No. 684,474. Patented Oct. 15, 1901.

D. SVENSON.

FLAX HARVESTING ATTACHMENT FOR MOWERS.

(Application filed Dec. 18, 1900.)

(No Model.) 5 Sheets—Sheet 1.

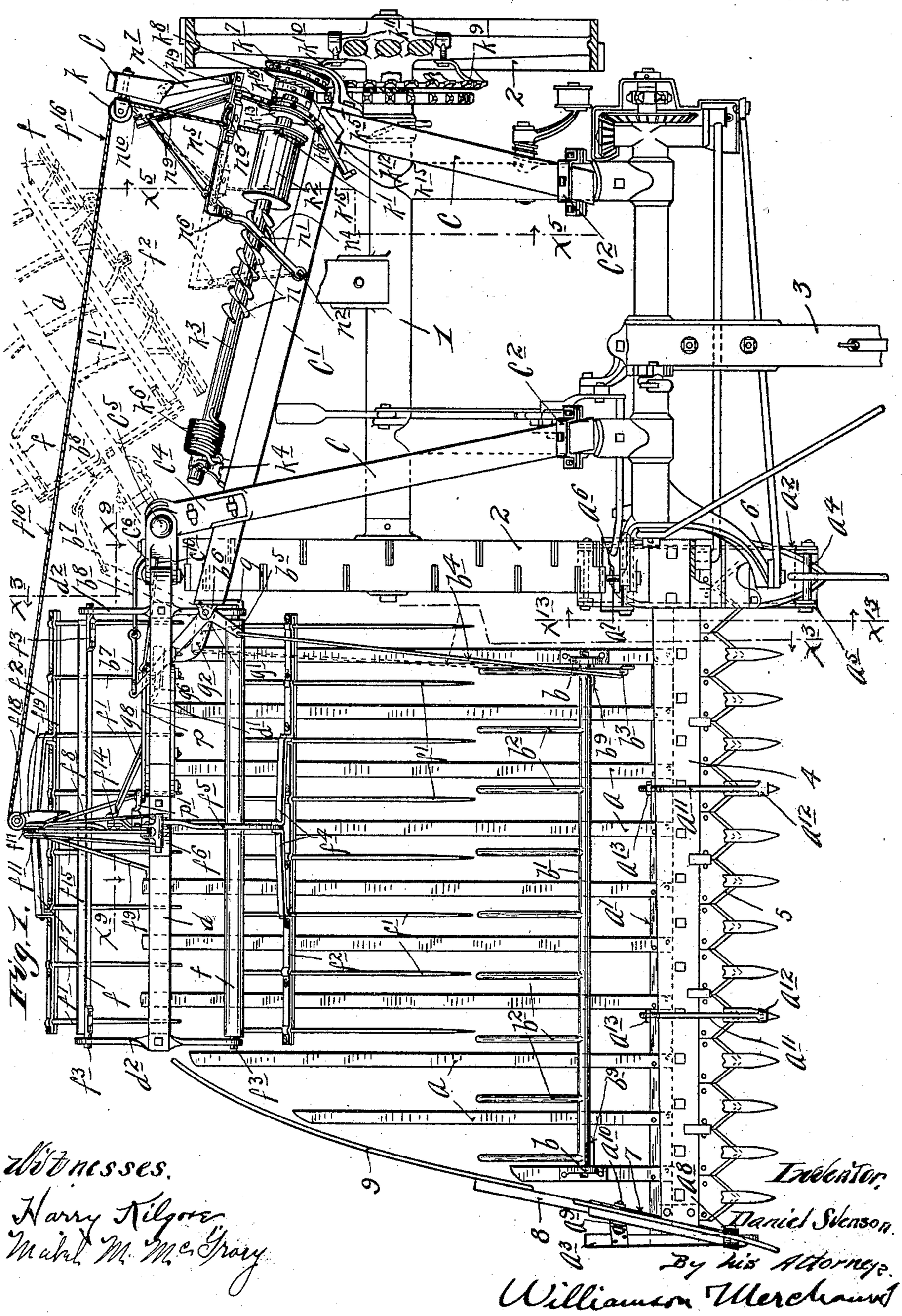

Fig. 1.

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No. 684,474. Patented Oct. 15, 1901.

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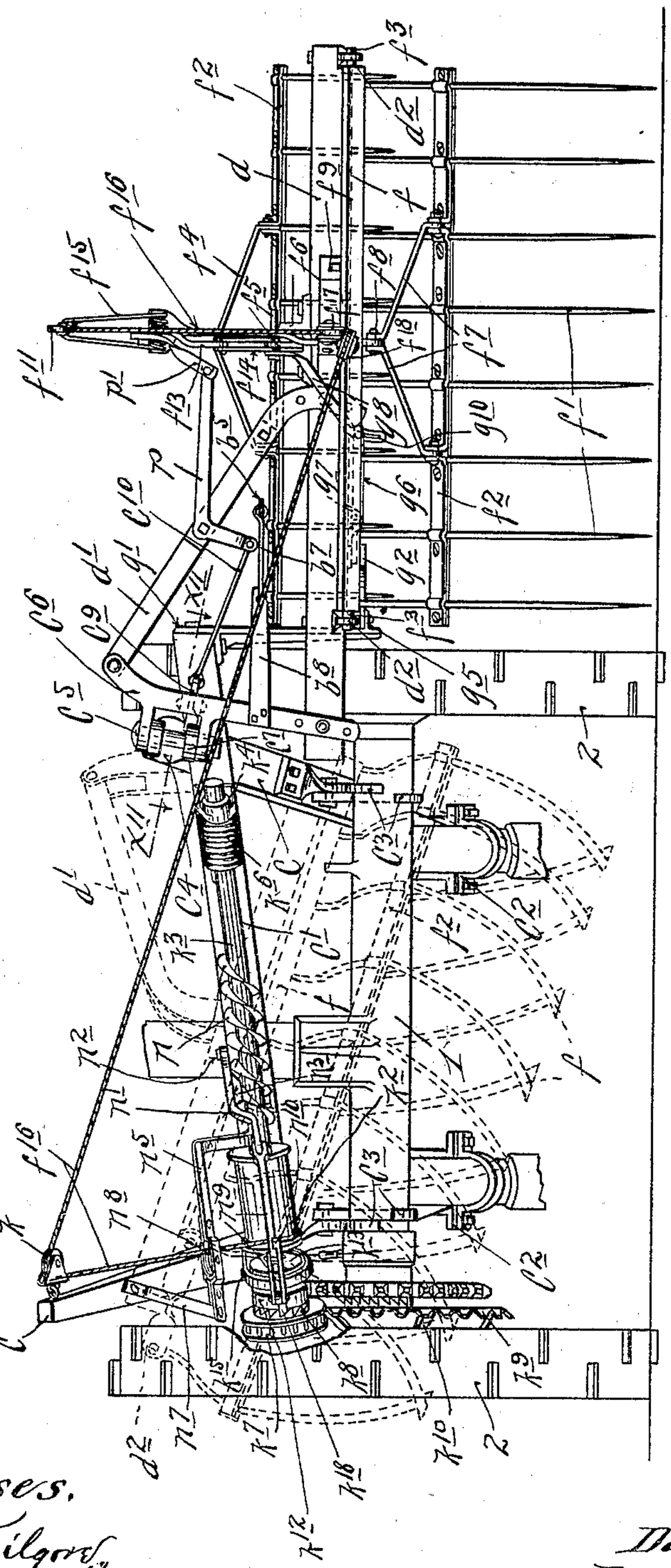
FLAX HARVESTING ATTACHMENT FOR MOWERS.

