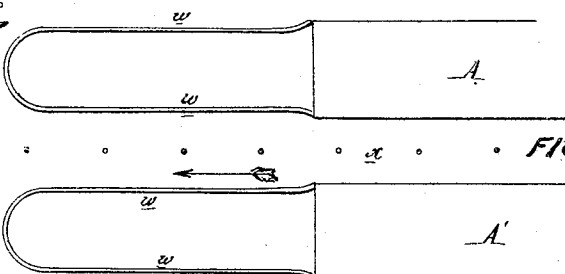
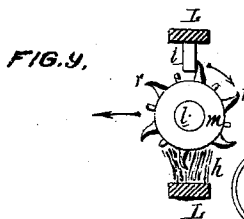
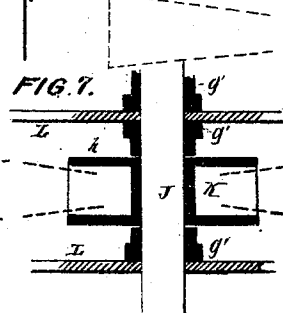
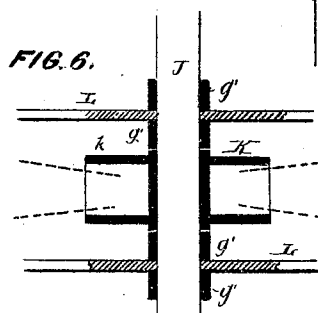
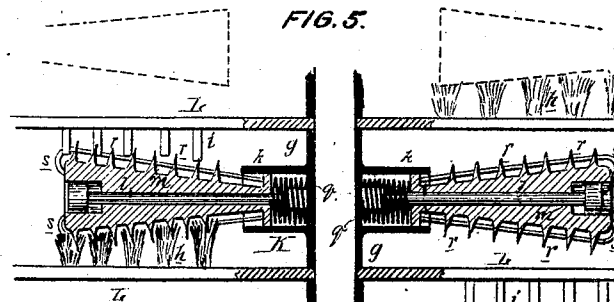
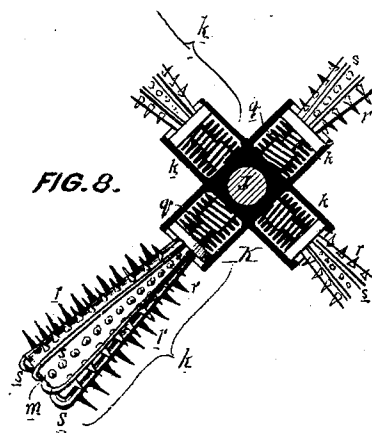
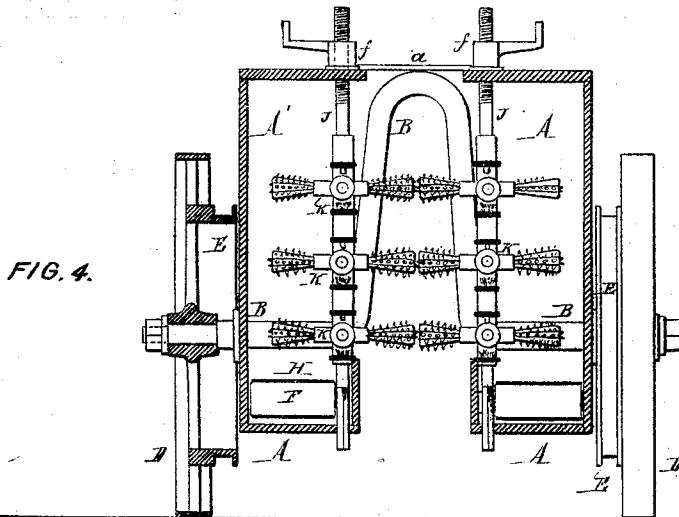


WILLIAM H. IRVING.
Cotton Harvester.

No. 123,704.

Patented Feb. 13, 1872.



WITNESSES,

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H. W. W. W.

UNITED STATES PATENT OFFICE.

WILLIAM H. IRVING, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN COTTON-HARVESTERS.

Specification forming part of Letters Patent No. 123,704, dated February 13, 1872.

Specification describing an Improved Cotton-Harvester, invented by WILLIAM H. IRVING, of Philadelphia, Pennsylvania.

Improved Cotton-Harvester.

My invention consists of a cotton-harvester, the construction and operation of which are too fully explained hereafter to need preliminary description.

