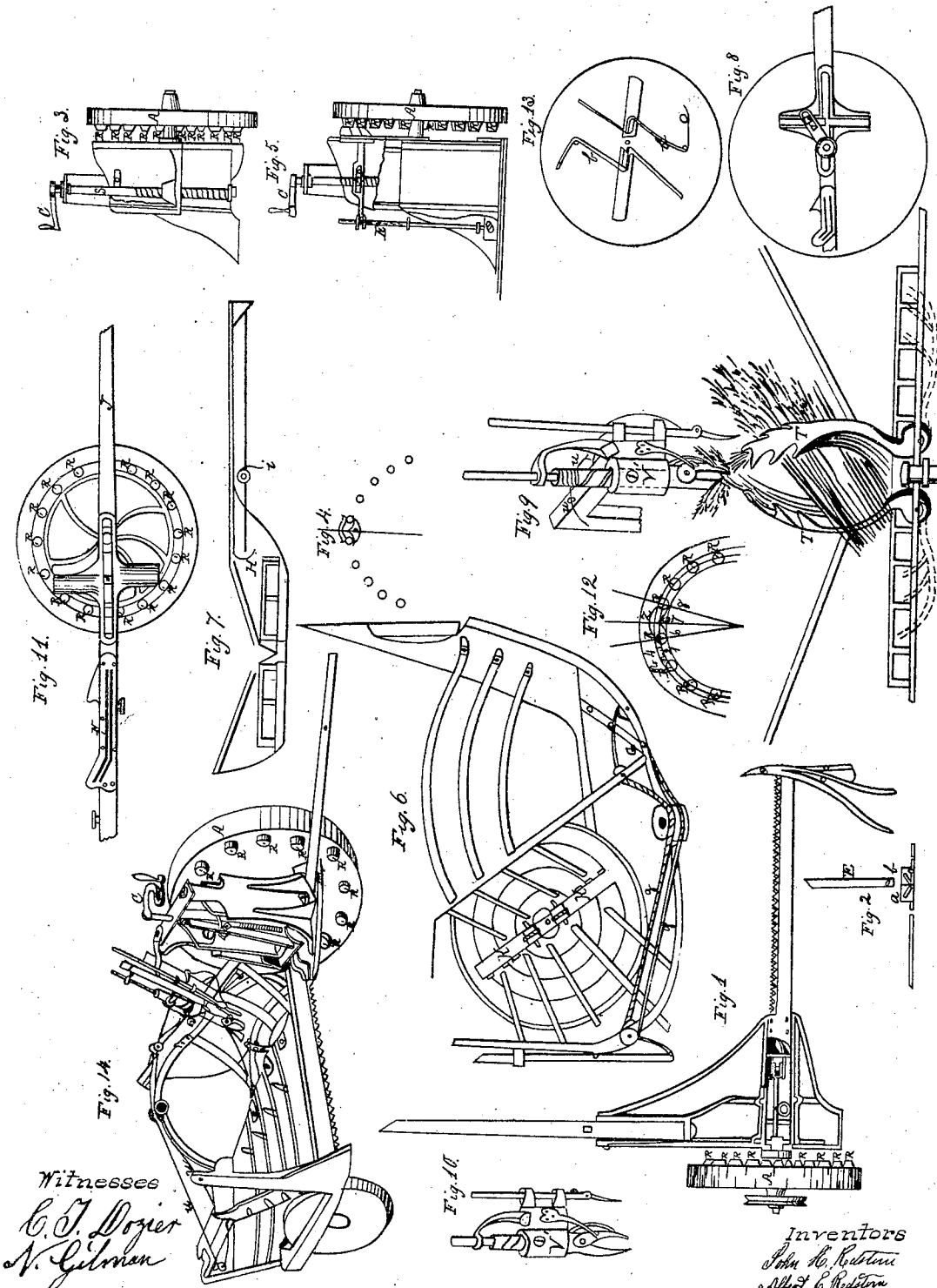


J. H & A. E. Redstone.

Grain Binder.

N^o 36258

Patented Aug. 19, 1862



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UNITED STATES PATENT OFFICE.

JOHN H. REDSTONE AND ALBERT E. REDSTONE, OF INDIANAPOLIS, INDIANA,
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IMPROVEMENT IN HARVESTERS.

Specification forming part of Letters Patent No. 36,258, dated August 19, 1862.

To all whom it may concern:

Be it known that we, JOHN H. REDSTONE and ALBERT E. REDSTONE, of Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Machinery for Reaping and Mowing, of which the following is a full and exact description, reference being had to the accompanying drawings and the letters marked thereon.

