

S. M. ALLEN.

Flax Brake.

No. 39,025.

Patented June 30, 1863.

Fig: 1.

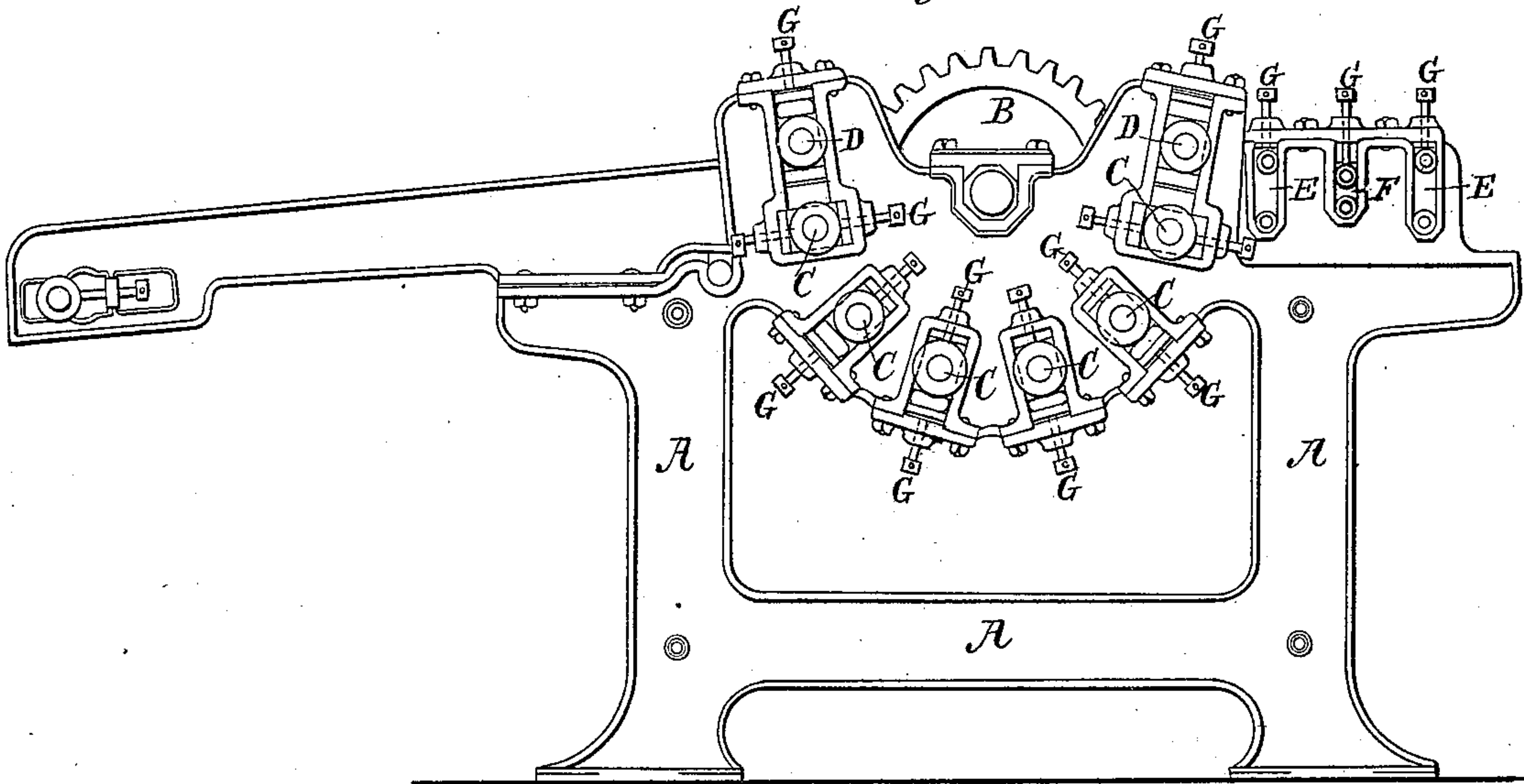
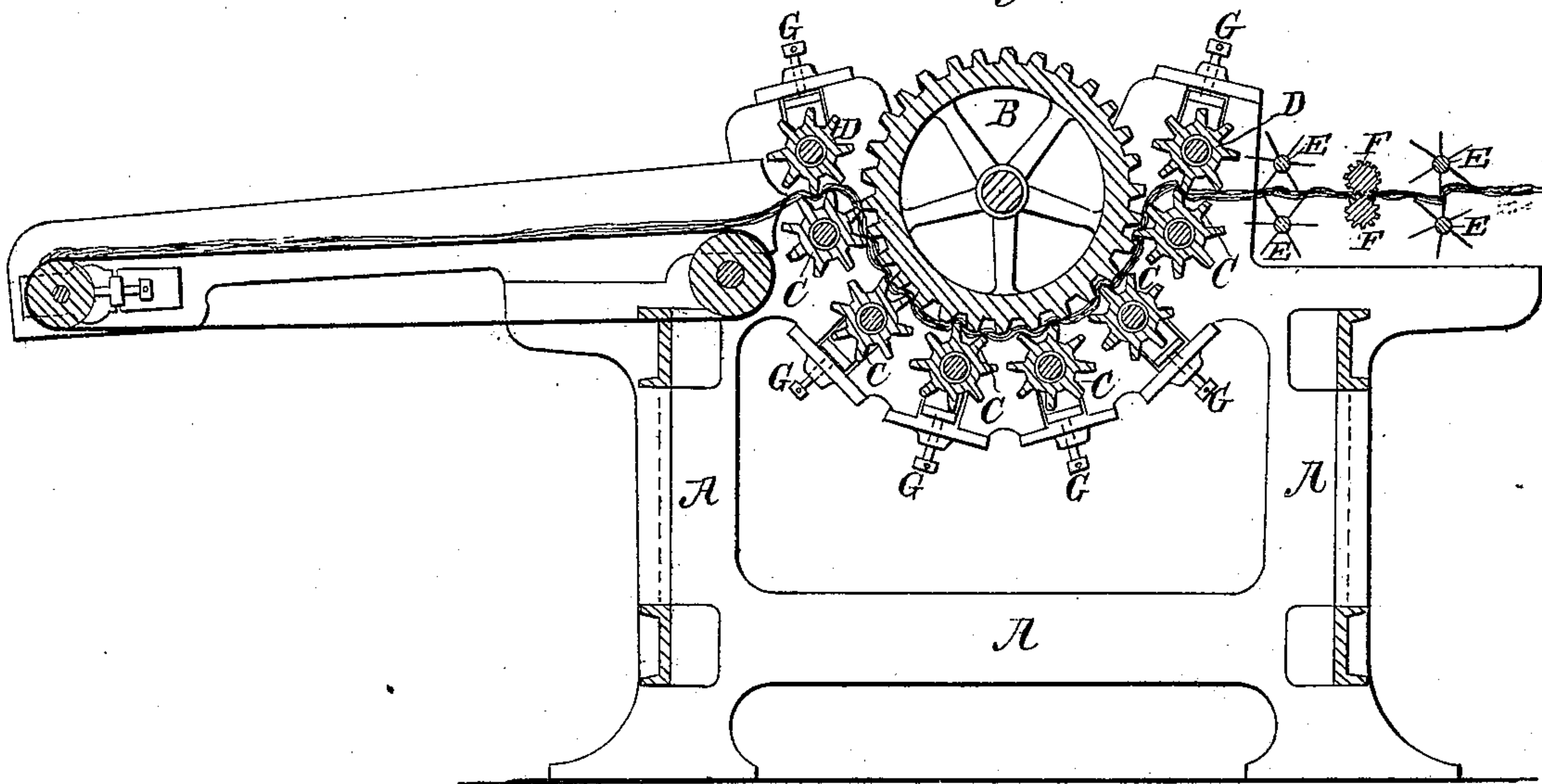


