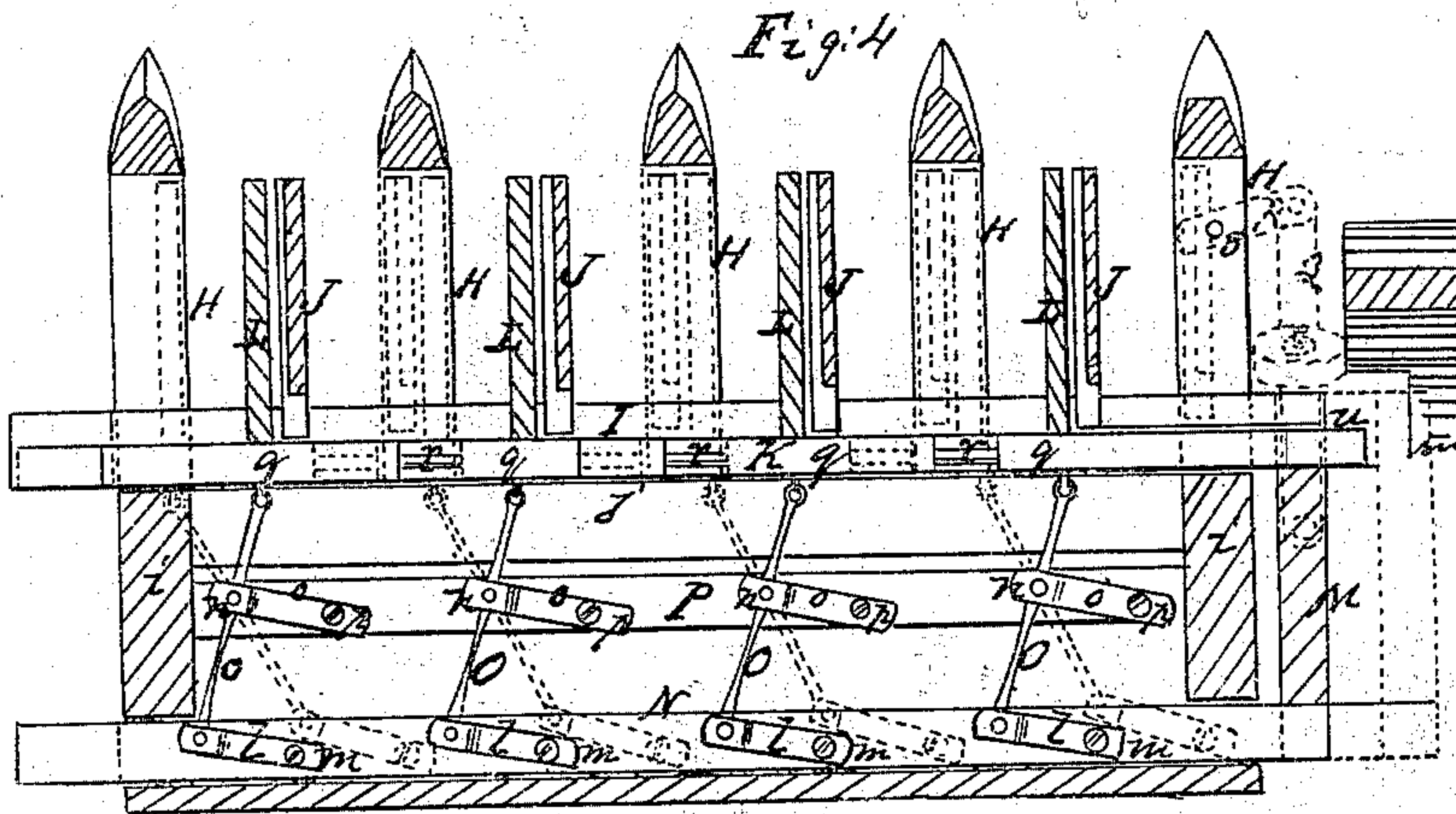