(Application filed Dec. 13, 1900.)

(No Model.) 5 Sheets—Sheet 2.

Fig. 2.



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(No Model.) 5 Sheets—Sheet 3.

Fig. 3.

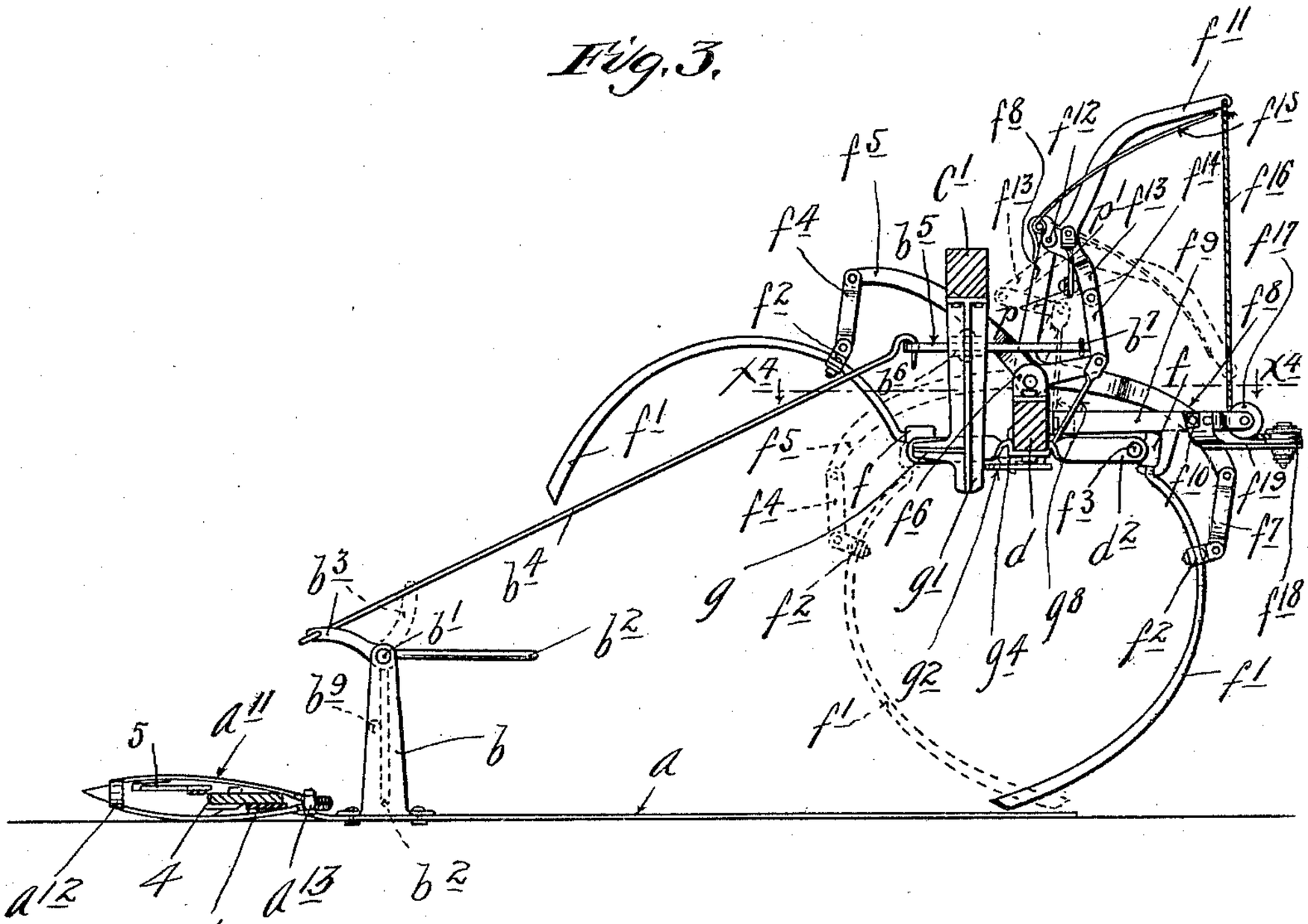
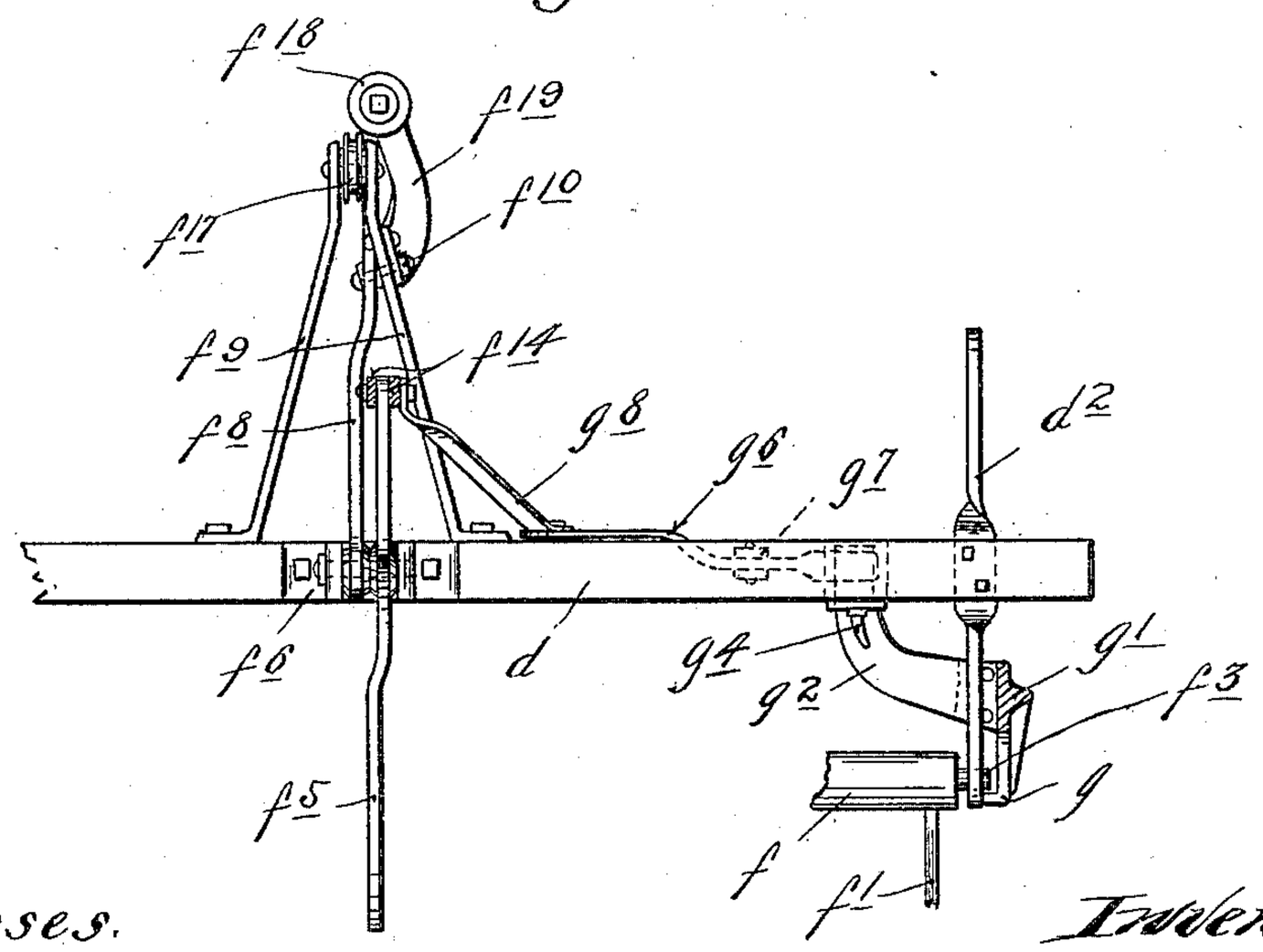


