

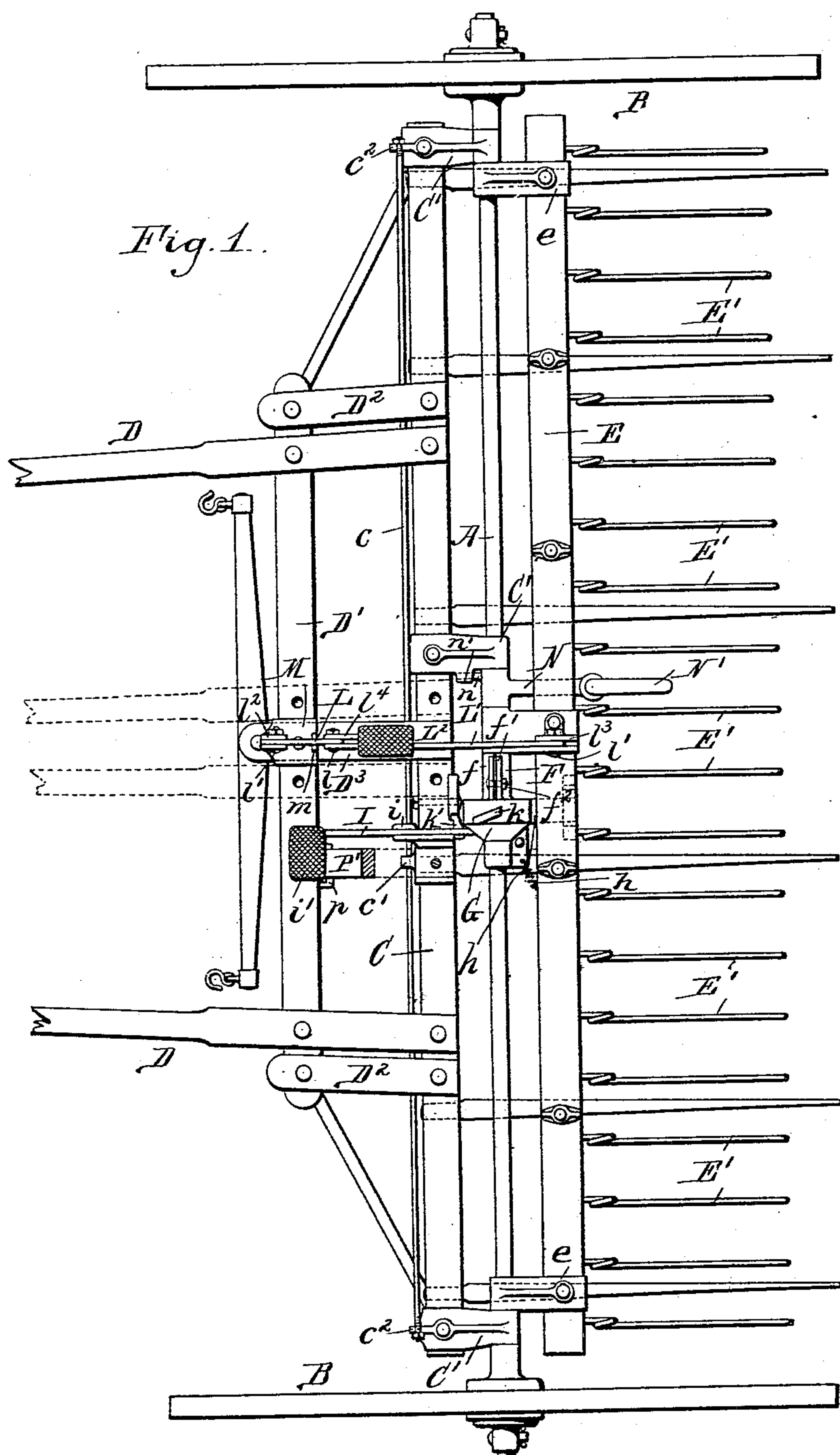
(No Model.)

4 Sheets—Sheet 1.

F. WIARD.
HORSE HAY RAKE.

No. 559,920.

Patented May 12, 1896.



Witnesses:

Emil Meinhart.
Thos. L. Popp.

F. Ward Inventor.

By *Wilhelm Hornet.*
Attorneys.