Figure 1 is a plain top view of the machine as a mower, or without the raking and binding attachment or the device for raising and lowering the machine. Fig. 2 is a section showing the double sickle-bar and the device by which they are operated. Fig. 3 is a section showing a part of the frame and the screw for elevating and lowering the same. Fig. 4 shows the device which is operated by the master-wheel and gives motion to the sickles by means of the device shown in Fig. 2. Fig. 5 shows the connection of the device shown in Fig. 4, with the bar which operates the sickles by means of the adjustable lever P. Fig. 6 shows the machine as a reaper, with parts detached, and is designed to show the position of the rake and binder. Fig. 7 is a rear view of the bundle-rack and band-table. Fig. 8 is a crank movement or device which is placed upon the axle between the master-wheel and the frame of the machine. Fig. 9 is an end view of the binder, showing the band-table with the band-arms and the twister. Fig. 10 is a side view of the band-twister. Fig. 11 shows the crank or device which is moved backward and forward as the master-wheel revolves for the purpose of giving motion to the raking and binding arrangement. Fig. 12 shows the construction of the device which is operated by the master-wheel for the purpose of operating the sickles. Fig. 13 is an under view of the band-table.

The operation of the machine is as follows: As the master-wheel is revolved, the knobs R, passing through the device B, cause it to move up and down as each knob passes through the curved groove in the same, giving motion to the sickle-bars by means of the adjustable lever P and upright connection or piston E, to which it is attached by a bolt at the required point as the machine is raised or

lowered by the screw C, shown in Figs. 3 and 5. The device by which the sickles are operated in connection will be understood by reference to Fig. 2. The slotted plates (a and b) are attached to the side-bars. The sickles upon the two bars lie face together, (as shown in Fig. 1,) so that the cutting-edges pass each other the same as the cutting-edges of shears. The bar E, shown above the plates a and b, has a similar projection upon the opposite side to the one shown in front, the angles of the two corresponding with the angles of the slots in the plates a and b, in which they are fitted for the purpose of operating the sickles as the bar E is played up and down. It will be seen that as the bar E is forced down, the projection operating in the slot of the plate a forces it to the left, while that in the slot of the plate b forces it to the right, thus causing the sickles to alternate past each other at each operation of the bar E, up or down, by the lever P.

The advantages of this device may be seen by reference to the well-known fact that the great velocity with which the sickle-bar must be moved, where but one is used and the whole cut made by the motion of a single bar, shakes the crank-fitting to pieces, and is one of the greatest causes of the rapid destruction of the machine.

It will readily be seen that in this arrangement, the weight of the bars being equal, the force applied in stopping and starting the one is balanced by the other, which is being equally moved in an opposite direction, and that each bar is required to move but half the distance in order to bring the same amount of cutting-edge to bear that is effected by the single bar. The operation of cutting by two sets of blades working face to face has been effected by other means.

By this device it will be seen that the stroke is given directly from the wheel to the sickle. The lever P being only used to allow the adjustment of the stroke of the sickles, and compensate for the wear and tear of the machine in the way of lost motion, it will be seen that nice fittings and calculations are unnecessary, as the stroke may be lengthened and shortened by moving the fulcrum of the lever P. The device B may be used to operate a single

sickle-bar where the fingers are used. The knobs R upon the master-wheel A fit closely in the groove of the device B, so as to slide smoothly through the same as the wheel A revolves. Our object in the employment of the device B is the accomplishment of a motion (by a single device) similar in its equation to that of a crank, in connection with spur-wheel pinion, connection-rod, &c., when used for effecting a rapid reciprocating movement, or one wherein the change from the point of rest to that of the highest speed is effected by a graduation of the motion similar to that of the crank. The construction of the device B is determined by the size of the circle in which the knobs R are placed upon the wheel, the size of the knobs, and the stroke required, as follows: In Fig. 12, circle No. 1 is described from the center of the wheel to the inner edge of the knobs R; No. 2, the distance of the stroke required above No. 1; No. 3 is extended the diameter of the knob R above the circle No. 1; No. 4 is then described twice the diameter of the knob R above the circle No. 1. Upon the point S, which is the intersection of the radius 7 with circle No. 2, is described the arc Z, being the quadrant of a circle whose radius equals the diameter of the knobs R. From points to the right and left of the radius 7 upon the circle 4 describe arcs from the point S right and left to the intersection of the radii 6 and 8 with circle No. 1. Parallel to these arcs, and at a distance equal to the diameter of the knobs R, produce the lines from the radii 6 and 8 at their intersection with the circle No. 3 to the intersection of the arc Z, which completes the form of the groove of the device B. It will be seen by reference to Figs. 3 and 5 that the sliding frame or sash in which the device B operates, and which holds the axle of the master-wheel, operates in the grooves *e* while the machine is raised and lowered by the screw C. By reference to Fig. 6, the position and operation of the rake will be understood. The rake F operates in a curve centering at the pulley G, to which it is attached. The pulley G is operated by the band or cord *g*, which is attached to the projection *k* upon the crank-device H, shown in Figs. 8 and 11. It will be seen that as the master-wheel A is revolved, the bar J, attached to the device H, is moved backward and forward, operating the rake F by means of the belt *g*, thereby sweeping the grain from the table at each revolution of the master-wheel A. The rake, as it passes forward sweeping the grain from the table, is thrown forward and down by the projection *h*, which is attached to the table, and meets the projection *i* upon the rake F, as shown in Fig. 7. The rake is carried back under the table, and the projection *i*, meeting the projection *j*, again throws the rake up in position to carry off another bundle as the wheel A revolves and operates the crank H. The band-table is operated by the band *p*, which is operated by means of the crank H, to which it is attached.