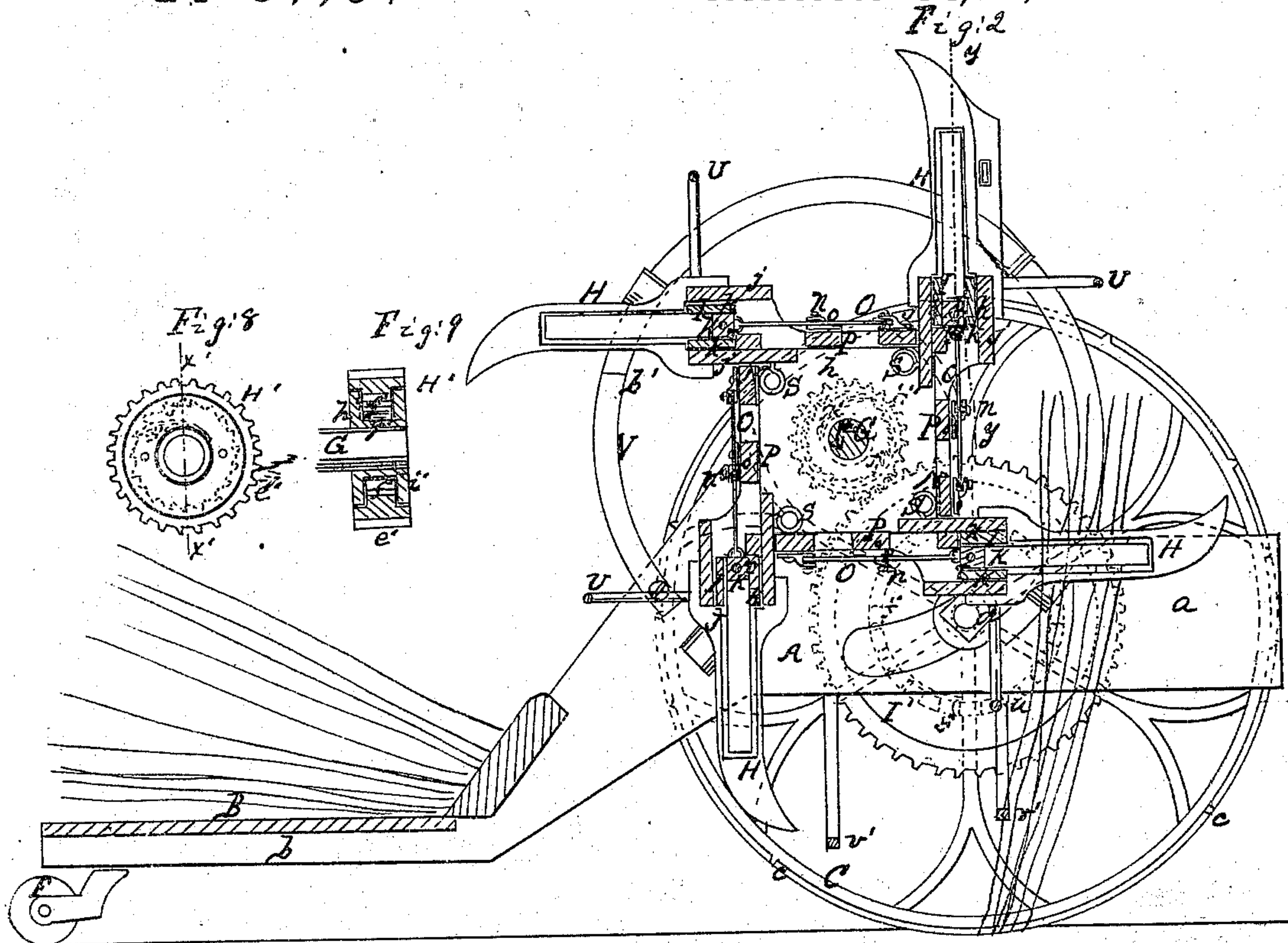




