(No Model.) 2 Sheets—Sheet 1.

A. CORBIN, Jr.

HARROW.

No. 384,131. Patented June 5, 1888.

Fig. 1

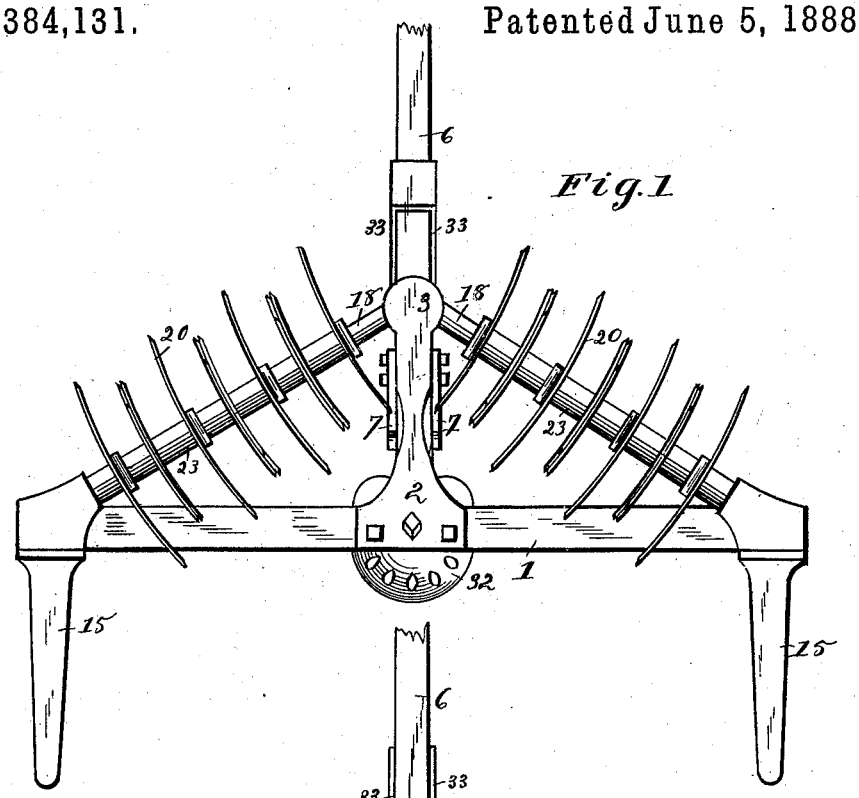
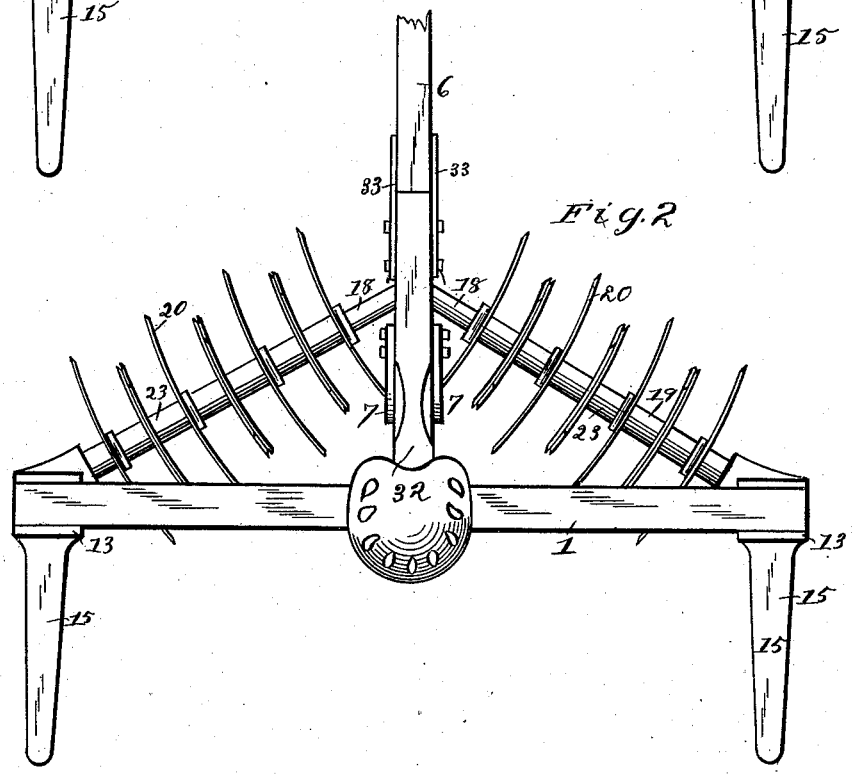


Fig. 2



Witnesses:
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B. A. Sommers.

Inventor:
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(No Model.) 2 Sheets—Sheet 2.