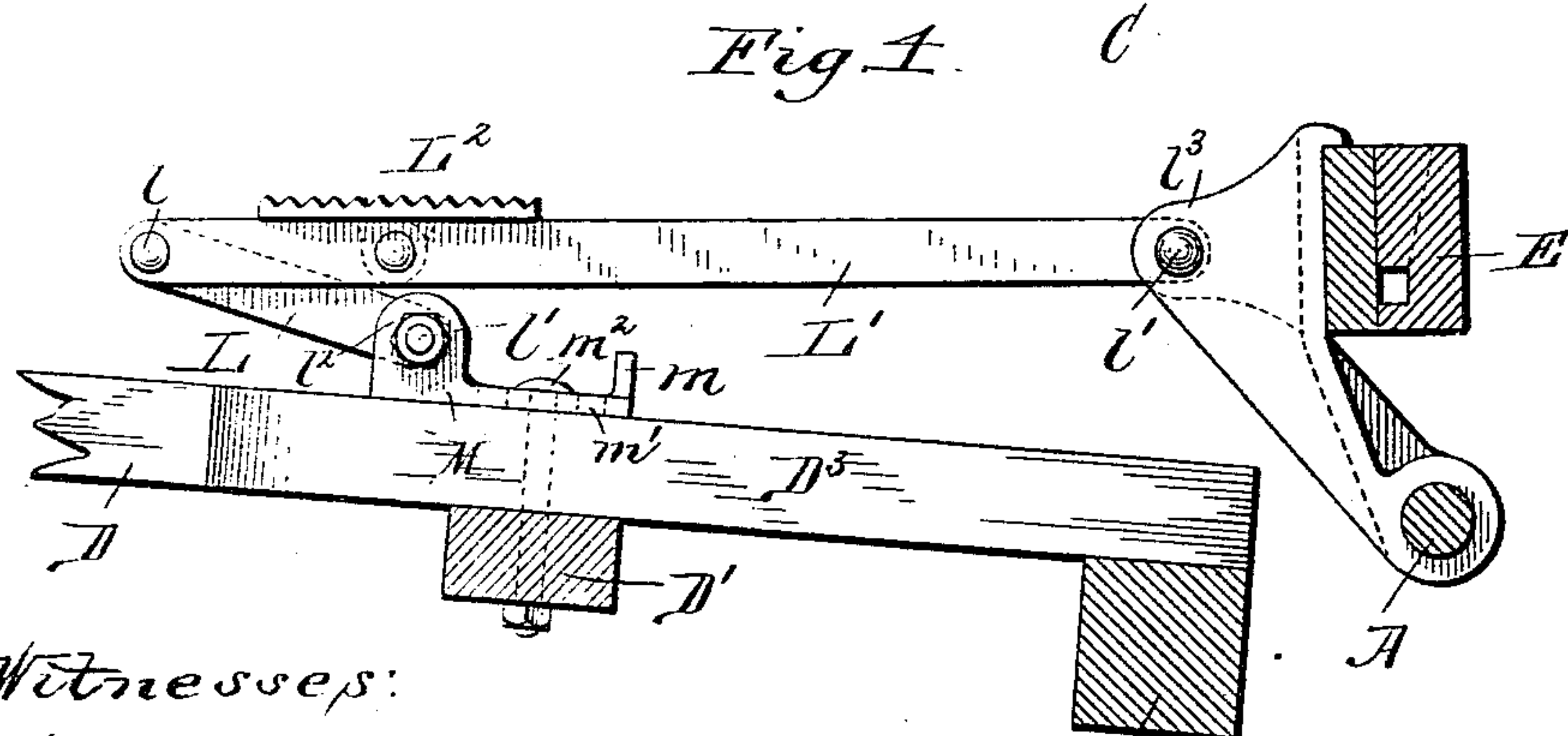
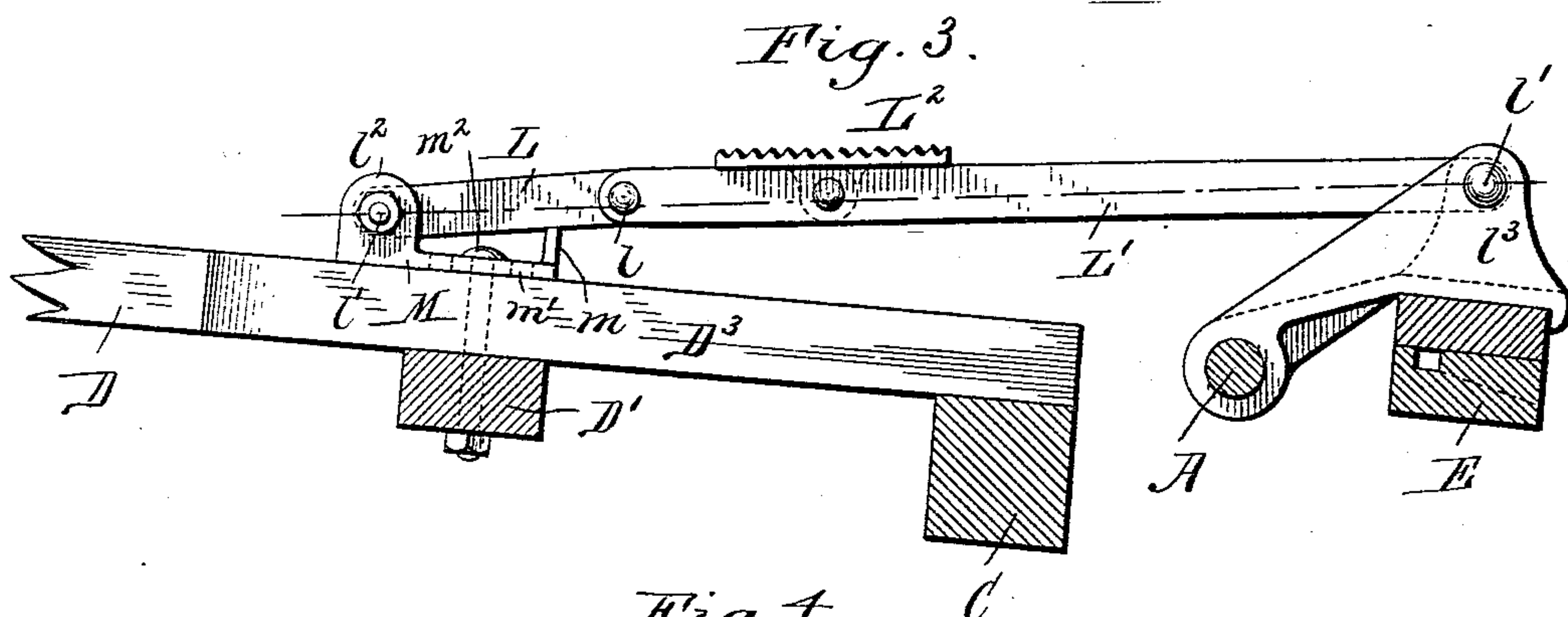
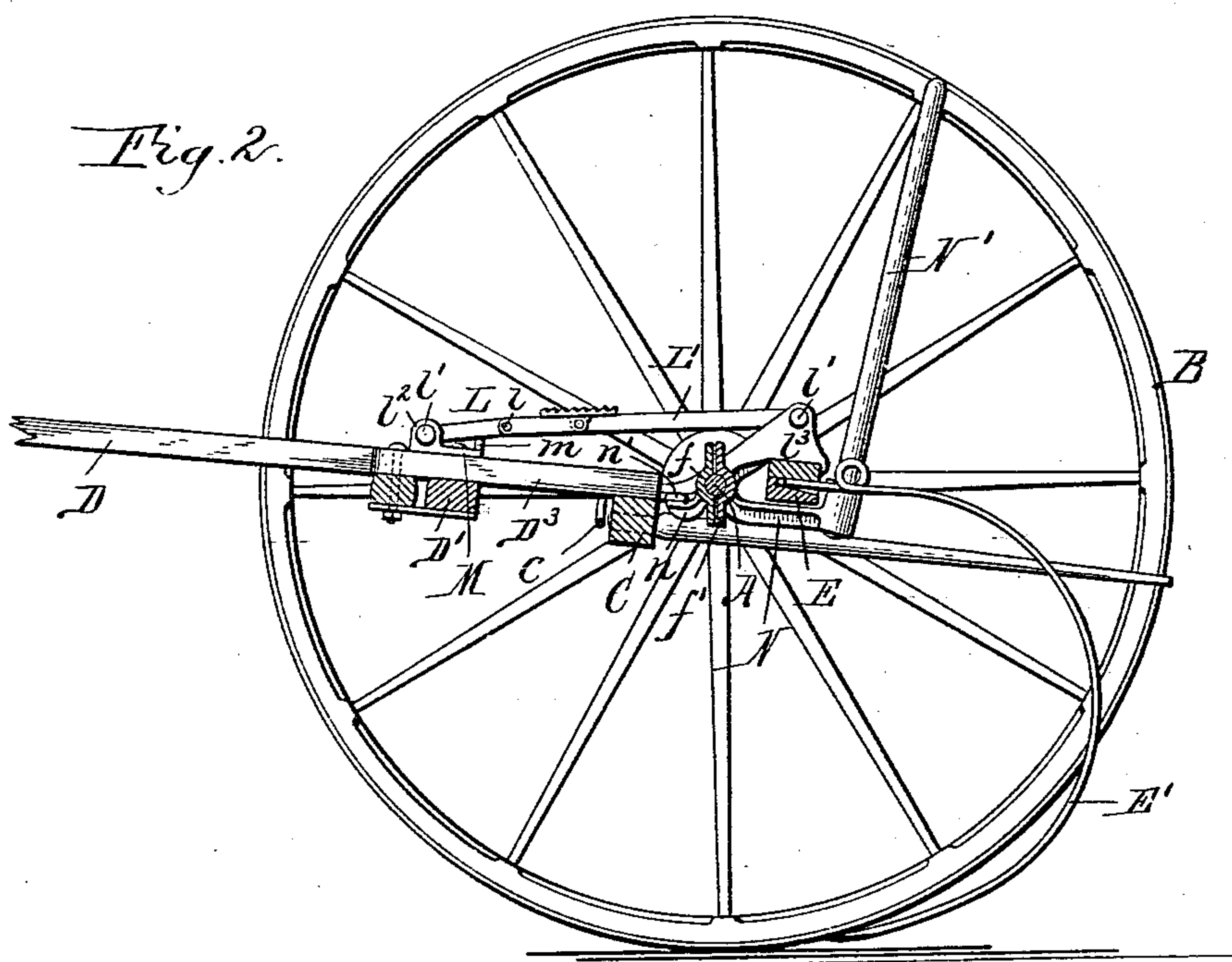
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4 Sheets—Sheet 2.

