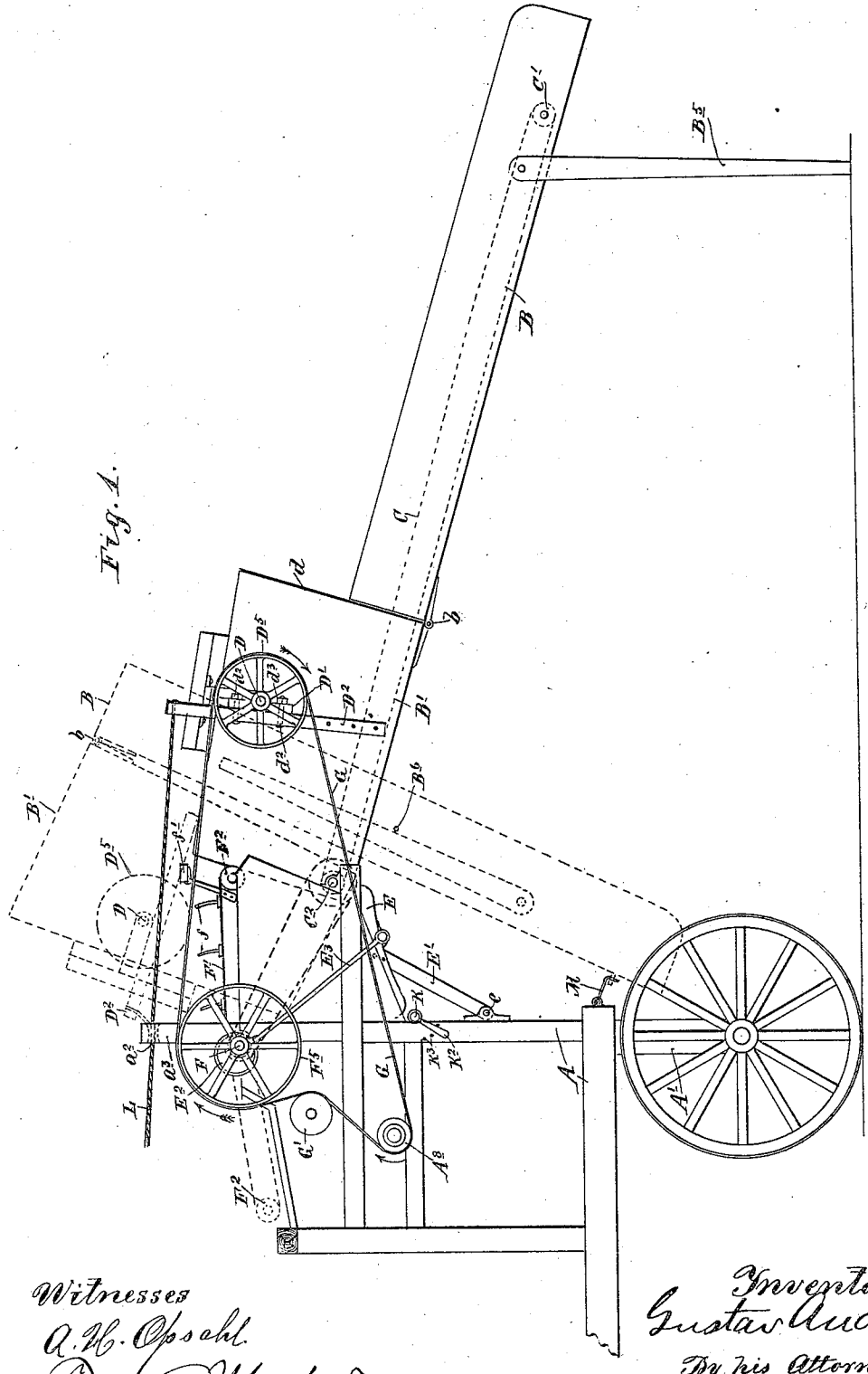
(No Model.) 3 Sheets—Sheet 1.

G. ANDERSON.

BAND CUTTER AND FEEDER.

No. 513,698. Patented Jan. 30, 1894.

Fig. 1.



