

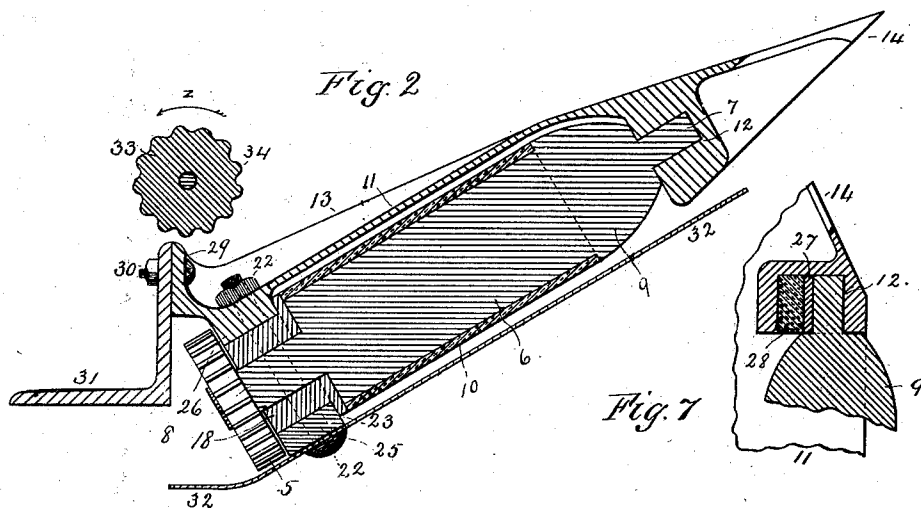
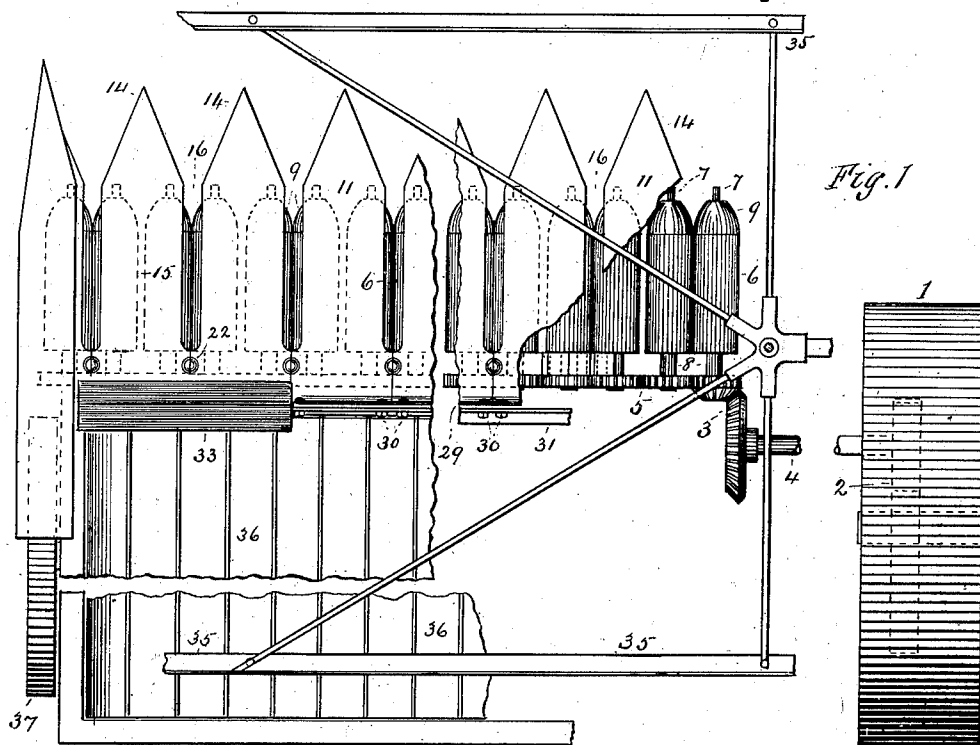
(No Model.)

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J. M. SMITH.  
FLAX PULLER.

No. 472,234.

Patented Apr. 5, 1892.



