(No Model.) 3 Sheets—Sheet 1.

C. E. EASTON.

HOP PICKER.

No. 541,431. Patented June 18, 1895.

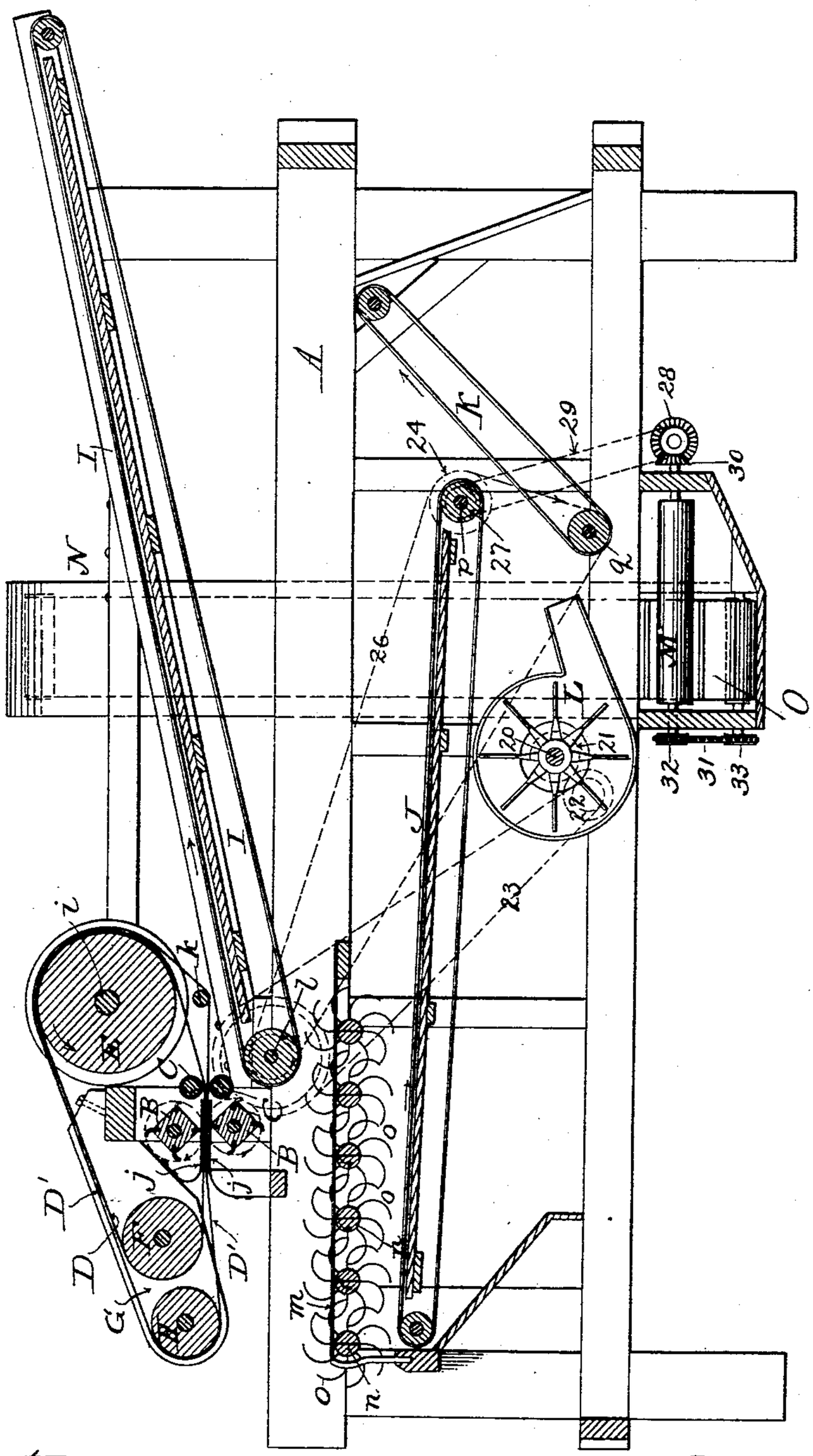

Fig. 1.