F. WIARD.
HORSE HAY RAKE.

No. 559,920.

Patented May 12, 1896.



Witnesses:

Emil Newhart.
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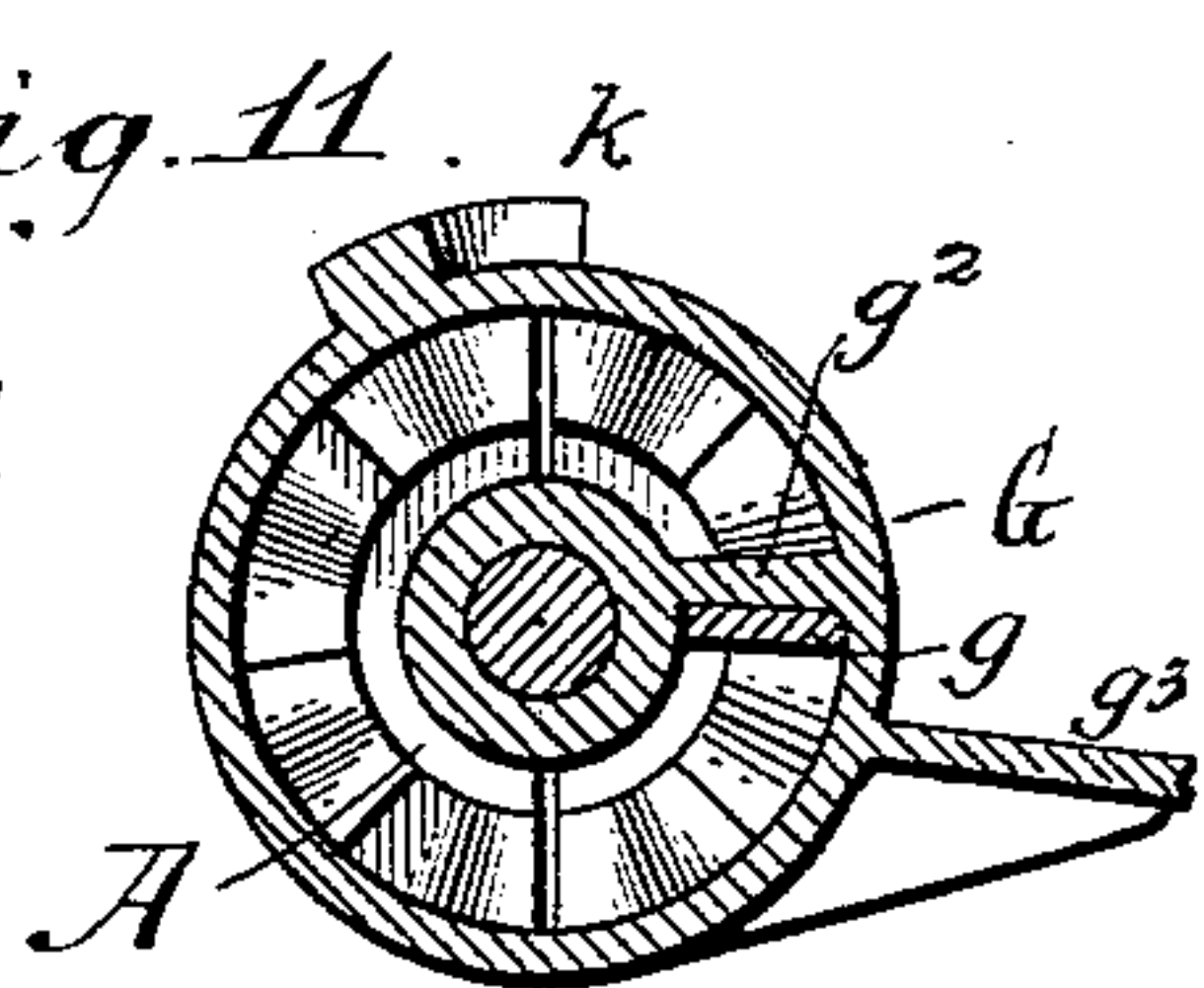
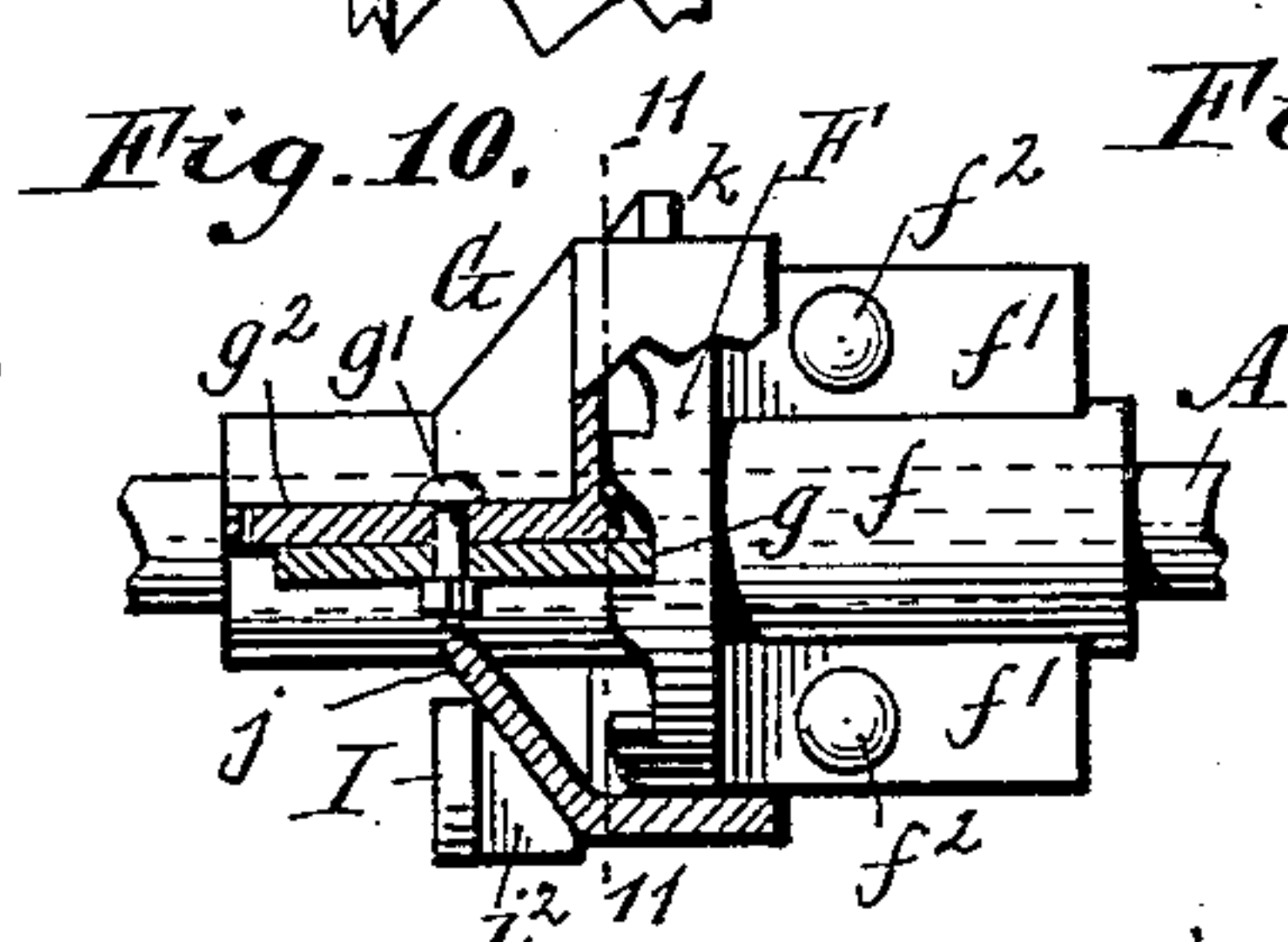
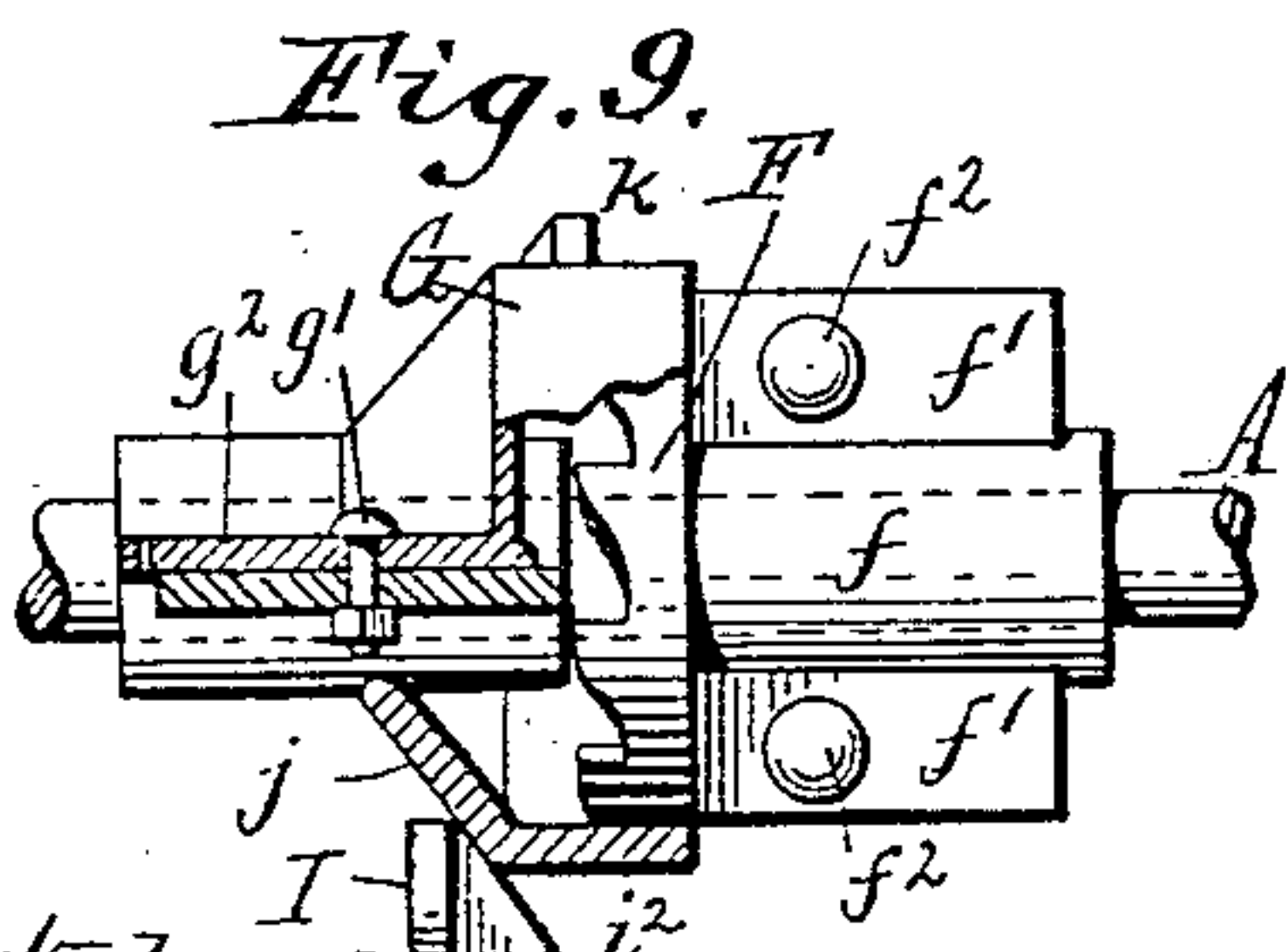
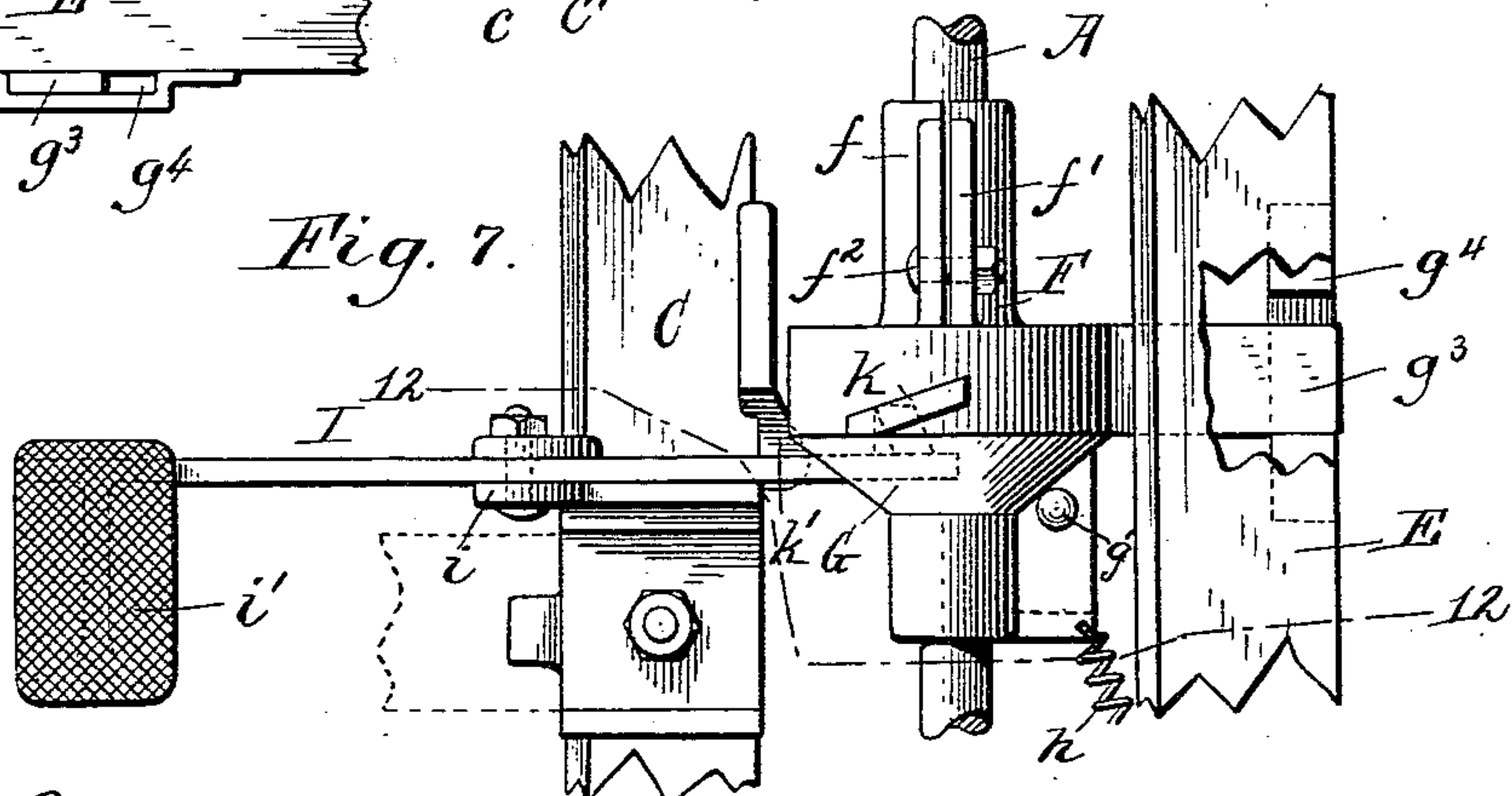
