

ZIMMERMAN & BEATTIE.

Hemp Brake.

No. 18,657.

Patented Nov. 17, 1857.

Fig. 1.

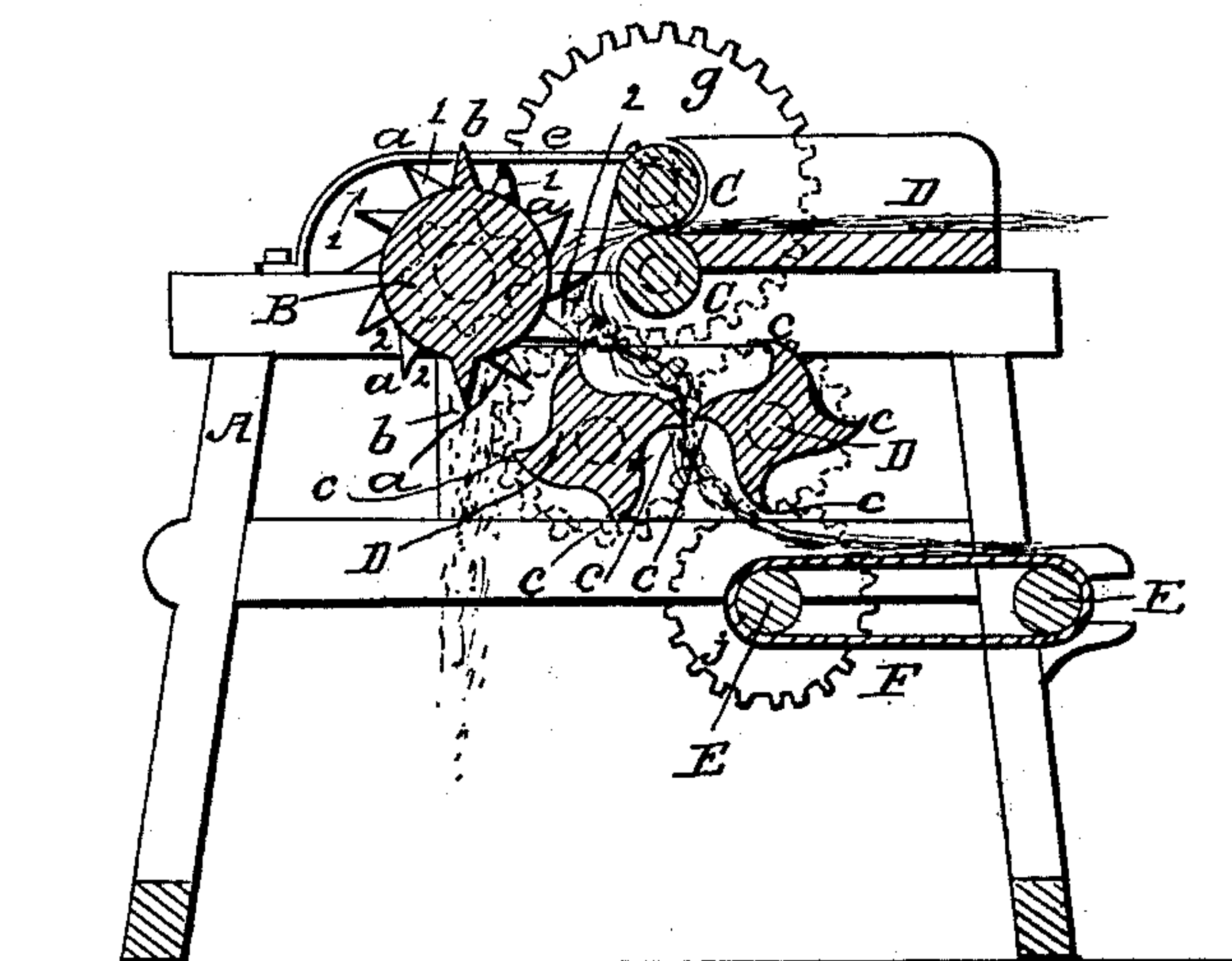
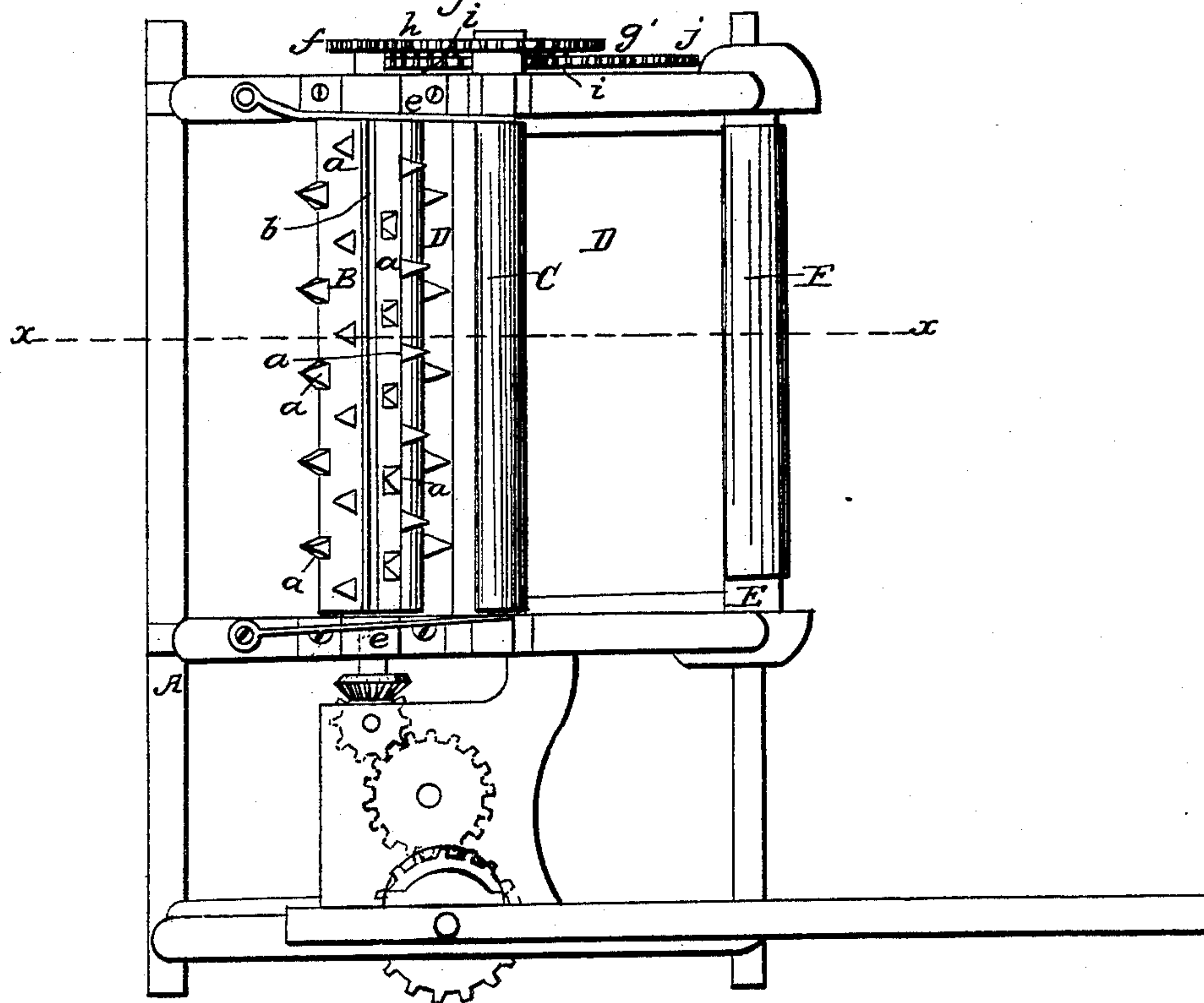