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Inventor:
C. E. Easton
by Dodger Lone,
Att'y.

(No Model.)

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C. E. EASTON.

HOP PICKER.

No. 541,431. Patented June 18, 1895.

Fig. 2.

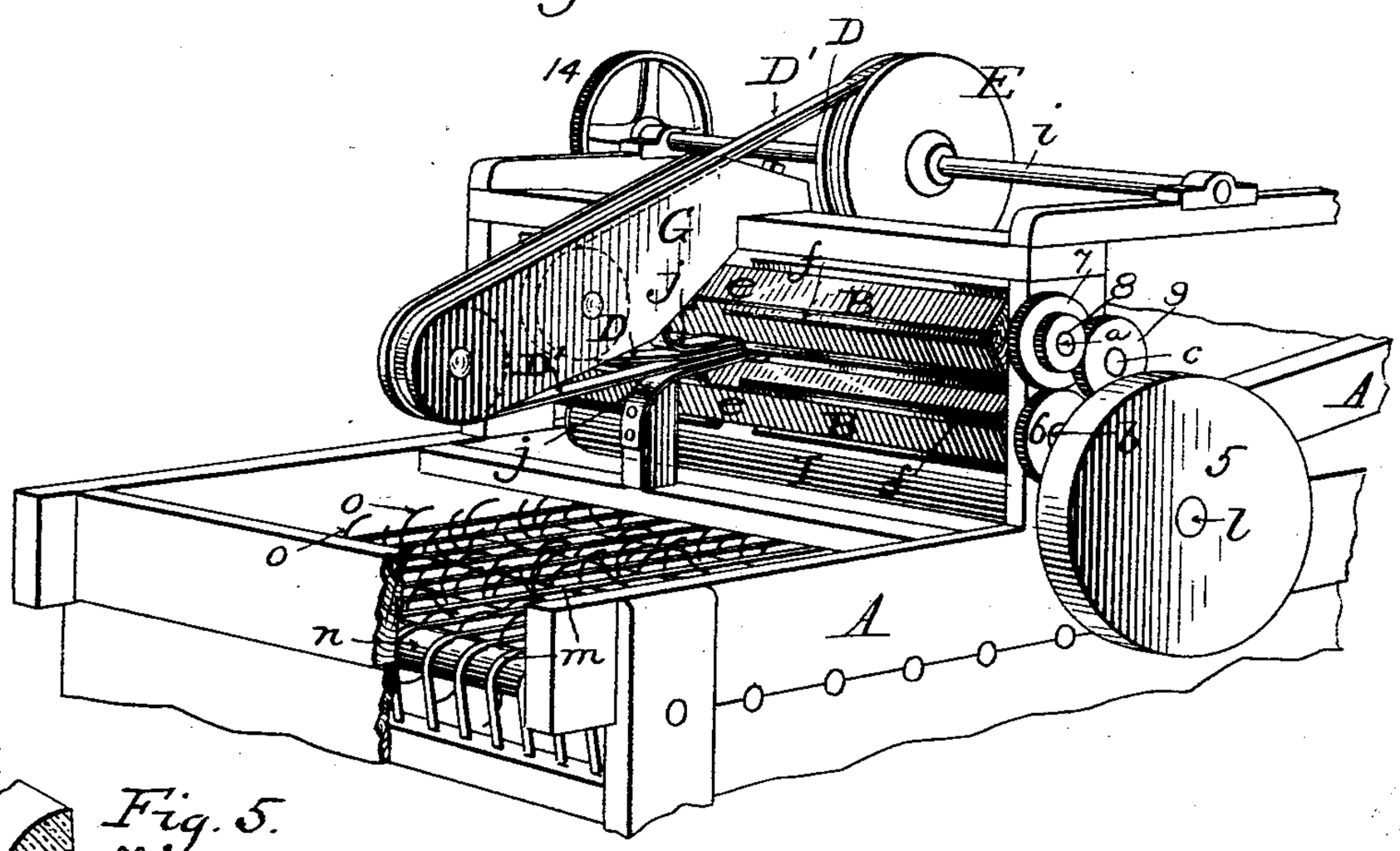


Fig. 5.