Fig. 4.



Witnesses.

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(Application filed Dec. 13, 1900.)

(No Model.) 5 Sheets—Sheet 4.

Fig. 5.

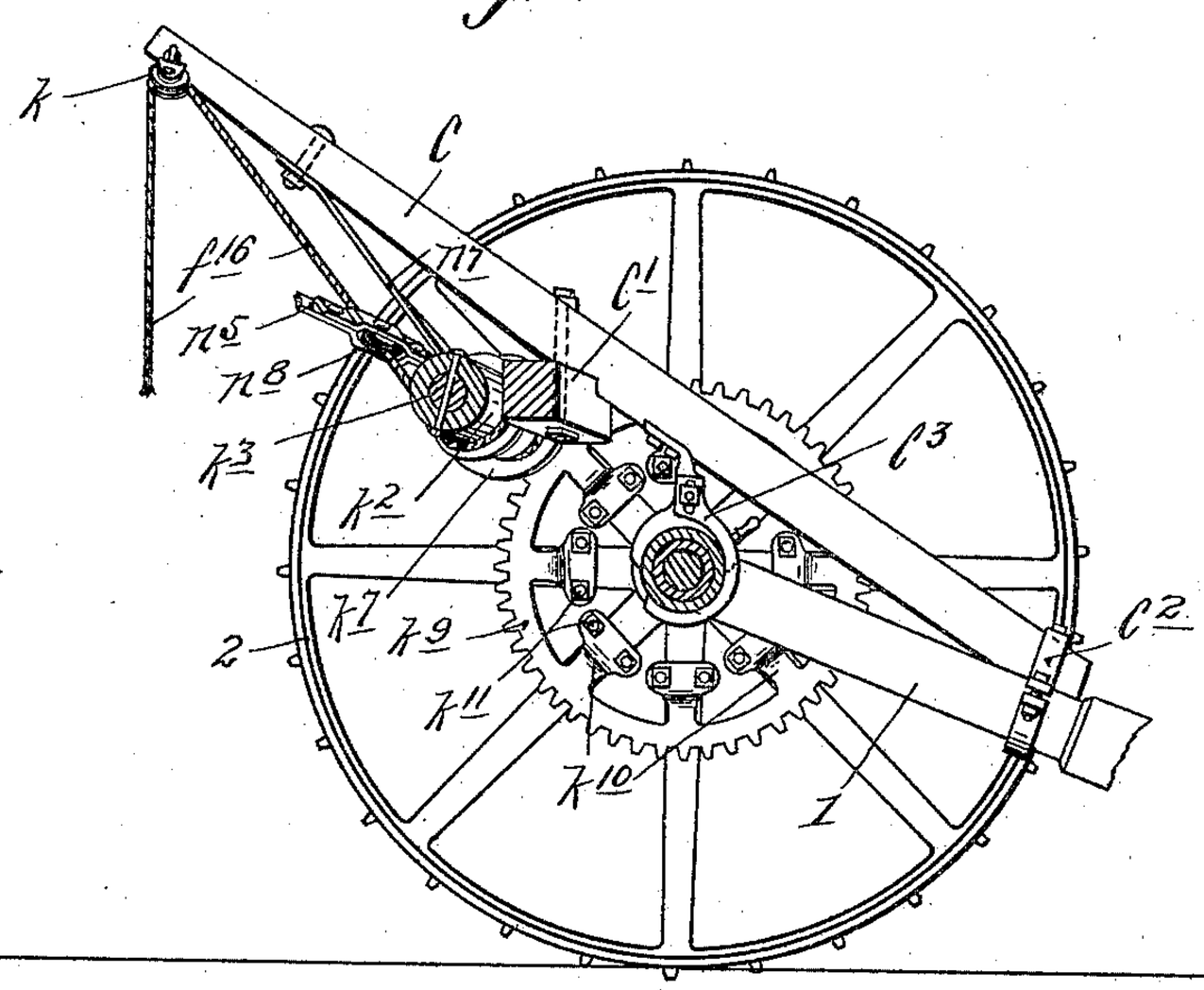


Fig. 6.