Fig: 2.



Witnesses;

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Inventor

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UNITED STATES PATENT OFFICE.

STEPHEN M. ALLEN, OF WOBURN, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR BREAKING AND DRESSING FLAX, &c.

Specification forming part of Letters Patent No. 39,025, dated June 30, 1863.

To all whom it may concern:

Be it known that I, STEPHEN M. ALLEN, of Woburn, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Machinery for Breaking, Dressing, and Cleaning Flax, Hemp, and other Long-Stapled Vegetable Fibrous Substance; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a side, and Fig. 2 a sectional, elevation of my improved apparatus.

The object of my invention is to extract from certain plants by mechanical means the fibers they contain without destroying their integrity. Machines were heretofore constructed that in part effected the object I have in view; but in such machines the fibers were either liable to be torn or crushed, which greatly detracted from their value, or the fibers could not be divested of their adherent woody wrapper, which necessitated additional labor by hand, the cost of which increased the expense of extracting the fiber to such an extent as to render the process of mechanical separation impracticable. I have combined or arranged the parts constituting the machine for breaking, dressing, and cleaning flax, hemp, or other similar fibrous plants, whether in their rotted or unrotted state, operating in such manner as to disintegrate the ligneous envelope, strip it off the fiber, and deliver the filaments perfectly clean, without destroying their natural strength of fiber, as is necessarily the case when chemical agents are used to effect the object in view, and without affecting the integrity of the fibers, as is the case when operated upon by the usual brakes or dressing or cleaning machinery; and my invention consists, first, in combining a series of fluted rollers geared by a revolving fluted drum with two fluted rollers, so arranged as to engage with and be geared by respectively the first and last drum-gear roller, substantially as and for the purpose hereinafter set forth; second, in the combination of a series of fluted rollers arranged about a central fluted drum, with one or more pairs of clusters of stripping or scutching blades arranged for operation, substantially as hereinafter described; third, in the combination of two or more pairs

of revolving scutching-blades with intermediate check-rollers arranged and operating substantially as hereinafter described.

