

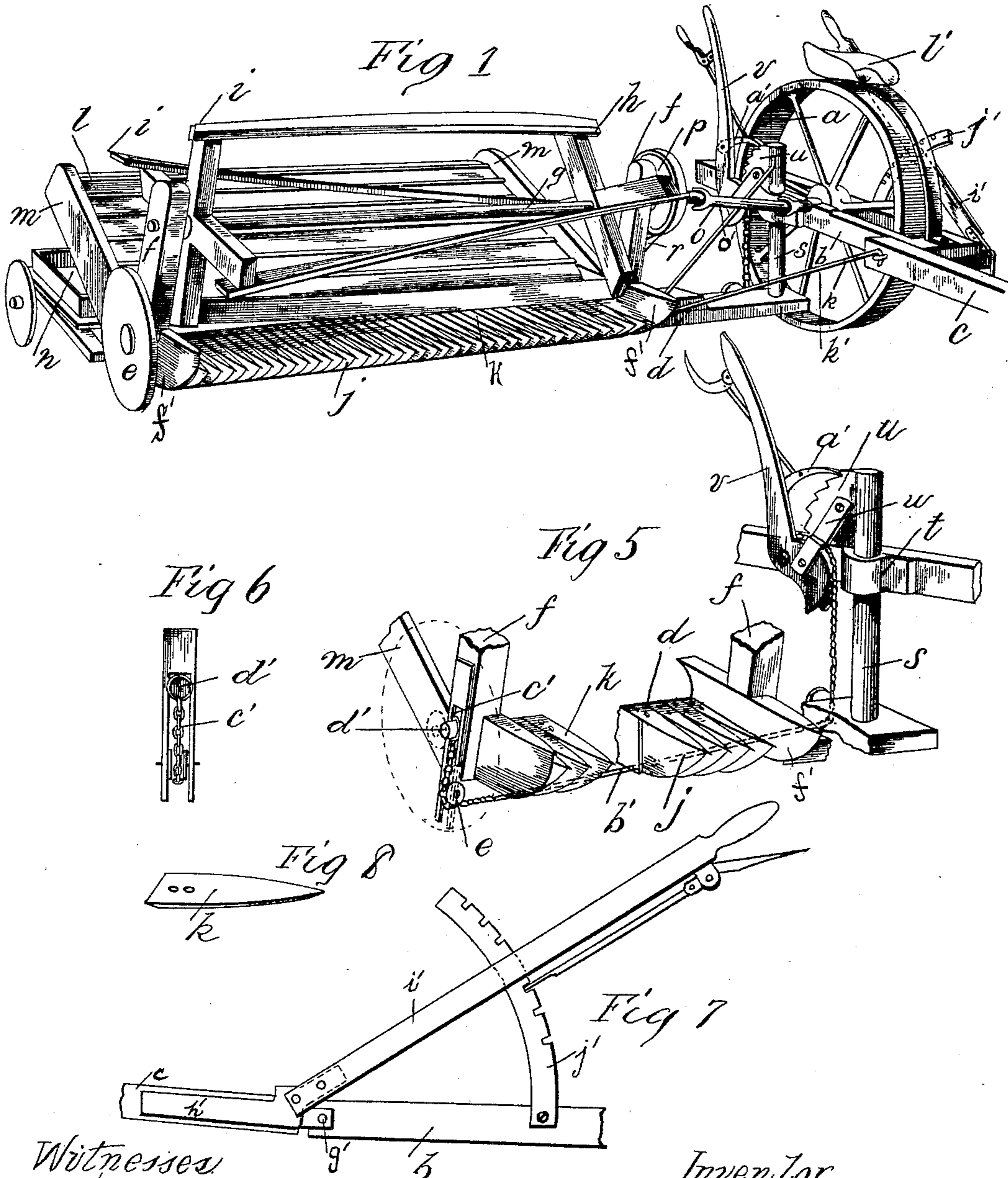
(No Model.)

2 Sheets—Sheet 1.

J. H. ETtinger.
CLOVER HARVESTER.

No. 435,809.

Patented Sept. 2, 1890.



