(No Model.) 2 Sheets—Sheet 1.

H. E. PRIDMORE.

GRAIN BINDER.

No. 343,152. Patented June 1, 1886.

Fig. 1.

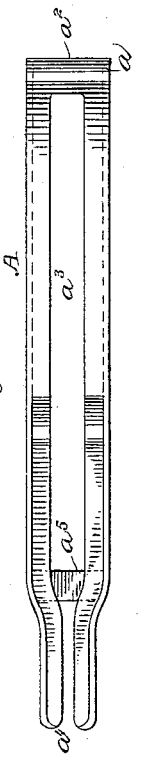


Fig. 2.

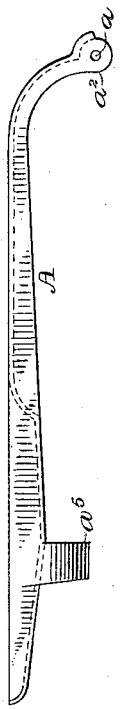


Fig. 3.

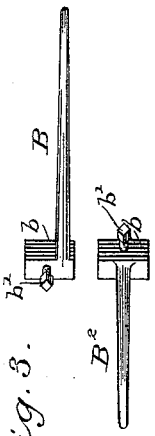


Fig. 4.

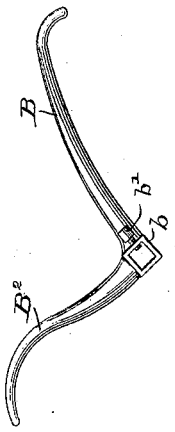


Fig. 5.

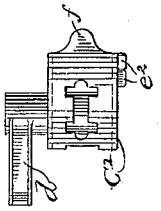


Fig. 6.

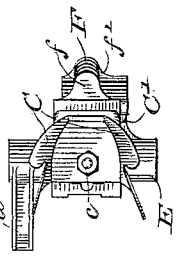


Fig. 7.

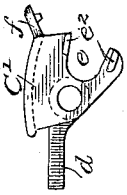


Fig. 8.

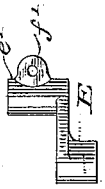


Fig. 9.

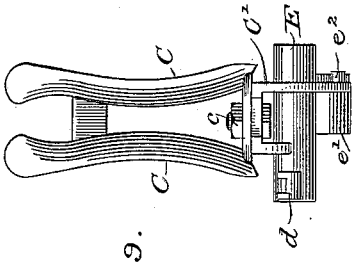
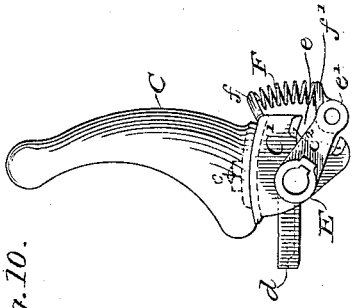


Fig. 10.



WITNESSES

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(No Model.) 2 Sheets—Sheet 2.

H. E. PRIDMORE.

GRAIN BINDER.

No. 343,152. Patented June 1, 1886.

Fig. 11.

