

(No Model.)

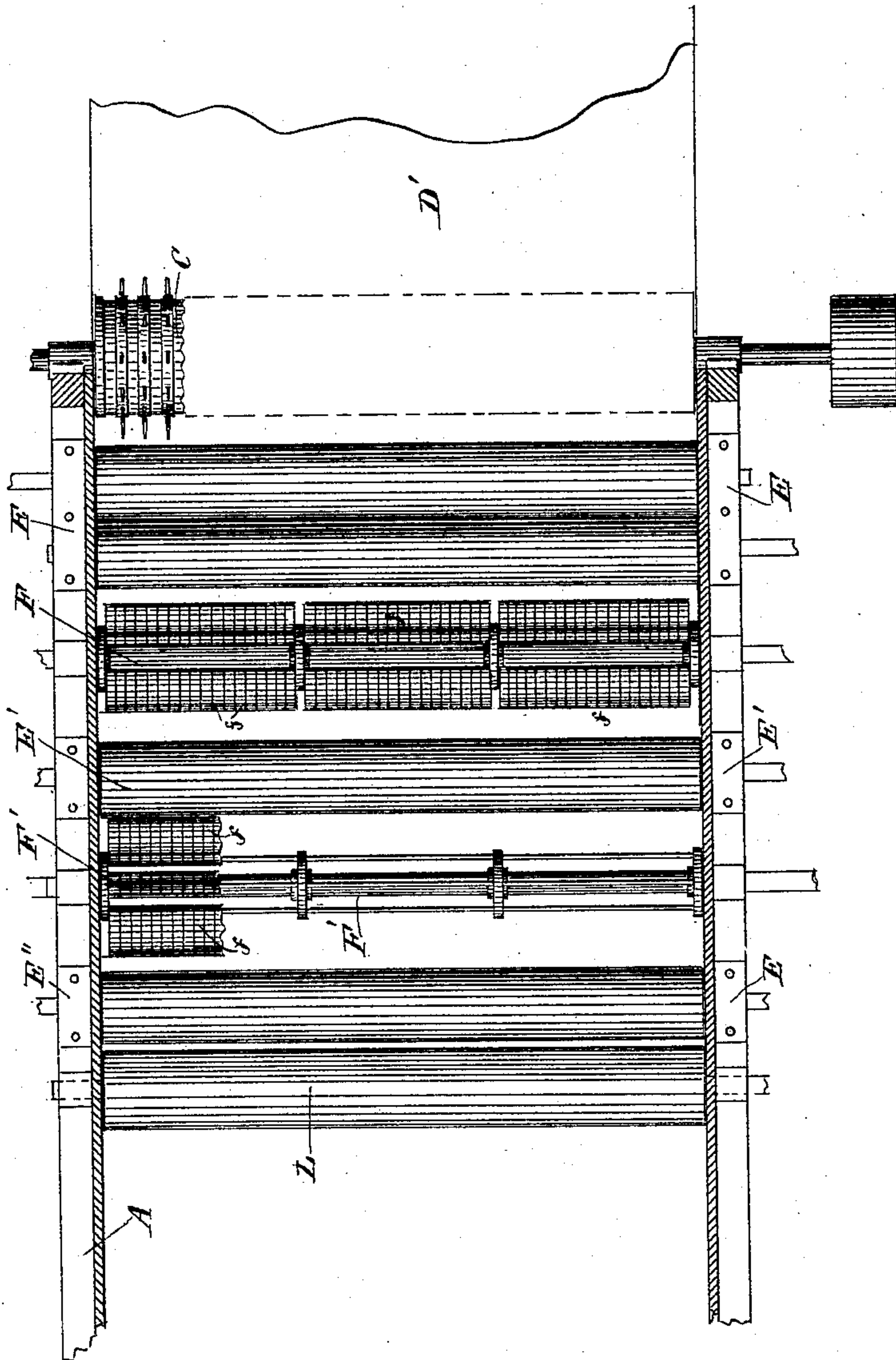
2 Sheets—Sheet 2.