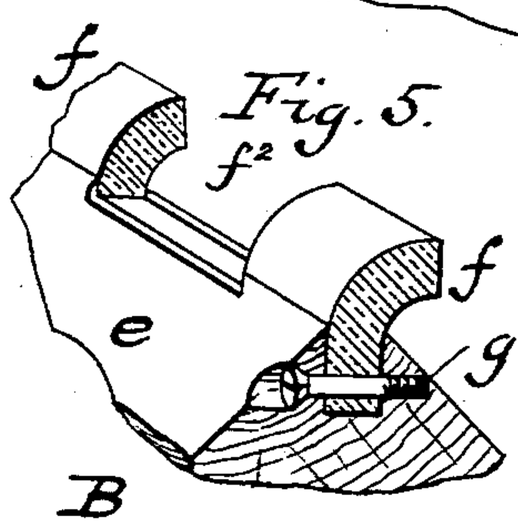
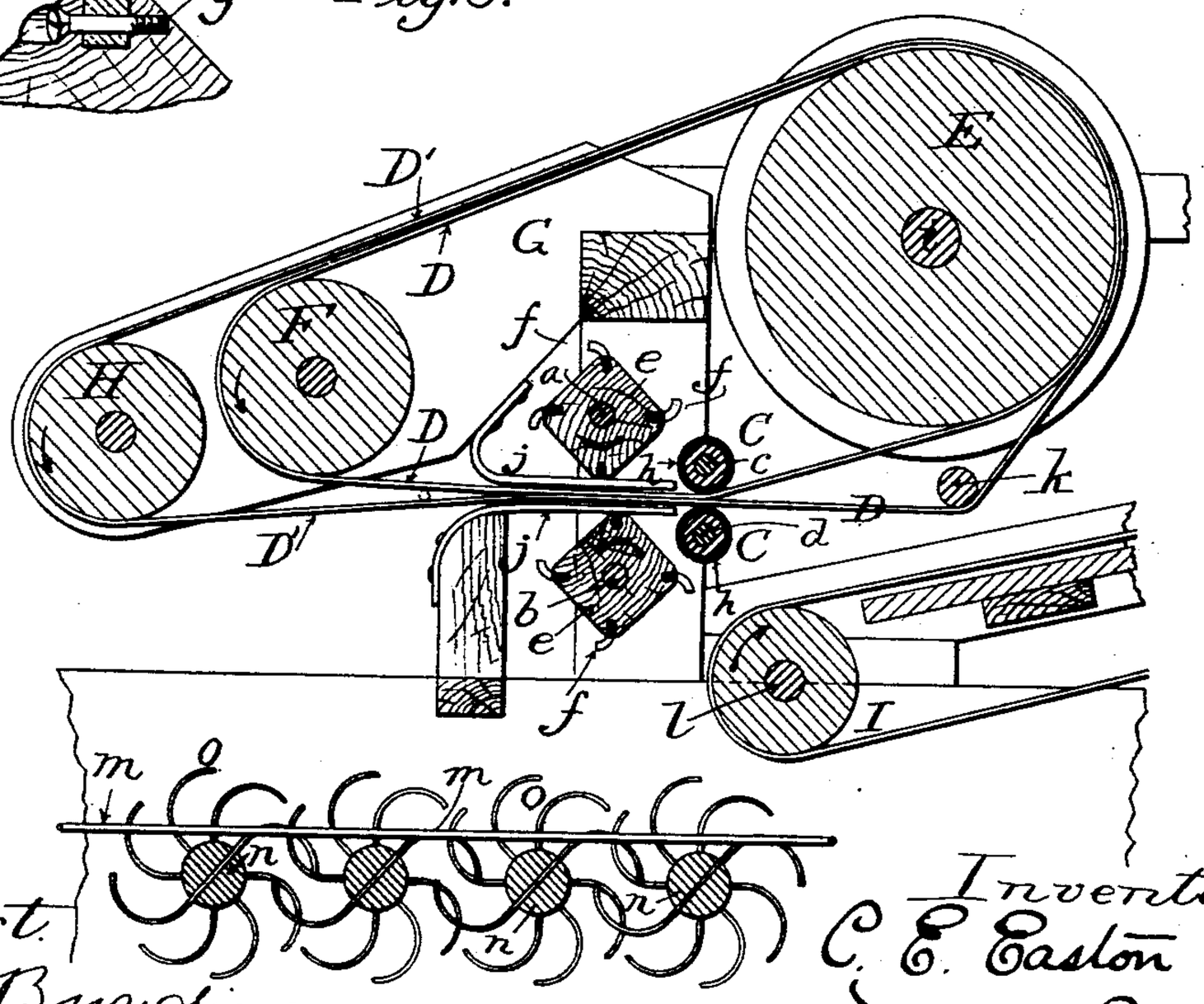