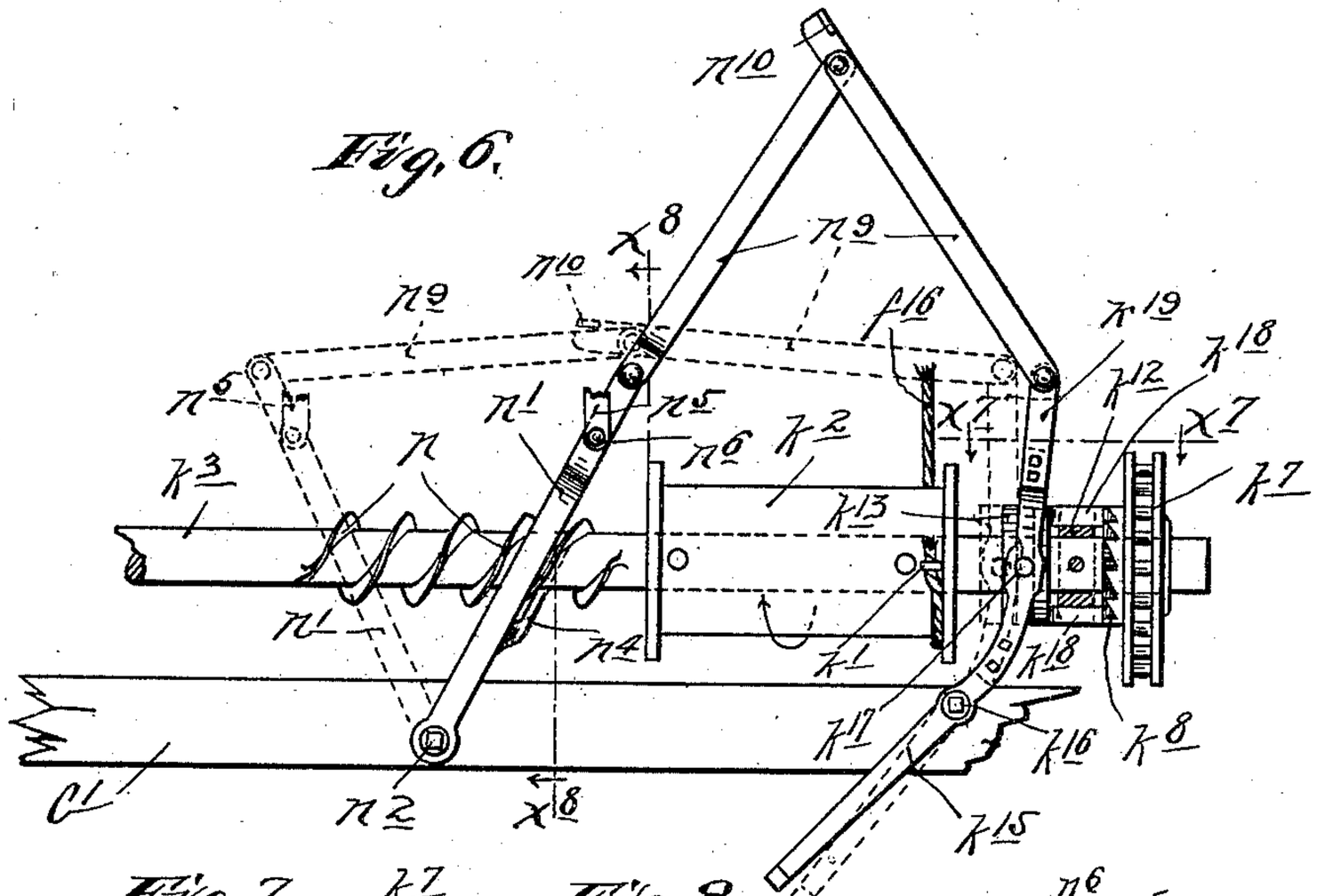


Fig. 7.

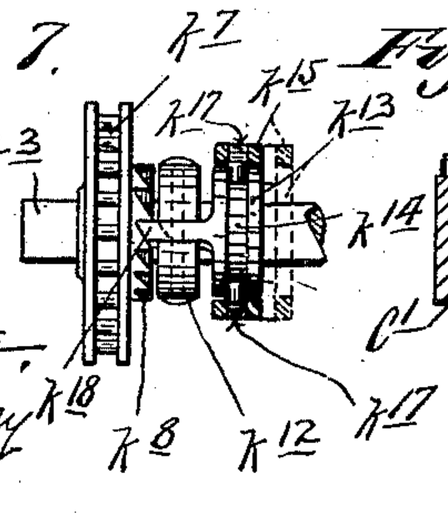
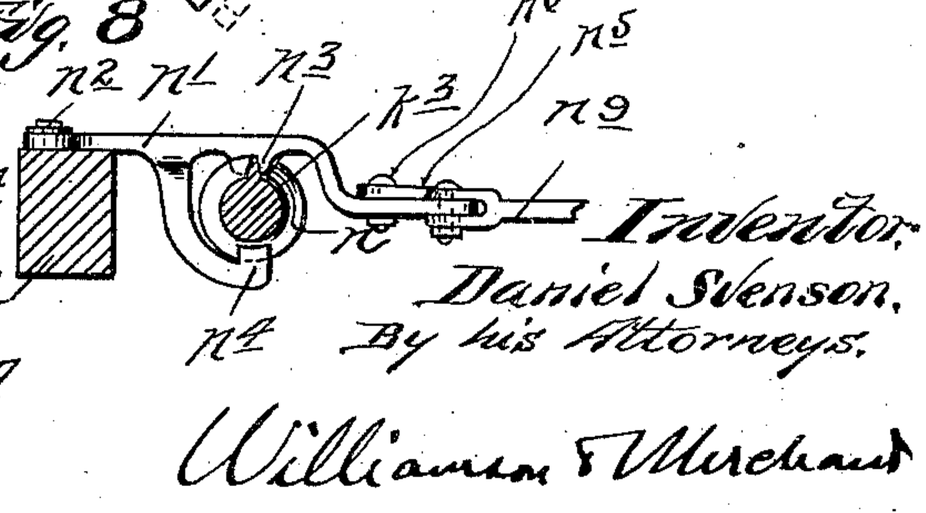


Fig. 8



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FLAX HARVESTING ATTACHMENT FOR MOWERS.

(Application filed Dec. 13, 1900.)

(No Model.) 5 Sheets—Sheet 5.

Fig. 9.