Figure 1, Sheet 1, is a longitudinal sectional view of my improved cotton-harvester; Fig. 2, a sectional plan view of the same on the line 1 2, Fig. 1; Fig. 3, a sectional elevation on the line 3 4, Fig. 2; Fig. 4, Sheet 2, a transverse section on the line 5 6, Fig. 1; Figs. 5, 6, 7, 8, and 9, enlarged views of parts of the machine; and Fig. 10, a diagram illustrating the arrangement of the draft-poles or shafts.

The frame of the harvester consists of two independent box-like sections, A and A', entirely separated from each other at the bottom, but so secured together at the top by cross-pieces *a a* and by a bent axle, B, that there shall be a central longitudinal space, *x*, between the said sections of sufficient width and height for the passage of the row of cotton-plants from which the cotton is to be picked by the machine. The frame is supported at a suitable height above the ground by wheels D D, hung to the projecting ends of the axle B, outside of the sections A and A'; and to the inner faces of these wheels are secured grooved pulleys E, from which, by means of cords or belts *b*, motion, in the direction of the arrows, is transmitted to four pulleys, *d*, *d*¹, *d*², and *d*³, on each section of the frame. The pulleys *d* are secured to the outer ends of rollers F F, hung to the rear of the frame, at points close to the bottom of the same, and the pulleys *d*¹ are situated at the extreme front end of the machine; being secured to the rollers F' F', hung to the tops of inclined extensions G and G', which project forward from the front of the frame. An endless traversing-apron, H, provided at regular intervals with transverse slats *e*, extends the whole length of the machine within the section A and extension G, and passes around and receives its motion from the rollers F and F'; the said apron also passing beneath and being held down by rollers *c* and *c*' at the base of the extension G, so that its front portion shall follow the inclination of the latter, and its rear

portion be parallel with and close to the bottom of the section within which it is contained. Both the extension G and frame proper project above apron H on both sides, thus inclosing the same, and forming what may be termed a trough, of which the apron is the movable bottom. A precisely similar endless apron, H', is arranged within the opposite section A' of the frame and its inclined extension G'; and over both of these aprons, at the front of the machine, are arranged fans I I, for a purpose described hereafter, which receive their motion from the above-mentioned pulleys *d*². Extending along the inner edge of each section of the frame is a row of vertical rods, J; there being in the present instance five of these rods on each side, arranged at points directly opposite each other in the two sections. (See Figs. 1 and 2.) Each rod J passes through and is guided by openings in the top and bottom of the frame, is squared at its lower end to prevent it from turning, and has a handled nut, *f*, adapted to its upper threaded end, by means of which it can be adjusted vertically in the frame. (See Figs. 1 and 4.) Upon each arm J is strung four or other suitable number of reels, K, each revolving loosely and independently in a horizontal plane, and each projecting outward into the central space *x* between the two sections of the frame, so that the reels of one section shall nearly meet, or slightly overlap, those of the other. The reels also of each section are set at such intervals upon their rods J that those of one rod shall lap and pass between the reels of the adjacent rods upon each side. (See Figs. 1 and 2.) The reels may have elongated hubs *g*, Fig. 5, to maintain them at proper distances apart; but as it is desirable that they should be adjustable toward and from each other, I prefer to form them with hubs of ordinary width, with washers or distance pieces *g'* strung upon the rod and interposed between them, in the manner illustrated in Figs. 6 and 7. The distance-pieces also serve to support upon the rods, at suitable intervals apart, horizontal strips L, which carry brushes *h* and wire combs *i*, the former projecting upward and the latter downward into the path of the reels, as best observed in Figs. 5 and 9. These brushes and wire combs, however, are not continuous, but only occur at intervals or at the most advantageous points for stripping the cotton from

the reels and depositing it upon the endless aprons H and H', in the manner fully described hereafter.

The manner of constructing the reels forms an important feature of my invention, and is as follows, reference being had to Figs. 5, 8, and 9: Each reel has a central hub, *g*, from which radiate arms *k*, and each of the latter consists of a fixed central rod, *l*, secured to the hub, and carrying a sleeve, *m*, enlarged in diameter toward its outer rounded end, and armed upon the exterior with rows of sharp-pointed bent teeth, *r*, between which rows, and extending longitudinally from end to end of the sleeve, is a number of wire rods, *s*, for a purpose described hereafter. This sleeve turns freely upon its axis or the rod, and can also slide longitudinally upon the same to a limited extent toward and from the center of the reel. The sleeve, however, is constantly forced outward by a spiral spring, *q*, bearing against its inner end and wound upon the rod *l* within the hub; the said spring permitting the sleeve to yield to pressure and slide inward when necessary, as hereafter described.