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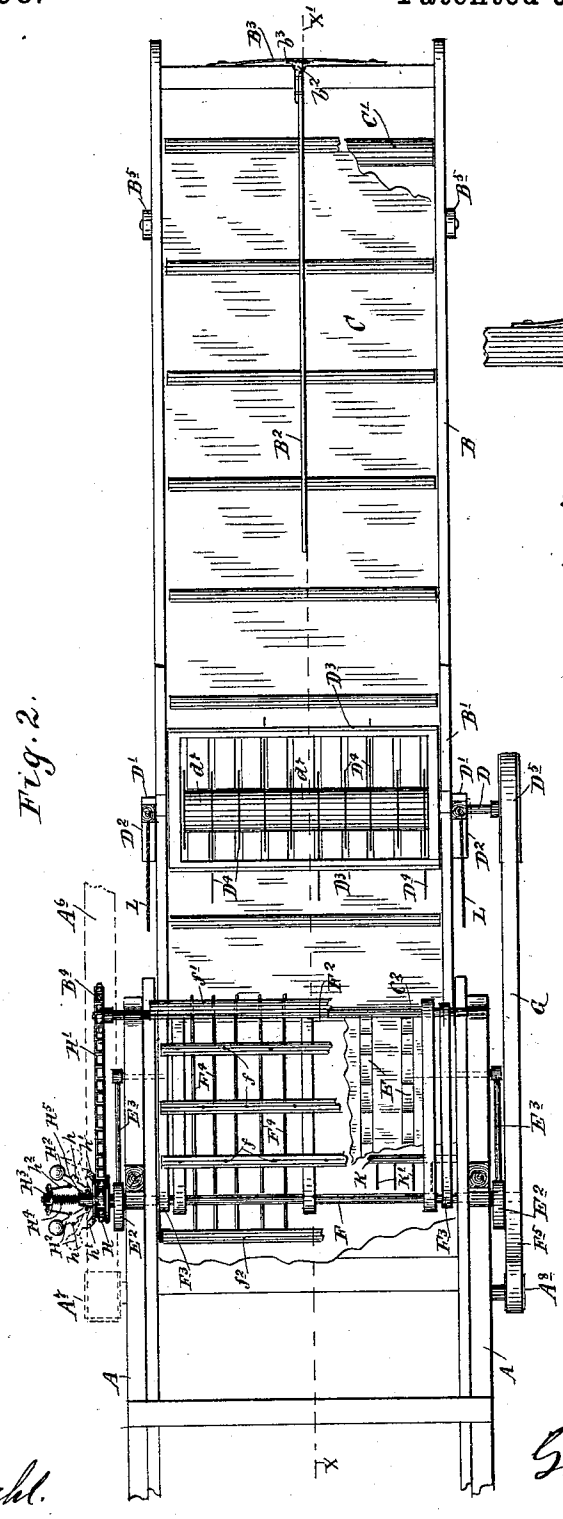

Fig. 2.

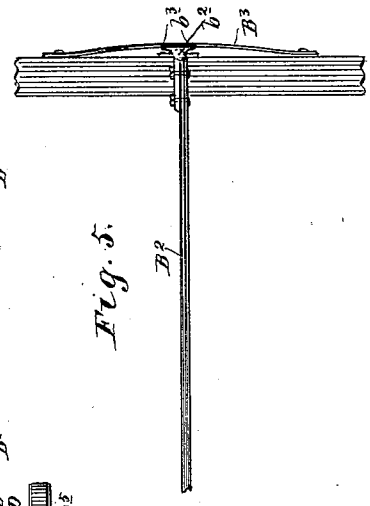

Fig. 5.

