

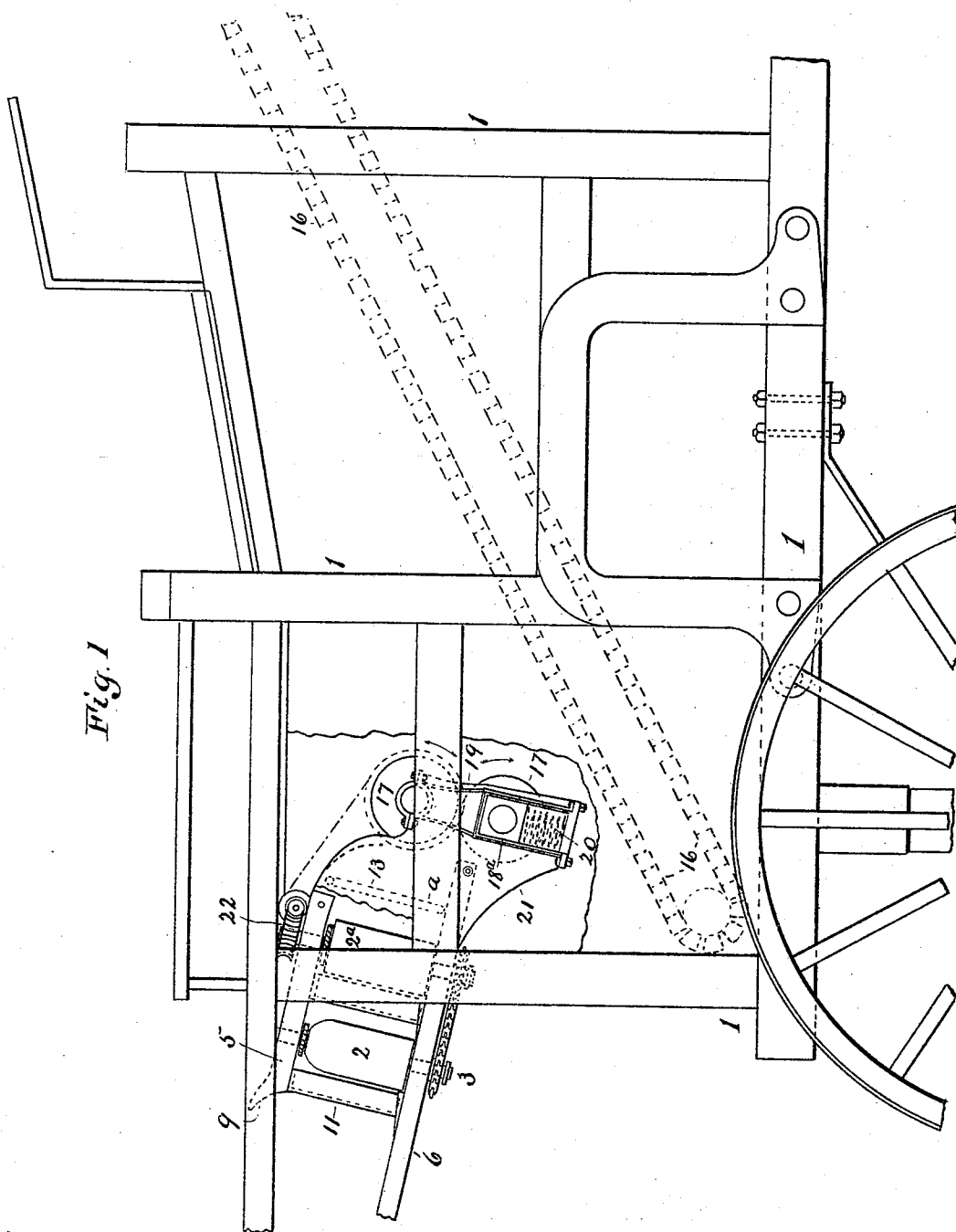
(No Model.)

4 Sheets—Sheet 1.

J. M. SMITH.
FLAX THRASHER.

No. 478,542.

Patented July 5, 1892.



Witnesses:
Katharine M. M. M.
A. L. Jones.

