

W. H. CLARK.

MACHINE FOR PICKING AND SEPARATING HOPS.

No. 529,598.

Patented Nov. 20, 1894.

Fig. 1.

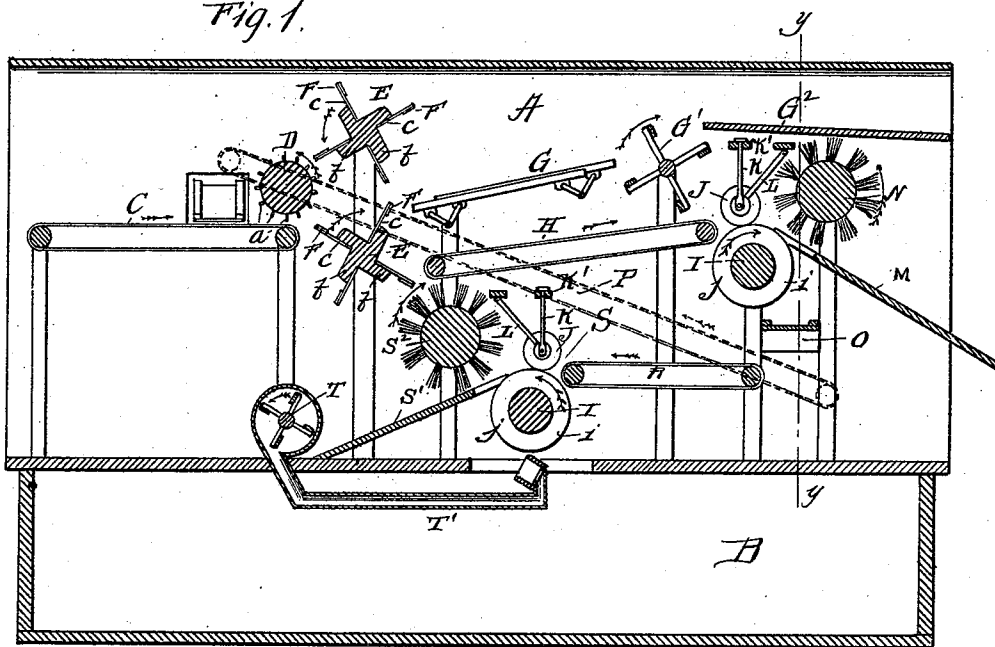
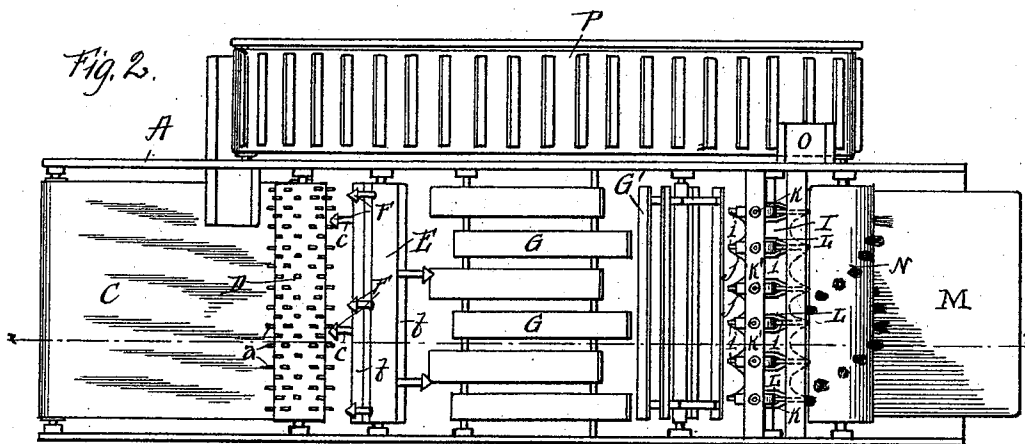


Fig. 2.