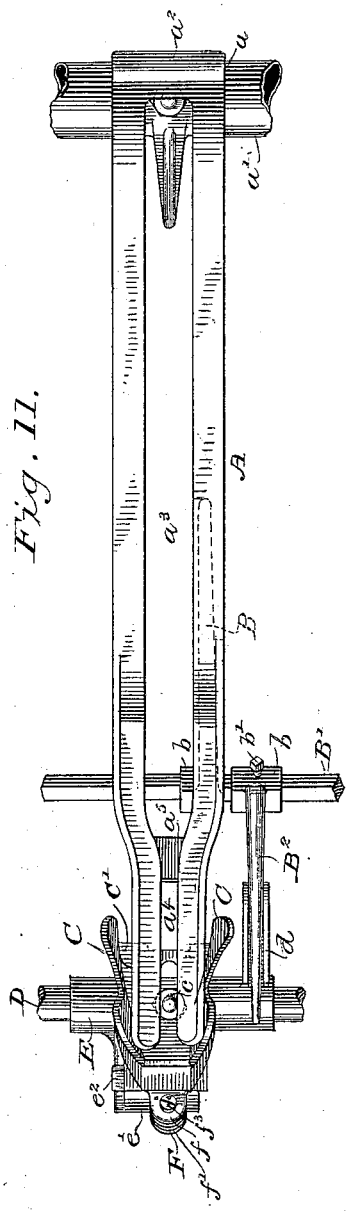
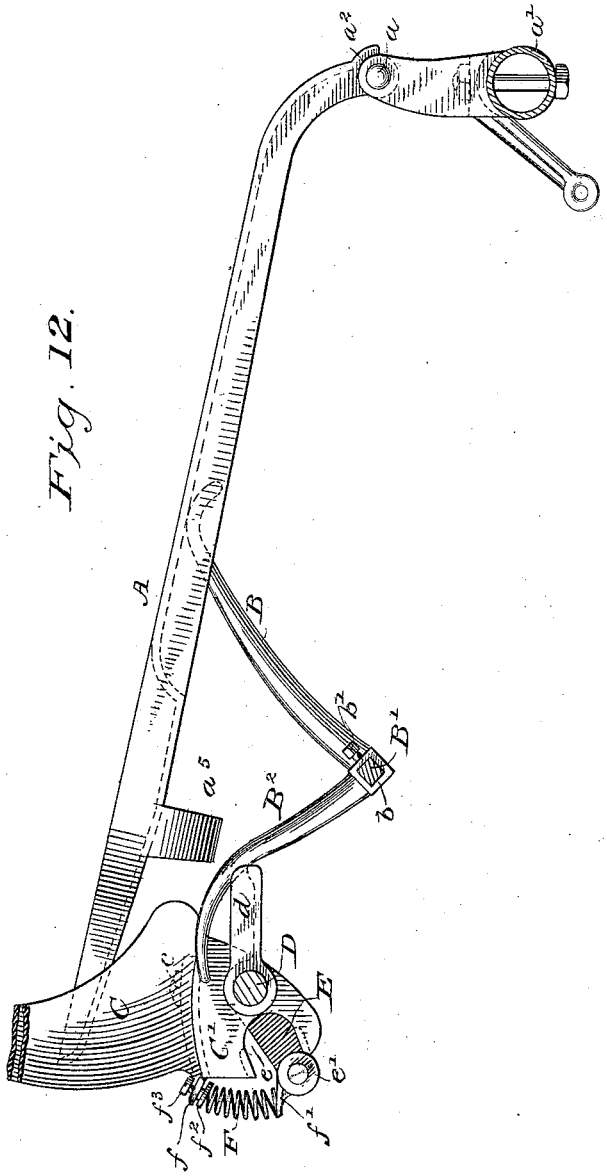


Fig. 12.



WITNESSES

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UNITED STATES PATENT OFFICE.

HENRY E. PRIDMORE, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE McCORMICK HARVESTING MACHINE COMPANY, OF SAME PLACE.

GRAIN-BINDER.

SPECIFICATION forming part of Letters Patent No. 343,152, dated June 1, 1886.

Application filed February 24, 1885. Serial No. 156,859. (No model.)

To all whom it may concern:

Be it known that I, HENRY E. PRIDMORE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Grain-Binders, of which the following is a specification.