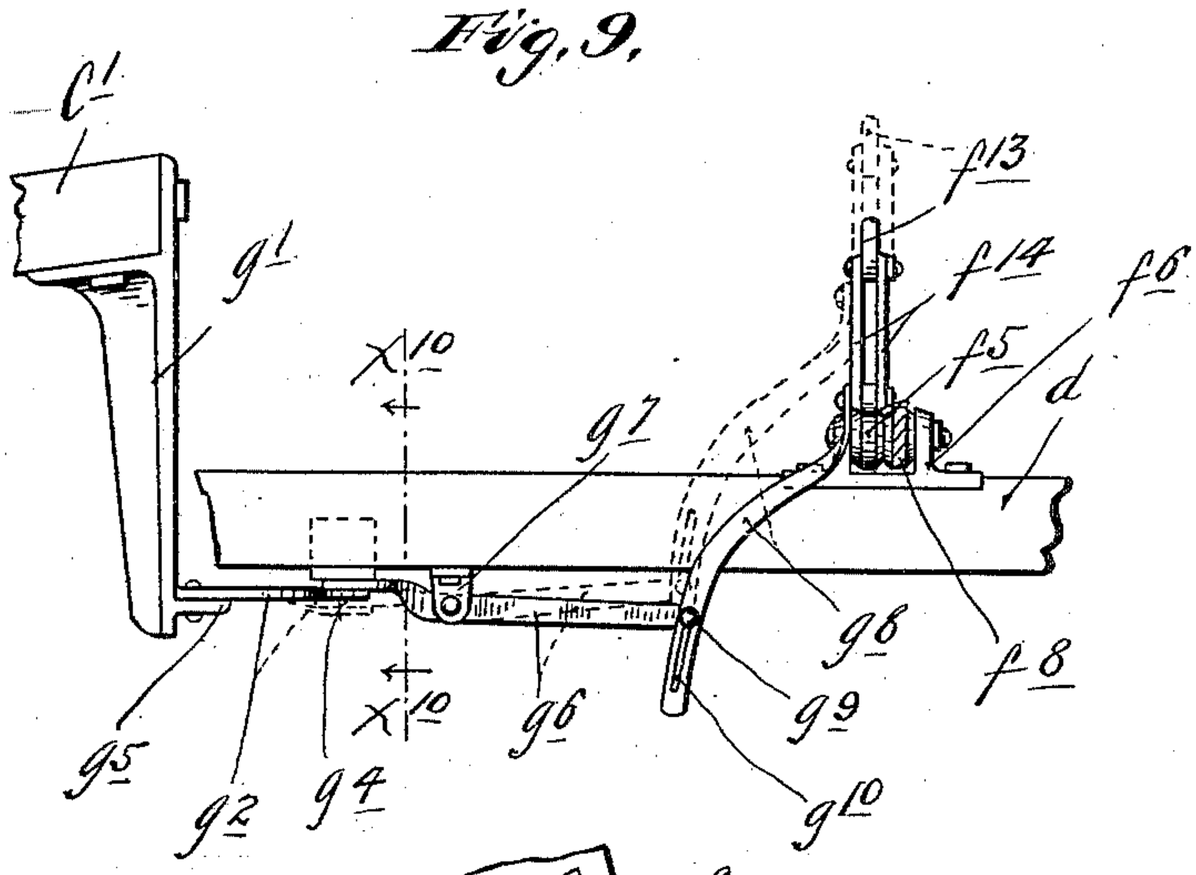


Fig. 10.

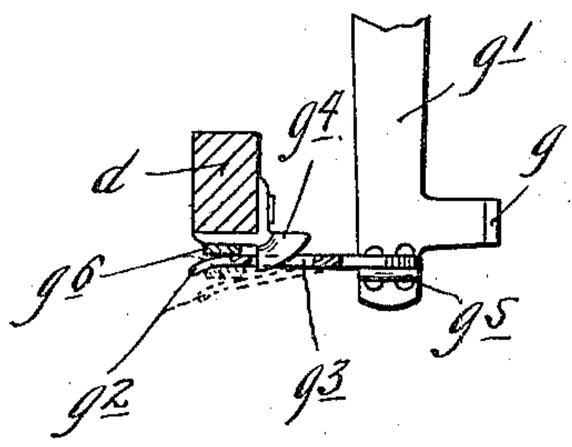


Fig. 11.

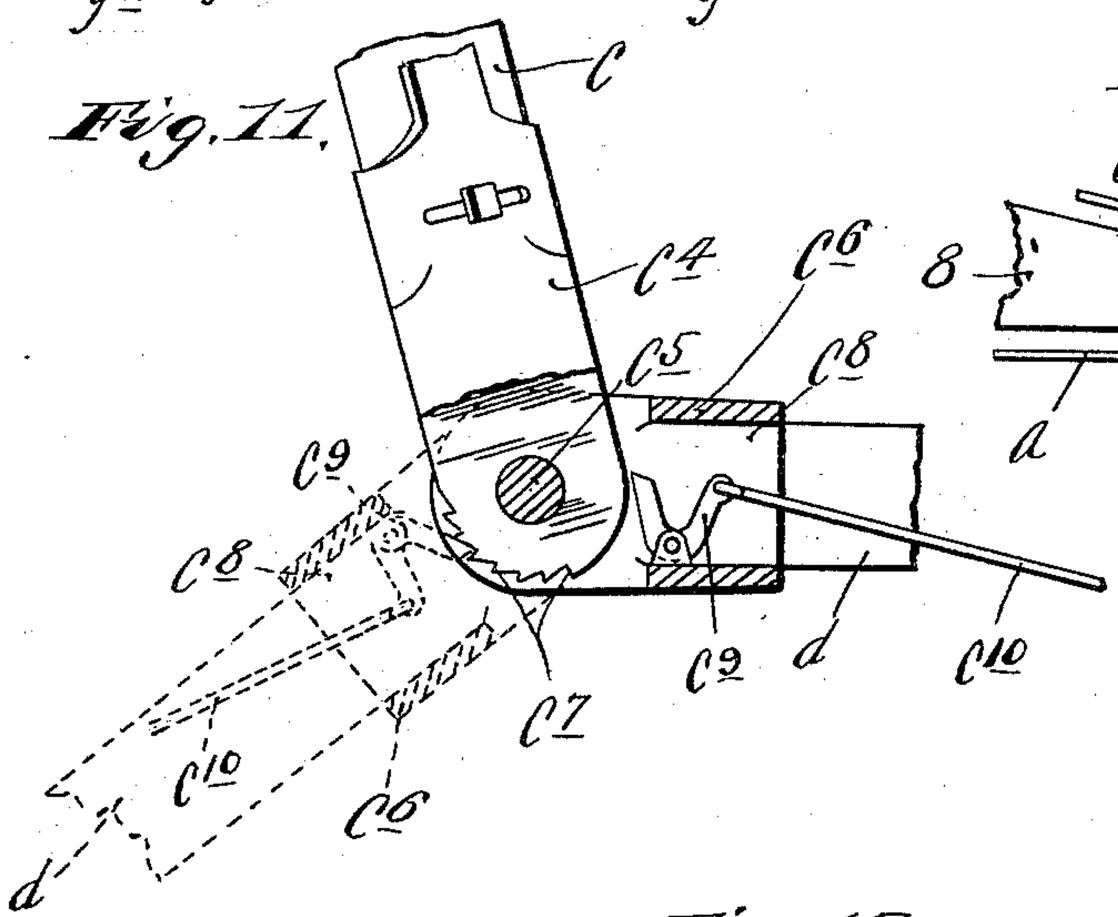


Fig. 12.

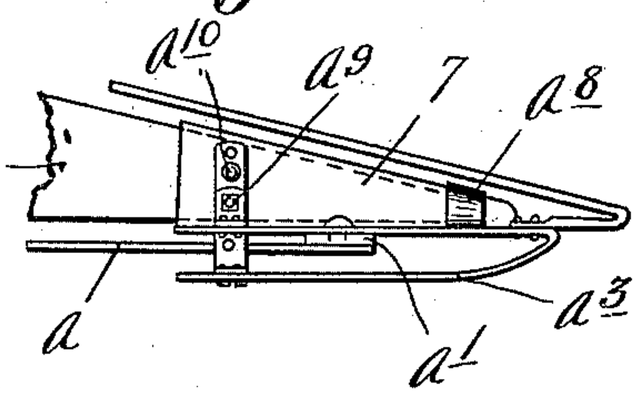
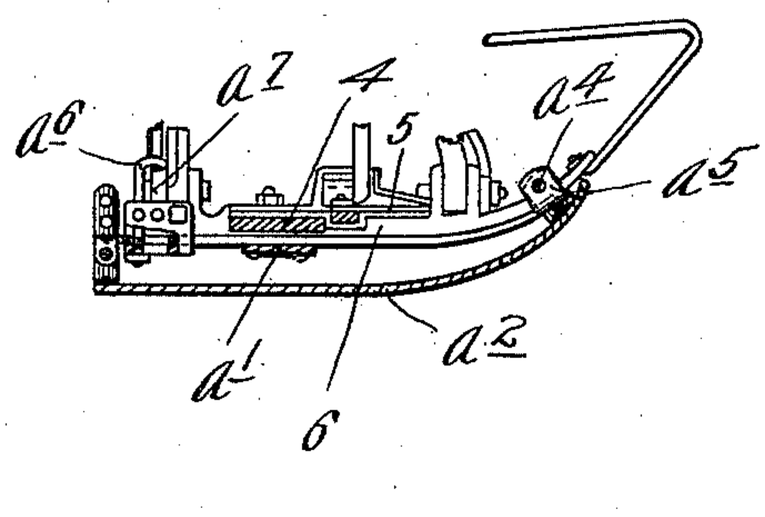


Fig. 13.