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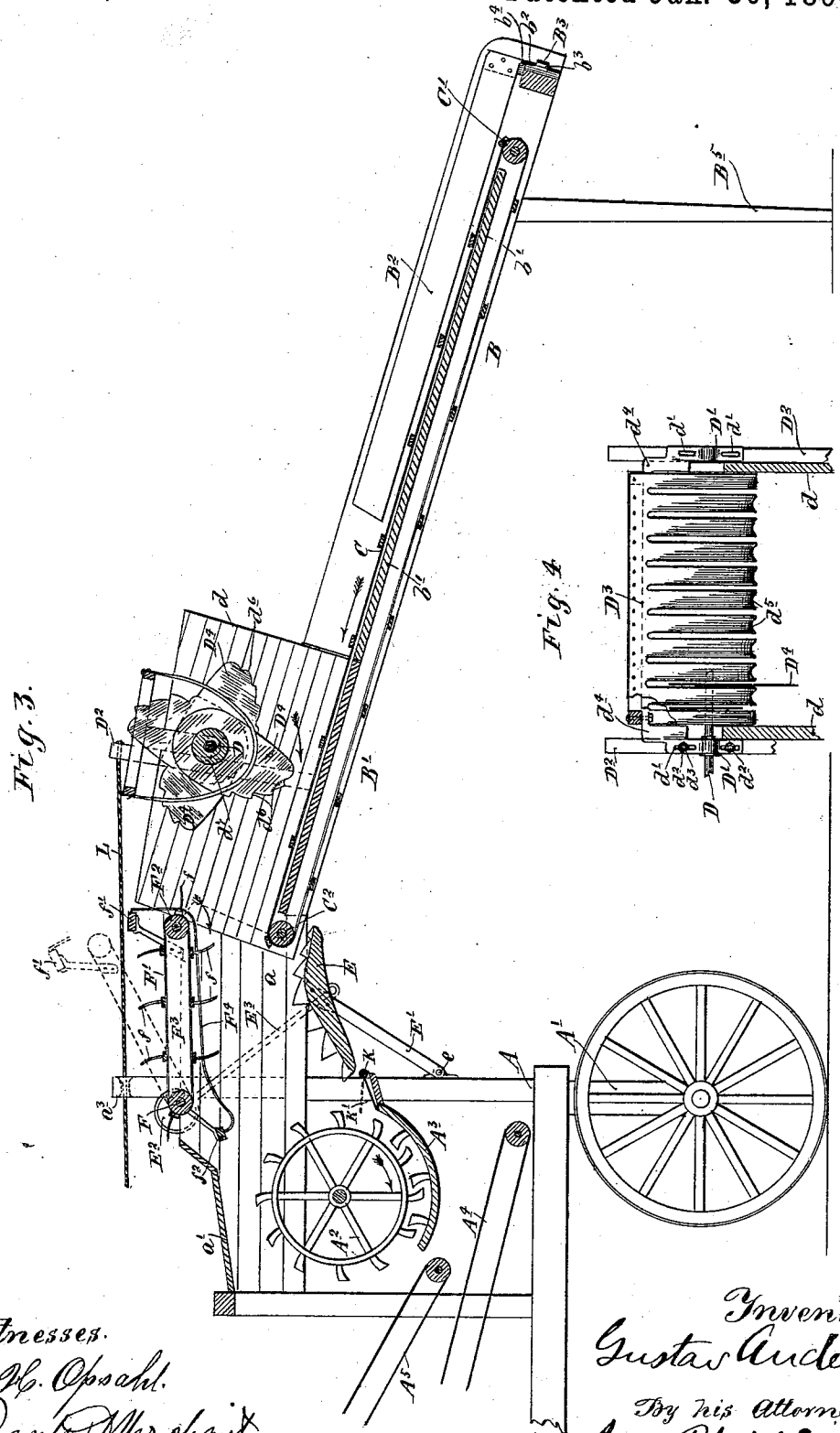

Fig. 3.

Fig. 4.

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UNITED STATES PATENT OFFICE.

GUSTAV ANDERSON, OF WELLS, MINNESOTA.

BAND-CUTTER AND FEEDER.

SPECIFICATION forming part of Letters Patent No. 513,698, dated January 30, 1894.

Application filed February 4, 1893. Serial No. 461,005. (No model.)

To all whom it may concern.

Be it known that I, GUSTAV ANDERSON, a citizen of the United States, residing at Wells, in the county of Faribault and State of Minnesota, have invented certain new and useful Improvements in Band-Cutters and Feeders; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to band cutters and feeders; and has for its object to provide an improved mechanism of this class.

To this end, my invention consists in certain novel devices and combinations of devices, which will be hereinafter fully described and be defined in the claims.