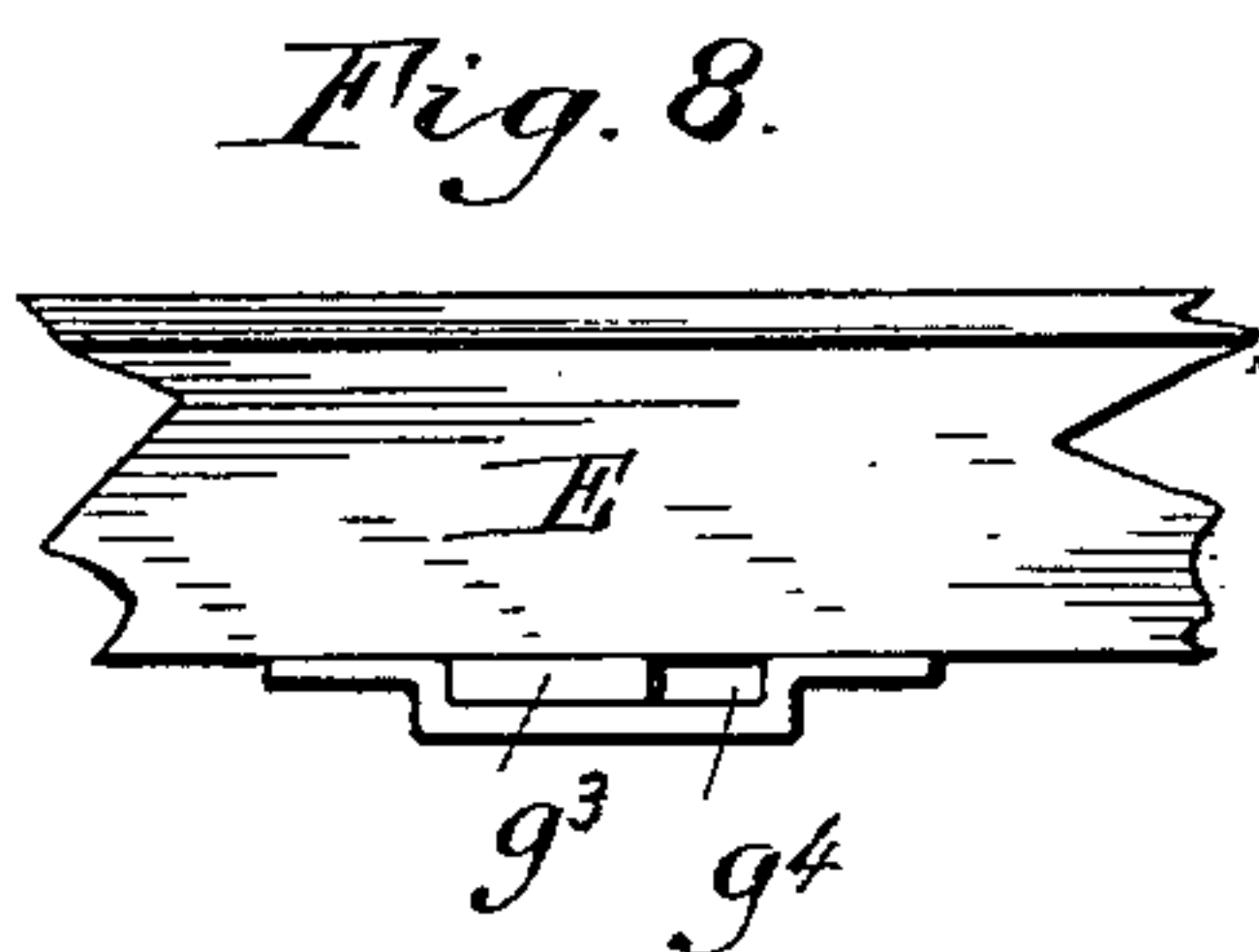
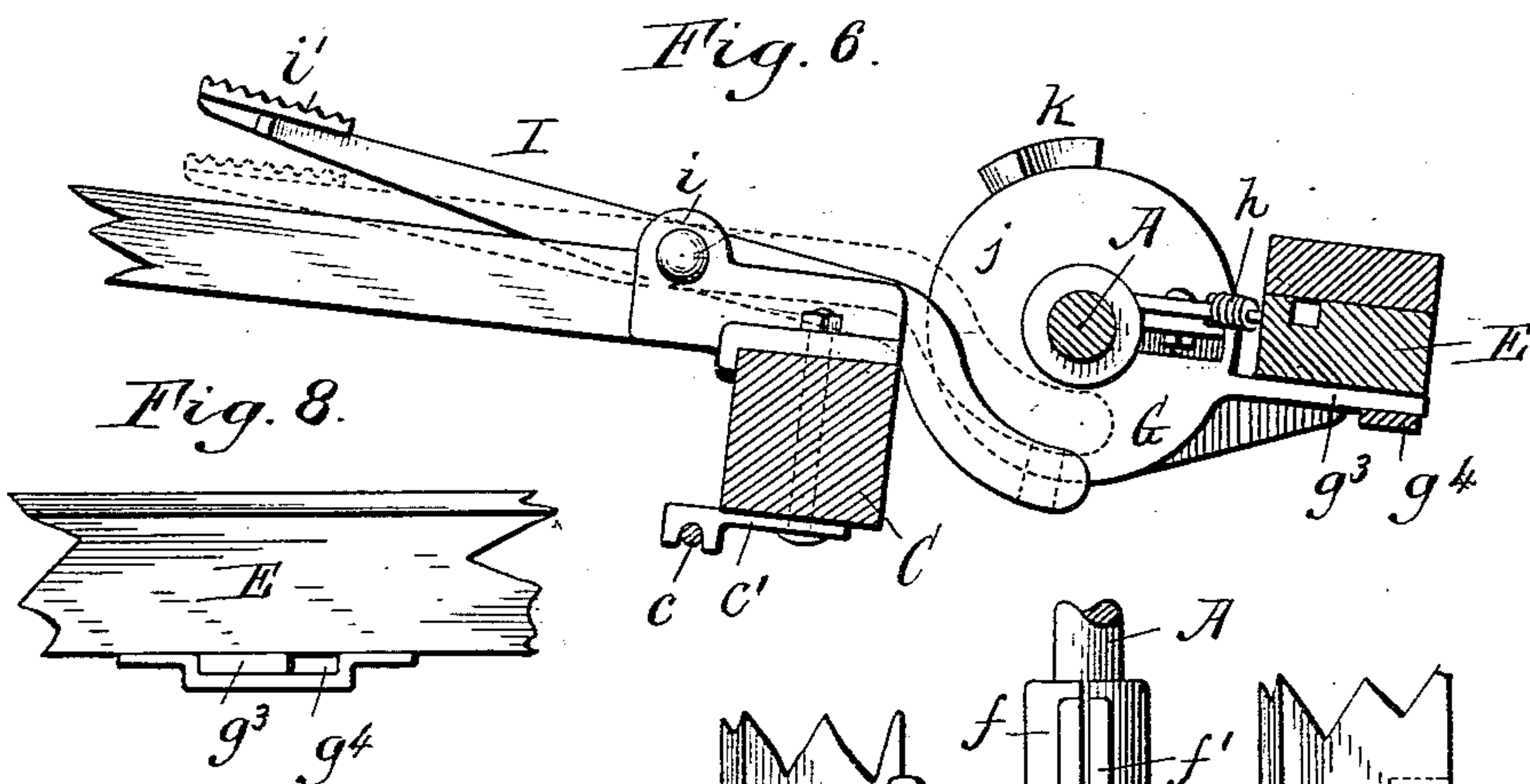
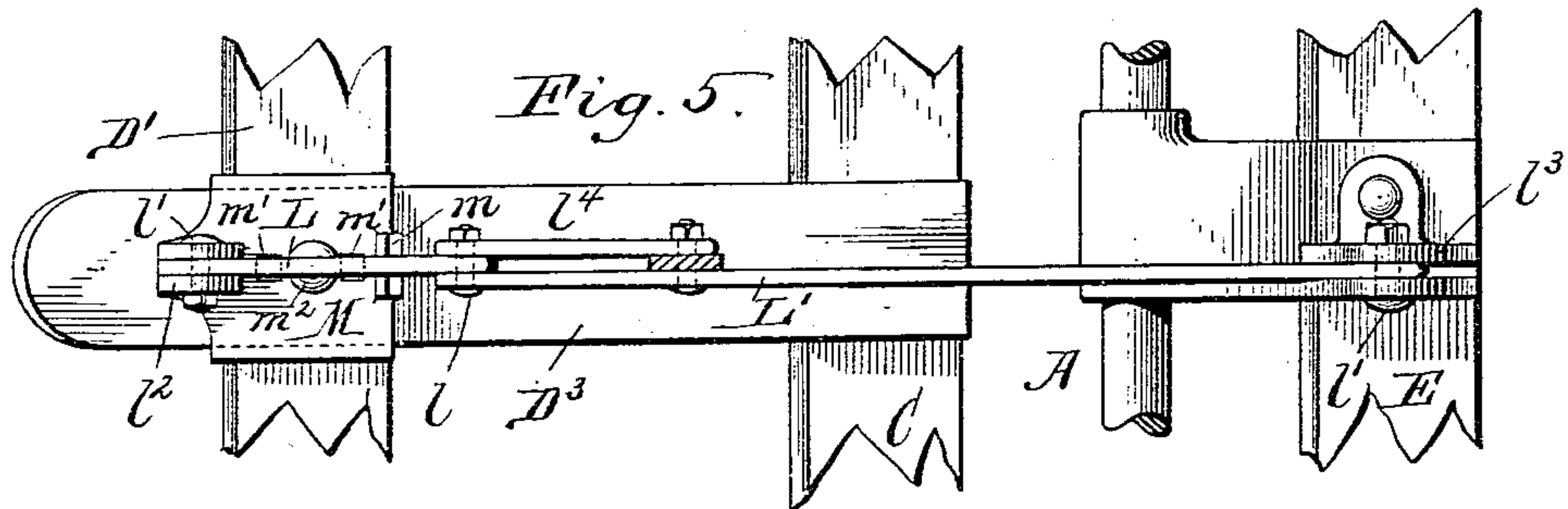
C. F. Ward Inventor.