Fig. 2.



UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN HEMP-BRAKES.

Specification forming part of Letters Patent No. **18,657**, dated November 17, 1857.

To all whom it may concern:

Be it known that we, G. F. S. ZIMMERMAN and ARMSTRONG BEATTIE, of St. Joseph, in the county of Buchanan and State of Missouri, have invented a new and Improved Hemp-Brake; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a vertical section of our improvement taken in the line *xx*, Fig. 1. Fig. 2 is a plan or top view of the same.

Similar letters of reference indicate corresponding parts in the two figures.

In machines heretofore employed for breaking and cleaning hemp at one operation, the material has been broken by passing it between a pair of cylindrical revolving brakes and scutchers that mesh into each other and break the hemp by bending it short between them. This method is highly objectionable in consequence of the great length of the fiber over which the swords of the cylinder are caused to scrape, the fibers of hemp being thus so broken as to be rendered unmerchantable. It has also been attempted to break and clean the hemp between a revolving brake and a stationary concave; but this method is liable to the same objections as the above. Likewise, it has been attempted to break with a revolving cylinder having swords or cleats on the outside thereof breaking against a stationary bed-plate, with revolving scutchers meshing into each other immediately below the cylinder, as in F. P. Holcomb's device, patented 1847. This method is found to also be highly objectionable, as when the swords come in contact with the hemp, the stock being firm and hard, the sword will break the lint at the point where it strikes the hemp on the bed-plate, thus wasting a large portion of the hemp. The revolving scutchers meshing into each other, as seen in the patent above named, are also objectionable, as they cannot clean well, and by their meshing into each other they will tear and waste the hemp at the same time. In all machines with cleated cylinders or swords the hemp is and must be fed into the machine by hand, one-half being broken at a time. This is also objectionable, as it renders the operation too slow and gives no advantage over the hand-brakes.

Our invention is for the purpose of obviating the above-mentioned difficulties.

To enable those skilled in the art to fully understand and construct our invention, we will proceed to describe it.