Inventor
John M. Smith
By P. H. Guenckel
His Attorney

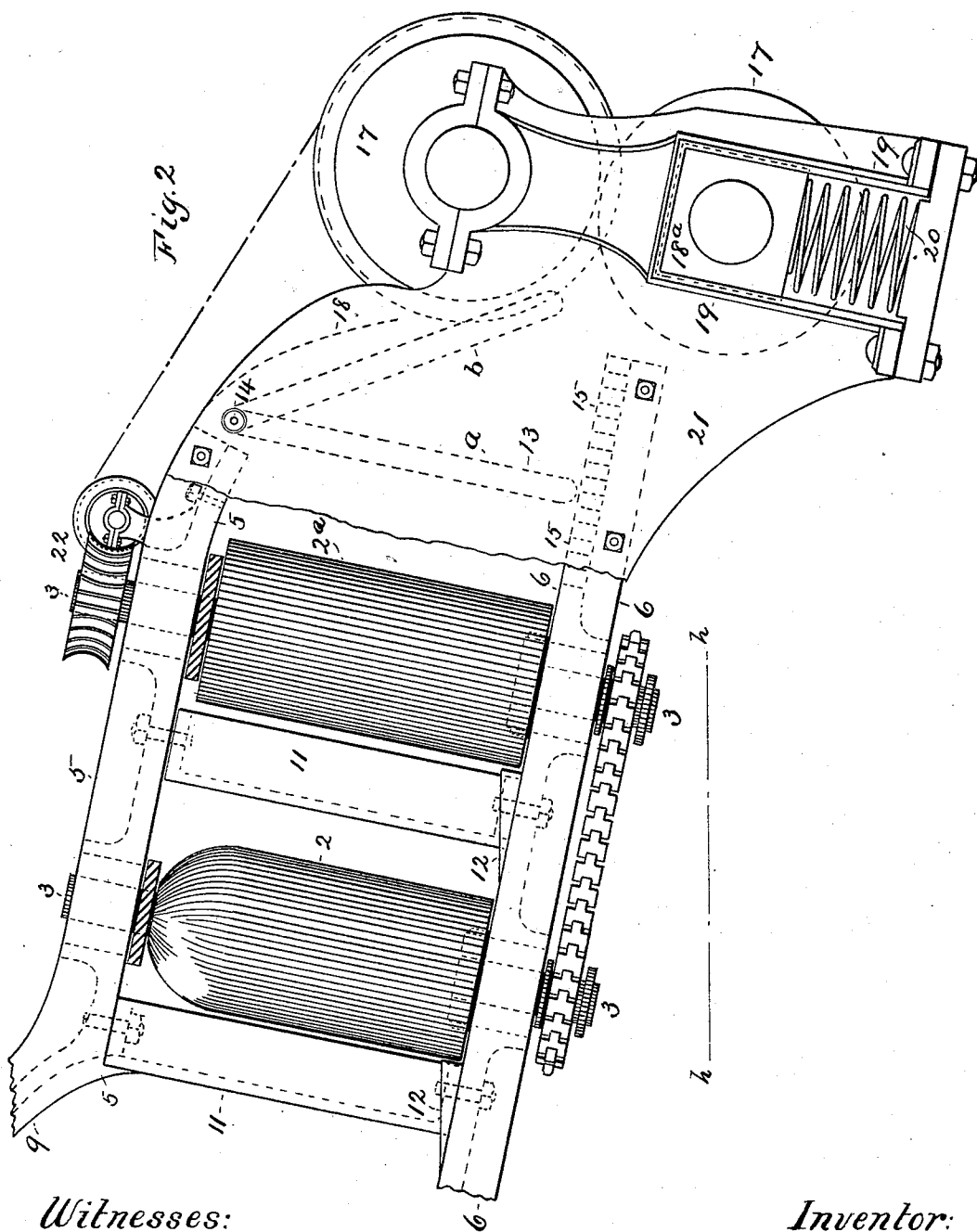
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4 Sheets—Sheet 2.

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FLAX THRASHER.

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Witnesses:

Katharine Moran
A. L. Jones.

Inventor:

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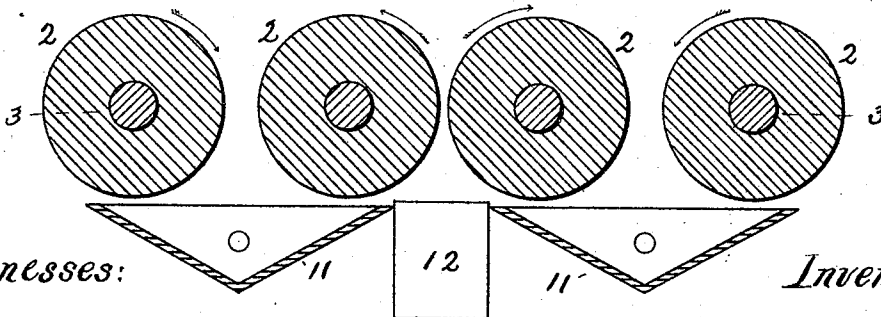
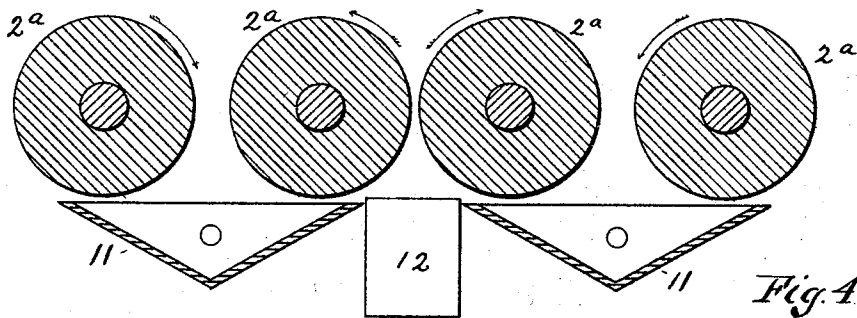
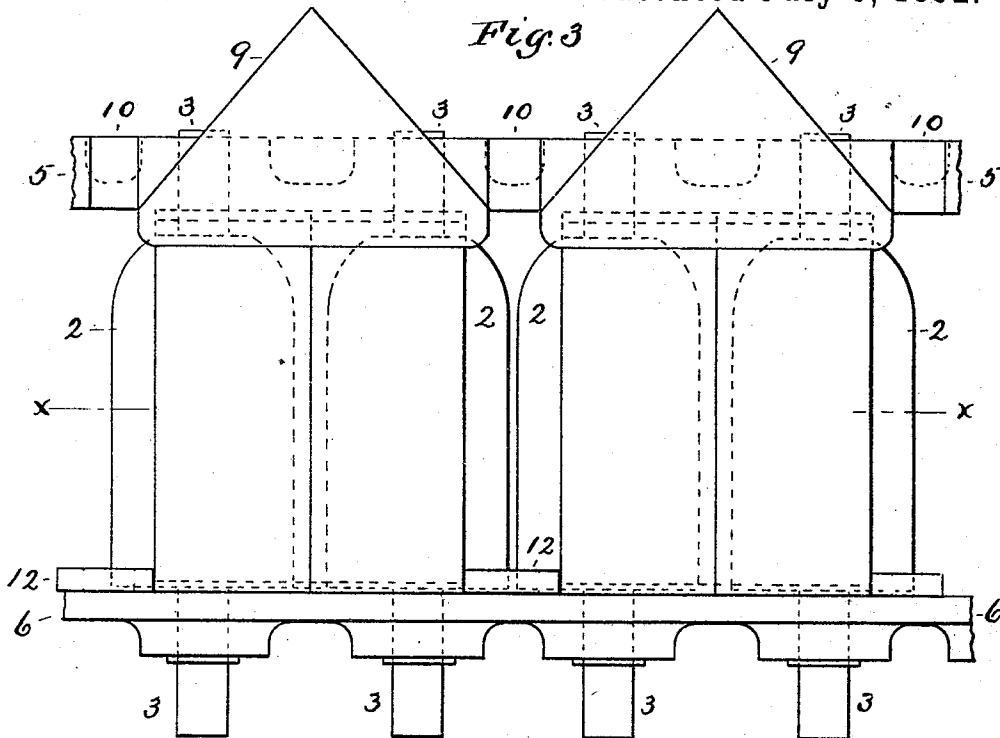
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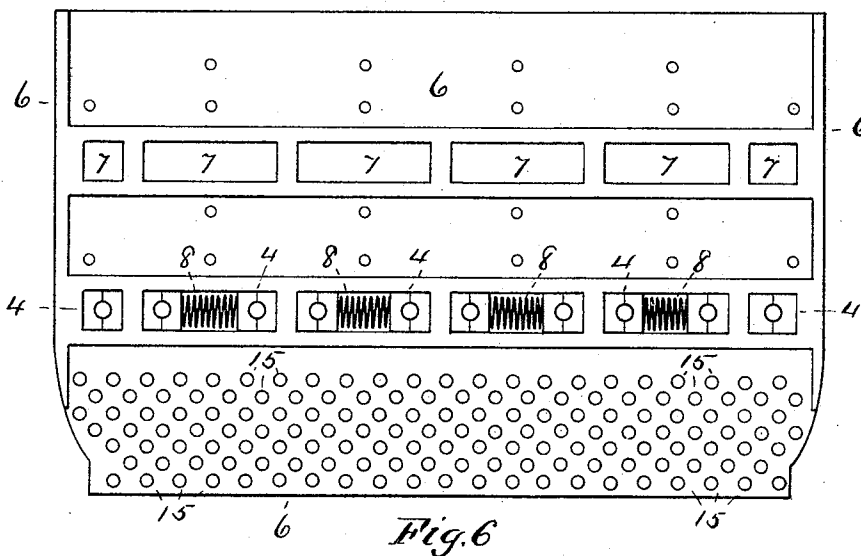
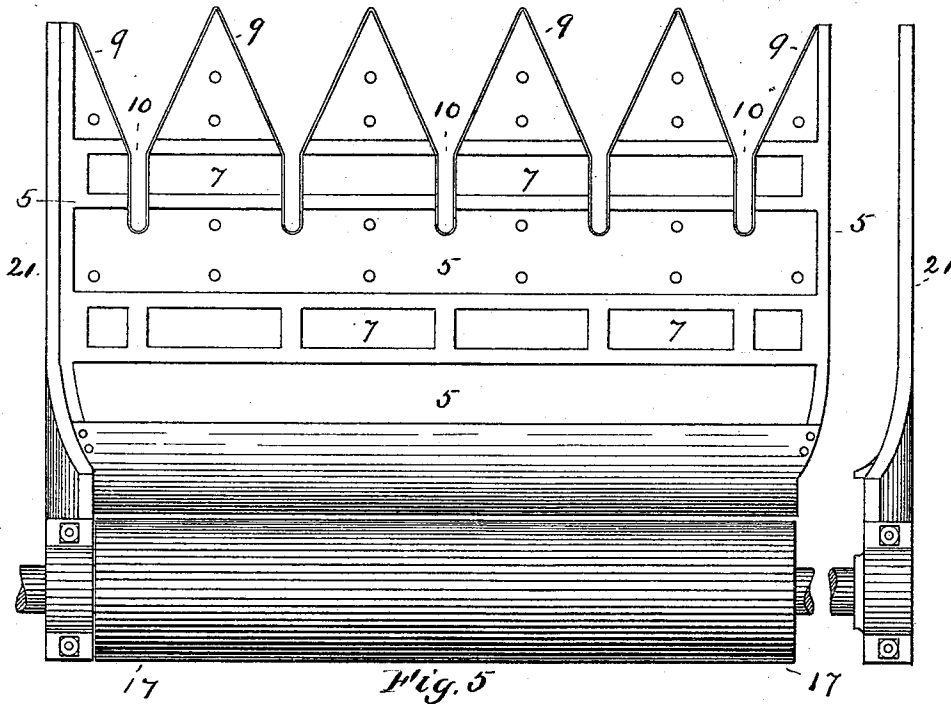
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4 Sheets—Sheet 4.