Witnesses

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C. B. Martin,

Inventor

John M. Smith  
By Mrs. Attorney  
P. H. Gunkel

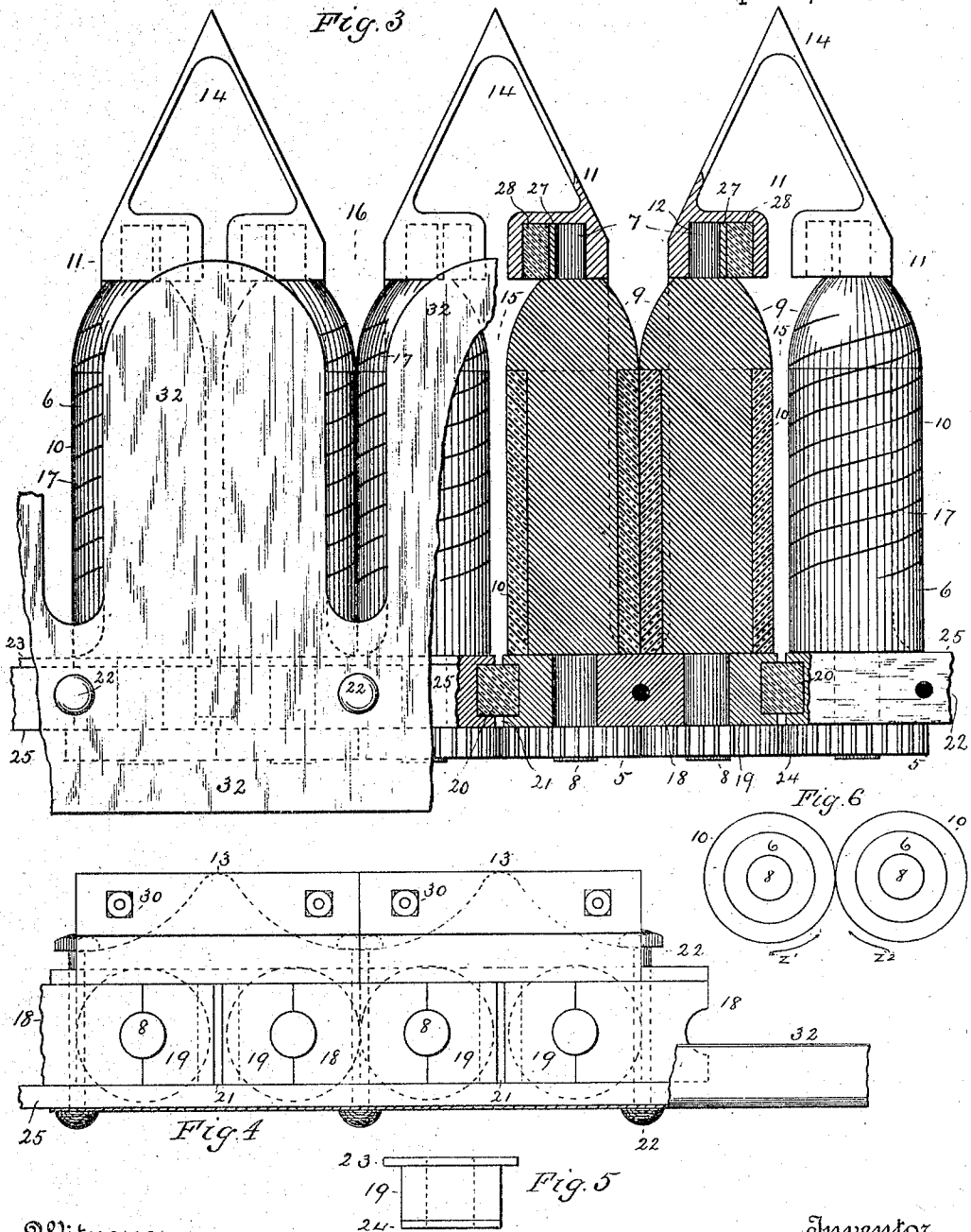
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# UNITED STATES PATENT OFFICE.

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

## FLAX-PULLER.

SPECIFICATION forming part of Letters Patent No. 472,234, dated April 5, 1892.

Application filed January 28, 1891. Serial No. 379,375. (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-Pullers, of which the following is a specification.

My invention relates to devices for pulling flax from the ground to save all of the fiber and the seed, and has for its object the organization of a mechanism that will serve efficiently to pull the flax and also to deliver it to a table or carrier with the stalks substantially parallel to one another. This object is accomplished by the devices illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of portions of the machine, parts being broken away to show other parts more clearly. Fig. 2 is a vertical longitudinal section, enlarged, of one of the pulling-rollers and its supporting devices. Fig. 3 is a view from the under side of several of the rollers and their connecting devices. Fig. 4 is an elevation of the rear end of the guards shown in Fig. 3 and the boxes for the rollers. Fig. 5 is a detail of one of the boxes. Fig. 6 is a rear end view of a co-operating pair of the rollers, showing their directions of rotation; and Fig. 7 is a detail of a yielding bearing for the front end of one of the pulling-rollers.