A machine embodying my improvements is illustrated in the accompanying drawings, wherein, like letters referring to like parts throughout the several views—

Figure 1 is a left side elevation of the front end of a thrashing machine equipped with my band cutter and feeder attachment, some parts being broken away. Fig. 2 is a plan view of the same, with some parts broken away and others removed. Fig. 3 is a longitudinal vertical section, on the line X X′ of Fig. 2. Fig. 4 is a detail partly in elevation and partly in section, looking from the front, showing the adjustable grating through which work the band cutting knives; and Fig. 5 is a detail in plan, showing the yielding dividing board on the bundle table, with the means for centering the same.

A represents the separator-frame, A′ the front end trucks, A^2 the thrashing cylinder, A^3 the concave, A^4 the grain-belt, A^5 one of the separating carriers, A^6 the belt (in dotted lines) from the engine to the pulley A^7, on the right end of the cylinder shaft. All these parts are of the ordinary well-known construction.

B B′ is the band-cutter and table-frame, the two sections of which are pivotally connected together, as shown at *b*.

C is the endless carrier, of the apron and slat variety, for supplying the uncut bundles. This carrier is mounted on rollers C′ C^2, at or near the ends of the frame and runs over the central deck *b*′. The journals of the upper end roller C^2 projecting inwardly beyond the side-boards *a* of the mouth of the separator and constitute a pivotal connection, on which the band-cutter and bundle table frame may be turned at will.

B^2 is a yielding dividing-board overhanging the apron C on the center line of the table. This dividing board B^2 is provided at its lower front end with a pintle or pivot casting b^2, which is pivoted in a suitable bearing on the front cross-bar of the bundle table frame; and is provided with a laterally extended lug or flanged head b^3, which is subject to the action of a centering spring B^3, which is in the form of a leaf secured at its opposite ends to the face of the front end cross-bar, and bears at its center against the said lug b^3. The bearing b^4 on the cross-bar, in which the pintle b^2 works, is raised above the level of the face of the carrier C, so that the center-board will normally stand slightly above and clear of the apron. The spring B^3 in its action on the dividing board B^2, will tend to hold the same in its normal or central position; while, at the same time, it will permit the board to swing laterally, if necessary, to permit the free movement of the bundles.

D is the band-cutter shaft, which is journaled in vertically adjustable boxes, D′, mounted on the faces of standards D^2, secured to the vertically extended side-boards *d*, of the frame-section B′. The boxes D′ are provided with vertical slots *d*′, through which work bolts d^2, projecting from the standards D^2, and secured by nuts d^3. This construction permits the boxes D′ and shaft D, together with all parts carried thereby, to be vertically adjusted and secured in any desired position on the frame section B′ *d*. The box-castings D′ have formed integral therewith, at their upper ends, angular projections d^4, to which is secured a concave grating or basket-like shell D^3. This shell D^3 is made of sheet metal with passages stamped out of the same, thereby forming corrugations or corrugated ribs d^5, between which work the knives D^4, carried on the shaft D, and operating to cut the bands. The smooth or rounded surfaces of the corrugated ribs d^5 are on the inner surface of the shell, and the flanged or projecting edges of the same, formed by the action of the die in stamping them out,

are on the outer surface of the shell. This construction tends to prevent the knives D^4 from carrying in any straw or other material; and if any pieces should be carried in, it enables the knives to readily force the same out at the front side of the grating. The knives D^4 are preferably formed with serrated edges, as shown at d^6. The successive knives are set on the quarters of the circle with respect to each other, and are suitably spaced apart by collars d^7, on the shaft D.

E is a serrated feed-board, which is carried by a pair of braces E′, pivoted at their lower ends to the separator-frame, as shown at *e*. This feed-board is subject to the action of a pair of eccentrics E^2, on the ends of a roller shaft F, through straps and eccentric-rods E^3, the lower ends of which are pivoted to opposite sides of the feed-board.