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Witnesses.
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Mahl. M. McGrory.

Inventor:
Daniel Svenson.
By his Attorneys.
Williamson & Merchant

UNITED STATES PATENT OFFICE.

DANIEL SVENSON, OF TWIN VALLEY, MINNESOTA.

FLAX-HARVESTING ATTACHMENT FOR MOWERS.

SPECIFICATION forming part of Letters Patent No. 684,474, dated October 15, 1901.

Application filed December 13, 1900. Serial No. 39,597. (No model.)

To all whom it may concern:

Be it known that I, DANIEL SVENSON, a citizen of the United States, residing at Twin Valley, in the county of Norman and State of Minnesota, have invented certain new and useful Improvements in Flax-Harvesting Attachments for Mowers; and I 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.

My present invention has for its object to provide an attachment for mowers and mowing-machines which will render the same efficient for harvesting flax; and to this end it consists of the novel devices and combinations of devices hereinafter described, and defined in the claims.

The attachment is applicable to any mower or similar machine, but is in the illustration given shown as applied to a mower of the type disclosed in the Patent No. 554,601, issued to Pliny F. Hodges, of date February 14, 1896, entitled a "Mowing-machine."

It is a well-known fact that mowers are frequently used to cut flax in substantially the same manner that they are used to cut grass, the swath which is cut being dropped directly behind the sickle and finger-bar. When thus deposited, the horses on the next round will of course pass over the previously-dropped swath. In the case of flax, which when cut is easily threshed, this is very objectionable, for the reason that the flax will be threshed and wasted to a very considerable extent.

By my invention I provide a device which will collect the cut flax at the rear of the sickle and finger-bar and will at intervals deposit the same in loose bundles at the rear of the machine and outward of the line of the swath which is being cut by the machine.

In the accompanying drawings, which illustrate my improved attachment applied as above indicated, like characters indicate like parts throughout the several views.

Figure 1 is a plan view illustrating my invention as applied to the mower above identified. Fig. 2 is a view in rear elevation of the mower and attachment illustrated in Fig. 1. Fig. 3 is a vertical section on the line x^3 x^3 of Fig. 1. Fig. 4 is a horizontal section on the line x^4 x^4 of Fig. 3, some parts being broken away. Fig. 5 is a vertical section on the irregular line x^5 x^5 of Fig. 1. Fig. 6 is a detail view in plan, showing the grapple-actuated windlass and connected parts, some parts being broken away. Fig. 7 is a transverse vertical section taken approximately on the line x^7 x^7 of Fig. 6. Fig. 8 is a transverse vertical section on the irregular line x^8 x^8 of Fig. 6. Fig. 9 is a detail in transverse vertical section on the line x^9 x^9 of Fig. 1. Fig. 10 is a vertical section on the line x^{10} x^{10} of Fig. 9. Fig. 11 is a detail in horizontal section approximately on the line x^{11} x^{11} of Fig. 2, some parts being broken away. Fig. 12 is a detail in side elevation of the grain-board shoe, and Fig. 13 is a vertical section on the line x^{13} x^{13} of Fig. 1.

Of the parts of the mower it is only necessary for the purposes of this case to briefly enumerate the following parts, to wit: the main frame 1, traction-wheels 2, pole 3, finger-bar 4, sickle 5, sickle-bar shoe 6, grain-board shoe 7, and grain-board 8, the latter of which is shown as provided with an extension 9.

In accordance with my invention I provide for attachment to the finger-bar 4 a so-called "collecting-deck," preferably afforded by a series of rearwardly-extended slats a, secured at their forward ends to a connecting-bar a'. The bar a' is secured at its inner end to a supplemental shoe a^2 and at its outer end to a supplemental shoe a^3, as best shown in Figs. 12 and 13. The shoe a^2 is adapted to be detachably secured to the shoe 6 by means of a bolt a^4, which works through lugs a^5 at its forward end and overlies the forward end of said shoe 6, and by means of one or more nutted clamping-bolts a^6 is secured to the rear end thereof and is engageable with a lug a^7 on the rear portion of said shoe 6. The supplemental shoe a^3 is adapted to be detachably secured to the shoe 7 by means of a socket a^8 and a bracket a^9, through which bracket a^9 and shoe 7 one or more nutted bolts a^{10} are passed. The bar a' is further secured at its intermediate portion by means of split bolts a^{11}, provided at their forward ends with sockets a^{12}, which engage with the fingers of the finger-bar 4. The rear ends of these divided bolts a^{11} are semicylindrical and when drawn

together make a complete bolt, on which nuts a^{13} work, as best shown in Figs. 1 and 3. Pivoted in brackets b, secured on the outer and inner slats of the skeleton deck a, is the transverse rock-shaft b' of a grain cut-off device. This rock-shaft b' is provided in a common plane with a series of fingers b^2, which when turned downward prevent the cut flax or grain from sliding rearward on the deck-strips a, but when turned upward permit the said cut flax to slide rearward over the said deck strips or slats a under the advance movement of the machine and the frictional contact with the ground or stubble and to be taken up by a so-called "grapple-rake," presently to be described. The shaft b' is further provided at its inner end with an arm b^3, to which the forward end of an operating-rod b^4 is pivotally connected. A very strong supplemental frame made up of rigidly-connected beams c and c' is detachably secured to the frame 1 of the mower by means of clamps c^2 and brackets c^3. (Best shown in Figs. 1 and 2.)