The apparatus represented in the accompanying drawings embodies the principal of my invention. By it I am enabled to dispense with the pulling of the flax and hemp heretofore thought indispensable, my machine taking the flax in a tangled condition, if necessary, the same as gathered in the track of a mowing-machine. It also does away with the rotting process and allows of the preparation of the fiber with power and dispatch, so that it may be baled for the market on the farm. In such case the shives are left on the farm as manure, or if unrotted they afford good feed for cattle, thus requiring transportation from the farm of only about five or six hundred pounds of fiber out of two thousand pounds of straw. My machine is intended to break, dress, and clean long-stapled fibrous substances, like flax, hemp, jute, and other similar fibers, either rotted or unrotted, and is so arranged that the fiber passes between a succession of rollers suitably fluted to break and crush all the woody matter connected with the fiber and start the resinous substances, binding the same together. These are followed by sets of binding-rollers, between which the fiber passes, which hold it firmly while revolving. Scutching-blades receive it and with superior speed revolve and somewhat slide over the fiber, so as to throw off all the shives and beat out the resinous matter and yet not break or strand the fiber.

To enable others to make and use my invention, I shall now proceed to describe the construction and operation of my said machine, as follows:

A in the accompanying drawings is the frame of the machine. At one end it is provided with a feed-apron running round friction-gear rollers.

B is the large fluted drum or cylinder connected with the smaller fluted cylinders, through and between which the fibrous substances are passed.

C C C C C C are the smaller fluted rollers connected with the large cylinder, through and between which the fibrous substance passes before coming to the scutching-knives. These rollers are arranged concentrically relative

to the axis of the drum and derive their motions from the drum, which in its turn receives its rotary motion from some prime mover.

D D are two fluted feeding and delivering rollers, one at each side of the large cylinder, connecting with two smaller rollers, but not with the large cylinder.

E E are the scutching blades or rollers moving at a higher velocity than the rollers D D or F F.

F F are check-rollers holding the fiber while the scutchers run over the surface.

The arrangement shown in the accompanying drawings of the central fluted drum and the concentrically-disposed fluted rollers allows of great compactness and efficiency of the machinery for crushing or breaking up the woody fiber and resinous matter. If the rollers were disposed longitudinally, so as to pass the fiber horizontally through them, the machine would occupy more than double the space and have a proportionate weight, besides requiring more power to be driven on account of additional gears that would have to be introduced necessarily. The position of each of the small fluted rollers C in respect to the drum B may be regulated by means of male and female screws G G, actuating the sliding boxes in which the axles of the small rollers rest. By this arrangement the depth of penetration of the flutes or cogs, and consequently the amount of friction produced by the one against the other, and crushing power may be regulated according to the toughness or tenderness of the fibrous plant under treatment. The scutching-blades are so arranged that they overlap each other, thus scraping the fiber very thoroughly without tearing it or subjecting it to a strain sufficient to strand it, the revolving scutching-blades being formed so that one edge of the upper knife is pressing one side of the fiber while the lower one is pressing the other, thus forming at all times a back to rest upon in the revolution of the blades different from what it would be if the revolving blades were so geared as to let the blades or beaters set between each other without touching, so that a constant strain would be produced on the fiber; or, if the same effect were produced by drawing-rollers, both of which plans have heretofore been tested, and both of which have a tendency to shorten the fiber before it is properly dressed, which renders it almost impossible to clean at a subsequent operation, as all the length of staple is required in the fiber to enable it to be held while it is being scutched.

The large fluted drum is connected with a series of smaller fluted rollers, which are moved

by and run with the same. The fiber or straw passing through these rollers is thus thoroughly broken free from its woody and resinous matter. Attached to the machine and moved by belts or gears is another set of fluted check-rollers which receive the fiber and pass it to a set of double revolving scutching-blades revolving much faster than the check-rollers. The fiber is received, held, or slowly delivered or fed to the scutching-rollers, which thoroughly scrape it without drawing or stranding it, but throwing off all the shives and resinous matter. The fiber then passes into another set of binding-rollers of as slow motion as the first, and is passed to another set of revolving scutching-blades like the first which operates the same as the first set. The lower revolving knife interlaps with the upper one, so that there is a constant bearing on each side of the fiber, which is found necessary to prevent breaking or stranding the same by the superior velocity of the blades. Care is to be taken in gearing these blades that nothing shall prevent their touching the fiber on both sides, and thus protecting the strain on the same, as also that there should be no draft to the fluted rollers, which also strands the fiber. If said blades were so geared as to pass between each other without touching and the fiber to pass between, there would be such a strain on the same as would part it, and thereby injure the same for future cleaning, the same having the effect of drawing-rollers, both of which processes should be avoided.

Having thus described my invention, I will state my claims as follows:

1. In combination with a series of fluted rollers geared by a revolving fluted drum, two fluted rollers so arranged as to engage with and be geared by respectively the first and last drum-gear roller, substantially as and for the purpose herein set forth.

2. The combination of a series of fluted rollers arranged about a central fluted drum, with one or more pairs of clusters of revolving stripping or scutching blades arranged for operation substantially as herein described.

3. The combination of two or more pairs of revolving scutching-blades with intermediate check-rollers, arranged and operating substantially as herein described.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

STEPHEN M. ALLEN.

Witnesses:

WM. D. SEAVER,
R. HENRY GAY.