A. CORBIN, Jr.

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Fig. 3

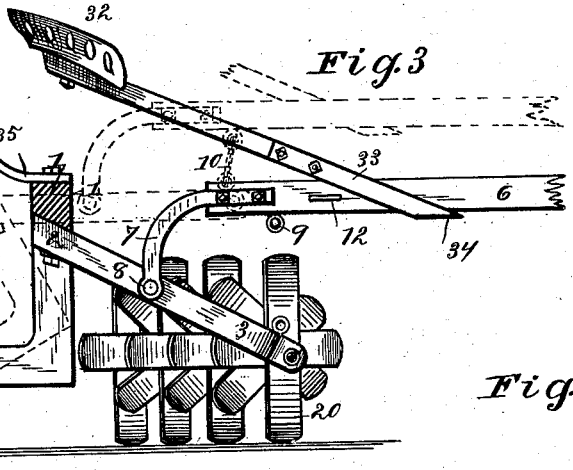


Fig. 8

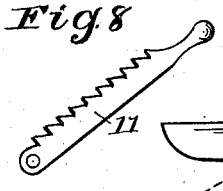


Fig. 7

Fig. 4

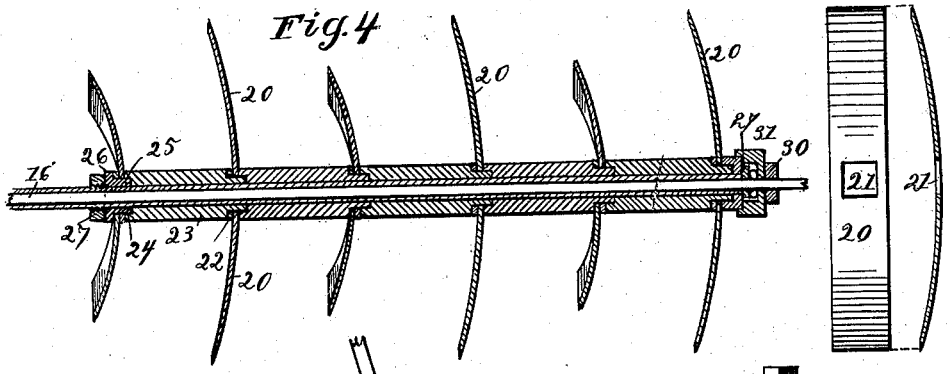


Fig. 5

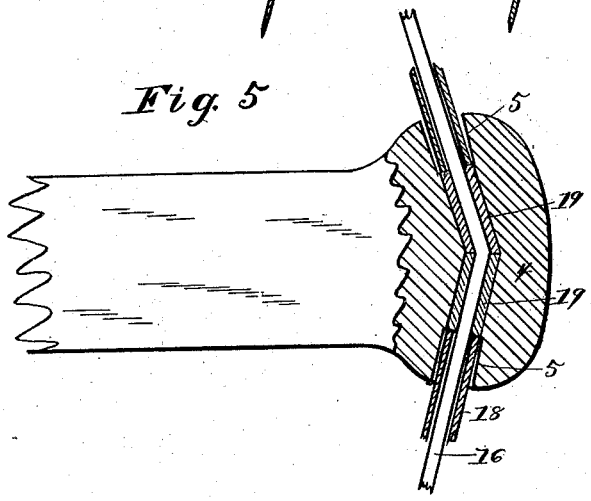
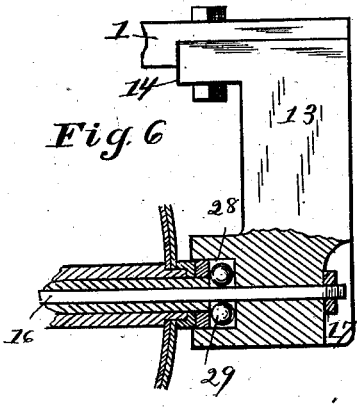


Fig. 6



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UNITED STATES PATENT OFFICE.

AMASA CORBIN, JR., OF GOUVERNEUR, NEW YORK.

HARROW.

SPECIFICATION forming part of Letters Patent No. 384,131, dated June 5, 1888.

Application filed February 24, 1888. Serial No. 265,138. (No model.)

To all whom it may concern:

Be it known that I, AMASA CORBIN, Jr., a citizen of the United States, residing at Gouverneur, in the county of St. Lawrence and State of New York, have invented certain new and useful Improvements in Harrows, of which the following is a specification, reference being had therein to the accompanying drawings.

Figure 1 is a top or plan view of my improved harrow. Fig. 2 is a bottom view. Fig. 3 is a vertical section on line *x x*, Fig. 1, looking in the direction of the arrow, Fig. 1. Fig. 4 is a vertical section taken centrally through one of the gangs. Figs. 5, 6, 7, and 8 are detached views enlarged.