In a number of binders constructed by the McCormick Harvesting Machine Company during the last season a peculiar form of "table-trip," so called, was employed as auxiliary to the outside tripping and compressing fingers, consisting in a longitudinally-slotted metallic arm hinged at the inner side of the binding-receptacle, beneath the decking, and rising through the usual slot provided therein for the play of binder-arm, which slot, of course, was widened, as in the new arrangement the binder-arm played between the lateral bars of the table-trip, and of such length that its outer end reached and vibrated between said compressing-fingers according as it happened to be actuated. In its construction at that time this table-trip was closed at its outer end—that is to say, the two side arms of which it was composed curved and met integrally at that point. This was objectionable, as straws would frequently be carried by the binder-arm against the closed end of the trip and impede its movement up or down, so that it would either fail to yield for one gavel or else to return to position for the next, in which latter case the binder would continue to operate incessantly. The table-trip rested upon and was supported in an elevated position by an arm from a tripping rock-shaft connected by another arm with the outside trip-fingers, so that by the movement of either or both tripping devices against its respective arm from the rock-shaft said rock-shaft would be oscillated and the binding mechanism set in motion. The trip-fingers, also, instead of being hinged at the end of a long supporting-bar pivoted to the heel of the binder-arm, as in the type of machines at present most generally used, were adjustably secured to a block loosely journaled on a supporting rock-shaft, and alongside this block was placed a crank keyed to said rock-shaft and having a lateral lug taking into an elongated slot in the side of said supporting-block, so that as the fingers rocked outward they might, by bringing one end of the slot against the finger, eventually force back said crank and rock the shaft to start the binder, while at the same time they had a free range of movement sufficient to allow for the accumulation of the gavel before such starting. In this latter arrangement also there was danger of the slot becoming clogged, and thus interfering with the perfect action of the outside trip. These features have been made the subject of an application filed by William R. Baker jointly with myself on the 29th day of September, 1884, No. 144,247, and need not be further explained herein.

My present invention relates to the two instrumentalities above adverted to, and is as follows:

First. It has been found, as already intimated, that the uniting of the side bars of the table-trip at the outer end is objectionable, since the binder-arm, playing up and down between the bars, frequently packs grain into the slot at said end, where it lodges and accumulates in such manner as to clog the play of the trip upon its pivot and make it uncertain. Therefore I leave the bars open or disconnected at this end, carrying the slot clear through, so that any grain coming between them and pushed onward by the binder-arm may pass out without obstruction, and, to prevent their being wedged apart, I connect or brace them by an under-curved bridge somewhat preceding this end, and depending so far beneath them that it will not interfere with the passage of grain.

Second. The segmental slot in the side of the block which supports the tripping-fingers also has proven to afford a lodging place for dust, chaff, and broken straw which lodge therein, owing to the play of the finger from the adjacent crank-arm, and accumulate until this play is so seriously hindered or limited as to affect the size of the bundles. For this reason I propose to open an ineffective side of this slot near the exterior of the block, so that any accumulations of this sort may drop out, and in doing this I find it advisable to somewhat change the location of the slot.

Third. To insure an elastic yielding movement to the outside tripping-fingers, I arrange

a spring between the heel of their supporting-block and the outer end of the crank-arm from the rock-shaft on which they play, and I further propose to make this spring adjustable, to control the facility with which they yield. This, it will be understood, is independent of or supplementary to the spring heretofore used between the trip-shaft and the locking-dog.

Fourth. When the arms from the trip-shaft, acting, respectively, with the table-trip and with the outside tripping-fingers, are both integral and permanently applied to the trip-shaft, so that one cannot be removed without the other, the tripping will oftentimes be too delicate, at least in heavy or wet grain, so that the bundles are made too quickly and too small. To obviate this, I make these arms independent each of each, and secure them independently to the shaft, so that one or the other may be removed to permit the action of but a single one of the tripping instrumentalities where the state of the crop is such as to make this advisable.