A represents a frame, on the upper part of which a cylinder, B, is placed. This cylinder is provided with teeth *a*, which are placed on it in a series of rows, the teeth of every alternate row being opposite the centers of the spaces of the intermediate rows. The teeth *a* are of quadrilateral taper form, and their face sides (designated by 1) have a tangential or nearly tangential position relatively with the periphery of the cylinder B, their opposite sides, 2, having a radial position on the cylinder, as plainly shown in Fig. 1. Two longitudinal scrapers, *b b*, are placed on the cylinder B at opposite points, the edges of said scrapers extending outward a trifle or short distance beyond the edges of the teeth *a*. The teeth *a* terminate in points, as shown clearly in Fig. 2.

C C represent two feed-rollers, which are placed one over the other in the same plane and at the inner end of a horizontal feed-board, D, which is placed on the upper part of the frame. The point of contact or "bite" of the two rollers C C is in line with or on the same level with the upper surface of the feed-board D, and somewhat above the center of the cylinder B, as shown plainly in Fig. 1.

D D are two scutching-rollers, which are placed in the frame A directly below the feed-rollers C C. The scutching-rollers are formed of longitudinal blades or scrapers *c*, attached to shafts. The blades or scrapers may be cast with the shafts. In the drawings, Fig. 1, four blades are shown on each roller; but more or less may be used, as desired. The journals of the rollers D D are placed at such a distance apart that the edges of the blades or scrapers *c* approach quite near each other as the rollers rotate.

E E are two rollers, around which an endless apron, F, passes. This apron is placed below the scutching-rollers D D, and rather at one side of them, as shown in Fig. 1.

The breaking-cylinder B and feed-rollers C C and scutching-rollers D D are all parallel with each other. The upper feed-roller, C, has a spring, *e*, bearing upon it at each end.

Motion is given the breaking-cylinder A by

any proper means, and motion is given the feed-rollers C, scutching-rollers D D, and the endless apron F by means of gearing *f, g, h, i, i,* and *j*, and the several wheels are of such a size relatively with each other that the feed-rollers C C have the slowest movement of all the parts. The breaking-cylinder B has a quicker movement than the feed-rollers. The scutching-rollers move quicker than the feed-rollers, but a trifle slower than the breaking-cylinder. The hemp is placed on the feed-board D, and passes between the feed-rollers C C and down between the scutching-rollers E E. In consequence of the feed-rollers C C rotating slower than the scutching-rollers D D, the blades *c* of said rollers are enabled to strip the shives or bruised portions of woody matter from the fiber as the hemp is held by the rollers C C, they, in consequence of the difference of speed between them and the scutching-rollers D D, serving the office of holders as well as feeders. The teeth *a* on the cylinder B, in consequence of their form, penetrate the hemp and bruise or break the woody portion without injuring the fiber, while the scrapers *b* remove a portion of the woody matter, and thereby lighten to a certain extent the duty of the scutching-rollers D D. The feed-rollers having a slower movement than the breaking-cylinder B, serve to hold back the hemp, and by the faster action of cylinder B, the material is stretched between said cylinder and the feed-rollers. This stretching is produced by the taking hold of the hemp by the teeth of the cylinder B. The advantage of the stretching is that the material is kept spread out in an even condition, so that all the teeth of cylinder B, as they revolve, have a fair chance to enter, comb, and act upon the material. Indeed, there would be no combing action by the teeth of the cylinder B if the hemp were not stretched, as stated. In the same manner the hemp is stretched between the scutching-rollers D D and the breaking-cylinder B. The movement of rollers D D being faster than the delivery of the material by

the cylinder B, the hemp is kept stretched and laid out evenly in a fair condition to receive the whipping and clearing action of the wings of rollers D D. By this stretching of the material during its passage through the machine, the employment of breaking-cylinders whose teeth press the fibers hard up against a concave or rest and break the fiber into two is avoided. This stretching also obviates the necessity of employing rollers whose teeth mesh into each other, and thus break, injure, and waste the fiber.

We regard our improvement to be one of great value and importance, for, by avoiding the use of mechanism which breaks the fiber or cuts it into short lengths, none of the material is wasted, and it comes from the machine in a better state, having larger and stronger fibers, than when dressed in the ordinary manner.

We do not claim separately, or in itself considered, either of the parts herein shown and described; nor do we claim the broad idea of operating upon both sides of the hemp simultaneously, for this is seen in the device of F. P. Holcomb, patented March 13, 1847, where the hemp is carried in between a pair of rollers, the teeth of which mesh together; but

What we claim as new in hemp-brakes, and desire to secure by Letters Patent, is—

The arrangement and operation of the feed-rollers C C, scutching-rollers D D, and breaking-cylinder B, as herein set forth, whereby the hemp is stretched between the feed-rollers and breaking-cylinder, and also between the latter and the scutching-rollers, the material while thus stretched being acted upon by the breaking-cylinder B and the scutching-rollers D D, all as described.

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Witnesses:

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