In the construction illustrated the so-called "grapple-rake" is pivotally supported from the rear end of the inner beam c, and to afford this connection a pronged metal head c^4 is directly secured to the end of the said beam c. Through the prongs of this head c^4 an inclined pintle or pivot-bolt c^5 is passed, as best shown in Figs. 1, 2, and 11. On the bolt or pintle c^5 the prongs of a hinge c^6 are pivoted. As shown, the lower prong of the head c^4 is formed with ratchet-teeth c^7, and the hinged bracket c^6 is provided with a recess c^8, in which is pivoted a pawl c^9. The pawl c^9 coöperates with the ratchet-teeth c^7 and is operated through a rod c^{10}, as hereinafter described. (For above construction see Figs. 2 and 11.) A swinging beam d is secured between the depending prongs of the hinge-bracket c^6 and the intermediate portion thereof is connected to the upper portion of the hinge-bracket c^6 by an inclined brace-bar d'. (See Fig. 2.) Rigidly secured one at the outer end and one near the inner end of the swinging beam d is a pair of parallel supporting-straps d^2, that project both forward and rearward of the said beam, as best shown in Figs. 1, 3, and 4. The so-called "grapple-rake" is made up of a pair of members having much the form of a hay-rake, and, as shown, comprising pivot-bars f, having curved tines or teeth f', tied together near their fixed ends by transverse tie-straps f^2. The bars f have projecting trunnions f^3, by means of which they are pivotally mounted in the ends of the supporting-straps d^2, as best shown in Figs. 1 and 4. It may be here stated, however, that the forward member of the grapple-rake is given a pivotal movement from its normal position, (indicated by full lines) into its closed position, (indicated by dotted lines in Fig. 3,) while the rear member of the said grapple is held against pivotal movement in its normal position, (indicated by full lines in Fig. 3,) so that the said rear member acts as a gathering-rake to collect the cut flax or grain delivered thereto from the collecting-deck a. The tie-strap f^2 of the forward grapple member is connected by a short link f^4 to the free end of a bell-crank f^5, which is pivoted at its elbow to a bearing-lug f^6 on the swinging beam d. The tie-bar f^2 of the rear grapple member is connected by a short link f^7 to the rear end of another bell-crank f^8, which is also connected to the lug-bracket f^6 on the bar d. A guide-bracket f^9, rigidly secured to the beam d, projects rearwardly therefrom and near its outer end is detachably but rigidly secured to the rearwardly-projecting portion of the bell-crank f^8, as shown, by means of a small nutted bolt f^{10}. (See Fig. 4.) In this manner the bell-crank f^8, and hence the rear member of the grapple-rake, is secured against pivotal movement. A grapple-actuating lever f^{11} is pivoted at f^{12} to the outwardly-projecting arm of the bell-crank f^8 and is provided with a depending arm f^{13}, which is connected by a short link f^{14} to the short and rearwardly-projecting arm of the bell-crank f^5. (See Fig. 3.) A spring f^{15}, which has its base of reaction on the upper arm of the bell-crank f^8, yieldingly holds the actuating-arm f^{11} in its extreme uppermost position. (Indicated by full lines in said Fig. 3.) One end of a grapple-actuating cable f^{16} is connected to the free end of said lever f^{11}. This cable f^{16} runs over a guide-sheave f^{17}, mounted in the outer end of the bracket f^9, and over another guide-sheave f^{18}, mounted on a projecting arm f^{19} of said bracket f^9. The other end of this cable f^{16} is connected to the winding-drum of a windlass, to be hereinafter described. The forward swinging movement of the grapple-rake is limited by the engagement of the inner strap d^2 with a stop-lug g of a bracket g', which depends from the supplemental frame-beam c'. Normally the bar d and grapple are locked, as indicated in Figs. 1 and 3 by full lines, by means of a latch consisting of a spring latch-plate g^2, which is perforated at g^3 and coöperates with a cam-lug g^4, secured on the said swinging bar d. The forward end of the spring-latch g^2 is shown as riveted to a flange g^5 of the said depending bracket g'. When the grapple-rake swings forward, the cam-lug g^4 is automatically engaged with the perforation g^3 of the latch-plate g^2. The latch-plate g^2 is released from the lug g^4 by means of a lever g^6, pivoted to a lug g^7 on the swinging bar d, the free end of which lever overlies the free end of said latch-plate, as best shown in Fig. 9. A connecting-strap g^8, pivoted at its upper end to the short rear end of the bell-crank f^5, is connected to the outer end of the lever g^6 by means of a pin or stud g^9 on said lever g^6, which works in an elongated slot g^{10} in the lower end of said strap g^8. The normal positions of these parts are best indicated in

Figs. 3 and 9. The slot g^{10} is of such length that when the grapple-actuating lever f^{11} is forced into the position indicated by dotted lines in Fig. 3 the forward grapple member will be moved into the position also indicated by dotted lines in said Fig. 3, and the strap g^8, lever g^6, and latch-plate g^2 will be moved into the positions indicated by dotted lines in Figs. 9 and 10, thereby releasing the said latch-plate from the lug g^4 and permitting the closed grapple-rake to be swung into the delivery position indicated by dotted lines in Figs. 1 and 2. To throw downward the cut-off comb or device b' b^2, as indicated by dotted line in Fig. 3, the rear end of the actuating-rod b^4, heretofore noted, is connected to one arm of a bell-crank b^5, pivoted to a lug b^6 on the upper end of the bracket g' and having its other arm connected by a link b^7 to a spring-arm b^8, secured to one side of the swinging hinge-strap c^6. When the grapple is thrown into its delivery position, (indicated in Fig. 1,) the spring-arm b^8 will bend, as indicated by dotted line in said view, and the cut-off comb will be thrown downward to its limit against a stop b^9 on one of the brackets b, as best indicated in Figs. 1 and 3. As already stated, one end of the grapple-actuating cable f^{16} is attached to the actuating-lever f^{11}. Its other end runs over a guide-sheave k, suitably mounted on the upper rear end of the outer frame-beam c and is secured at k' to a drum k^2, carried by a windlass-shaft k^3, which is suitably mounted at one end in a bearing-box k^4 and at its other end in a bearing-plate k^5, which parts k^4 and k^5 are secured on the supplemental frame c c', as best indicated in Fig. 1. The shaft k^3 and drum k^2 are put under yielding strain to unwind and let out the cable f^{16} by a coiled spring k^6, secured at one end to the bearing k^4 and at its other end to the shaft k^3. At its outer end the windlass-shaft k^3 is provided with a loose gear k^7, the teeth of which are shown as afforded by pins extending between parallel plates. This gear k^7 is provided with a half-clutch k^8, and it meshes with the teeth of a sprocket-like gear k^9, which, as shown, has laterally-bulged spokes k^{10}, that are detachably secured to the spokes of the adjacent traction-wheel 2 by means of clamps k^{11}. Just inward of the half-clutch k^8 of the gear k^7 the shaft k^3 is provided with a fixed collar k^{12}, and just inward of this fixed collar said shaft is provided with a sliding collar k^{13}, which is grooved at k^{14} and is adapted to be shifted by a foot-actuated shipper-lever k^{15}, pivoted at k^{16} to the frame-beam c' and provided with studs k^{17}, which engage the gear k^{14} of said sliding collar. The sliding collar k^{13} is provided with pawl-like projections k^{18}, that work through suitable grooves in the secured collar k^{12} and engage the teeth of the half-clutch k^8 of the gear k^7. The collar k^{12} causes the collar k^{13} to rotate with the shaft k^3. Hence when said collar k^{13} is moved outward, so that the pawl members k^{18} engage the teeth of the half-clutch k^8, the shaft k^3 will be driven in a direction to wind up the cable f^{16} from the outer traction-wheel 2 through the gears k^9 k^7. Under the winding action of the cable f^{16} it is guided onto the drum k^2 by the following device: n indicates a spiral formed on the windlass-shaft k^3. This spiral n operates a vibrating lever n', pivoted to the frame-beam c' at n^2 and provided with prongs having lugs n^3 n^4, which engage, respectively, between the upper and lower portions of the spiral n, as best shown in Figs. 6 and 8. n^5 indicates a sliding link which is pivoted at one end to the upper prong of the lever n', as shown at n^6, and is pivoted at its other end to the depending end of a vibrating link n^7, pivoted at its upper end to the upper rear end of the outer frame-beam c, as best shown in Figs. 1, 2, and 5. At its intermediate portion the sliding link n^5 is provided with a guide-sheave n^8, over which the cable f^{16} runs and by which it is forced laterally, so that it will be wound spirally on the drum k^2. The outer end of the upper prong of the lever n' is connected to a projection k^{19} of the shipper-lever k^{15} by means of a toggle-lever n^9, one arm of which has a stop n^{10}, which engages the other arm, as indicated by dotted lines in Fig. 6, to prevent the said toggle from being thrown to a dead-center. When the lever n' is forced to its extreme position toward the left, as shown in Fig. 6, the toggle-lever n^9 is straightened to its limit and then acts upon the shipper-lever k^{15} to draw the pawls k^{18} out of engagement with the teeth of the half-clutch k^8, whereupon the drum k^2 and shaft k^3 are released from the driving-gear k^7 and are then quickly thrown back to their normal positions (indicated by full lines in Fig. 6) under the action of the spring k^6 and the tension from the cable f^{16}. When the grapple and swinging beam d are swung into the delivery position, (indicated by dotted lines in Figs. 1 and 2,) the pawl c^9 is engaged with the ratchet-teeth c^7 of a fixed cap or head c^4 by means of the following device, (for these parts attention is directed to Figs. 2, 3, and 11:) The rod c^{10}, already noted, is pivotally connected to the depending arm of a bell-crank p, which is pivoted at its elbow to the brace-bar d'. The other arm of this bell-crank p is connected by a link p' to the actuating-lever f^{11} at a point very close to its pivot, as best shown in Fig. 3. When the actuating-lever f^{11} is drawn downward toward its dotted-line position, (indicated in Fig. 3,) the rod c^{10} will be subjected to an end thrust and will be buckled more or less, so that it acts as a spring to force the pawl c^9 into engagement with the ratchet-teeth c^7.