In using the machine, the draft animals are attached to yokes or shafts *w*, hung to the front end of each section of the frame, and bent or rounded in front in the manner best observed in Fig. 10, so as not to catch in or be obstructed by the cotton-stalks, and the machine is drawn forward over the ground, as indicated by the arrows in Figs. 1, 2, and 10, in such a direction that it shall pass over the row of cotton-plants which extends upward into the space *x* between the two sections of the frame into the path of the projecting reels K. The first of the latter, on striking the stalks, will be turned by the same on their rods J in the direction of the arrows, Fig. 2, the hooked and pointed teeth on their arms *k* seizing and dragging a portion of the cotton from the opened bolls, and, as each stalk will be thus subjected to the action of the whole number of reels upon both sides, the cotton will be effectually and completely plucked from the same by the time it emerges from the rear of the machine. The empty cups of the bolls, however, will not be detached from the stalks, but will remain upon the latter; and such leaves, small twigs, &c., that may be broken off and caught upon the teeth of the reels will be prevented from adhering too closely to and from becoming matted upon the latter by the wire-spring rods *s*, which, by springing out between the teeth, either cause such foreign matter to fall off or facilitate its after removal with the cotton by the brushes *h*. The arms of the reels, being rounded at the ends, will offer no serious impediment to the passage between them of the cotton-plants, and should any of the said arms strike one of the rigid main stalks it will at once yield and slide inward toward the center upon its rod *l* to the extent permitted by the spring *q*, thus allowing the said stalk to pass. As the reels move forward with the machine and strike a number of plants successively, they will be ro-

tated continuously upon their rods J in the direction of the arrows, Fig. 2, and each arm *k* of the said reels, in passing between the strips L prior to again emerging into the space *x*, will be partially turned upon its axis by the wire comb *i* and stripped of its cotton by the brush *h*.

This operation will be best understood by referring to the enlarged views, Figs. 5 and 9, where it will be seen that each arm, with its adhering cotton, is permitted to pass unobstructed into its section of the frame and over the endless apron H or H'; but that in emerging from the said section it is compelled to pass between one of the brushes *h* and its wire combs *i*. The latter, as shown in Fig. 9, is struck by the teeth *r*, and thus turns the arm upon its axis and against the brush *h*, which effectually strips the arm of its cotton, and permits the latter to drop onto the endless conductor H or H'. A continuous supply of cotton, with some little foreign matter, such as leaves, twigs, &c., is thus deposited upon the aprons and conveyed by the same toward the front of the machine, passing beneath the rollers *c c*, by which it is slightly compressed; then up the inclined extensions G and G' of the frame, upon which it is exposed to currents of air induced by the fans I I, thus cleansing it of dust, debris, &c.; and the cotton is finally discharged over the ends of the extensions into bags placed to receive it. The bags are hooked onto the front ends of the extensions G and G', and removed when filled and replaced by empty ones, by attendants who are stationed for the purpose at either side of the machine upon steps.

As before mentioned, the reels can be adjusted vertically, either upward or downward, or can be brought closer together or separated from each other, according as the machine is to be used for harvesting lowland, midland, or upland cotton.

The machine might be modified in construction by placing the inclined extensions G and G' at the back, so as to discharge at the rear instead of the front; but I prefer to arrange the parts as above described.

I claim as my invention—

1. The frame, consisting of the two box-like sections, connected together, open at their inner sides and ends, and traversed at the bottoms by endless bands, as specified, in combination with a series of vertical shafts and radiating arms or beaters, arranged and operating as set forth.
2. The toothed picking-reels K, constructed substantially as described, and arranged, in respect to each other, upon the opposite sections of the frame, substantially as set forth.
3. The rods J, in combination with the reels K, and capable with the latter of being adjusted vertically upon the frame, substantially as herein described.
4. The combination, with rods J and reels K, of strips L, carrying combs *i* or their equivalents, and strung upon the said rods alternately with the reels, substantially as herein described.

5. The combination of the arms *k* of the reels, constructed substantially as described, and brushes *h* attached to the strips *L*.

6. The arms *k* of the reels, each consisting of a central rod, *l*, toothed sleeve *m*, rods *s*, and spring *q*, hung to and arranged to rotate freely upon the rod.

7. The combination of the toothed sleeve *m*, constructed substantially as described, and capable of sliding longitudinally upon its rod *l* and a spring, *q*, which tends to force it outward, all substantially as specified.

8. The combination, with the rows of teeth upon each arm of the reel, of wire rods, arranged to have limited play, as and for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WM. H. IRVING.

Witnesses:

WM. A. STEEL,
HARRY SMITH.