The devices of the improvement are adapted to be used in a machine constructed upon the principle of an ordinary harvesting-machine, or by slight modifications of mechanism, to be used in place of the cutter-bar in the ordinary harvesting-machines.

In the accompanying drawings, 1 designates the master-wheel of the machine, which is provided with internal gears 2 for driving the several operative parts of the machine. Connections for the several operative parts may be made with this driving mechanism in any well-known manner.

In the drawings a miter-gear 3 on a shaft 4, that is driven by means of connections with the driving-gear, is utilized to drive a train of gears 5 for operating the pullers. The pullers consist of co-operating pairs of rollers 6, 50 having at their opposite ends spindles 7 and

8, respectively. These rollers are preferably provided with tapering heads 9 for directing the flax inward to the contact-surfaces, and the contact-surfaces of the body are preferably coated with rubber or other yielding substance 10, in order that a firm hold may be taken of straws or other objects of varying thickness without injurious crushing of the thicker or undue strain on the pulling devices. The yielding contact-surface may be supplied by a rubber or other sleeve slid over the body of the roller from the rear to the head 9 and secured in place by cement or otherwise. Intermediate the pairs of rollers are provided guards 11, and in the forward ends of the guards are provided sockets 12, which furnish the bearings for the forward spindle 7 of the rollers. The guards are preferably of thin metal with a stiffening-rib 13 and have pointed forward ends 14. The position of the guards and the bearings they provide are such that the two rollers which they partially cover are separated by a slight space 15, and a space 16 intervenes between the edges of the guards next the line of juncture of the co-operating rollers, and the co-operating rollers in the space 16 between the guards are in contact or separated only by a narrow space. The tapering front ends of the guards should be of suitable form to deflect the stalks of the flax toward each side and to position to be engaged by the pullers. It is desirable that the engaging surfaces of the rollers have spiral corrugations, projections, or grooves 17, adapted to work the stalks toward the rear ends of the rollers as they are carried through by the rotations of the rollers, so that when stalks are grasped between the pullers they will be worked inward as well as upward to make room at the front ends of the pullers for other stalks, while the first may not yet have been discharged.

The rear spindles 8 of the rollers have bearings in boxes composed of two parts 18 and 19, which may be held to contact with the rear ends of the rollers, so as to prevent longitudinal movement of the latter while permitting free rotation. Between the loose portions 19 of the boxes for each pair of rollers there may be interposed a block 20 of rubber 100

or other spring device of suitable character, serving to hold the rollers of a pair in contact, and yet capable of yielding slightly to any unusual lateral pressure to avert injury to the devices. The edges of the boxes adjacent to the spring device 20 are separated by a suitable space 21, to permit the required lateral movement. The portions 18 of the boxes, which are between the spindles of the rollers of a co-operating pair, may be secured in rigid position by means of bolts 22. The boxes have at their forward ends flanges 23 at the four sides and at their rear ends flanges 24 only on the vertical sides, as indicated in Figs. 2 and 5. These flanges at the front serve to cover the ends of the rollers, and the rear lateral flanges to hold the spring devices 20 in place. All of the boxes of the series may be supported on a single bar 25, on which they rest, and which bears against their forward flanges. The guards 11 have downward flanges 26, which fit upon the upper surfaces of the boxes and bear against their forward flanges 23. Thus the rollers by reason of their forward bearings in the heads of the guards and their rear bearings on the ends of the boxes, which are firmly secured between the bar 25 and the flanges 26, are prevented longitudinal movement. To permit slight lateral play in opposite directions of the front ends of the rollers of a pair, the bearings in the guard-heads may be provided with a loose box-section 27, backed by a block of rubber 28, or other spring device. (See Fig. 7.) In this way both ends of each roller of a pair are capable of slight independent movement in direction away from the fellow roller. The gears 5 permit this lateral play by having their cogs working short of the full depth of the interdentil spaces.

The guards have at their rear ends upward flanges 29, which are secured by bolts 30 to an angle-bar 31 or other suitable portion of the frame of the machine. On the face of the bar 25 is secured a guard or apron 32, which may extend rearward for the protection of the gearing and forward for the protection of the rollers, the latter portion being provided with slots coincident with the spaces 16.