J. M. SMITH.
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Witnesses:
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UNITED STATES PATENT OFFICE.

JOHN M. SMITH, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR OF ONE-HALF TO
PATRICK H. GUNCKEL, OF SAME PLACE.

FLAX-THRASHER.

SPECIFICATION forming part of Letters Patent No. 478,542, dated July 5, 1892.

Application filed August 31, 1891. Serial No. 404,175. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. SMITH, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Flax-Thrashers, of which the following is a specification.

My invention relates to machines for separating flaxseed from its stalks; and the object of the invention is to produce devices for effecting such separation with the least injury to the straw in order that the straw may be preserved in suitable condition for manufacturing purposes. This object is accomplished by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the front portion of an ordinary thrashing-machine provided with my improvements. Fig. 2 is an enlarged side elevation of a portion of the devices of my improvement. Fig. 3 is a front elevation of the same. Fig. 4 is a partial transverse section on the line *xx* of Fig. 3, and Figs. 5 and 6 are plan views of the top and bottom plates for supporting the devices in place.

The devices of my improvement may be used in a special machine adapted to them or in connection with an ordinary thrashing-machine. They are illustrated in the drawings in connection with a machine of the latter character. In such drawings 1 designates portions of the forward part of the frame of a thrashing-machine of the character of the well-known "Pitts" machine, from which the cylinder and concave have been removed. The devices of the improvement are placed in the portion of the machine usually occupied by the concave and cylinder.

