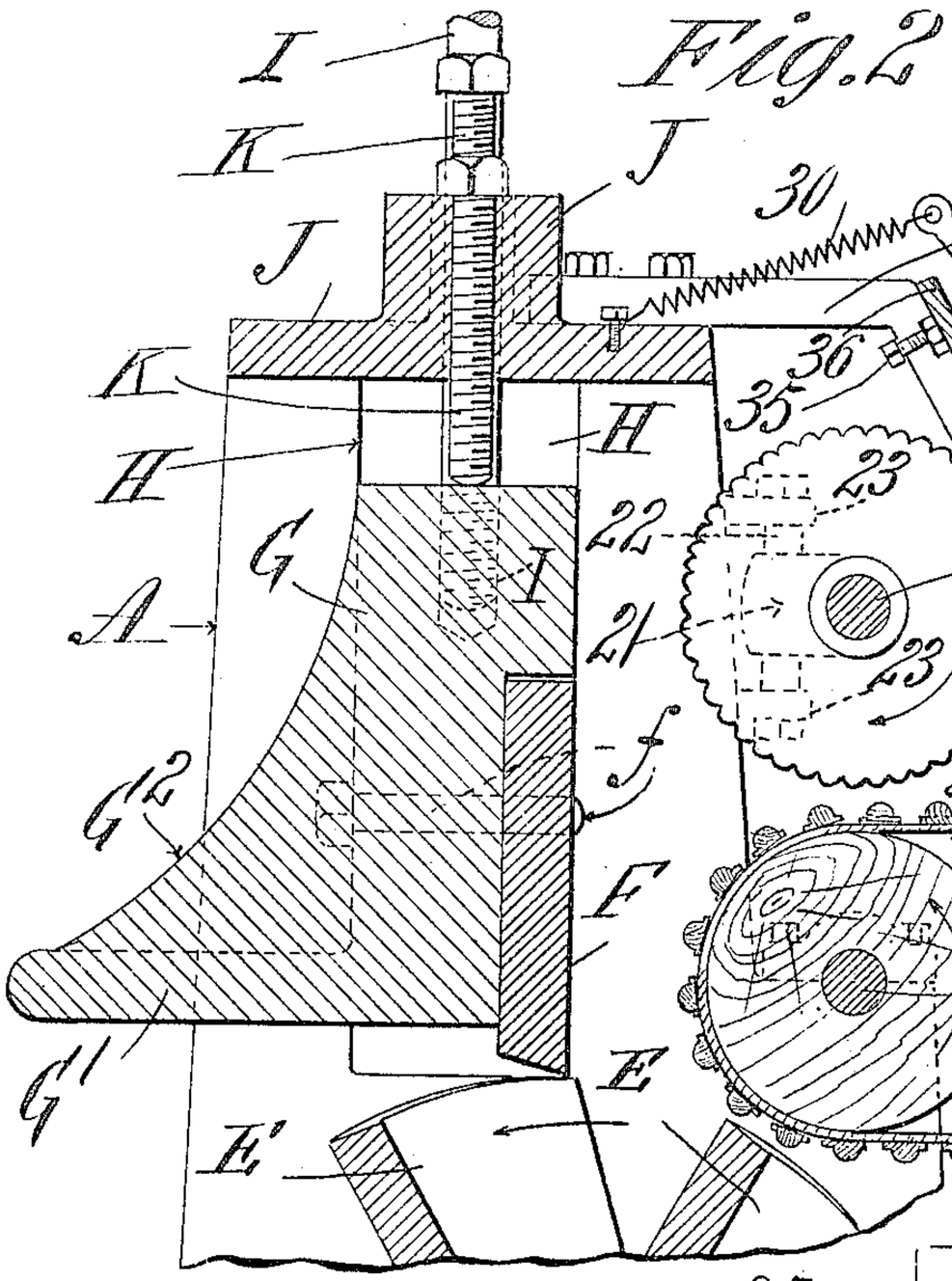


Fig. 4.