As the bar J is drawn backward and forward across the axle as the wheel A is revolved, the ends of the cord *p* are alternately drawn, thereby partially revolving or vibrating the band-table at each revolution of the wheel. The band-arms K are operated by means of the cords *l*, which operate around the joints or knuckles of the arms K, which swing upon the journals or centers of the knuckles of the same. The cords *l* are attached to the periphery of the band-table, and operated by projections upon the frame underneath. As the table is partially revolved, the cord *l* is caught by the projections, and draws the arm up as it passes to its former position. The end passing down through the arm is caught, and again brings it down in the position for receiving the band. The band, when thrown up, is held in the position shown in Figs. 9 and 10. The band-twister V' is then in the position shown in Fig. 10.

By reference to Fig. 14, the general arrangement of all the parts combined will be seen.

Fig. 10 is a representation of the twister and tucker by which the band is twisted and the ends of the same are tucked under, the hand or tucker being attached to a sliding stem, and, by means of attachment shown in Fig. 14, is carried down and up to its place of rest while the twister is still at its lowest descent. It will also be seen that when the twister is thrown up the jaw upon which the spring presses is held open by means of the pin on the same coming against the projection fastened to the frame to which the guide is attached, holding the jaws or hands open to receive the ends of the band when thrown up by the band-arms, as represented in Fig. 9, and by the movement or tightening of the cord that operates the movement the shaft of the twister is turned, allowing the hands to be closed by the spring upon the ends of the band, and holding the same as it is revolved by the movement, forcing it around and down by means of a projection put in the groove in shaft of the twister, as shown in Figs. 9 and 10.

The cord running down through the stem of the twister is attached to the spring-clamp of the twister, and as the bar J passes along an inclined plane, V, upon the same, operates the end of the lever to which the cord is attached. Withdrawing the same brings them tightly together upon the band, when the cord that passes around the pulley of the twister, being operated by the bar J, makes two and one-half turns of the band, the ends of which project from the sides of the twister. It will be seen by reference to Fig. 10 that the clamp of the twister is attached to a sleeve, down through which a plunger passes, containing two blades or flat punches. The lever L surrounds the sleeve or outer part of the twister, operating upon the neck of the same. The lever M operates over a flanged collar, which is connected with the inner plunger by means of a bolt passing through

slots in the outer sleeve, designed to allow the sleeve and inner plunger to act separately when moving up and down, but together when turning around. As the bar J is moved forward, the levers L and M, being operated by the grooved device N, are kept in the same position until the device N passes to the inclined part of the grooves, when the levers L and M are carried up, forcing the twister down into the bundle. The point of the twister parts the straw as it descends into the bundle, and stops in a position to leave the projecting ends of the band over the opening in the bundle made by the twister. The fulcrum of the lever L, being farther from the twister than that of the lever M, is moved so that at the time that the twister has completed its descent the blades have forced the ends of the band tightly into the opening of the bundle made by the twister. As the twister is withdrawn, the bundle, being tightly held by the band, closes tightly, holding the ends of the band. At each motion or revolution of the wheel A, each part, having gone through its evolution, returns to its original position. As each bundle is swept into the bundle-rack over the band-table, a sufficient amount falls into the band-arms to form the band. The guards O separate the band from the rest of the bundle as the table is revolved

or vibrated. When in position across the bundle, it is carried up and crossed over the top of the bundle, and received and operated upon by the twister, as has been shown.

What we claim, and desire to secure by Letters Patent, is—

1. The device B, when operated in connection with the master-wheel A and frame, substantially in the manner and for the purposes set forth.

2. Operating the sickles of a reaper by means of inclined slots in plates or ears attached to the bar and operated upon by a connection-rod, substantially as set forth.

3. Operating the rake F by means of a crank placed over the main axle, and operated between the master-wheel and the frame of the machine, substantially as described.

4. The revolving band-table, in connection with the arms K, when operated substantially as set forth.

5. The band-twister V', when constructed and operated substantially as set forth.

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