Fig. 3.



Attest.
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C. B. Bull.

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(No Model.)

3 Sheets—Sheet 3.

C. E. EASTON.

HOP PICKER.

No. 541,431. Patented June 18, 1895.

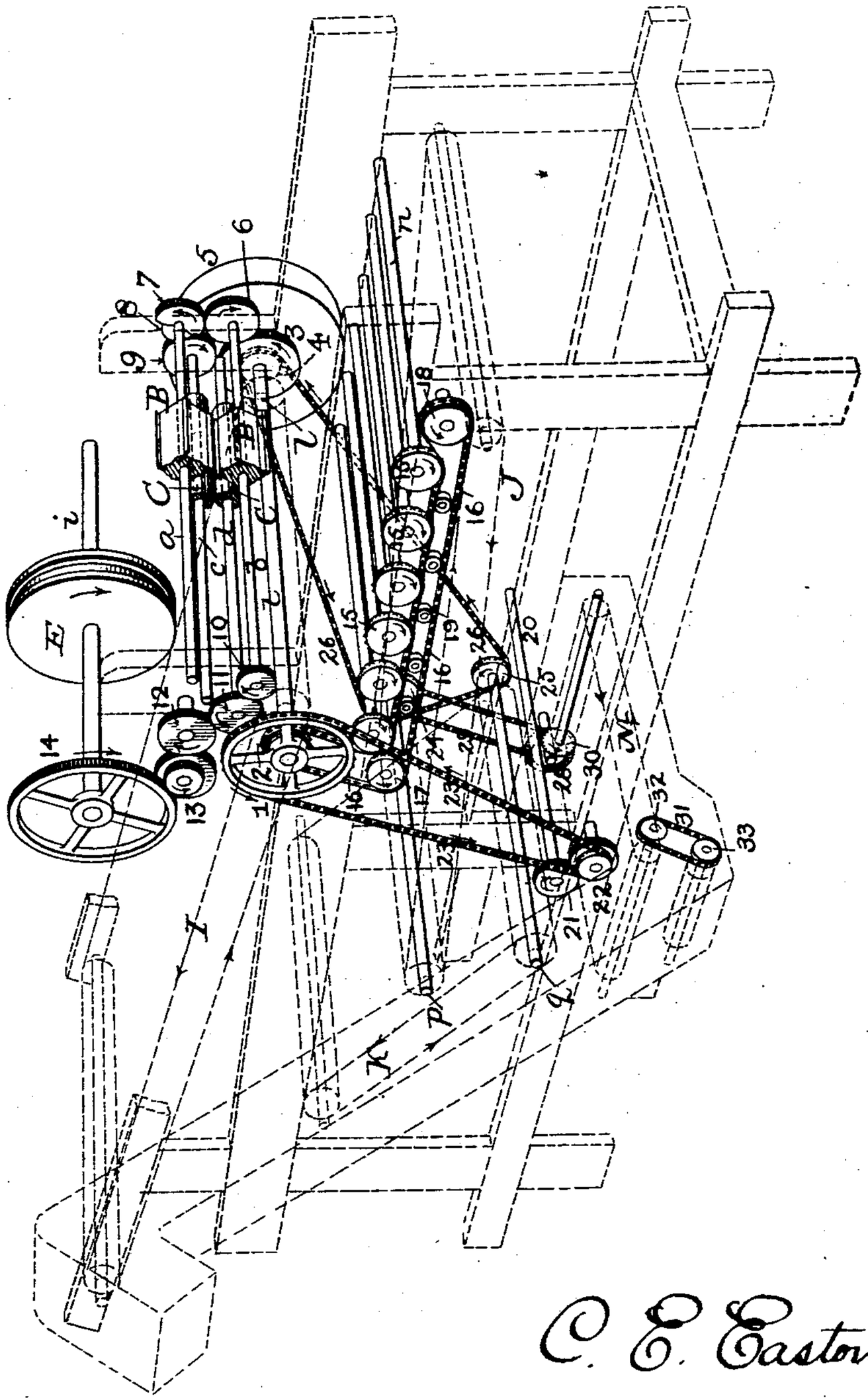

Fig. 4.

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UNITED STATES PATENT OFFICE.

CHARLON E. EASTON, OF RICHFIELD SPRINGS, NEW YORK.

HOP-PICKER.

SPECIFICATION forming part of Letters Patent No. 541,431, dated June 18, 1895.

Application filed October 25, 1894. Serial No. 526,944. (No model.)

To all whom it may concern:

Be it known that I, CHARLON E. EASTON, a citizen of the United States, residing at Richfield Springs, in the county of Otsego and State of New York, have invented certain new and useful Improvements in Hop-Pickers, of which the following is a specification.

My invention relates to machines for picking hops—that is, a machine for picking each strobile or catkin from the vine,—and the object of the invention is to produce a machine that will remove the catkins from the vine or stem thoroughly, rapidly, and without injury.

In the drawings, Figure 1 is a vertical longitudinal sectional view of my improved machine; Fig. 2, a perspective view, partly broken away, of a portion of the front end of the machine; Fig. 3, a vertical central sectional view through the feeding devices; Fig. 4, a perspective view of the gearing for imparting motion to the various mechanisms, with certain parts shown in dotted lines; and Fig. 5, a sectional perspective view of a portion of one of the pickers.

A indicates a suitable main frame in which are journaled the two pickers B B and the feed rolls C C, the respective shafts *a*, *b*, *c*, *d* of which project beyond the sides of the frame.

The pickers B B are arranged one above the other, with the upper one slightly in advance of the lower; while the feed rollers C C are also located one above the other, but in rear of the pickers as shown in Figs. 1, 3 and 4.