In the drawings, Figures 1 and 2 are respectively plan and side elevations of my improved table-trip; Figs. 3 and 4, respectively, plan and side elevations of my independent tripping-arms from the trip-shaft; Fig. 5, a plan of the supporting-block for the outside compressing and tripping fingers; Fig. 6, a like plan with said fingers in position; Fig. 7, a side elevation of the supporting-block, and Fig. 8 a plan of the crank-arm sleeved to the rock-shaft upon which said block is mounted; Fig. 9, an elevation from the inner side of the supporting-block, crank, and tripping-fingers in position, and Fig. 10 a side elevation of the just-mentioned parts in the same arrangement; and Figs. 11 and 12, respectively, plan and side elevations of the foregoing parts arranged in their relative positions for conjoint operation.

A is a metallic table-trip, hinged, as in the machine described in the above-mentioned application, at the point a, to the upper supporting-bar, a', of the binder-frame, and serving also, as therein, the purpose of an under compressor. This table-trip is formed of two bars united at the hinged end by a connecting-sleeve, a^2, integral with each. From this they extend parallel with each other at such distance apart as to leave a broad slot, a^3, for a length sufficient to accommodate the play of the binder-arm, which, in machines of this construction, generally rises from beneath. Near their ends they converge slightly, and then again become parallel, leaving a somewhat narrower slot, a^4, in continuation of the first, which extends through to the air. This convergence is simply to bring them sufficiently near together to pass between the cheeks of the outside tripping and compressing fingers, and if such fingers should be placed farther apart than usual the convergence will not be found necessary. Just at the point where they begin to converge they are connected by a subtending bridge, a^5, which curves or bellies down, as shown, sufficiently to escape entanglement with the grain passing along said trip. A trip arm or lever, B, branching from the trip-shaft B′, comes in contact with a ledge on one bar of the table-trip and sustains it normally in its highest position. Therefore it follows that whenever the table-trip is depressed by the accumulation of grain thereon this trip-arm is also depressed at its contiguous end, and serves as a lever to rock the trip-shaft. In the former application the arm was represented as integral with or arranged in fixed relation to a second trip-arm, B^2, also diverging from the trip-shaft, but operated by the outside tripping-fingers, as will presently appear, so that both permanently worked together, and neither could be removed without the other. This arrangement, as already explained, has proven to fall short of perfect efficiency under all circumstances. I therefore form each tripping-arm independently, and provide each with a hub, b, in the present instance squared to slip over a square portion of the trip-shaft, and provide such hub with a set-screw, b', whereby it may be clamped in fixed position on said shaft, or may be loosened and slipped laterally to leave either of the tripping devices at rest, in order that the full effect of the accumulating grain may come on a single instrumentality.

Instead of being square, the trip-shaft may of course be provided with a spline or feather, and the sleeve or hub on the trip-arm with a corresponding groove, the set-screws of course still being used to hold them in adjusted position.

The outside tripping and compressing fingers, C, are mounted, as before, upon a block, C′, having an arched crown with longitudinal and transverse slots, said crown fitting the curved face of the fingers, and the transverse slots receiving a tongue from said base, and a clamping-bolt, c, passes from the base through the longitudinal slot, so that by loosening the bolt the fingers may be adjusted in and out along the block, to diminish or increase the grain-receiving space and the consequent size of the gavel. This block is journaled loosely upon the rock-shaft D, which, at its front end, is connected by a crank and pitman with a lever operated by a cam-track in the usual gear and cam wheel, so as to be restored to position after each binding operation has been concluded and the sheaf discharged.

As explained in the previous application, already referred to, the just-mentioned supporting-block has an inwardly-projecting lug or toe, d, which comes beneath the corresponding trip-arm, so as to raise it and rock the trip-shaft whenever the tripping-fingers are pressed sufficiently back, and which, by means of said arm and the spring between the trip-shaft and locking-dog usual in this type of machines, aids in carrying the tripping-fingers back to position whenever they have from any