1 is a cross-bar bolted to the rear end of the thrust-bar 2 and 3, which projects forward and downward from the cross-bar.

4 5 is a recess in the front end of the thrust-bar, the ends 4 of the recess being preferably of greater diameter in cross-section than the intermediate portion, 5.

6 is a tongue hinged to the thrust-bar about midway between its ends, preferably by means of curved strips 7 7—one upon either side of the tongue—the strips being connected with the thrust-bar by a pivot, 8, forming a sort of hinge-joint.

9 is a hook, preferably pivoted to the tongue, and 10 is a chain attached by its lower end to the thrust-bar, so that the thrust-bar and the parts of the gangs carried thereby can be hung upon or supported from the hook.

11 (see Fig. 8) is a latch-plate, which may be connected to the thrust-bar in such position that its teeth will take hold of a loop, 12, on one side of the tongue, and thus support the front end of the thrust-bar in place of the hook and chain.

13 14 are down-hangers, of which the horizontal arm or bracket parts 14 are bolted to the under side of the cross-bar; and in practice I propose to provide these bracket parts with upward-projecting lips or flanges to embrace the cross-bar and prevent it from splitting. Each down-hanger has a rearward-projecting shoe, 15, which may be either cast in one and the same piece with the upright part of the hanger or may be made separately and attached thereto. In the drawings I have shown a desirable shape or conformation of shoe; but any other pattern may be used which is adapted to slide over the ground without cutting too deeply into it.

16 is a bent rod supported centrally within the recess 4 5 and at its rear outer ends upon the lower parts of the down-hangers. I prefer to pass the ends of the rods through the hangers and apply nuts 17. The function of this rod is to support and carry forward over the ground the gangs of disks, stirrers, or other agitators, which may be of any usual or approved construction. However, in practice I contemplate using gangs of a peculiar structure, which I will describe.

18 is a hollow shaft, which for convenience may be gas-pipe. There is a similar shaft at either side of the machine, and of a length somewhat less than the length of the rod 16, between either end and the bend at its center, at which latter place I mount upon the rod thimbles 19 19, for the inner ends of the hollow shafts to abut against. The use of these thimbles is desirable not only to receive the inner ends of the hollow shafts, but also because they fill up the inner part of the recess, which I prefer to make of greater diameter than the rod, to facilitate the introduction of the latter into the recess.

20 20 are narrow blades, each provided about midway between its ends with a hole, 21.

22 23 24 is a thimble, having one end, 22, reduced to enter the hole 21, and having at its opposite end a socket, 24, to receive the reduced end of the adjacent thimble. A series of such blades and thimbles are strung onto a hollow shaft, 18, with a washer, 25 26, at one end and a nut, 27. The reduced end 25 of the washer receives the inner group of blades, and confines them between the part 26 and the adjacent end 24 of the first thimble. At the opposite end of the gang there is a washer and another nut, 27, whereby the washers, blades, and hollow shaft can be clamped tightly to each other, so that they shall all rotate together upon the rod as the harrow is drawn over the ground, there being a duplicate gang upon either side of the thrust-bar 2 3. I prefer to curve these blades as indicated in Fig. 4, and as there is an outward end-thrust upon each of the gangs, I propose to employ anti-friction balls between the outer ends of the

gangs and their adjacent supports to reduce the friction and consequent wear upon these parts. A convenient mode of applying these balls is shown in Fig. 6, in which the inner face of each down-hanger is recessed, as at 28, to receive the balls 29, the nuts 17 serving to support the lower ends of the down-hangers against spreading apart. Another construction which I have devised for mounting the anti-friction balls is shown in Fig. 4, where there are jam-nuts 30 31 upon the rod 16, the nut 31 having an inward-projecting flange, the anti-friction balls being arranged within the recess or chamber formed between the said nut 31 and the adjacent nut 27 on the outer end of the hollow shaft. I am aware that it is old to mount disk-gangs upon a continuous non-rotating shaft which is angular in form to correspond with the desired inclination of the disks to the line of draft; but I believe myself to be the first to use a V-shaped supporting-rod having its ends supported on the main frame, with a support at its apex, whereby the depth of cut of the disks may be regulated. And I am aware that the use of anti-friction balls to receive the end-thrust of the disk-gang is old; but I believe my construction and arrangement of parts, whereby the vertical walls of the recesses of the down-hangers serve as abutments to receive the outward thrust of the disk-gangs and anti-friction balls, is novel. By preference I make the flange of this nut 31 to overlap the adjacent end of the hollow shaft so as to constitute a sand-band, and when these nuts 30 31 are not used I propose to make the recesses 28 in the down-hangers of such depth and size that they serve the same purpose. So, also, as indicated in Fig. 5, I propose to make the ends 4 of the recess of such size that the inner ends of the hollow shaft will enter therein, whereby the end of the thrust-bar performs the office of a sand-band.