Witnesses
C. C. Burdine
H. E. Peck

Inventor
Joseph H. Ettinger
By his Attorney
O. E. Duff

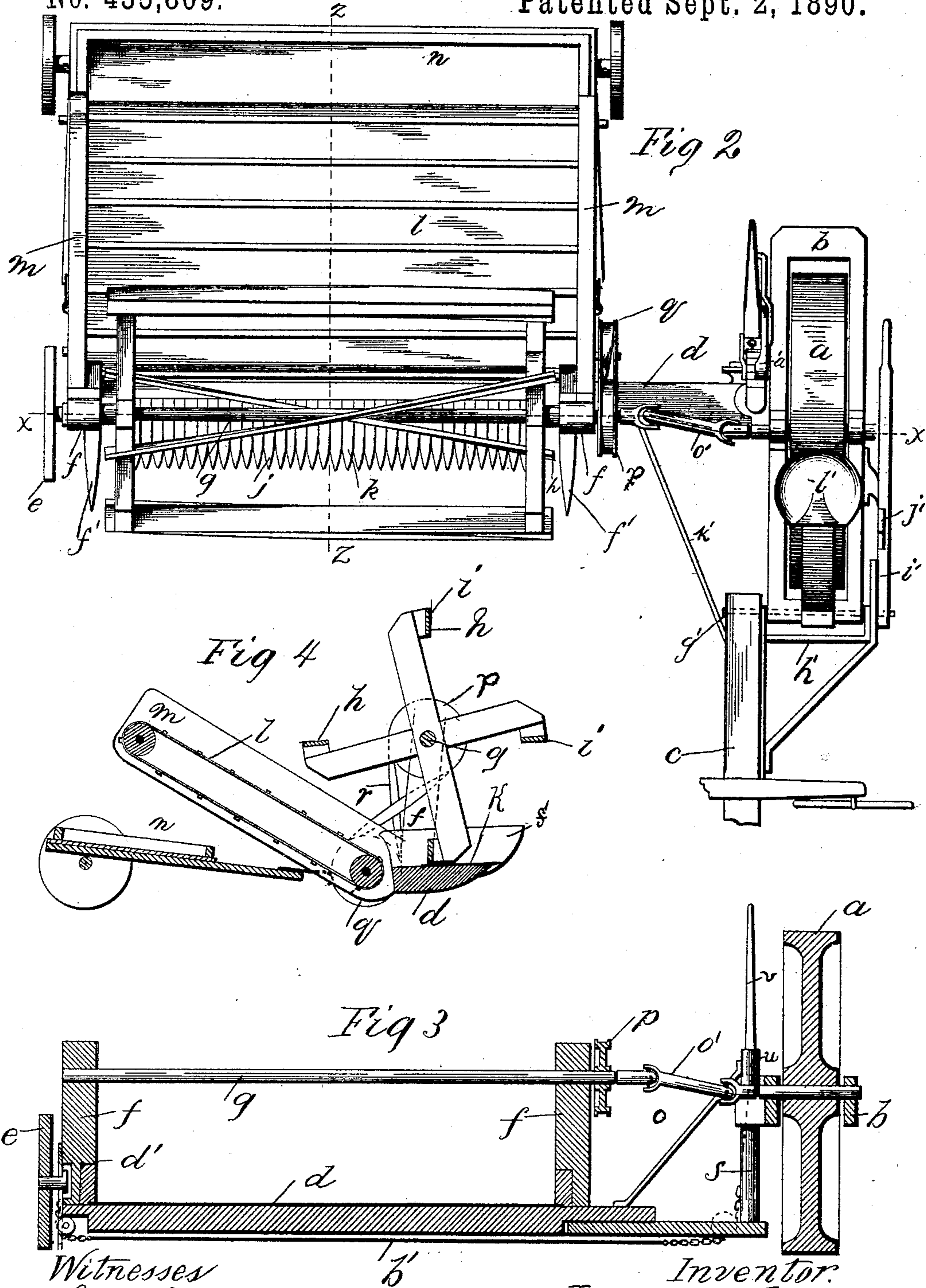
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UNITED STATES PATENT OFFICE.

JOSEPH H. ETTINGER, OF LEXINGTON, VIRGINIA, ASSIGNOR TO HIMSELF
AND WILLIAM H. WADDELL, OF SAME PLACE.

CLOVER-HARVESTER.

SPECIFICATION forming part of Letters Patent No. 435,809, dated September 2, 1890.

Application filed October 24, 1889. Serial No. 328,016. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH H. ETTINGER, of Lexington, in the county of Rockbridge and State of Virginia, have invented certain new and useful Improvements in Clover-Harvesters; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

My invention relates to certain improvements in clover-harvesters; and the invention consists in certain novel features of construction and in combinations of parts, more fully described hereinafter, and particularly pointed out in the claims.

Referring to the accompanying drawings, Figure 1 is a perspective of the complete machine. Fig. 2 is a top plan of the same. Fig. 3 is a longitudinal section on the line *xx*, Fig. 2. Fig. 4 is a cross-section on the line *zz*, Fig. 2. Fig. 5 is a detail perspective, portions being broken away, illustrating the adjusting arrangement for vertically adjusting the tooth-frame. Fig. 6 is a detail of the sliding bearing of the small wheel. Fig. 7 is a detail of the adjusting device for tilting the frame and teeth. Fig. 8 is a detail perspective of one of the cutting-blades on the teeth.