cause receded therefrom. Alongside the block a crank-arm, E, is keyed to the supporting rock-shaft, so as to come in close proximity to one face thereof and move therewith, or itself move the shaft. Formerly this arm had a loose connection with the block by means of a lateral projection taking into a curved slot in the adjacent face of the block, or vice versa; but this slot being closed at each end was liable to be obstructed by chaff and broken straw. Therefore I now form it as a notch, *e*, open to the air at the heel of the block, and discharging freely whatever débris momentarily enters it. With this expedient the lateral finger may be supplanted by the lateral sleeve *e'* from the crank, which sleeve serves as means for connection with the hinged leaf or tail-board at the foot of the binding-receptacle, so as to open this leaf whenever the rock-shaft D is oscillated; or, instead of the slot or notch, or supplemental to it, the heel of the block may have laterally-projecting lugs e^2, one at top and one at bottom of the slot; or, in other words, at each extreme of the permitted movement between the block and the crank, which lugs in turn come against the adjacent edges of the crank.

To entirely obviate any possibility of clogging, I deem it preferable that both lugs and notch should be used concurrently.

The construction just described facilitates still another improvement, which, however, is not necessarily dependent upon these specific features, although practically beneficial therewith, and that is the application of a spring independent of the spring formerly used and above alluded to, whereby the tripping-fingers may be returned to position after depression. For this purpose the heel of the block which supports the fingers has, above the slot or lugs which limit its play, an offsetting lip, *f*, suitably formed on its under side, to serve as a seat for a spiral spring, F, while the sleeves at the end of the crank over the supporting rock-shaft have an opposing lip, *f'*, similarly formed to receive the other end of the spring, whereby, whenever the fingers are rocked back upon the supporting-shaft under the pressure of the accumulating grain they will gradually compress said spring until they reach the point at which the binding mechanism is started or their supporting-block engages with the crank-arm on said shaft. They will therefore oppose an elastic resistance to the grain, and, after the binding operation, will be certainly restored to their normal position.

In order to adjust the stress of the spring, I prefer, instead of resting it nakedly upon the upper (or lower) lip, to interpose a disk, f^2, having a seat for the adjacent end of the spring, and receiving one end of a set-screw, f^3, threaded into said lip, whereby the normal space between its seats may be increased or diminished. Instead of said set-screw the disk may have a screw-shank fitting into the lip, so as to be adjusted therein. This spring, in addition to its office in returning the tripping-fingers to place, has a further function in assisting the discharge of the bundle, since while this bundle is being discharged by the usual revolving ejecting-arms, the tripping-fingers are necessarily depressed below the horizontal; but their spring is continually urging them upward against the bundle or sheaf, so that as it reaches their ends they fly up, giving to it a final push from the machine.

It will be understood that although my above-described improvements all relate to a single machine, and to a single object, and will, so far as I am at present aware, be used conjointly, some features of the invention are capable of separate use in connection with mechanism of different structure, but still performing the same function or accomplishing the same effects relatively to these as their co-operating parts herein described.

I claim—

1. The table-trip formed, substantially as described, of two parallel bars united at the receiving end and by a subtending bridge near the lower end and open from the joint at the receiving end to the discharging end.

2. The table-trip formed, substantially as described, of two parallel bars united at the receiving end by a sleeve, or equivalent provision for a hinge-joint, and extending therefrom in parallelism to a point near the discharging end, where they converge and are united by a sub-tending bridge, and from that point again become parallel to the extreme and open end.

3. The combination, substantially as hereinbefore set forth, of the table-trip formed of two parallel bars united at their receiving end to afford provision for a hinge, and from that point open to the discharging end, with the exception of a subtending bridge or brace near said end, and the outside compressing-fingers.

4. The combination, substantially as hereinbefore set forth, with the outside compressing-fingers, of a table-trip composed of bars united at the receiving or inner end, to afford provision for a hinge-joint, and thence parallel to near the discharging end, where they are united by a subtending bridge, and then converging and again parallel to the open discharging end playing between said outside compressing-fingers.