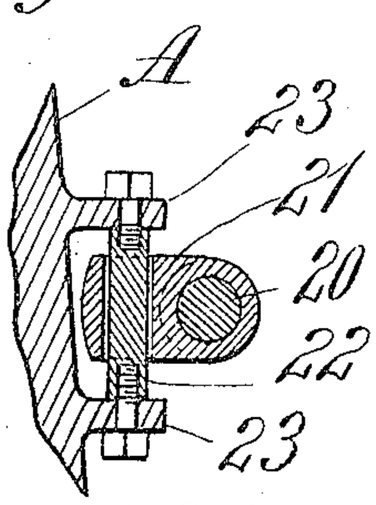
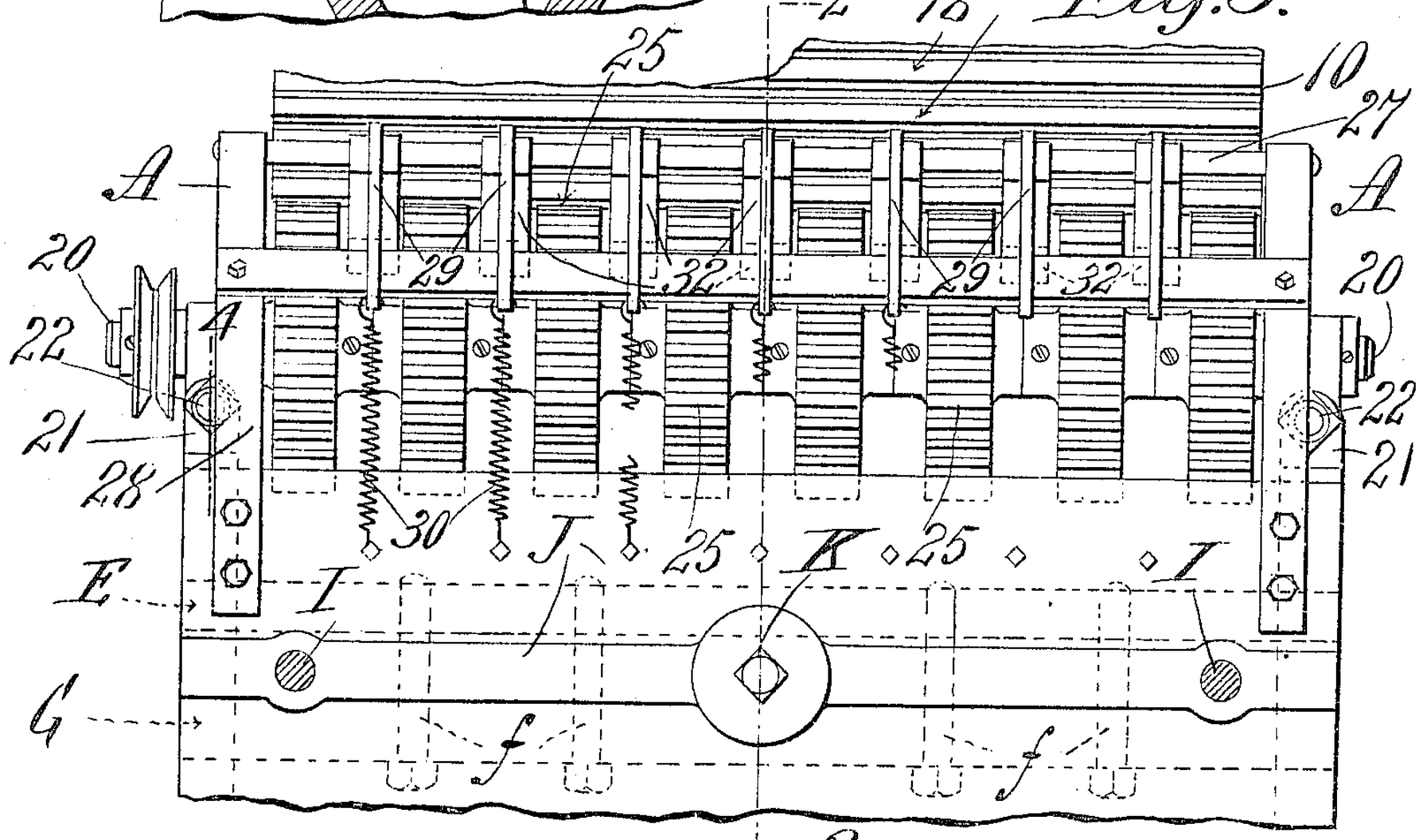


Fig. 3.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR REDUCING RAGS FOR PAPER-STOCK.

No. 822,765. Specification of Letters Patent. Patented June 5, 1906.

Application filed March 6, 1905. Serial No. 248,581.

To all whom it may concern:

Be it known that I, JOHN LEWIS PERKINS, a citizen of the United States of America, and a resident of Holyoke, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Machines for Reducing Rags for Paper-Stock, of which the following is a full, clear, and exact description.

This invention relates to improvements in machines for producing rags for paper-stock preparatory to rendering the same in pulp.

The object of the invention is to provide a machine which in its mechanical construction is of extreme simplicity and which possesses the capability of stripping and comminuting rag-stock most evenly and in quantities increased beyond the capacity of machines as formerly made.

The invention consists in the combinations or arrangements of parts and of constructions of certain of the parts, all substantially as hereinafter fully described, and set forth in the claims.