In the drawings, the reference-letter *a* indicates the master or main driving wheel surrounded by and carrying the main frame *b*. The tongue *c* is pivoted to one side of this frame *b*, as hereinafter set forth. A horizontal strong rigid finger or tooth bar or frame *d* is attached at one end to said frame *b* and at its opposite end is supported by the small wheel *e*, so that the finger-bar lies near the surface of the ground, while the main frame *b* is in a plane considerably above the same. This finger-bar is provided at its ends with the vertical standards *f f*, in which a reel-shaft *g* is journaled carrying a reel composed of radial arms from the shaft connected by the reel-arms *h*, having metal strips *i*, secured to and projecting outwardly from their front (in the direction of motion) longitudinal edges to scrape along the top faces of the teeth *j*

and the finger or tooth bar. This tooth-bar is provided on its front side with a series of forwardly-extending teeth. These teeth consist of a series of forwardly-projecting teeth tapering to their front edges, which are sharp, so that narrow slightly-tapering spaces are left between the teeth, and the teeth are quite thick at their rear ends, flat on top, and taper downwardly to their bottom edges, as shown. Each tooth on its upper flat edge has a forwardly-tapering cutting-blade *k*, secured thereon. These blades taper forwardly to a point and project in front of and over the sides of the teeth, and are sharpened from the under sides of their edges to form cutting-edges on the upper side, and at their rear ends these blades on the adjacent teeth are in contact, so that the cutting-edges of the series of blades meet above the spaces between the teeth. The teeth are preferably formed of wood. These flat metal blades are secured to the tooth-bar only, so that their forward portions extending out upon the flat top surfaces of the teeth have a slight upward spring, and, as before stated, the edges of these teeth are beveled or sharpened up from the under side, so that the cutting-edges are at the top surface. The thin metal strips projecting radially from the longitudinal edges of the reel scrape along the top surfaces of these teeth and press them down, hence maintaining a constant positive contact between the teeth and said metal strips, insuring accurate and effective cutting of the clover, and also constantly keeping the edges of the teeth sharp. This is a feature of importance and a great improvement. The reel consisting of the radial spokes and the longitudinal arms having the thin metal strips longitudinally secured on and projecting radially from their longitudinal edges is also an important improvement. As the machine moves forward the clover is caught between the teeth and lifted up by the same, so that the heads pass above and between the cutting-blades and are cut off by the same, or by the same in conjunction with the reel, and the clover-heads are swept rearwardly by the reel to a slatted conveyer *l*, located directly in rear of the reel and moving upwardly and rearwardly therefrom and carried by shafts and drums mounted in the two

upwardly and rearwardly inclined arms *m*, rigidly secured to the finger-bar. The clover-heads from the conveyer are discharged into a box or receptacle *n*, located below the same and mounted on wheels and provided with forwardly-extending arms having hooks to detachably secure the following receptacle to the arms *m*, as shown. The shaft of the reel is extended through the inner supporting-standard of the same, and is connected with the rotary axle or the master-wheel by a universal or flexible coupling or joint *o*, consisting of the tumbling-shaft *o'*, connected to the reel-shaft and the driving-wheel shaft by two universal joints, so that the reel will be rotated and can be moved vertically independently of the main frame and master-wheel. The inner end of the reel-shaft is provided with a pulley *p*, and the inner end of the lower conveyer driving-shaft is also provided with a pulley *q*, which two pulleys are connected by a twisted belt *r* to drive the upper side of the conveyer in a direction opposite to the movement of the reel. The finger bar or frame and all parts carried thereby are secured to the main frame to be capable of vertical adjustment by means of the vertical post *s*, rigidly secured at its lower end to the inner end of the finger-frame and extending upwardly through and sliding in a block *t*, rigidly secured to the inner side of the main frame. This post is suitably braced, as shown, and upon its upper end is provided with a ratchet-segment or lateral head *u*. The parts carried by the finger-frame and the cutting apparatus are raised and lowered by the operating-lever *v*, pivoted to the side of the main frame, just in rear of the block *t*, and the lower end of this lever below the fulcrum and on the opposite side from the handle portion is connected with the head *u* of the post immediately above by the link *w*, so that when the handle end of the operating-lever is pressed down the post *s* is raised, and with it the cutting apparatus, through the medium of said link and head, and the lever is held in the desired adjustment by means of a pivoted pawl *a'*, carried by said lever and engaging said ratchet on the head *u* of said post. The outer end of the cutting apparatus carried by the small wheel *e* is correspondingly raised and lowered with the inner end thereof by means of a connection *b'* on the under side of the finger-bar at one end, connected with a segment on the end of the lever *v* by means of a chain working around a pulley and secured to said segment at one end, and said connection *b'* at its opposite end is connected with the shaft of the wheel by a chain passing around a pulley. A vertical inclosed slot or way *c'* is located at the end of the finger-bar, in which the end *d'* of the stud or shaft carrying the wheel slides and is confined, so that when the operating-lever is pressed down to lift the cutting apparatus the connection *b'* is drawn in a direction to