Each picker comprises a central shaft, and a wooden body *e*,—preferably rectangular in cross section,—which body is grooved longitudinally at its edges or corners to receive the strips *f* of rubber. Screws or other fastenings *g* hold the rubber strips in place. These rubber strips are each segmental in cross section, and the strips of the two pickers are so arranged that the convex faces on one picker nearly, but not quite, meet or touch the corresponding faces of the strips of the other picker. These pickers rotate toward the operator, while the feed rollers turn or rotate away from the operator. Rollers C C comprise each a shaft and a body or surface *h* of rubber.

Passing between the pickers B B and between the rollers C C are two endless feeding bands D D′ which receive motion from a band wheel E mounted upon a shaft *i* above and in rear of the feed roller.

B and D passes over the wheel E and thence to a wheel F supported by a forwardly-projecting arm G, Figs. 1, 2 and 3, while band D′ extends from wheel E to a wheel H carried by the arm G but in advance of and a little below the wheel F; the bands D D′ being in the same vertical plane and thereby overlapping throughout a portion of their length. By reason of the difference in position of the wheels F and H, the bands D D′ are separated from each other on the lower side, in advance of the pickers, in order to afford a space or opening for the insertion of the butt of the stem or vine. These bands are held up in proper position to insure their proper entrance between the pickers, by means of two curved arms *j j* which extend from a point in advance of the pickers well inward into the space between the latter,—the said arms *j j* being located, respectively, above and below the two bands D D′ as shown in Figs. 1, 2 and 3. The rubber strips *f* are cut away as shown at f^2, Fig. 5, to receive the arms *f*, *f* and bands D, D′.

In order to separate or spread the bands D D′ after they pass from between the rollers C C, and to thereby release the stems or vines held by the bands, there is placed in rear of the latter a small roller or shaft *k*, Figs. 1 and 3, under which the band D′ is carried before being allowed to pass to the wheel E,—the band D passing directly from the feed rollers to the said wheel. In practice, these bands have been made of steel, about three-fourths of an inch in width, and, as will be seen upon reference to the drawings, are arranged centrally with reference to, or midway between the ends of, the pickers and feed rollers.