WITNESSES

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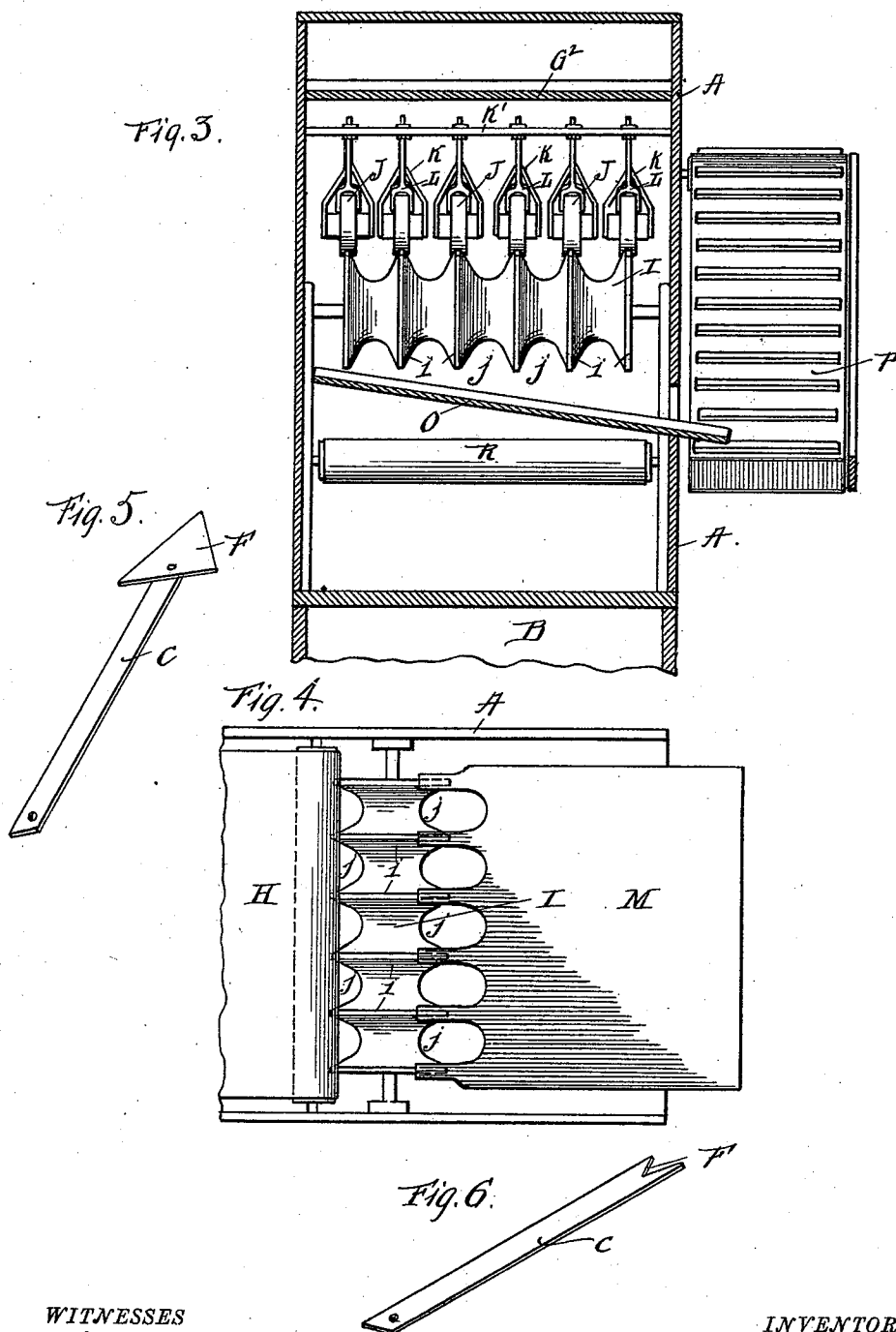
Warren H. Clark
by E. W. Anderson
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UNITED STATES PATENT OFFICE.

WARREN H. CLARK, OF WEST BURLINGTON, NEW YORK.

MACHINE FOR PICKING AND SEPARATING HOPS.

SPECIFICATION forming part of Letters Patent No. 529,598, dated November 20, 1894.

Application filed June 27, 1894. Serial No. 515,844. (No model.)

To all whom it may concern:

Be it known that I, WARREN H. CLARK, a citizen of the United States, and a resident of West Burlington, in the county of Otsego and State of New York, have invented certain new and useful Improvements in Machines for Picking and Separating Hops; and I do 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a representation of a vertical section of the machine through line $x-x$, Fig. 2. Fig. 2 is a plan view of the machine with top of frame and board G^2 removed. Fig. 3 is a section on line $y-y$ Fig. 1. Fig. 4 is a plan view of tailboard and cylinder I. Figs. 5 and 6 are details of forms of pickers.

This invention has relation to certain new and useful improvements in machines for picking and separating hops from their vines, the object of the invention being to provide practical means whereby hops after being stripped from the poles or other supports upon which they are grown, may, without manual labor except such as is necessary to tend the machine, be picked from the vines and separated from the leaves and stems, in a thorough and efficient manner.