draw down the wheel and by bearing upwardly against the pulley *e'* lift the outer end of the frame, and when the operating-lever is adjusted to lower the cutting apparatus the connection *b'* is loosened and the outer end of the frame allowed to drop. The finger-bar at its ends is provided with the forwardly-extending guards or dividers *f' f'*.

The tongue *c* is located on the inner side of the main frame, and is pivoted thereto at its rear end by means of a pivot-bolt *g'*, passing through the front end of the main frame and the rear ends of a triangular frame *h'*, located on both sides of the front end of the main frame and rigidly secured to the outer side of the rear end of the tongue, and this frame on the outer side of its rear end is provided with an upwardly-extending arm, to which the lower end of an upwardly and rearwardly extending lever *i'* is rigidly secured, and this lever is provided with a transverse opening, through which a curved rack-bar *j'* loosely extends. This bar is pivoted to the main frame at its lower end, so that it can swing with the lever, and the lever is provided with a pawl and releasing hand-clip, as shown, to hold the lever in the desired relative adjustment. By this lever and connection between the tongue and frame the frame and teeth can be inclined up or down and tilted to any angle. The rear end of the tongue is connected with the cutter-bar frame by an inclined brace *k'*.

The machine is provided with a driver's seat *l'*.

The further operation and superior advantages of this machine are obvious from the drawings and foregoing description.

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

1. In a clover-harvester, the tooth-bar having the forwardly-tapered teeth rigid therewith and provided with flat upper faces and the separate tapered metal cutting-blades on the teeth, each secured at its rear portion on the tooth-bar and extending out on the flat upper face of a blade, so as to have a slight upward spring, each blade having the lateral cutting-edges sharpened from the under side, in combination with the reel mounted above the bar and consisting of the shaft, spokes, and longitudinal bars, having the thin metal cutting-strips radially projecting from the longitudinal edges thereof to press down and cut in conjunction with said blades.

2. In a clover-harvester, the combination of the main frame, the main wheel mounted therein, a tooth-bar provided with a series of forwardly-extending teeth, a small wheel adjustably carrying the outer end of said bar, a vertical post rigidly secured to and extending up from the inner end of said bar and extending movably through an opening in the main frame, and a lever pivoted to the main frame and connected with the upper part of said post by a link and with said small wheel to

vertically adjust said bar, and provided with means to hold the bar in the desired adjustment, substantially as described.

3. In a clover-harvester, the combination
5 of the tooth-bar, a small wheel adjustably supporting one end thereof, the main frame and main wheel carrying the same, the vertical post rigid on the inner end of said bar and extending movably through an opening
10 in the main frame, a toothed head on the upper end of said post, an operating-lever fulcrumed on the main frame, a link pivotally connecting the lower end of said lever and said lateral head, and a locking-pawl carried
15 by said lever to engage the teeth of said head, as set forth.

4. In a clover-harvester, the combination of the tooth-bar, a small wheel carrying the outer end thereof, the main frame carried by
20 the driving-wheel supporting the inner end thereof, upright posts at the inner ends of said bar, a reel carried thereby, a tumbling-shaft connecting the reel-shaft and driving-wheel axle, a pulley on the inner end of said
25 reel-shaft, a pair of rearwardly and upwardly

inclined arms from said bar, rollers mounted between said arms and carrying a conveyer from the rear edge of said tooth-bar, one of said rollers having a pulley, and a belt connecting said two pulleys, substantially as described.

5. In a clover-harvester, the combination of the master-wheel, the main frame, a tooth bar or frame supported at one end by a vertically-adjustable wheel, a vertical post at the
35 other end of said bar confined and sliding in an aperture in the main frame and provided on its upper end with a lateral head, a lever fulcrumed to the main frame and having one end connected with said head by a link to
40 raise and lower said bar, and means to hold the bar in the desired vertical adjustment, substantially as described.

In testimony that I claim the foregoing as my own I affix my signature in presence of
45 two witnesses.

JOSEPH H. ETTINGER.

Witnesses:

WILLIAM H. WADDELL,
THOMAS B. WADDELL.