The operation, briefly summarized, is as follows: As already stated, the parts normally stand as indicated by full lines in Figs. 1, 2, 3, 9, and 11. Under the advance movement of the machine the grain which is cut will fall onto the skeleton deck a and will be caught by

the rear and relatively-fixed members of the so-called "grapple-rake." When a sufficient bundle has been accumulated, the operator by engagement of the free end of the shipper-lever k^{15} forces the pawls k^{18} into engagement with the half-clutch k^8 of the constantly-running gear k^7, and thus starts the windlass k^2 k^3 into action to wind up the cable f^{16}. As the latch-plate g^2 and lug g^4 (shown in Fig. 10) at this time lock the grapple in its receiving position, the first effect of the winding of the cable is to draw downward the grapple-actuating arm f^{11}, and thereby close the pivoted member of the grapple, as shown by dotted lines in Fig. 2. At approximately the same time that the parts reach the dotted-line positions (indicated in Fig. 3) the latch-plate g^2 is released from the lug g^4, as previously described, and the continued movement of the cable positively draws the closed grapple with its load into its delivery position. (Shown by dotted lines in Figs. 1 and 2.) It will be noted in Fig. 2 that the grapple is materially raised as it is thrown rearward. This is due to the fact that the pintle or pivot-pin c^5 is set on an incline. This rising moving is necessary in order that the loose bundle when dropped to the ground will be cleared by the teeth of the grapple. When the cable f^{16} has been sufficiently wound to bring the grapple to its discharging position, the lever n' reaches its dotted-line position (indicated in Fig. 6) and through the toggle-lever n^9 releases the windlass from the running-gear f^7 in a manner already clearly described; but as the grapple is locked against its return swinging movement by the pawl c^9, as indicated by dotted lines in Fig. 11, the first effect of slacking the cable f^{16} is to permit the jaws of the grapple to open up and drop the loose bundle of grain and the actuating-lever f^{11} to be restored to its normal position under the action of its spring f^{15}. The final movement of the lever f^{11} to its normal position again releases the pawl c^9 from the ratchet-teeth c^7, and the grapple is then swung back to its normal position under the action of its own gravity and under the action of the spring-arm b^8.

It will of course be understood that the mechanism above described is capable of a very large range of modification within the scope of my invention.

The term "mower" is herein used in a very broad sense to include any and all machines having the general character of an ordinary standard mower or reaper and capable of cutting grass, flax, or grain of any kind.

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

1. The combination with a mower, of a swinging grapple-rake receiving the cut grain from the sickle-bar thereof, said grapple-rake having a pivoted forward member, and means under control of a common controlling-lever for first closing said pivoted member onto the collected grain and for then swinging the said grapple outward of the swath which is being cut, and for then opening up the said grapple-rake to drop the loose bundle at the rear of the machine, substantially as described.

2. The combination with a mower, of an oscillating carrier adapted to receive the cut grain and deposit the same outward of the swath which is being cut, a lock for securing said carrier in its receiving position, another lock for holding the same in its discharging position, and means under control of a common controlling-lever for oscillating said carrier operating, first, to release said former lock, then to swing said carrier into its discharging position, and then to release the said latter lock and restore said carrier to its normal position, substantially as described.

3. The combination with a mower, of an oscillating grapple arranged to receive the grain from the sickle and to deliver the same outward of the swath which is being cut, which grapple has a pivoted forward member, a lock normally holding said grapple in its receiving position, a second lock for temporarily holding said grapple in its delivery position, and operating connections for said grapple involving a windlass, a cable, a grapple-actuating lever, and connections between said actuating-lever and said two locks, whereby the winding of said cable first closes the grapple, second, releases the former of said locks, third, swings said grapple to its discharging position, and whereby the slacking of said cable first permits the opening of said grapple, second releases the latter of said locks, and, third, permits the said grapple to return to normal position, substantially as described.

4. The combination with a mower, and an oscillating grapple operating to receive the grain and deposit the same outward of the swath which is being cut, which grapple has relatively-fixed and pivoted members, of a windlass having a flexible connection applied to the pivoted member of said grapple and working over guides of the relatively-fixed grapple member, a latch for holding said grapple in receiving position, which latch is subject to said flexible connection, and is arranged to be tripped only after the grapple has been closed, whereby, under the action of said windlass, said grapple will be closed, said latch then released and said grapple then swung into a delivering position, substantially as described.

5. The combination with a mover, of a grapple intermittently movable to deposit the grain outward of the swath which is being cut, of a cut-off device pivotally movable to hold the grain while said grapple is swung from its operative position, a stop for said cut-off device, and connections between said cut-off device and grapple involving a yielding part which is put under strain assisting in throwing said grapple back to its normal position, substantially as described.

6. The combination with a windlass and a cable to be wound thereon, of a constantly-running driver, cluch members for connecting said windlass with said driver, a spiral operated by said windlass, a vibrating part operated by said spiral, and a connection between said vibrating part and one of said clutch members for throwing the clutch out of action at a predetermined time, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

DANIEL SVENSON.

Witnesses:
MARIE LARSEN,
SAXE J. FROSBURG.