In the drawings, Figure 1 is a sectional elevation. Fig. 1ª is a sectional elevation, on a larger scale, of a portion of the delivery end of the machine. Fig. 2 is a sectional elevation taken on line 2 2, Fig. 3, and particularly illustrating the feed-regulating devices; and Fig. 3 is a plan view of the same. Fig. 4 is a vertical sectional view of parts in detail as taken on line 4 4, Fig. 3.

Similar characters of reference indicate corresponding parts in all of the views.

In the drawings, A represents the side frames of the machine, supported on which in suitable bearings is the driving-shaft B, having thereon the pulley C, driven by belt C′, as shown partly in dotted lines in Fig. 1. At a point near the left-hand end of the machine, as illustrated in Fig. 1, and about midway of its height is a shaft E′, which carries, secured thereon and extending transversely across the machine, the rotary cutter E, having a plurality of cutting-blades, the edges of which extend in gradual helical lines, as common in this description of cutters. A large gear-wheel E², secured on the end of shaft E′ outside of the frame A, meshes with a smaller gear-wheel B² on shaft B and is driven thereby. Located above and a little to the left of the axis of the rotary cutter E and with its edge in cutting engagement with said rotary cutter is a knife-bar F, which is detachably secured by bolts *f* to a knife-bar slide G. This slide G has a horizontal strengthening-flange G′ and vertical webs G² formed thereon, and its ends are guided in slideways H on the side frames A. Elevating-screws I, which have screw-thread engagements with slide G, pass through holes in a transversely-arranged bar J, which is secured on the side frames A just above slide G and have hand-wheels *i* affixed thereto, by means of which the slide G, with the knife-bar F bolted thereto, may be raised or lowered to a position adjacent the cutting edges of the rotary cutter E and that such adjustment may be rigidly maintained by the square-headed set-screw K, which has screw-thread engagement in bar J to be downwardly set against the top edge of slide G, thereby rigidly resisting any tendency of the knife-bar E to be forced upwardly and relieving the adjusting-screws I.

At the right-hand end of the machine, as shown in Fig. 1, an endless power-driven apron or belt conveyer 2 is provided, onto which the rags or other material to be reduced to small pieces are fed. This belt conveyer 2 is carried around the rolls 3 and 4, which are mounted on shafts having bearings in side boards 5, and roll 3 has driving connections by belt 3ª with shaft M, which shaft is driven from shaft B through gear N. These side boards are held in an approximately horizontal position by legs 6, which extend to the floor. A curved end plate 7 unites the opposite sides of the delivery end of the conveyer and deflects the material fed thereon downward between toothed rolls 8 in upper and lower pairs of series, the rolls in a given pair of one series lapping edgewise beyond and in close proximity to those in another series and which form no part of this invention, but are operable to cut or tear the material into strips, as commonly done in this general class of rag-reducing machines. Located below these strip-cutting wheels 8 and extending therefrom to a point just above the rotary cutter E is a conveyer-belt 10, which runs over rolls 12 and 13, which are respectively supported on shafts 14 and 15, having bearings in the side frames A. Roll 13 is driven by a belt or sprocket-chain 13ª, having connection with shaft M.

Side frames 15, with rear end board 16, serve to keep the material carried on the belt 10 from falling off, and a bottom flooring 17 supports the upper course of the endless belt 10 in straight alinement. The rag-support-

ing surface of the belt 10 is provided at suitable distances apart with battens or ribs 18, which facilitate the progress of the material carried thereon.

A shaft 20, located directly above the conveyer-shaft 14, is supported in bearings 21, which are slidably supported on the short vertical studs 22, which are supported by and between lugs 23, projecting from the frames A, as seen in dotted lines in Figs. 1 and 2. Secured to the shaft 20 are corrugated or fluted pressure-wheels 25, which are rotated by the material passing thereunder, and in the event of an excessive accumulation of material being brought to these wheels they are raised thereby, their journal-bearings 21 sliding on the studs 22; but at all times, by reason of their weight exerting a downward pressure on the material that is passed under them, a constant forward feed of the material is insured. A stationary shaft 27 extends across the machine parallel with shaft 20 and suitably adjacent the surfaces of pressure-wheels 25 and is supported in brackets 28, which are secured on bar J. Loosely mounted on this shaft 27 are the curved levers 29, the upper ends of which are drawn toward bar J by the spiral springs 30. The lower and depending ends of these levers 29 are provided with flat curved ends 32, which normally rest very closely to, but just clear of, the belt 10, but are raised by the material which is carried thereunder. The rising of these ends 32 is resisted by the springs 30, whereby if the material brought forward toward the delivery ends of conveyer 10 is unevenly piled thereon these individual spring-pressed levers 29 hold back such piles or accumulations and cause a more even delivery under the pressure-wheels 25. The degree of clearance of the lever ends 32 to be normally maintained relatively to the belt 10 is regulated by the adjusting-screws 35 in transverse bar 36. (See Fig. 2.)