S. W. Tyler.  
Flax Harvester.

N<sup>o</sup> 39764

Patented Sep. 1, 1863.



Witnesses

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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN FLAX-HARVESTERS.

Specification forming part of Letters Patent No. **39,764**, dated September 1, 1863; antedated September 27, 1862.

*To all whom it may concern:*

Be it known that I, S. W. TYLER, of Greenwich, in the county of Washington and State of New York, have invented a new and useful Machine for Harvesting Flax; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a front view of my invention. Fig. 2 is a side sectional view of the same, taken in the line *x x*, Fig. 1. Fig. 3 is a detached plan of a portion of the same. Fig. 4 is a section of a portion of the same, taken in the line *y y*, Fig. 2. Fig. 5 is a detached view of a portion of the same, showing a modification of certain parts as arranged in the other figures. Fig. 6 is a section of Fig. 5 taken in the line *z z*. Fig. 7 is a section of Fig. 5 taken in the line *z' z'*. Fig. 8 is a detached face view of a ratchet-pulley pertaining to the same. Fig. 9 is a section of Fig. 7, taken in the line *x' x'*.

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

The object of this invention is to obtain a machine which, as it is drawn along, will pull up the flax by the roots and deposit the same regularly or systematically on a suitable platform, convenient for being raked off into gavels either by hand or otherwise.

The invention is designed to supersede the comparatively tedious manual operation of gathering the crop as hitherto practiced; and to this end the invention consists in the employment or use of reciprocating jaws connected to or arranged on a revolving or other frame, to operate substantially as hereinafter fully shown and described.

The invention also consists in the employment or use of a ratchet-pulley arranged and applied, substantially as hereinafter fully shown and described, for the purpose of relieving the driving-gear from concussions, which would otherwise attend a sudden stoppage of the machine.

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

A represents the frame of the machine, which is formed of two side bars, *a a*, which are parallel with each other at their front parts and at

a suitable height above the surface of the ground, the back parts of said side bars being curved downward and forming two parallel sleepers, *b b*, to support a platform, B, which is quite near to the surface of the ground, as shown in Fig. 2. This frame A is supported at its front part by two wheels, C D, one of which, C, is the driving-wheel of the mechanism, mounted on the frame, and is much larger in diameter than D, and has projections *c* on its periphery to prevent slipping. The driving-wheel C is fitted loosely on an arm, *d*, which is permanently attached to the left-hand or "near" side bar *a* of the frame A. The other front wheel, D, which is much smaller in diameter than C, has its arm or axle *e* attached to a frame, E, underneath frame A, the use of which will be presently explained. The back part of the frame A is supported by two caster-wheels, F, underneath the back part of the platform B.

On the front part of the frame A there is placed a horizontal shaft, G, which is allowed to rotate freely in suitable bearings. This shaft G has a ratchet-pinion, H', attached to it at one end, into which a wheel, I', gears, the latter being placed loosely on the arm *d* of the driving-wheel C, and having a concentric ratchet, *f*, at its outer or face side, into which a pawl, *g*, on the wheel C catches when the machine is drawn forward, the pawl and ratchet causing the shaft G to be rotated in the direction indicated by the arrows 1, through the medium of the gearing H' I, both of which are shown in Fig. 1, in dark shade and by dotted lines in Fig. 2.

On the shaft G there are placed two square heads, *h h*, one near each end. These heads are attached permanently to the shaft G, and to each side of each head *h* there is secured an arm, *i*. These arms *i* have a tangential position with the shaft G, and to them parallel bars or plates *j j* are attached, which are parallel with the shaft G, and are secured one to the outer and the other to the inner sides of the arms, as shown clearly in Fig. 2.

To the bars or plates *j j* of each pair of arms *i* there are attached a series of fingers or guards, H. These fingers or guards are placed at a suitable distance apart, and they are slotted longitudinally in planes coinciding with those of the sides of the heads *h h*.