G. Y. SMITH & J. McGRATH.
FLAX THRASHER.

No. 452,442.

Patented May 19, 1891.

Fig. 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

GEORGE Y. SMITH AND JOHN McGRATH, OF MINNEAPOLIS, MINNESOTA,
ASSIGNORS TO GEORGE N. LYMAN, SR., OF SAME PLACE.

FLAX-THRASHER.

SPECIFICATION forming part of Letters Patent No. 452,442, dated May 19, 1891.

Application filed January 30, 1891. Serial No. 379,672. (No model.)

To all whom it may concern:

Be it known that we, GEORGE Y. SMITH and JOHN McGRATH, citizens of the United States and Great Britain, respectively, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Flax-Thrashers; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention has for its primary object to provide an efficient flax-thresher of large capacity, which will leave the straw intact and uninjured in proper condition for use for fiber. To this end in a frame similar to that of an ordinary thrashing-machine we arrange transversely to the travel of the straw sets of parallel crushing-rollers, the different sets being spaced apart from each other, and in the spaces between the sets of rollers we place beaters of a special construction, the same consisting of revolving supports provided with series of radial arms loosely pivoted thereon eccentrically to the axes of the supports. The successive beaters act on the opposite sides of the straw. In the head angle between the rollers and the beaters are located narrow concaves which act as bases of resistance or thrashing-beds for the strokes of the radial arms. Before the forward set of rollers there is placed a toothed feed-roller, under which is located a pivoted feed-table. The feed-wheel stands in a transverse slot or opening in the forward end of the frame, which may be provided with vertically-adjustable gates for varying the feed. Back of the rearmost set of rollers may be located a star-shaped tumbler of the ordinary construction. Spanning the spaces between the sets of rollers above and below the beaters are located concave shells, of which those on the under side are perforated for the passage of the seed. Under and to the rear of the rollers are placed the ordinary grain-belt, straw-carrier, cleaning-sieves, fan, &c.

The machine is illustrated in the accompanying drawings, wherein like letters refer to like parts throughout.

Figure 1 is a vertical longitudinal section;

Fig. 2, a plan view of the thrashing mechanism. Fig. 3 is a detail in end elevation of the beater; and Figs. 4 and 5 are details in plan and section, respectively, of the concave.

A is the main frame, provided with the transverse opening *a* in its front wall.

B B are adjustable gates or slides for varying the size of the opening.

C is the toothed feed-wheel. D is a fixed curved bed under the same, and D' the pivoted feed-table.

E, E', and E'' are the sets of crushing-rollers, and F F' are the beaters. The first group or set of crushing-rollers are four in number, or two pair arranged side by side, one over the other. The others, E' and E'', are single pairs. The upper roller of each pair has sliding journals under spring-tension, as shown at *e*. The rollers are therefore automatically adjustable to the work. The lowermost limit to the adjustable roller is such that the rollers do not quite meet, thus preventing the crushing of the seed or the injury of the straw. The beater is composed of the trundle-wheel and the radial arms *f* loosely pivoted on the rungs of the wheel. These arms are of metal, so as to have considerable weight, and are curved backward toward their tips. They are placed as close to each other as possible on the rungs of the trundle-wheel, and when the wheel is in rapid motion they stand outward on radial lines and strike the straw with a series of yielding strokes. As shown, the two beaters are revolved in opposite directions, the first revolving toward the front of the machine, and the second toward the rear. The first will therefore strike the top of the straw and the second the under side of the same.

G are the concaves.

H are the perforated shells.

K are the imperforate shells, and L is the star-shaped tumbler beyond the rear pair of rollers.

M is an inclined chute located under the crushing-rollers or part of them for delivering the bolls and seed to the grain-belt N.