With this object in view, the invention consists in the novel construction and combination of parts, all as hereinafter described and pointed out in the appended claims.

Referring to the accompanying drawings the letter A designates the frame of the machine, which in the smaller form shown in the drawings, is usually supported upon a hop box B, but which in larger forms will be provided with supporting wheels in the manner of a thrashing machine.

At the forward part of the machine is supported an endless, traveling belt or apron C upon which the hops and vines are fed as they come from the field. Over the rear, or discharge portion of said belt or apron, is journaled a transverse rotary cylinder D having its surface studded with spikes or projections a whose purpose it is to catch the hops

and feed them along to the pickers E, E, just behind said cylinder. Said pickers are journaled transversely of the machine one above the other, and consist each of a drum having longitudinal ribs or flanges b , and carrying a series of picker knives F arranged in spiral order. These knives are carried by arms c removably secured to the drum and having abutments against the said ribs or flanges, being preferably of somewhat yielding, or springy character. Various forms of knives may be employed, such as the triangular form shown in Figs. 2 and 5, or the forked form of Fig. 6. The arms c being detachable, the knives may be readily reground when necessary. I prefer, in operation, to run the lower picker at a much slower rate than the upper one in order that the vines may be held back somewhat in their passage while being subjected to the operation of the upper picker. The operation of these pickers strips the hops from the vines singly and in clusters, together with more or less of the leaves, the vines passing from the pickers onto a series of longitudinal, vibrating bars or fingers G, along which they are carried by the vibration of the bars or fingers to a rotating reel G' at the rear thereof which passes them onto board G^2 from which they fall to the ground. Any hops that may be mixed with the vines are separated therefrom by the vibration of the bars or fingers, and fall therethrough onto an endless traveling carrier H, which also receives the hops directly from the pickers. The movement of this carrier brings the hops to the separator which will now be described.

Journaled transversely of the machine at the rear of the carrier and in close relation thereto is a cylinder I which is formed with a series of circumferential flanges i , having comparatively broad peripheries, and usually convex or beveled on their lateral faces. These flanges being of considerably larger diameter than the cylinder which carries them, and being well apart from each other on the cylinder, openings j of considerable size are formed between them. Parallel with said cylinder, above, and slightly forward of the center thereof, is a series of disks J which are provided with peripheral portions of rubber, or other somewhat yielding material. One of these disks is provided for each

flange of the cylinder I, resting upon said flange and rotated by frictional contact therewith. Said disks are independent of each other, and are carried each by a fork K, the series of forks depending from a common support K' in which the shanks are permitted a vertical play to allow the disks to yield somewhat. Each disk is also provided with a second fork L which loosely embraces its peripheral portion, and guarding it against backward or lateral movement. Supported over the said cylinder I, just back of its center, and in close relation to the flanges *i*, is an inclined tail board M, whose upper end is cut-away opposite each space *j* between the said flanges, the cut-away portions forming with said spaces openings of considerable size. As the hops are delivered to the cylinder I by the carrier H, the finer broken portions, seeds, and single hops fall through the spaces *j* at the front side of said cylinder, while the leaves are caught between the flanges *i* and the disks J. The said disks being forward of the center of the cylinder I, the leaves as they pass under the disks, are tipped or raised sufficiently to carry them over the openings at the back of the cylinder, and they fall onto the solid portion of the board M down which they are swept, preferably by means of a rotary brush N, journaled transversely over the upper portion of said board. The hop clusters, which are too large to pass through the openings at the front side of the cylinder I, pass between the flanges *i*, and drop through the openings at the rear, either into a receptacle provided for the purpose, or, as shown, upon an inclined chute board O which delivers them at one side of the machine upon an endless conveyer P which carries them back to the front of the machine and deposits them upon the carrier C, or it may be between the spiked cylinder and pickers. By this arrangement the clusters are again passed through the pickers, to complete the operation of picking. Where a receptacle is used instead of the conveyer P, said receptacle must be removed at intervals and emptied upon the conveyer C.

Inasmuch as a single operation of the separator will not usually prove sufficient to effect a complete separation of the leaves, the hops, fine parts, seeds, &c., which fall through the spaces at the front of the cylinder, are received upon an endless carrier R which takes them to a second separator S underneath the carrier H, and which is in all respects a duplicate of the first separator with the exception that it is not necessary to provide means for the reception of clusters. A board S' and brush S² are provided for this second separator. The hops from this second separator fall down into the hop box B, while the leaves are discharged from said board S'. A fan T is preferably provided, from which air is conveyed by a blast tube T' and discharged underneath the cylinder I of the second separator in an upward and forward

direction, for the purpose of blowing away the leaves and extraneous matter. The blast cannot be applied until the hops have been separated, as, owing to their light character, they would be blown away with the leaves and other matter.