5. The combination, substantially as hereinbefore set forth, with the table-trip and outside tripping-fingers, of the tripping rock-shaft and the trip-arms extending from said rock-shaft, respectively to the table-trip and to the tripping-fingers and independently detachable from the rock-shaft.

6. The combination, substantially as hereinbefore set forth, of the table-trip, the outside tripping-fingers, the tripping rock-shaft squared at its end beneath the table-trip, and the trip-arms having square sleeves and clamps and independently applied to said shaft, to operate in connection with the table-trip and with the tripping-fingers, as set forth.

7. The combination, substantially as hereinbefore set forth, of the outside tripping-fingers mounted loosely upon their supporting-shaft, and having an open slot in their base, and a crank-arm keyed to the shaft, and having an offset playing in said slot.

8. The combination, substantially as hereinbefore set forth, of the outside tripping-fingers mounted loosely upon their supporting-shaft, and having lateral lugs projecting from their base, and a crank-arm keyed to said supporting-shaft and playing, as to its crank projection, between said lugs.

9. The combination, substantially as hereinbefore set forth, of the outside tripping-fingers, a block upon which they are adjustably mounted to be moved in or out, a shaft supporting said block loosely, and a crank-arm keyed to said shaft, and having an offset playing in an open slot in said block.

10. The combination, substantially as hereinbefore set forth, of the outside tripping-fingers, a block upon which they are adjustably mounted to be moved in or out, and supported loosely upon a shaft connected with the gear and cam wheel, a crank-arm keyed to said shaft to move therewith, or cause its movement, and lugs projecting laterally from said supporting-block, between which the crank-arm plays.

11. The combination, substantially as hereinbefore set forth, of the outside tripping-fingers, a block upon which they are adjustably mounted to be moved in or out, a shaft to which said block is loosely sleeved, an open slot in said block, and lugs projecting laterally at top and bottom of said slot, between which slot and lugs an offset from the arm and the arm itself play.

12. The combination, substantially as hereinbefore set forth, of the outside tripping-fingers mounted loosely upon their supporting-shaft, a crank-arm keyed to said shaft and having an offset playing in a slot in the supporting-base of said fingers, and a spring interposed between said crank-arm and the fingers.

13. The combination, substantially as hereinbefore set forth, of the outside tripping-fingers, the shaft upon which they are loosely mounted, a crank-arm keyed to said shaft to move therewith and restrained in its movement by contact with stops afforded by the base of said fingers, and a spring, adjustable as to its stress, interposed between said crank-arm and the tripping-fingers.

14. The combination, substantially as hereinbefore set forth, of the outside tripping-fingers, the block upon which they are adjustably mounted, the shaft upon which said block is loosely sleeved, a crank-arm keyed to said shaft and playing between stops afforded by said block, and a spring interposed between the block and the crank-arm.

15. The combination, substantially as hereinbefore set forth, of the outside tripping-fingers, the block upon which they are adjustably mounted, the shaft to which said block is loosely sleeved, the crank-arm keyed to said shaft, and having a lateral offset playing between stops afforded by the block, the lips or lugs projecting, respectively, from the offset and from the block, and the coiled spring interposed between the two.

16. The combination, substantially as hereinbefore set forth, of the outside tripping-fingers, the block to which they are adjustably attached, the shaft on which said block is loosely sleeved, the crank-arm keyed to said shaft, and having a lateral projection playing between stops afforded by said block, the lips projecting, respectively, from the crank-arm and from the block, the coiled spring interposed between said lips, and the set-screw and its disk, whereby the stress of the spring is adjusted.

17. The combination, substantially as hereinbefore set forth, of the outside tripping-fingers, the block to which they are adjustably attached, the shaft upon which said block is loosely mounted, the open slot and lateral lugs afforded by said block, the crank-arm keyed to the shaft to play between said lugs, and having a lateral projection to work in the slot, and a spring interposed between said lateral projection and the block.

HENRY E. PRIDMORE.

Witnesses:
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PAUL ARNOLD.