By Wilhelm Hornum Attorneys

F. WIARD.
HORSE HAY RAKE.

No. 559,920.

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Witnesses:
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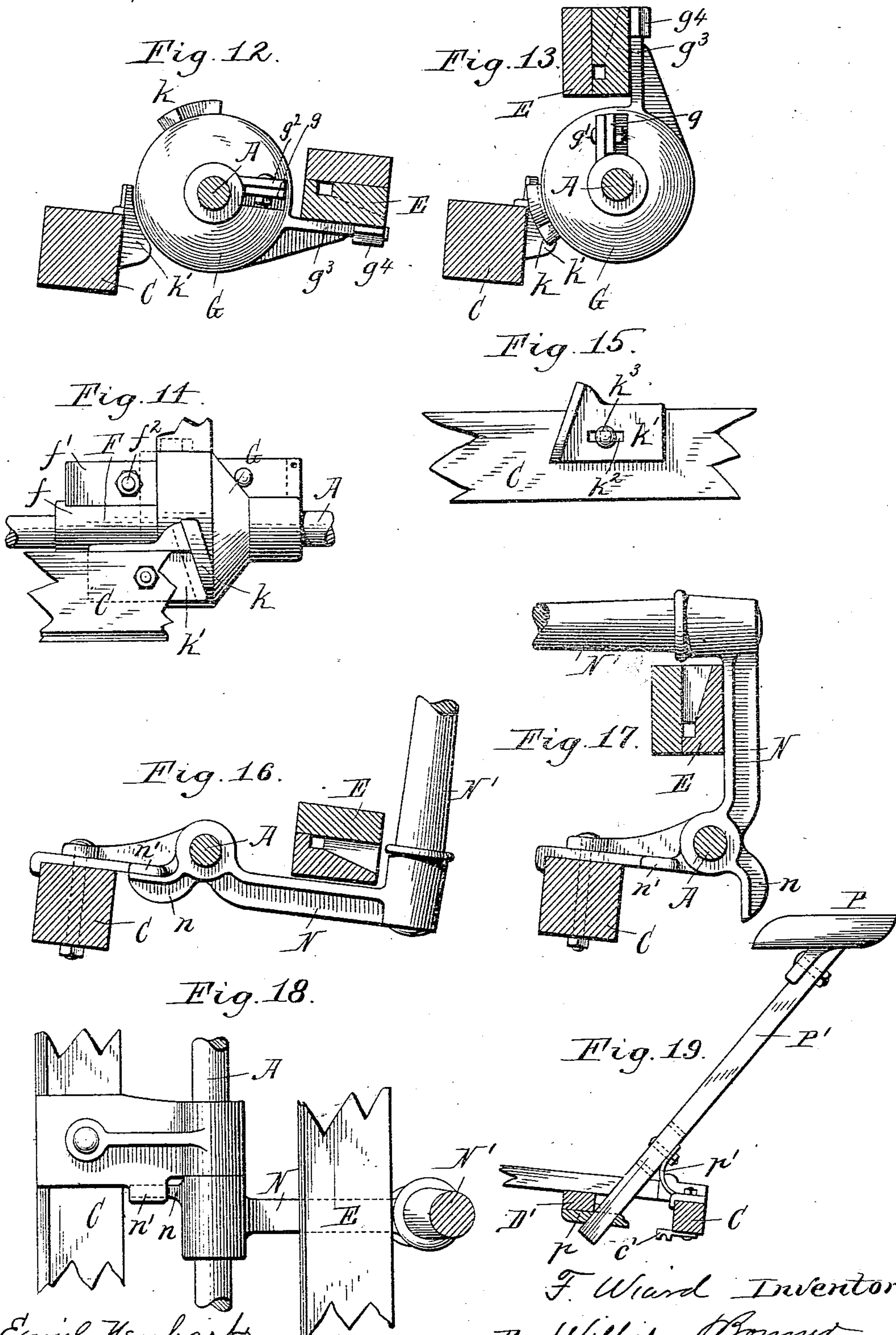
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4 Sheets—Sheet 4.

