(No Model.) 2 Sheets—Sheet 1.

W. ALDRICH.

GRAIN BINDER.

No. 265,232. Patented Oct. 3, 1882.

Fig. 1.

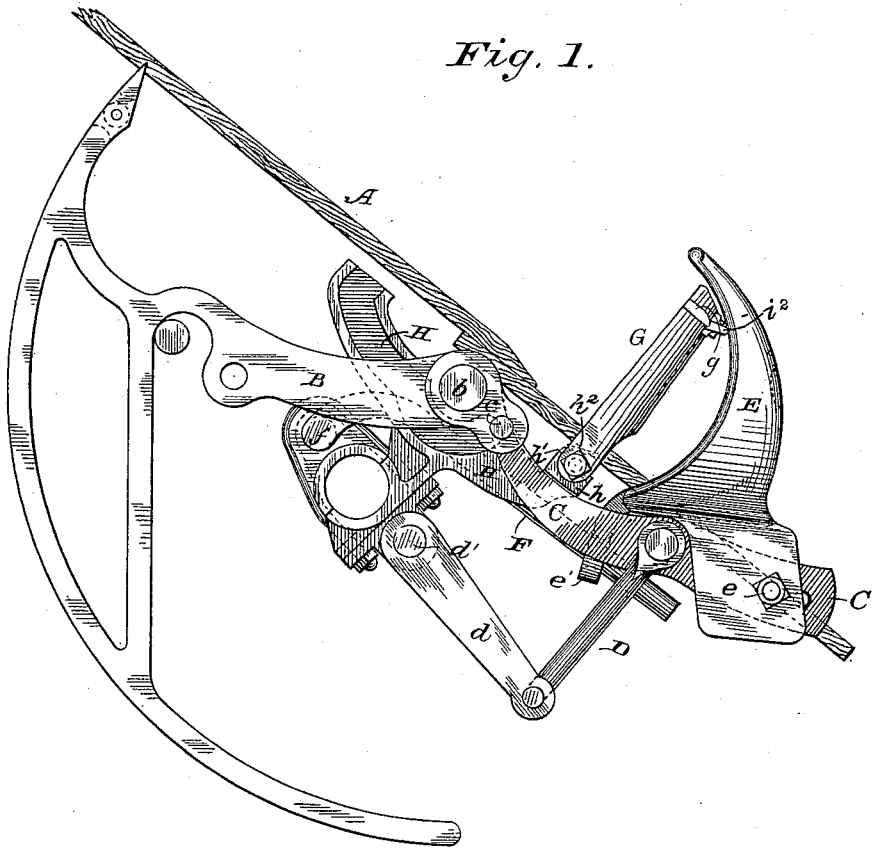
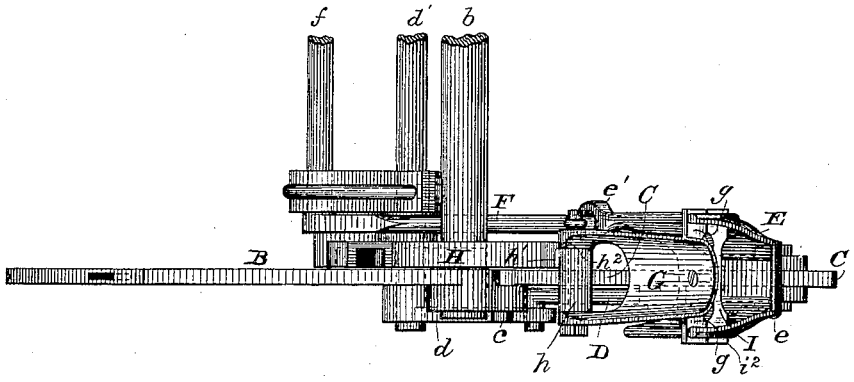


Fig. 3.



WITNESSES

Wm A. Skinkle.

Edwin A. Newman.

INVENTOR.

Wales Aldrich.

By his Attorneys.

Dewison & Dewison

(No Model.) 2 Sheets—Sheet 2.

W. ALDRICH.

GRAIN BINDER.

No. 265,232. Patented Oct. 3, 1882.

Fig. 2.