I indicates an endless belt or carrier, with its front end beneath the feed rollers and its upper end overhanging the main frame so as to deliver the vines and stems outside of the machine as they fall from between the feeding bands. This endless belt or conveyer receives motion from the driving shaft *l* which carries the lower belt-supporting roll.

Beneath the pickers and feed rollers is the "separator," which comprises a grating com-

posed of a series of parallel wires *m*, and a series of toothed rollers *n*, whose teeth *o* work between the vines, as shown in Figs. 1, 2 and 3.

The rollers are advisably made of wood, and the teeth *o* are of S-form and pass through the body of the rollers. The teeth of each roller are arranged spirally and they project into the spaces between the teeth of adjacent rollers so that there shall be no interference with each other.

It will be noticed upon reference to Fig. 1 that the rollers are located just below the grating or wire *m*, and that the convex sides of the teeth which project between and above the wires, are toward the operator, or front of the machine. These rollers are rotated uniformly toward the operator, and they return to him any of the clusters, or vines with adhering clusters,—the small leaves and hops passing downward through the separator onto a second endless belt J which extends from the front of the machine well toward the rear. This endless belt is arranged to deliver the hops and small leaves onto another belt K, which as shown in Fig. 1, is arranged in an inclined position opposite the discharge of a fan or blower L.

One of the supporting rollers of each of the belts J and K is provided with a shaft to which necessary motion is imparted, the said shafts being designated respectively *p* and *q*.

As the leaves of the plant are lighter than the hops, the latter will fall from the inclined belt K onto a transverse horizontal belt M, while the leaves will be caught by the blast from the fan and held against the up-moving side of the belt K by means of which they are discharged from the machine. The horizontal belt or apron M delivers the hops into the boot of an elevator N, which latter is provided with a suitable elevating apron O driven from the belt M.

Upon reference to Fig. 4 the gearing for imparting motion to the various mechanisms will be readily understood.

Driving shaft *l* is provided at one end with sprocket wheels 1 and 2; and at the other end with gear 3, sprocket 4 (shown in dotted lines) and band wheel 5. Gear 3 engages with gear 6 on shaft *b* of the lower picker B, and the said gear 6 meshes with a similar gear 7 on the shaft *a* of the upper picker. On this same shaft *a* is a small gear 8 which meshes with a larger gear 9 secured to shaft *c* of the upper feed roller C, thereby giving to the feed rollers a slower motion than that of the pickers. On the left hand end of lower picker shaft *b* is a gear 10 of the same size as gear 8, which transmits motion to the lower feed roll whose shaft *d* carries gear 11; and the motion thus given to gear 11 is transmitted through idler 12, and the double idler gear 13, to the gear 14 on shaft *i*.

Upon one end of each of the toothed rollers of the separator is a sprocket 15, which sprockets receive motion from a chain 16 which passes over the sprocket 2 on the driving shaft, and also about sprockets 17 and 18, the chain being supported and held up in engagement with the sprockets 15 by means of rollers 19. To impart motion to the fan L, its shaft 20 is provided with gear 21 which engages the combined gear and sprocket 22, to which latter motion is imparted by a chain 23 passing over the wheel 1 on the driving shaft.

The shafts *p* and *q* of belts J and K are provided respectively with sprocket wheels 24 and 25, which receive motion from a chain 26 passing over sprocket 4 on the driving shaft. On the end of shaft *p* there is a second sprocket 27, about which, and a combined sprocket gear 28, passes a chain 29; the said gear 28 transmitting motion, through bevel gear 30, to the endless belt M. Motion is transmitted from the belt M to the elevating apron, by means of chain 31 and sprocket wheels 32 and 33.