F. WIARD.
HORSE HAY RAKE.

No. 559,920.

Patented May 12, 1896.



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UNITED STATES PATENT OFFICE.

FREDERICK WIARD, OF BATAVIA, NEW YORK, ASSIGNOR TO THE WIARD
PLOW COMPANY, OF SAME PLACE.

HORSE HAY-RAKE.

SPECIFICATION forming part of Letters Patent No. 559,920, dated May 12, 1896.

Application filed August 2, 1894. Serial No. 519,241. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK WIARD, a citizen of the United States, residing at Batavia, in the county of Genesee and State of New York, have invented a new and useful Improvement in Horse Hay-Rakes, of which the following is a specification.

This invention has more especial reference to that class of horse hay-rakes in which the pivoted rake is raised or dumped from the rotary axle by a pawl or ratchet or other clutch device, which is thrown into gear with the axle by the driver when the desired quantity of hay has been gathered by the rake and which is automatically disengaged from the axle to allow the rake to descend after clearing the gathered pile of hay.

One of the objects of my invention is to improve the construction of the dumping devices and also the means whereby the elevated rake is automatically released when raised sufficiently to dump the rake.

Another object of my invention is to simplify and improve the devices whereby the rake is held in its normal or working position and in its elevated or inoperative position.

A further object is to so construct and arrange the means for dumping the rake by hand that the same does not annoy or endanger the driver.

In the accompanying drawings, consisting of four sheets, Figure 1 is a top plan view of a horse hay-rake containing my improvements. Fig. 2 is a vertical longitudinal section of the same. Fig. 3 is a longitudinal sectional elevation, on an enlarged scale, of the devices for holding the rake in its raised and lowered positions, showing the position of the parts when the rake is lowered. Fig. 4 is a similar view showing the position of the parts when the rake is elevated. Fig. 5 is a top plan view of said devices, corresponding to Fig. 3. Fig. 6 is a fragmentary longitudinal section of the clutch of the dumping mechanism and its operating-lever. Fig. 7 is a top plan view of said parts. Fig. 8 is a fragmentary rear view of the rake-head. Figs. 9 and 10 are fragmentary top plan views of the clutch, partly broken away, showing different positions of the same. Fig. 11 is a vertical cross-section in line 11 11, Fig. 10.

Fig. 12 is a longitudinal section in line 12 12, Fig. 7, showing the position of the parts when the rake is lowered, the foot-lever of the clutch-hood being omitted. Fig. 13 is a similar section showing the position of the parts when the rake is elevated. Fig. 14 is a front view of the clutch and the adjacent portion of the main frame, showing the retracting-cam of the clutch in the act of riding over the incline on the main frame. Fig. 15 is a rear view of said incline. Fig. 16 is a fragmentary longitudinal section, on an enlarged scale, of the lever whereby the rake is elevated by hand, showing the position of the lever when the rake is lowered. Fig. 17 is a similar view showing the position of the parts when the rake is elevated. Fig. 18 is a top plan view corresponding to Fig. 16. Fig. 19 is a fragmentary longitudinal section of the seat and its support.

Like letters of reference refer to like parts in the several figures.

A represents the rotary axle upon which the wheels B are mounted, the latter being provided with the usual clutches, which compel the same to turn forward with the axle, but permit them to turn backward independently of the axle.

C represents the main cross-bar arranged in front of the axle, and C' the brackets secured to the ends thereof and carrying the bearings in which the axle turns.

D represents the thills secured at their rear ends to the main cross-bar and connected a short distance in front of said bar by a cross-piece D'. The projecting ends of the latter are connected with the main cross-bar by short longitudinal bars D², while the central portion of the cross-piece is connected with said cross-bar by a longitudinal bar D³. The main cross-bar C is preferably stiffened by a longitudinal truss-rod c, arranged on the front side of the bar. This truss-rod bears centrally against a grooved bracket c', projecting forwardly from the under side of the bar, as shown in Figs. 1 and 6, while its ends are clamped in notches c², formed in the front portions of the bracket C', as shown in Fig. 1.

E is the transverse rake-head arranged in rear of the axle and carrying the teeth E'. The rake-head is pivoted to the axle by the

usual arms or brackets e , which permit the head to swing upward and forward for elevating the teeth.

F is a clutch or ratchet wheel secured to the axle and forming part of the clutch whereby the rake is dumped from the rotary axle. This ratchet-wheel and its hub are divided longitudinally into similar halves, and the hub-sections f are formed at their opposing edges with outwardly-projecting flanges f^1 , which are connected by bolts or rivets f^2 , whereby the divided hub is firmly clamped to the axle. This construction avoids the necessity of drilling a hole through the axle and weakening the same.

G is a cylindrical hood or clutch-collar, which incloses the ratchet-wheel F and which is capable of turning on the axle as well as sliding lengthwise thereon toward and from the ratchet-wheel. g represents a radial tooth arranged with one end within the hood G and adapted to interlock with the teeth of the ratchet-wheel, so as to cause the hood to turn with said wheel. The tooth g consists of a flat steel bar extending through an opening formed in the hood and secured with its central portion by a bolt g^1 to a web g^2 , formed on the hood adjacent to the opening. When one end of the bar becomes worn by engagement with the ratchet-wheel F , the bar may be reversed, so as to bring its opposite end into the working position. This construction of a clutch-tooth enables the clutch to work for a long time without repairs, and when eventually the tooth is entirely worn out it can be easily replaced by a new one.

The teeth of the ratchet-wheel F are formed on the lateral edge thereof, as shown, so as to face the tooth of the hood. g^3 is a lifting arm or lug projecting rearwardly from the hood and bearing against the under side of the rake-head, whereby the latter is swung upward and forward by the forward rotation of the hood. This lifting-arm passes through an elongated loop or strap g^4 , which is secured to the under side of the rake-head and which permits the arm to slide laterally with the clutch-hood and at the same time acts as a stop which limits the longitudinal movement of the hood. The teeth of the ratchet-wheel are provided with abrupt front faces and beveled backs, so as to compel the hood to turn forward with the ratchet-wheel when one tooth of the latter is in engagement with the tooth of the hood.

By forming the ratchet-teeth on the lateral edge of the wheel and arranging the hood to inclose the ratchet-wheel the driver's clothing and the hay are effectually prevented from becoming entangled with the ratchet-wheel.

h is a spring, which is attached at one end to the web of the clutch-hood and at its opposite end to the rake-head and which tends to hold the tooth of the hood out of engagement with the ratchet-wheel and prevent the same from accidentally engaging with the ratchet-wheel.