Between the bars or plates *j j* of each pair of arms *i* there is placed a slide, *I*, to which jaws *J* are attached at right angles. These jaws are formed of straight bars of such a length that they may pass into the slots of the fingers or guards *H*; and said jaws are made of concave form at their face sides. The slide *I* is formed of two parallel plates, *k k*, and between them a slide, *K*, is placed, having jaws *L*, also attached to it at right angles. The jaws *L* are equal in length to the jaws *J*, and are parallel with them, the face sides of the former being made convex to correspond inversely with the concave surface of the latter. The slides *I*, which have the jaws *J* attached, have each a bar, *M*, connected to them at one end at right angles, and to the lower end of each bar *M* a slide, *N*, is attached. These slides *N* are parallel with the slides *I K*, and in the same planes with the fingers or guards *H*, and to the slides *N* the inner ends of levers *O* are attached by links *l* which are secured to the slides by pivots *m*. The levers *O* have their fulcrum *n* in links *o*, which are pivoted, as shown at *p*, to a fixed bar, *P*, secured between each pair of arms *i i*, and the outer ends of the levers *O* are connected to the slides *K*. The levers *O* are not rigid. They have a certain degree of elasticity, so that each jaw *L* is allowed a certain degree of lateral play independently of its fellows. This result is attained by having each jaw *L* attached to a socket or collar, *q*, which is fitted on a rod, *r*, which forms the main portion of the slide *K*, the levers *O* being attached to the sockets or collars *q*, as shown clearly in Fig. 4. The links *l o* compensate for the lateral movement of the slides *K* in right lines by allowing the levers to slightly change their position while operating said slides.

The bars *M* are connected to levers *Q*, the outer ends of which are attached to arms *R*, pivoted in the end fingers or guards, *H*, as shown at *s* in Figs. 1 and 4. The levers *Q* have each a friction-roller, *t*, attached to them, and each slide has a spiral spring, *S*, connected to it, which springs keep the jaws *J L* in contact with each other and within the fingers or guards *H*. The slides *K* work through the bars *M* of the slides *I*, as shown at *u* in Fig. 4.

*U* represents projecting bars, which are parallel with the bars or plates *j j*, and are out at a short distance in front of them and form rests for the pulled flax, as hereinafter described.

The frame *E* is formed of a longitudinal bar, *v*, and parallel bars *v' v'*, the latter extending nearly the whole width of frame *A*, and serving as guards to protect the working parts of the machine from obstructions or obstacles which may be in its path.

*V* is a vertical cam, which is attached to one side of the frame *A*, and in connection with the springs *S* serves to operate the jaws *J L*. The cam *V* is formed of a ring having its inner edge beveled or cut to form the cam. The ring is so attached to the frame *A* as to be adjustable—that is to say, turned axially—so

that the position of the cam-edge may be raised relatively with respect to the rollers *t* of the levers *Q*.

The operation is as follows: As the machine is drawn along the fingers or guards and their jaws are rotated through the medium of the gearing previously described. The fingers or guards serve to divide the standing stems or stalks of flax and gather between them a portion to be grasped by each pair of jaws *J L*. When the roller *t* of each lever *Q* comes in contact with the front prominent part, *a'*, of the cam *V*, the slides *I K N* are actuated and the jaws *J L* forced toward each other out from the fingers or guards *H* and grasp the standing stems or stalks between them, and as said jaws move upward they pull up the stems or stalks by the roots, the bars *U* serving as supports for the stems or stalks and preventing them coming in contact with or interfering in the least with the fingers or jaws which are behind them when rising or those in front of them when falling. The lifted stems or stalks are carried over to the back part of the machine and deposited on the platform *B*, the jaws being opened at the proper time under the action of the springs *S*, in consequence of the rollers *t* passing the prominent part *b'* of the cam *V*. (Shown in Fig. 2.) The springs *S*, when the rollers *t* pass the prominent part *b'* of the cam, throw the jaws *J L* back to their original position within the fingers or guards *H*, so that the latter may perform their proper function in gathering the standing stalks or stems between them for a succeeding operation of the jaws. The gathered stems or stalks may be raked from the platform *B* manually or by any proper automatic device.

I do not confine myself to the precise means herein shown and described for operating the jaws *J L*, for that may be modified in various ways. For instance, one of each pair of jaws may be constructed so as to combine a finger and jaw, as shown at *A'* in Figs. 5 and 7, the jaw *B'* fitting within a recess, *c'*, in *A'* when the jaws are closed or in contact and are not grasping the stems or stalks of flax. The face sides of the jaws may also be covered with india-rubber *d'*, or other suitable elastic material, to prevent the stems or stalks being injured by the pressure of the jaws. (See Fig. 6, in which one jaw, *A''*, is shown provided with a concave surface, *d''*, over which the rubber *d'* is fitted to admit of a very yielding surface for the fellow jaw, *A'''*, to act against.)