The shredded or stripped material as it is delivered from belt 10 is caught by the rotary cutter E and cut or chopped into short pieces between it and the knife-edge F, whence the finely-cut pieces are dropped onto an apron or belt 40, of similar construction to that of belt 10. This belt 40 is carried on rolls 41 and 42 and is driven by a suitable belt or sprocket connection 43 between roll 41 and cutter-shaft E′, as shown in dotted lines in Fig. 1. The side boards 45 of conveyer 40 have depending telescoped legs 46, which are pivotally connected near the floor, thus permitting the delivery of the comminuted material from the conveyer 40 at any desired elevation, and the bearings for roll 41 are mounted in a slideway 47 in the side frames supporting such roll and are adjustable therein to serve as a take-up or belt-tightener.

Machines organized and built as shown and described have been found extremely satisfactory in the performance of their expected duty in that they possess capacity for the performance of a large amount of work within a given time, are comparatively simple and inexpensive in construction, have little liability to derangement, comminute the rag-stock most evenly, and require very little attention on the part of the operator.

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

1. In a rag-reducing machine, the combination with series of coacting slitting-rolls; and a normally stationary cutter-bar, and a rotary cutter coacting therewith, having locations endwise of the machine beyond, and below, the slitting-rolls; of an endless-belt conveyer having a portion thereof located below the slitting-rolls, and extending to a position adjacent and above the rotary cutter, and having a supporting-roll 12 therefor; a series of separated rolls or wheels above the roll-supported delivery end of the belt conveyer; a shaft supporting said separated rolls, journal-supports for said shafts constrained for free rising-and-falling movements; and members yielding in an upward direction and having positions between said separated rolls, and normally adjacent the conveyer.

2. In a rag-reducing machine, the combination with a series of coacting slitting-rolls; and a normally stationary cutter-bar, and a rotary cutter coacting therewith, having locations endwise of the machine beyond, and below, the slitting-rolls; and an endless-belt conveyer having a portion thereof located below the slitting-rolls, extending to a position adjacent and above the rotary cutter, and having a supporting-roll 12 therefor, a series of separated rolls or wheels 25 above the roll-supported delivery end of the belt conveyer, the stationary vertical studs 22, the journal-supports 21 engaged about and vertically freely movable on said studs, and the shaft, carrying said rolls 25; members yielding in an upward direction and having positions between said separated rolls, and normally adjacent the conveyer.

3. In a rag-cutting machine, in combination, a horizontally-extending belt conveyer 10, shredding or strip-cutting wheels above the receiving end of the conveyer, and a rotary cutter and cutter-bar, below the delivery end of such conveyer, a series of separated corrugated-faced pressure-wheels, and a shaft on which they are mounted, above the discharge-end portion of said belt convéyer, vertically-slidable bearings for said shaft, and a series of intermediately-pivoted levers having members 32 thereof located between the pressure-wheels and adjacent the conveyer, and coacting with said wheels to preserve an evenly-distributed discharge of the shredded

rags conveyed thereto, and the springs 30 connected with arms of said levers as described.

4. In a rag-reducing machine, in combination, the main frame including opposite side members, and supporting an intermediately-located transverse driving-shaft B, provided with a gear-wheel B^2 thereon, a rotary cutter having the shaft thereof provided with a gear-wheel E^2 in mesh with said gear-wheel B^2, a normally stationary transverse cutter-bar coacting with the rotary cutter, sets of separated and coacting slitting-rolls, one thereof being gear-connected with the main shaft B, a belt conveyer and supporting-rolls 3 and 4 therefor, and the driving connection 3^a between one of the slitting-roll shafts and the roll 3, the belt conveyer 10 having supporting-rolls 12 and 13 therefor, located below the slitting-rolls, and above the rotary cutter, and driving connections 13^a between the roll 13 and said slitting-roll shaft, the separated pressure-rolls 25 located above the roll 12, the yielding members 32 located between the rolls 25 and adjacent the delivery end of the conveyer 10, and the belt conveyer 40 located below and extended endwise of the machine beyond the rotary cutter, and having supporting-rolls 41 and 42 therefor, and driving connections 43 between the rotary cutter-shaft and one of said rolls 41 42.

Signed by me at Holyoke, Massachusetts, in presence of two subscribing witnesses.

JOHN LEWIS PERKINS.

Witnesses:
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G. R. DRISCOLL.