The operation is as follows: The butt of the vine or stem is passed between the bands D D′, and the vines or stems are carried by the bands in between the pickers B B, the pickers turning or rotating in a direction opposite to that of the travel of the bands and vine. The vine will not be detached from the bands because the spring arms *j j*, pressing upon opposite sides of the bands, press the latter closely upon the interposed vine. As the vine is carried along it is beaten or struck by the backs or rounded faces of the rubber strips *f* of the pickers, and the latter detach or pick the catkins or blossoms from the vine or stem. After the catkins have been removed or picked from the stem, the latter is carried farther inward by the bands D D′ and the feed rollers C C, and is finally released by the separation of the bands, and allowed to fall upon the endless apron I by means of which it is discharged from the machines. The blossoms or catkins picked off from the stem by the pickers B B fall onto the separator (with more or less of the smaller leaves), and as the toothed rollers of the separator revolve, they carry the hops and small leaves down through the grating *m* onto the endless belt J, and return to the operator any clusters that were broken off or improperly detached from the stem in order that they may be re-presented to the action of the pickers. The hops and leaves which fall onto apron J fall from the end of the latter, onto the inclined apron K, but owing to the fact that the hops are heavier than the leaves, they will fall across the blast from fan L onto the apron M while the leaves will be held against the belt K and delivered by the latter outside the machine. The hops falling upon apron M are delivered to the boot of the elevator N and are carried up and discharged into bags by means of the elevating apron O.

Having thus described my invention, what I claim is—

1. The pickers B B provided with curved rubber strips *f*, extending longitudinally of

the pickers, and projecting therefrom a short distance, in combination with means for turning the pickers away from each other at their front meeting edges.

2. In combination with rotatable pickers and a pair of feed rolls in rear of the same; two superposed feeding bands passing between the rolls and pickers; and means for moving the bands and rolls in a direction the reverse of that of the pickers.

3. In combination with pickers rotating toward the front of the machine; rollers in rear of the pickers, rotating toward the rear of the machine; two feeding bands passing between the pickers and the rollers; and means for spreading the bands in front of the pickers and in rear of the feed rollers.

4. In combination with a pair of rotating pickers, and a pair of rollers in rear of the pickers; the superposed bands passing between the rollers and pickers; and means for moving the bands and rotating the rollers in a direction the reverse of that given the pickers.

5. In combination with a pair of rotating pickers, and a pair of rotating feed rollers in rear thereof; the superposed bands passing between the pickers and rollers; and the fingers *j j* extending inward between the pickers above and below the bands.

6. In combination with a pair of rotating pickers provided with curved flexible strips, cut away at a point between their ends; a pair of rotating feed rollers in rear of the pickers; the superposed bands passing between the pickers and rollers; and the fingers *j j* projecting between the pickers above and below the bands.

7. In combination with a pair of rotatable pickers, and a pair of feed rollers in rear thereof; the superposed feeding bands passing between the pickers and rollers, between their ends, whereby the hops may be presented to the bands from either or both sides.

8. In combination with the rotatable pickers and the feed rollers; the superposed bands passing between the pickers and rollers; a frame or support G; wheels F and H for the respective bands at the forward end of said support; a wheel E common to both bands; a roller *k* between the bands, in rear of the feed rollers; and means for rotating wheel E.

9. In combination with rotatable pickers, and a feed mechanism comprising the rollers C C and the superposed bands; a roller *k* between the bands for spreading them in rear of the rollers C C; and a conveyer I located beneath said roller *k* to receive the stalks or stems when discharged from the bands.

10. In combination with rotatable pickers and a feed mechanism therefor; a separator located beneath the pickers and extending toward or to the front of the machine; whereby the clusters are returned at once to the operator.

11. In combination with rotatable pickers and a feed mechanism therefor; a separator located beneath the pickers, and comprising the rods *m*, and the rollers provided with curved teeth *o;* said teeth overlapping as shown, and means for rotating the rollers toward the front of the machine.

12. In combination with rotatable pickers and a feed mechanism therefor; an apron I in rear of the pickers to receive the stems; a separator beneath the pickers; an apron J beneath the separator; an inclined apron K at the end of the apron J; and a fan L to deliver a blast against the face of apron K whereby the lighter leaves &c. are held against the apron K.

In witness whereof I hereunto set my hand in the presence of two witnesses.

CHARLON E. EASTON.

Witnesses:

GEORGE A. SITTS,

K. B. WEATHERBEE.