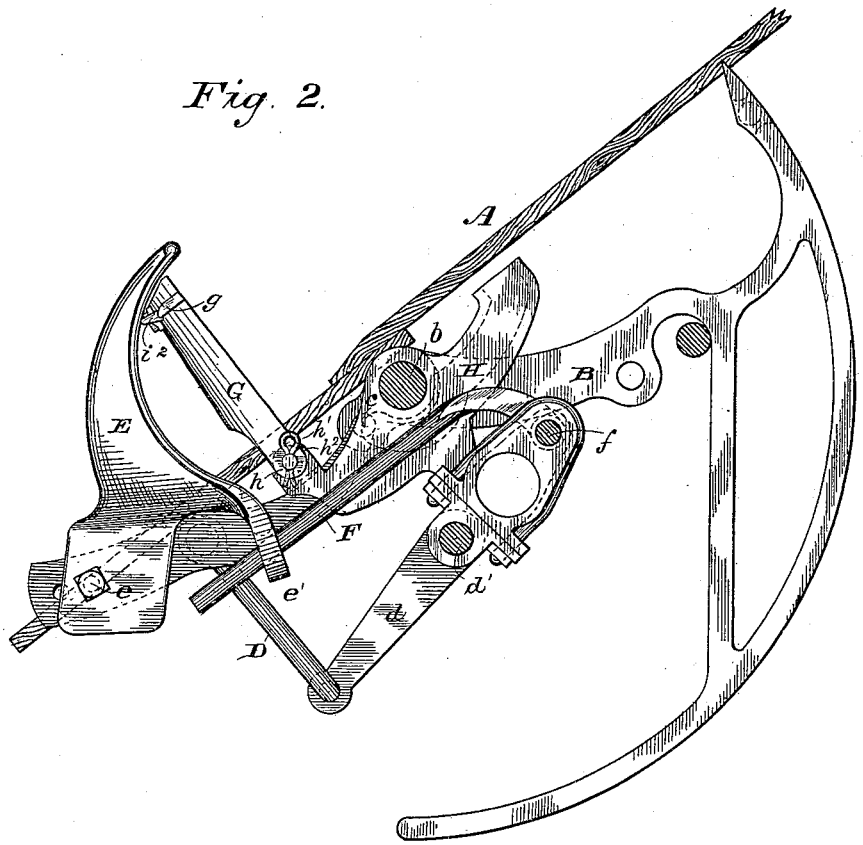


Fig 5

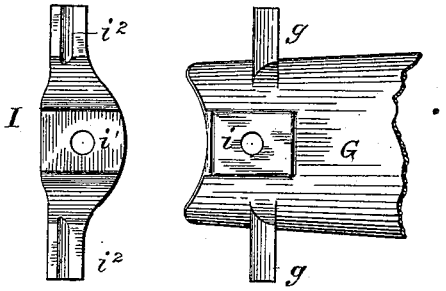
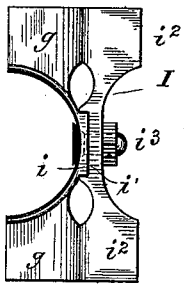


Fig. 4.



WITNESSES

Wm. A. Skinkle

Edwin A. Newman.

INVENTOR

Wales Aldrich.

By his Attorneys

Parkinson & Parkinson

UNITED STATES PATENT OFFICE.

WALES ALDRICH, OF MIAMISBURG, OHIO, ASSIGNOR TO ABEL HOOVER AND WILLIAM GAMBLE, OF SAME PLACE.

GRAIN-BINDER.

SPECIFICATION forming part of Letters Patent No. 265,232, dated October 3, 1882.

Application filed August 2, 1882. (No model.)

To all whom it may concern:

Be it known that I, WALES ALDRICH, of Miamisburg, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Grain-Binders, of which the following is a specification.