I would remark that the slide *K* may be flush with the outer surface of slide *I*, as shown in Fig. 7, so as to effectually exclude dirt or trash, and openings *a<sup>x</sup>* may be made in the lower parts of the jaws *J* to admit of the passage of dirt through them, so that the dirt cannot be grasped by the jaws. The slide *K* may also be secured in slide *I* by means of feathers and grooves *b<sup>x</sup> c<sup>x</sup>*, (see Fig. 7,) which form an economical and simple attachment.

The jaws *J L*, previously described, by the independent sliding movement which is allowed



the jaws *L* by the elasticity of the levers *O*, are made to grasp masses of stems or stalks of different sizes or bulks with a uniform pressure, thereby avoiding the straining of the jaws or any of the working parts of the machine.

The ratchet-pinion *H'*, which is on the shaft *G*, is constructed by having the toothed rim *e'* of the pinion made detached or separately from the other parts. This rim *e'* has a ratchet, *f'*, formed in its inner side, into which a pawl, *g'*, attached to the shaft *G*, catches, as shown clearly by the dotted lines in Fig. 8. The toothed rim *e'* is fitted on a fixed collar, *h'*, on shaft *G*, and also on a movable collar, *i'*, which is screwed thereon, as shown in Fig. 9. When the machine is drawn forward the toothed rim is made to rotate shaft *G* through the medium of the pawl *g'* and ratchet *f'*, and when the machine is suddenly stopped the shaft *G* is allowed to rotate independently of the gearing, the pawl *g'* slipping over the internal ratchet, *f'*. This is an important feature of the invention, as it allows the loaded or filled jaws to complete their throw in case the machine should be stopped suddenly when the loaded or filled jaws are just back of the shaft *G*, and thereby protects the gearing from sudden jars or strains to which it would be otherwise subjected, as the stalks or stems of flax give considerable centrifugal force or momentum to the rotation of shaft *G*.

The small wheel *D* is placed at a point in line with the centers of the spaces between the two outermost fingers or guards, *H*, so that the latter will not come in contact with it, and the wheel at the same time allowed to travel on the smooth or harvested part of the field.

In order to draw the machine from place to place, and at the same time render the working parts inoperative, the pawl *g* of wheel *C* may be disengaged from its ratchet *f*.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The employment or use of reciprocating jaws applied to a rotating shaft and arranged to open and close at proper intervals, so as to grasp the standing flax and eradicate it or pull it up from the earth and deposit it in layers at the back of the machine, substantially as set forth.

2. The employment or use of the reciprocating jaws, in combination with a depositing platform or receptacle, when arranged on a mounted frame and operated automatically so as to grasp and pull up the standing flax and discharge the same at the proper time upon the platform or receptacle, and this I claim irrespective of any pulling or eradicating movement which may be given the jaws, so long as the latter are made to pull up and discharge the flax automatically or by the draft-movement of the machine.

3. In combination with the reciprocating jaws, guards or fingers arranged either separately from the jaws or combined therewith in such a manner as to divide or separate the standing flax into masses or parcels to be grasped by the jaws, substantially as described.

4. The employment or use of the supporting-bars *U*, when placed in relation with the reciprocating jaws and fingers to support the pulled flax and keep it in proper position until it is discharged from the jaws.

5. The combination and arrangement of the slides *I K N* and elastic levers *O*, operated through the medium of the cam *V* and spring *S*, or their equivalents, as set forth.

6. The ratchet-pinion *H'*, constructed substantially as shown, when used in connection with the reciprocating jaws applied to a rotating shaft for the purpose of allowing the jaws to complete their throw when the draft-movement of the machine is stopped.

7. Providing the reciprocating jaws with cushions or elastic coverings *d'* at their face sides, substantially as and for the purpose set forth.

8. The wheel *D*, attached to the bar *v* of frame *E* or other suitable support, when said wheel is arranged relatively with the fingers or guards *H* and jaws *J L*, for the purpose specified.

9. Combining the slides *g* and *I* with feathered guides *e*, substantially as described.

S. W. TYLER.

Witnesses:

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JAMES LAIRD.