The separator above described is regarded as of especial importance. Heretofore it has been very difficult, if not impossible, in machines of this character, to make a satisfactory separation of the leaves and hops, owing to the fact that the light character of the hops prevented the use of a blast, while on the other hand it has not been found possible to construct a picker or stripper which would not remove more or less leaves from the vines with the hops.

The separator above described is found to effect a very thorough and satisfactory separation.

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

1. A hop picking and separating machine, comprising essentially, feeding mechanism, a pair of rotating pickers between which the hops and vines are delivered by the feeding mechanism, separator fingers which receive the vines from said pickers, a traveling carrier below said fingers, a circumferentially flanged separator cylinder, disks in contact with the flanges of said cylinder, and means for removing the leaves at the rear of said cylinder, substantially as specified.

2. A hop picking and separating machine, comprising essentially, feeding mechanism, a pair of rotating pickers between which the hops and vines are delivered by the said feeding mechanism, vibrating separator fingers which receive the vines from said pickers, an endless traveling carrier below said fingers, a circumferentially flanged cylinder having deep spaces between its flanges, friction disks resting upon said flanges slightly forward of the center of said cylinder, a tail board supported with its upper edge in close relation to the said flanges, and somewhat back of the center of said cylinder, said board having cut-away portions corresponding to the spaces between said flanges, and a leaf discharging brush, substantially as specified.

3. A hop picking and separating machine, having feeding mechanism, a pair of rotating picker drums, a series of separator fingers to the rear of said drums, a traveling carrier under said fingers, a circumferentially flanged separator cylinder having deep spaces between its flanges, friction disks in contact with said flanges, a tail board supported in close relation to said flanges and having cut-away portions corresponding to the spaces between said flanges, a traveling carrier below said cylinder, and a second separator similar to the first at the opposite end of said carrier, substantially as specified.

4. A hop picking and separating machine, having feeding mechanism, a pair of rotating

picker drums, a series of separator fingers to the rear of said drums, a flanged separator shaft having deep circumferential grooves between its flanges, friction disks in close relation to said flanges, a tail board having cut-away portions corresponding to said grooves, a laterally inclined chute board under the upper portion of said tail board, and an endless conveyer onto which said chute board discharges and which itself discharges upon the feeding mechanism of the machine, substantially as specified.

5. A hop picking and separating machine, comprising essentially a frame, the feed apron C, the spiked cylinder D, the rotating picker drums E, E, the vibratory separating fingers G, the traveling carrier H below said fingers, the vine reel G', the circumferentially flanged separator cylinder I, the friction disks J, the tail board M, having cut-away portions at its upper end, the brush N, the chute board O, the return conveyer P, the lower carrier R, and the second set of separating devices in connection with said carrier R, substantially as specified.

6. In a hop picking machine, a pair of picker drums having longitudinal ribs or flanges therein, and arranged to rotate at different speeds, knife carrying arms secured to said drums and abutting against said ribs or flanges, and picker knives on said arms, substantially as specified.

7. In a hop picking machine, a picker, comprising a rotary drum having longitudinal ribs or flanges thereon, a series of yielding

knife-carrying arms attached to said drum and abutting said ribs or flanges, and picker knives carried by said arms, substantially as specified.

8. In a hop machine, the combination of a cylinder having a series of circumferential flanges thereon, separated from each other by deep spaces, and having comparatively broad peripheries, and a series of friction disks, one of said disks resting upon each of said flanges slightly forward of the center thereof, substantially as specified.

9. In a hop machine, the combination of a cylinder having a series of circumferential flanges thereon formed with comparatively broad peripheries, a series of independent and vertically yieldable friction disks resting one upon each of said flanges, slightly forward of the center thereof and supporting and guard forks for said disks, substantially as specified.

10. In a hop machine, the combination of a circumferentially flanged cylinder, having deep spaces separating its flanges, a series of friction disks, and a tail board having its upper portion in close relation to said flanges, and formed with cut-away portions corresponding to the spaces between said flanges, substantially as specified.

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

WARREN H. CLARK.

Witnesses:

GEORGE H. PARMELEE,
PHILIP C. MASI.