On the spindles 8 of the rollers are secured the gear-wheels 5, which are in mesh when the rollers are suspended in place, as shown. Any one or more of the guards, together with the rollers they carry, can be removed at pleasure by removing the bolts 22 and 30.

The position of the guards and the rollers they carry may be parallel to or, preferably, at a slight inclination to the ground over which they operate, so that in the operation of pulling and delivering flax it will be carried slightly backward toward the platform instead of in vertical direction.

In the rear of the pullers, in position to receive the stalks pulled by them, there may be

provided a roller or other carrier 33. If a roller, it should have a corrugated or roughened surface 34, adapted to prevent the stalks from slipping on its surface, and be rotated in the direction of the arrow  $z$  to convey the stalks toward the platform of the machine.

A reel 35, operating over and in front of the pullers, may be provided for bending the stalks backward to position to be more readily grasped by the pullers and for aiding in carrying them rearward to the platform. Over the platform may be provided an apron 36 or other carrying device for conducting away the flax delivered upon it. The reel and the roller 33 may be driven by any of the usual devices for such purpose, connected to the driving mechanism of the machine.

In operation, the machine being supported on the wheels 1 and 37 and being propelled forward, the stalks of flax are deflected by the guards to the spaces between them, the reel serving to bend the stalks toward the pullers and the rollers being in rapid motion, and those of each pair being rotated in opposite directions, as indicated by the arrows  $z'$  and  $z''$ , the co-operating rollers engage the stalks and pull them, and while moving them upward the spiral projections or depressions work them rearward. When the stalks have been passed through between the rollers, if not thrown rearward far enough by the rollers to fall upon the platform and if not caught by the reel immediately upon being freed from the rollers and thrown by it to the platform, they will be carried thereto by the roller 33.

Having described my invention, what I claim is—

1. In a flax-puller, a series of oppositely-rotating rollers co-operating in alternate pairs as pullers, and guards intermediate the pairs of pullers.

2. In a flax-puller, a series of oppositely-rotating rollers co-operating in alternate pairs as pullers, and intermediate guards providing bearings for the front ends of the pullers.

3. A flax-pulling mechanism comprising a series of rollers co-operating in pairs, a series of guards intervening the pairs of rollers, and means for rotating in opposite direction each roller of a pair.

4. In a flax-puller, a series of co-operating rollers and a series of independent guards providing bearings for the forward ends of the rollers and adapted to be separately detached.

5. In a flax-puller, a series of rollers co-operating in pairs, guards providing bearings for the front ends of adjacent rollers of adjacent pairs, boxes for their rear ends, a support therefor, and connections between such support and guard adapted to permit the separate removal of each guard, together with the rollers it carries and their bearings.

6. In a flax-puller, the combination with

pulling-rollers, of independent separately-detachable guards, each of which provides bearings for the forward ends of two rollers.

7. In a flax-puller, a series of co-operating rollers and intermediate guards, and a carrying-roller in their rear, for the purpose set forth.

8. In a flax-puller, a series of rollers co-operating in pairs, and independent guards intermediate the pairs of rollers, providing bearings for adjacent rollers of adjacent pairs.

9. A flax-pulling roller comprising a cylindrical body, a rounded head thereon of greater diameter than the body, and a yielding sleeve on the body having its exterior flush with the head, substantially as set forth.

10. The combination, with a series of rollers co-operating in pairs, of inclined guards intervening the pairs and serving to provide bearings, whereby the rollers may be held at a suitable inclination, for the purpose set forth.

11. A pulling-roller comprising a cylindrical body having an enlarged head, and a sleeve adapted to be slid on the body to the head and secured.

12. A series of rollers co-operating in pairs as pullers, independent guards intermediate the pairs and serving to support the roller-

journals, and a frame to which all of the guards are connected to support the rollers in a common plane.

13. A series of pairs of pulling-rollers, guards providing bearings for their forward ends; a frame to which all the guards are attached, and means for separately removing each guard, together with the two adjacent rollers of the adjacent pairs, substantially as set forth.

14. A series of pairs of pulling-rollers, guards separating the pairs and serving to support their bearings, a horizontal frame to which the guards are attached, devices connected to the rollers for rotating them, and a driving mechanism therefor provided at one side of said frame.

15. Flax-pulling devices comprising a series of rollers co-operating in pairs, bearings therefor, and guards for supporting them, the same being adapted to be connected to the frame of a harvesting-machine in the place of a cut-ter-bar, substantially as set forth.

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Witnesses:

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