P is the straw-carrier; Q, one of the sieves; and R indicates the position of the fan.

The operation is as follows: The flax is laid on the table or dropped into the gravity

feed-box, formed by the table when raised into its inclined position, and is fed to the rollers parallel therewith. The double pair of crushing-rollers at the head of the series will sever most of the bolls and crush the same, permitting the separation of the seed. On passing from this set the straw is caught and given a series of strokes by the beater F against the concave G, the effect of which is to thoroughly loosen up the straw, turn the same over and continue the thrashing action. From the beater F the straw passes to the second set of rollers, where the thrashing action is continued, and thence to the second beater, passing over the same, this beater acting on the under side of the straw and delivering it to the last pair of rollers, by which time the thrashing should be complete. The tumbler L will shake out the last portions of the seed from the straw onto the grain-belt N, which will deliver the seed to the sieves and the straw to the carrier in the usual manner.

This machine has a very large capacity. The peculiar character of the beaters employed and their relation to the crushing-rollers effectually overcomes one of the greatest difficulties incurred in ordinary flax-thrashers—viz., the matting of the straw by the crushing-rollers. The straw is very liable to come from the rollers, especially when the least bit damp, in a matted mass, from which it has been practically impossible to separate the crushed bolls and seed, or effect any further thrashing in succeeding sets of rollers. These beaters both loosen up the straw and assist in the thrashing and the separation as the material passes from one set of rollers to the other, making the thrashing and separation complete. The straw comes from the machine in an uninjured condition, so that the same may be used for fiber.

The relative arrangement of the beaters and the crushing-rollers, whereby the action of the successive beaters takes effect on the opposite sides of the straw, is of large importance toward the successful operation of this machine. The fact that the radial arms of the beaters are eccentrically pivoted to the revolving support, whereby the centrifugal force is made to control their strokes, is also a very important feature, as it gives a yielding stroke of considerable power which will loosen up the straw without injuring the fiber.

It should be noted that the concaves and the shells may be made adjustable, so as to regulate the stroke of the radial arms and the clearance under the beaters. Of course

the force of the stroke, apart from the question of clearance effected by the position of the concave, will depend upon the weight of the arms and the speed at which they are driven. Though especially designed for thrashing flax, the machine may of course be employed to thrash other grains, such, for example, as rye, where it is desirable to save the straw in an unbroken condition. The especial form of beater herein shown and described is also capable of general application in thrashing-machines, though the particular necessity for it in other uses is not so great.

What we claim, and desire to secure by Letters Patent of the United States, is as follows:

1. The combination, with the sets of crushing-rollers, of the beaters between the sets of rollers, each consisting of a revolving support having radial arms eccentrically pivoted thereto, concaves in the head angles between the rollers and the beaters, and shells spanning the spaces between the rollers above and below the beaters, substantially as described.

2. The combination, with the successive sets of crushing-rollers, of the beaters located between the sets of rollers, the beaters between the successive sets of rollers revolving in opposite directions and acting on opposite sides of the straw, substantially as described.

3. In a thrashing-machine, the beater consisting of a revoluble trundle-wheel arranged transversely to the travel of the straw and having several rungs, and a series of metallic radial arms with backwardly-curved tips loosely pivoted on the rungs of said wheel, substantially as and for the purpose specified.

4. The flax-thresher comprising the parallel sets of crushing-rollers adapted to a parallel feed, the beaters located between the sets of rollers, each consisting of a trundle-wheel having several rungs and a series of metallic radial arms with backwardly-curved tips loosely pivoted on the rungs, the successive beaters revolving in opposite directions and acting on opposite sides of the straw, the thrashing concaves, the shells spanning the spaces between the rollers under the beaters, the lower shells being perforated, and the tumbler beyond the last set of rollers, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

GEORGE Y. SMITH.
JOHN McGRATH.

Witnesses:

EMMA F. ELMORE,
JAS. F. WILLIAMSON.