My invention relates to that class of automatic grain-binders in which the binding mechanism is started by the pressure of the accumulating gavel against a compressing and tripping arm, composed generally of two connected parallel fingers, which closes the exit from the grain-receptacle and opposes itself to the action of the packing devices by which the grain is fed and compressed until the moment a predetermined size or compression of the gavel is reached, when by rocking or yielding it clutches the binding mechanism with the continuously-driven harvester-gearing, and then in the ensuing binding operation is temporarily withdrawn to permit the discharge of the bound sheaf, immediately returned to its former position, and reset for the reception of the next gavel. These compressing and tripping fingers are differently mounted in different styles of machines and throw the binding mechanism into gear by various devices; but they all act upon the common principle of engagement of the clutch, whatever may be its form, superinduced by the yielding or rocking of said fingers upon their pivot or axle, thus by cranks or connecting-links releasing the stop which holds the movable part of the clutch out of engagement, or else positively actuating such movable part to bring it into engagement. In that special type of machine which I have chosen to illustrate my invention these compressing or tripping fingers are pivoted to a supporting arm or bar, which in turn is pivoted to the heel of the binder-arm, and is yieldingly sustained intermediate of its length by a link and spring connection—such, for instance, as shown in the patent granted to John F. Appleby on the 18th day of February, 1879, No. 212,420. As the tripping-fingers yield before the incoming gavel they rock upon their pivotal point upon this bar, and, being connected by means of an eye to a trip-rod fast to a rock-shaft ultimately controlling the clutch mechanism, lift the end of said rod, rocking the shaft, and throwing the clutch into engagement. Immediately thereafter, and after the binder-arm has moved to carry the cord around the gavel, the supporting-arm, which until this moment has held them up, closing the outer side of the grain-receptacle, sinks with them beneath the table, the bound sheaf is ejected, and as they immediately thereafter rise again, the pressure upon them at the time being removed, they are reset in readiness for the next gavel. In this construction it has been common to adjust the tripping-fingers longitudinally of the supporting-bar to vary the size of the sheaf, which is frequently desirable owing to the varying conditions of the grain, some grain being choked with weeds, other grain being light and dry, and still other tangled or lodged or in a wet condition. Now, it is obvious that a change of position of the tripping-fingers along the supporting-bar will lengthen or shorten the leverage on the trip-rod, so that when the space between the tripping-fingers and the packers is least to make a small-sized gavel, the leverage required to actuate the trip-rod and start the binding mechanism will be greatest. The small gavel will therefore be packed and compressed much more than a large one, whereas practical uniformity of compression in all these adjustments is desirable. To obviate this defect it has been proposed to make a portion of the tripping-finger adjustable independent of that part which is pivoted to the supporting-bar; but although this leaves the pivot constant, and the length of the trip-rod from its axis or rock-shaft to the point of its connection with the tripping-fingers is unchanged, still the effect of adjusting on the other side of the pivot is to change one of the lever-arms, and therefore to a more or less important extent change the leverage.

My invention consists in the employment of an independent arm or bar removably pivoted to a stationary part of the frame-work or binding mechanism in advance of the compressing-fingers and eccentrically to their pivot, with its free end resting upon these fingers near their tip, and adapted to travel upon said fingers, so that as grain is packed against it it pushes them back, riding gradually down toward their pivot in the act until they have re-

ceded far enough to start the binding mechanism.

It also consists in combining with said independent or supplementary compressing-arm wings or runners which rest upon the separate edge or ribs of the compressing finger or fingers and travel thereon; in combining with said independent or supplementary compressing-arm or "rider" lifts or blocks which may be inserted between it and the compressing-fingers, to further diminish the grain-receiving space or increase the range of adjustment; and in the various other combinations and details of construction hereinafter described and claimed.

In the drawings, Figure 1 is a side elevation of so much of an automatic binder with my invention applied as is necessary to an understanding thereof; Fig. 2, an opposite side elevation, enlarged, of a compressing and tripping arm or fingers and sustaining bar with a supplementary arm or rider mounted upon the tucker-cam and in position for action. Figs. 3, 4, and 5 are details.

A designates a portion of the decking or floor of a grain-receptacle; B, the vibrating binder-arm, keyed to the rock-shaft *b* beneath said floor; C, a supporting-arm for the compressing and tripping fingers, pivoted at *c* to the heel extension of the binder-arm, so that as the latter rises it may tend to draw up said supporting-arm and the compressing-fingers borne thereby to give the gavel an additional compression. About midway of its length this supporting arm or bar has pivoted to it a link, D, which at its other end connects with a crank, *d*, upon a rock-shaft, *d'*, to which spring-pressure will be applied in such manner as to normally retain the bar in its elevated position. To said bar, beyond the point of attachment with the link, are pivoted at *e* the compressing and tripping fingers E. Usually these constitute an integral bi-fingered casting. They may, however, be merged into a single arm or increased in number as found advisable.

Upon the shank of the compressing and tripping fingers, sufficiently in front of their pivotal attachment to the supporting-arm to afford suitable leverage, is an eye, *e'*, in which is received the free end of trip-rod F, formed as a crank or offset from the rock-shaft *f*, hereinafter called the "trip-shaft," which immediately controls the clutching mechanism. As the compressing-arms are pushed back upon their pivot by the accumulation of the gavel they will raise the free end of the trip-rod and rock the trip-shaft, thus releasing or otherwise causing the engagement of the clutch to start the binder. In like manner as heretofore, the tripping-fingers are or may be made adjustable as to their pivotal point along the supporting-bar, thus enabling me to control the amount of leverage necessary to trip the binder; but for the purpose of sizing the sheaf, while retaining such leverage practically uniform unless independently altered, I pivot to the frame-work in advance of the tripping-fingers a supplementary compressing-arm, G. The free end of this arm rests upon the inner curved side of the compressing-fingers, near their tip, when there is no load upon them, and is advisedly provided with runners *g*, which permit it, as grain is packed against it, to ride down the face of these fingers and push them back upon their pivot until the binder is started. It will be observed that the pivot of this arm or rider must be not only eccentric to the pivot of the tripping-arms, but eccentric to the arc of their forward faces. It might under some circumstances, observing these conditions, be upon the inner end of the supporting-bar itself; but I deem it more beneficial to have it pivoted to some fixed part of the frame, and have found it most convenient to pivot it to a lug or projection or offset, *h*, from the tucker-cam H. This latter usually lies close alongside the sustaining-bar in this class of machines, and in order to bring the rider properly in front of the tripping-fingers pivoted to said bar the offset is made to overhang the bar sufficient to properly center said rider. The hinge between the rider and cam is made with stops or shoulders h' h^2, to check the rider from shutting or falling in over the cam when thrown violently forward by the return of the tripping-arms to their normal position. In the other direction the rider will be sufficiently checked by the tripping-arms or by striking against the sustaining-bar should it be pushed so far back. In cross-section the rider is preferably made somewhat hollow or dished to afford a space within which the band can lie without frictional contact, in this simply following the analogy of the compressor-arms heretofore used in these machines. It may be made of skeleton form, and is, in fact, not limited to any particular shape or size, such items being determined by convenience or preference.