The primary thrashing mechanism consists of a series of rotary rollers 2, set in vertical or nearly vertical position and co-operating in pairs as thrashing devices. The rollers of each pair are caused to rotate in opposite directions, so that the contiguous faces of the rollers of a pair move inwardly or toward the rear of the machine, and these faces are preferably a slight distance apart—say a sixteenth of an inch, which is sufficient to grasp the flax-straws and carry them through without permitting the bolls to pass through un-

crushed. The rollers of the series have their spindles 3 in boxes 4, that are supported, respectively, in an upper plate 5 and a lower plate 6. The boxes are placed in openings 7 in these plates, and between the loose box-sections for adjacent pairs of rollers are spring devices 8, which permit such portions of the boxes to yield in direction away from the faces of co-operating pairs of rollers, so that when sticks or other objects thicker than flax-straws are inserted between the faces of co-operating rollers each roller is adapted to yield in direction away from the other, both at its upper and lower end, and when such obstruction is removed both rollers will resume their normal positions.

The upper plate 5 is provided at its forward end with a series of pointed tongues 9, between which are slots 10, extending rearward in the plate for directing the straws to the engaging surfaces of the rollers. In front of the rollers and parallel to them are V-shaped deflectors 11, extending between rollers of adjacent pairs and covering a portion of their outer surface, so as to prevent straws or other objects from being thrust in between rollers of adjacent pairs and permitting them to enter only between rollers of co-operating pairs. These angular plates 11 extend from the base-plate to the top plate, and intermediate the angle-plates are inclines 12 for directing the straws slightly upward to prevent them from passing under the lower ends of the rollers.

In feeding flax to the device for thrashing it the stalks are laid on the tongues 9 at an inclination to the rollers and with the butts inward. This is preferably done by setting the rollers at an inclination about as shown and feeding the straw by laying it on in about horizontal position. Thus arranged the effect of the operation of the rollers is to draw the straw inward, and at the same time work it toward the lower ends of the rollers as it is passing through, so that the upper ends of the engaging surfaces of the rollers are free to receive a second straw before the first has been passed entirely through. The upper ends of the rollers are preferably tapered or rounded in order that the straw may pass the more readily to the engaging surfaces.

In rear of the series of rollers 2 is a second

series of similar rollers 2^a, (which, however, need not have their upper ends rounded,) and the rollers of this second series serve to engage the ends of the advancing straws before they have been entirely freed from the rollers of the first series to carry them onward in nearly-horizontal position. The rollers of this second series are supported by the top and bottom plates in boxes similar to those of the first series, and intermediate the two series of rollers are vertical angular plates 11, similar to those at the front and for a like purpose. In rear of the second series of rollers are fingers 13, pendent from a shaft 14, to which longitudinal reciprocation is given by any well-known means for the purpose of causing the fingers to vibrate laterally between rollers of adjacent pairs to beat the straw as it is fed through the second series of rollers and free it of any seeds, chaff, dust, or other matter that may be adherent. In case the straw becomes clogged on the fingers provision is made to permit them to swing rearward by means of any suitable spring device bearing against the shaft or against the box in which it has its bearings. The normal working position of these fingers is shown by the dotted lines *a*, parallel to the rollers, and the position to which they may swing by the dotted lines *b* at a rearward inclination.

The flaxseed, chaff, dust, and other matter freed from the straw while the latter is being passed through the rollers fall upon the lower plate and by reason of its inclination flow inward to the rear portion of the plate having perforations 15, which permit such matter to fall below to an apron 16 or other device for conducting it away.

The straw after passing the last series of rollers passes between a pair of horizontal rollers 17, immediately in rear of the lower plate. A deflector 18 (shown by dotted lines) serves to prevent straws from being thrown above the rollers and they are prevented from falling below by the lower plate. These latter rollers serve to deliver the straw from the thrashing mechanism on a horizontal plane, and from them it may be made to pass onto the apron 16 or other conveyer. The upper of these rollers may be placed with its shaft in the position usually occupied by the cylinder-shaft in the thrashing-machine and the lower roller supported in a box 18^a, guided in hangers 19. The box is supported by a spring 20 to permit the lower roller to yield when a thick mass of straw passes between the two rollers. These hangers may be provided on side plates 21, which also serve to inclose the sides of the plates 5 and 6 and the operating-rollers, and which may be made to fit into the forward portion of the frame of the thrashing-machine.

The several rollers of the first and second series may be driven by means of gear-wheels or by a worm-gear 22 or in any other well-known manner.