32 is a seat and seat standard.

33 34 is a stirrup, of which the legs 33 are secured to the lower end of the standard, while the closed end 34 passes underneath the tongue, which is gripped between that closed end and the lower end of the standard. Thus the seat can be adjusted forward and backward to secure a proper distribution of the weight of the driver.

35 is a foot-rest or foot-lever preferably bolted to the cross-bar 1 in such position as to be within convenient reach of the driver while riding on the seat.

When it is desired to lift the cutting blades or disks or other forms of agitators which may be used from the ground, this can be accomplished by raising up the front end of the thrust-bar into about the position indicated by dotted lines, Fig. 3, thus relatively depressing the rear ends of the shoes, so that they will ride upon the ground, as will be readily understood without further explanation, and the driver can, by throwing his weight or a part of it upon the foot-lever 35, assist in changing the position of the thrust-bar, and consequently the position of the gangs relatively to the other parts of the harrow.

I am aware that Patent No. 344,950, to Dorsey, shows two disk-gangs with their inner ends nearer the rear of the frame than are their outer ends, with a tongue hinged to the frame and an adjusting device mounted on the frame for raising and lowering its front side; but in this Dorsey harrow the tongue is not so connected with the frame and adjusting devices that it (the tongue) performs any function in effecting such adjustment.

While I have described the best means now known to me for carrying out my invention, I do not wish to be limited to the details of construction herein shown and described, because many modifications thereof will readily suggest themselves to a skilled mechanic without departing from the spirit of my invention.

What I claim is—

1. In a harrow, the combination, with a V-shaped non-rotating supporting-rod adapted to receive upon either side a hollow shaft, of two gangs of rotating stirrers mounted loosely thereon, substantially as set forth.

2. In a harrow, the combination, with the thrust-bar recessed at its front end, of the rotating disk-gangs supported at their inner ends by the thrust-bar, and having their inner ends arranged within the recess, whereby the thrust-bar is adapted to serve as sand-bands, substantially as set forth.

3. In a harrow, the combination, with the recessed thrust-bar, of the supporting-rod and the thimbles 19 for supporting the rod within the recess, substantially as set forth.

4. In a harrow, the combination of the thrust-bar, the cross-bar at the rear end of the thrust-bar, the down-hangers, and the continuous bent supporting-rod mounted at its ends in the down-hangers and connected with the thrust-bar at a point intermediate of its ends, substantially as set forth.

5. In a harrow, the combination of a supporting-frame, a rotating gang mounted at its ends directly upon the supporting-frame, carriers attached to the supporting-frame and projecting rearward therefrom, a tongue hinged to the supporting-frame, and means for suspending the front part of the supporting-frame from the tongue and in a tilted position, whereby both ends of the gang are supported above the soil, substantially as set forth.

6. In a harrow, the combination of a supporting-frame, a rotating gang mounted at its ends in the supporting-frame, carriers attached to and projecting rearward from the supporting-frame and above the surface of the ground when said frame is in its normal position, a tongue hinged to the supporting-frame, and means for suspending the front part of the supporting-frame from the tongue, the said frame and carriers being in a tilted position, substantially as set forth.

7. In a harrow, the combination of a supporting-frame having a cross-bar and down-

ward-projecting hangers at the ends of the cross-bar, a hinged tongue, a rotating gang mounted upon the frame, and carriers projecting rearward from the frame, said carriers being formed integral with the downward-projecting hangers, substantially as set forth.

8. In a harrow, the combination of a hinged tongue, a frame having a cross-bar in rear of the tongue and a thrust-bar projecting forward from the cross-bar, with two gangs of rotating stirrers, each connected at its front end to the thrust-bar and at its rear end to the cross-bar, substantially as set forth.

9. In a harrow, the combination, with the cross-bar, of the rearward-projecting shoes, the thrust-bar, the hinged tongue, and devices for connecting the tongue with the thrust-bar in front of the hinging-point of the tongue, substantially as set forth.

10. In a harrow, the combination of a triangular frame having its apex in front, a tongue hinged to the frame, two gangs of rotating stirrers mounted on the frame, and devices for connecting the triangular frame with the tongue and adjusting the vertical position of the frame relative to the tongue, substantially as set forth.

11. In a harrow, a triangular frame having a cross-bar, a bar projecting at an angle from the central part of the cross-bar, two rods connecting the ends of the thrust-bar with the ends of the cross-bar, and rotating gangs of stirrers mounted on the rods, substantially as set forth.

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

AMASA CORBIN, JR.

Witnesses:

G. E. KINGSLEY,

JAMES T. MCMAHON.