As thus far described the use of the rider enables only a single change in size of the sheaf—that is, the size which will be given by the compressing and tripping fingers acting without the rider, and the size given when the rider is used. In order to obtain a greater range of adjustment, I make provision for applying to the tip of the rider lifts or blocks I, of varying sizes, all of which have the same general shape, but will vary as to the degree to which they lift the rider away from the tripping-arms. The simplest mode of applying these lifts known to me is to form upon the rear of the rider, at its tip, between the two runners which it carries, a square boss or enlargement, *i*, and to form in the body of each lift a corresponding seat or recess, *i'*. Beyond this body portion each lift has wings or runners i^2, which beneath are grooved to sit over and saddle the runners upon the rider itself, and which take the place of these runners as to the contact with the tripping-fingers, and therefore by their depth upon each individual lift determine the adjustment. When one of these lifts has been put in place it will be held firmly by a single screw-bolt, i^3, passing

from the rider to the boss or enlargement thereon into and through the body of said lift. Other modes of securing an extensive range of adjustment in connection with my hinged rider-arm will readily occur to a skilled mechanic.

I do not intend to limit myself to the use of the hinged rider, with or without adjusting lifts, in connection with the specific tripping mechanism herein described and shown, since it can obviously be made to actuate any pivoted compressing and tripping arm which is under suitable relations to the grain-receptacle and as to its own movements.

I claim—

1. The combination, with the compressing and tripping arm or fingers, of a supplementary arm or rider hinged in advance of said tripping-arm and resting at its free end against the tip thereof.

2. The combination, with the compressing and tripping arm or fingers, of a supplementary arm or rider hinged in advance of said tripping-arm, and a removable adjusting lift interposed between the free end of said rider and the tip of the tripping-arm.

3. The combination, with the pivoted compressing and tripping arm or fingers, of a supplementary arm or rider hinged in advance of said tripping-arm to a fixed portion of the binder and resting at its free end against the tip of said tripping-arm.

4. In combination with a compressing and tripping arm and a supporting-bar, to which it is pivoted and along which it may be adjusted to increase or decrease the leverage required to start the clutch, a supplementary removable arm or rider hinged in front of the tripping-arm and resting as to its free end against the tip thereof, to change the size of the grain-receiving space.

5. The combination of the supporting-bar, the tripping arm or fingers pivoted thereto, the trip-rod connected with the said tripping-arm, and the supplementary arm or rider pivoted to an offset from the heel of the tucker-cam above the supporting-bar and in front of the tripping-arm.

6. In combination with the tripping arm or fingers, the rider hinged in front thereof, and the stops whereby the rider is prevented from closing too far upon its hinge.

7. The rider formed with wings or runners at the end away from its hinge, to rest upon the ribs of the compressing and tripping arm.

8. In combination with the rider, formed with an angular boss at its end farthest from the hinge, the lift formed with a seat to take over said boss and with runners to rest against the tripping-arm, and the through-bolt detachably uniting the lift to the rider.

9. The rider formed, as described, with wings or runners at its unhinged end, and an angular boss between said runners, combined with the lift having a recess or seat to take over said boss, and runners grooved beneath to saddle the runners upon the rider, and a removable bolt passing through rider, boss, and lift to secure the parts together.

10. The tucker-cam formed with an offset to overhang the supporting-bar and afford means for hinging the rider above said bar and directly in front of the tripping-arm.

11. The tucker-cam having formed therewith one member of a hinge-connection and the shoulder or stop h', in combination with the rider having the other member of said hinge-connection and a second opposing shoulder or stop, h^2, substantially as described.

WALES ALDRICH.

Witnesses:
LEWIS H. ZEHRING,
GEO. BRASSINGTON.