It will be apparent that while the devices

of the improvement have been illustrated and described in connection with an ordinary thrashing-machine they may also be used in connection with a machine of special construction. My object in the present instance is only to show the devices of the improvement in connection with one form of mechanism adapted to take care of the product of its operation.

Having described my invention, what I claim is—

1. In a flax-thrasher, the combination, with a series of relatively vertical rollers co-operating in pairs, of the angular guards intervening the pairs of rollers at the front and the inclined tapering guides at the top for directing flax to the co-operating rollers, substantially as set forth.

2. In a flax-thrasher, a series of rollers having tapering ends arranged in relatively vertical position with their tapering ends uppermost, devices for rotating them in opposite directions and causing them to co-operate in pairs as thrashers, and devices for directing the flax to the upper ends of the rollers at an inclination to their axes, whereby the flax is moved axially along the rollers as it is being carried onward, substantially as set forth.

3. In a flax-thrasher, a series of rollers in relatively vertical position for thrashing the flax and conducting the straw inward in vertical planes, and co-operating horizontal rollers for spreading it on a lateral plane, substantially as set forth.

4. A flax-thrashing mechanism comprising co-operating pairs of rollers in relatively vertical position, devices for feeding the grain to the upper ends of the rollers, and upper and lower plates providing the bearings for the rollers, the said mechanism being adapted to be inserted in the space usually occupied by the concave and cylinder of an ordinary thrashing-machine, substantially as set forth.

5. In a flax-thrasher, a primary thrashing mechanism consisting of a series of relatively vertical rollers co-operating in pairs, guiding devices for feeding flax to their upper ends at an inclination to their axes, and a secondary thrashing and carrying mechanism consisting of a corresponding series of rollers co-operating in pairs and arranged to take the straw from the rollers of the first series and carry it onward in vertical planes, substantially as set forth.

6. In a flax-thrasher, a series of rollers having their upper ends tapering and arranged in relatively vertical position, means for rotating them in opposite directions, whereby they co-operate in pairs as thrashers, and slotted guides for directing the flax in downward direction to the space between the upper ends of the rollers of each pair and causing it to be caught by the rollers at an inclination to their axes, substantially as set forth.

7. In a flax-thrasher, a plurality of series of co-operating rollers arranged in corresponding vertical planes, whereby the straw is car-

ried onward from one pair of rollers to the next in horizontal direction, but in vertical layers, substantially as set forth.

5 8. In a flax-thrasher, a series of relatively vertical rollers co-operating in pairs, and upper and lower plates providing bearings for the rollers, and the former also providing the guides for directing the flax to the rollers, substantially as set forth.

10 9. The combination, with the series of rollers co-operating in pairs as thrashers, of the cap-plate providing the guides and slots for directing the flax to the heads of the rollers, substantially as set forth.

15 10. In a flax-thrasher, a suitable frame-work, series of rollers in relatively vertical position, devices for directing the flax to the rollers, means in rear of the rollers for agitating the straw laterally, and means for spreading it, 20 in combination with screening and conveying devices, substantially as set forth.

25 11. In a flax-thrasher, a series of rollers in nearly vertical position and co-operating in pairs, and devices for feeding flax-stalks in substantially horizontal position to them, substantially as set forth.

30 12. In a flax-thrasher, a series of rollers in nearly vertical position and co-operating in pairs, devices for directing flax-stalks in substantially horizontal position to them, and a second series of co-operating rollers parallel to the first and arranged to engage and ad-

vance the flax delivered by the rollers of the first series, substantially as set forth.

13. In a flax-thrasher, a series of rollers in 35 nearly vertical position and co-operating in pairs as thrashers, and guides intermediate the pairs of rollers, substantially as set forth.

14. The combination, with a series of oppositely-rotating co-operating rollers in rela- 40 tively vertical position and having their upper ends tapering, of a series of guides projecting above and to the front thereof for directing the flax in substantially horizontal position to the upper ends of the pairs of 45 rollers, substantially as set forth.

15. In a flax-thrasher, a plurality of series of rollers, those of each series co-operating in pairs, arranged to carry the straw onward in vertical planes, means for agitating the straw 50 as it passes from the last of said rollers, and means for spreading the straw laterally after it has passed the agitating device, substantially as set forth.

16. In a flax-thrasher, a plurality of series 55 of co-operating substantially vertical rollers arranged in corresponding vertical planes, and guiding devices at the sides and top and bottom of the pairs of rollers for directing the straw, substantially as set forth.

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Witnesses:

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A. L. JONES.