I is a foot-lever pivoted between its ends to a bifurcated lug i , secured to the main cross-bar C and having at its front end a foot-plate i^1 . This lever is provided on its downwardly-curved rear arm with a beveled or inclined nose i^2 , projecting laterally from the lever and adapted to bear against a conical or beveled face j , formed on the adjacent portion of the clutch-hood. Upon depressing the front end of this foot-lever its rear end is raised and the beveled nose of the lever, impinging against the corresponding face of the hood, forces the latter toward the ratchet-wheel, throwing the hood into gear with the ratchet-wheel and raising the rake-head.

k is a cam or oblique rib arranged on the periphery of the clutch-hood and adapted to ride over a corresponding incline or projection k^1 , arranged on the main cross-bar in the path of said cam, as shown in Figs. 13 and 14, so as to automatically withdraw the hood from the ratchet-wheel and release the rake-head when the latter is elevated sufficiently to dump the same. The cam k is so arranged relatively to the fixed incline k^1 that the rake in being elevated is thrown out of gear with the axle at the proper time, and the fixed incline is preferably made laterally adjustable with reference to the cam of the hood by means of a slot k^2 and a bolt or set-screw k^3 , as shown in Fig. 15, or any other suitable means. By adjusting the incline laterally the hood is allowed to turn to a correspondingly greater or less extent before the cam of the hood comes in contact with the incline and retracts the hood, thus elevating the rake-teeth accordingly.

L and L' represent a pair of toggle-bars or retaining-links whereby the rake is held either in its working position or in its raised position. These links are connected at their adjacent ends by a horizontal pin or bolt l , while their opposite ends are pivoted by horizontal bolts l^1 to bifurcated lugs l^2 and l^3 , secured to the cross-bar and the rake-head, respectively.

l^4 is a longitudinal link, pivoted at its front end upon the pivot-bolt l and attached at its rear end to the adjacent portion of the rear retaining-link L' .

L^2 is a foot-plate, which is arranged on the rear retaining-link near the pivot-bolt l , and whereby the two links are held in position. The link l^4 forms with the rear retaining-link a broad support for the foot-plate, whereby the latter is prevented from tilting or twisting.

m is a stop arranged on the main cross-bar or frame, preferably between the joint of the retaining-links and the pivot of the front link, whereby the downward movement of the links is limited. This stop is so arranged that when the retaining-links are in their extreme downward position they are slightly deflected upwardly, or, in other words, the joint l connecting the links is slightly above the dead-center, as shown in Fig. 3. By this arrangement the rake-teeth can be held down

in their working position by a comparatively light pressure. When the rake is elevated, the two links fold upon each other, as shown in Fig. 4, the rear link moving forwardly and upwardly as the rake rises, while the front link swings upwardly, forwardly, and downwardly and assumes a position in front of its front pivot and at an acute angle to the rear link. When the parts are in this position, the driver may hold the rake in the elevated position by placing his foot upon the plate I^2 , only a slight pressure being required for this purpose, as the two links closely approach the dead-center. The front retaining-link is preferably considerably shorter than the rear link, as shown, so that the upward movement of the latter is comparatively small. The retaining-links are thus brought on about a level with the foot-lever I of the clutch mechanism, thereby avoiding the necessity of raising the foot in shifting from one foot-plate to the other, rendering this operation less tiresome.

The lug to which the front retaining-link is pivoted and the stop m are preferably formed on a base-plate M, which is made adjustable on the draft-frame toward and from the rake-head, so that the elevation of the points of the teeth above the ground may be regulated. For this purpose the base-plate M is provided with a longitudinal row of openings m' , through either of which the bolt m^2 may be passed, whereby the base-plate is secured to the draft-frame. The base-plate is adjusted farther rearward in case the points of the teeth are too far from the ground, and farther forward if they are too low.

N is a hand-lever, whereby the rake may be raised by hand if desired, as, for instance, in backing. This lever is preferably pivoted upon the axle and extends rearwardly under the rake-head, but has no connection therewith, as shown in Figs. 16 and 18, so that upon swinging the lever upward, as shown in Fig. 17, the rake-head is elevated. The hand-lever is provided at its free rear end with an upright handle N' , which terminates within convenient reach of the driver. The hand-lever is held in its normal horizontal position by a lug n , extending forwardly from the hub of the lever and bearing against the under side of an ear n' , projecting laterally from the adjacent axle-bracket. The ear of the axle-bracket is so arranged with reference to the stop-lug of the hand-lever that the latter is normally out of contact with the under side of the rake-head, as shown in Fig. 16. Upon pulling the handle N' forwardly the lever is swung upward and forward, thereby elevating the rake-head. By arranging the hand-lever independently of the rake the same does not take part in the motion of the rake, except when the latter is raised by hand, and the danger and annoyance of a handle or hand-lever secured to the rake-head are therefore obviated.

P is the seat, and P' its inclined standard, which passes with its lower portion through a loop p , secured to the draft-frame and which is yieldingly supported above said loop by a curved spring p' , secured at its upper end to the standard and at its lower end to the main cross-bar.

If it is desired to use two horses, the thills are bolted side by side to the central portion of the main frame, as shown by dotted lines in Fig. 1, so as to form a pole in a well-known manner.

I claim as my invention—

1. The combination with the rotary axle and the pivoted rake-head, of a ratchet-wheel secured to the axle, a movable collar mounted on the axle and connected with the rake-head, and a reversible tooth attached to said collar and adapted to engage with the ratchet-wheel, substantially as set forth.

2. The combination with the rotary axle and the pivoted rake-head, of a ratchet-wheel secured to the axle, a movable collar mounted on the axle and connected with the rake-head and a tooth consisting of a bar secured with its central portion to said collar and adapted to engage with the ratchet-wheel, substantially as set forth.

3. The combination with the rotary axle and the ratchet-wheel secured thereto, of a movable collar mounted on the axle and provided with an opening and a web on one side of said opening, a tooth arranged in said opening and consisting of a bar secured to said web and adapted to engage with the ratchet-wheel and a rake-head connected with said collar, substantially as set forth.

4. The combination with the rotary axle having a ratchet-wheel, of a toothed clutch-collar arranged to slide on the axle toward and from said ratchet-wheel and having a conical shifting face, and a foot-lever having a beveled face which engages against the conical face of the clutch-collar, substantially as set forth.

5. The combination with the rotary axle and the pivoted rake-head arranged in rear of the axle, of a ratchet-wheel secured to the axle, and a clutch-collar mounted on the axle to move toward and from the ratchet-wheel and provided with a rearwardly-extending lifting-arm engaging underneath the rake-head and having a sliding connection therewith, substantially as set forth.

6. The combination with the rotary axle and the rake-head having a loop on its under side, of a ratchet-wheel secured to the axle, and a collar arranged to slide lengthwise on the rotary axle and having a tooth adapted to engage with said ratchet-wheel and a rearwardly-projecting lifting-arm arranged in the loop of the rake-head, substantially as set forth.

7. The combination with the axle and the rake-head, of a lifting arm or lever extending rearwardly under the rake-head, and a han-

dle arranged on the rear side of the rake-head and secured to the free rear end of said lifting arm or lever, substantially as set forth.

5 8. The combination with the axle, the pivoted rake-head and the main frame, of a lifting arm or lever extending rearwardly under the rake-head, a handle arranged on the rear side of the rake-head and secured to the free

end of the lifting arm or lever and a stop whereby the lifting-arm is supported in its normal position, substantially as set forth. 10

Witness my hand this 24th day of July, 1894.
FREDERICK WIARD.

Witnesses:

JNO. J. BONNER,
THEO. L. POPP.