F′ is a feed-carrier mounted on the roller F, at one end and the roller F^2 at the other, which are journaled in the frame F^3, which is free to turn on the journals of the roller F, as a pivot. The carrier F′ is of the slat and belt variety; and the slats of the same are provided with slightly curved fingers *f*, which work through a grating F^4, secured to the frame F^3. This feed-carrier frame and grating is free to rise at its forward end and float on the stock, if necessary, and may be turned upward and backward, so as to overlie the separator-deck *a*′, if so desired. The frame F^3 is provided at its forward end, with a projecting bracket *f*′, which serves as a means for the front end attachment of the grating shell F^4, and also serves as a rest to keep the teeth or fingers *f* clear of the separator-deck, when the feed-carrier and frame are turned back into their idle or inoperative position. The grating shell F^4 is supported at the rear end by a similar downwardly projecting bracket f^2, depending from the main frame F^3. The shaft or journal ends of the front roller F^2 are extended outward, and engage with the upper edges of the side-boards *a* of the separator mouth, to limit the downward motion of the feed-carrier, at its forward end. The shaft F, which imparts motion to the feed-carrier F′, is provided on its left end with a pulley F^5. The band-cutter shaft D has on its left end a pulley D^5. Motion is imparted to these pulleys F^5 and D^5, by a belt G, driven from a pulley A^8 on the left end of the thrashing cylinder shaft. The belt G is held under the proper tension, by a belt-tightener G′. Near its right end, the shaft F carries a loose sprocket H, which is connected by chain H′ with sprocket B^4, on the right end of the upper end bundle-carrier roller C^2. The right end of the shaft F, carries a ball governor, the ball carrying arms H^2 of which, are provided with projecting lugs *h*, which are adapted to engage with corresponding outwardly projecting lugs *h*′, on the outer face of the loose sprocket H. The yoke H^3 of the governor, is mounted to slide on the shaft in the usual way, as a governor stem against a spring H^4; and is connected by links h^2 with the ball carrying arms. The collar H^5 is of course, fast to the shaft F. It is obvious, that whenever the shaft F reaches a speed sufficient to throw the ball carrying arms H^2 into their extended position, by centrifugal force, the lugs *h*, on the said arms, will engage with the lugs *h*′ on the loose sprocket H, thereby driving the sprocket with the shaft F. Through the chain H′, the motion will be conveyed to the roller C^2, and the bundle-supplying apron C. The shaft F, as has already been stated, is driven from the thrashing cylinder. Hence, whenever the thrashing cylinder loses proper working velocity, the sprocket H will be set free from the governor, stopping the bundle conveyer; and whenever the thrashing cylinder regains the proper speed, the bundle-carrier will be again started into action. The necessity for employing a governor between the thrashing cylinder and the bundle supplying mechanism, in this class of machines, is well known. Without the use of a governor, automatic band-cutters and feeders cannot be made to successfully do the work. The governor avoids overfeeding the thrashing cylinder, so that choking or clogging of the thrashing machine is prevented and the feed is adapted to the character and condition of the stock. The form of governor and connections, which I have shown, is extremely simple in construction and is efficient for the purposes had in view. The outermost or front end of the bundle table is supported, when in working position, by pivoted or folding legs B^5.

In the drawings, the parts are shown in their working position in full lines.

The operation of the machine is probably obvious from the statements made, in connection with the detailed description; but may be summarized as follows:—The uncut bundles are thrown onto the table section B, and by the carrier C are supplied to the band-cutter. The band-cutter is driven at a comparatively high rate of speed; and by the action of the knives D^4, against the resistance offered by the carrier C and the deck *b*′, the bands are cut; and the co-operation of the carrier and knives open up the cut bundles and forward the stock to the feed-carrier F′ and feed-board E. Under the co-operation of the feed-board E and the feed carrier F′, the stock will be supplied or fed to the thrashing cylinder with a sliding feed. The top portions of the stock will be thrown toward the thrashing cylinder by the feed-carrier F′, while at the same time, the whole body of the stock between the feed-carrier and the feed-board will be lifted, at the outer end of the feed-board, by the tilting action of the board under its eccentric motion, thereby delivering the stock to the thrashing cylinder with a dip or tilting action somewhat similar to that obtained in hand-feeding.

At the junction between the feed-board E and the concave A^3, I place a rock-shaft K having a series of fingers K′, and provided on

one of its projecting ends with a hand-lever K^2. Pins K^3 engaging holes in the frame A, or any other suitable locking device, serve to hold the shaft K in any position, in which it may be set by the lever K^2. This device enables me to impede or check the flow of the bottom layers of the stock from the feed-table, if the same should be necessary. The fact that the knives D^4 work through the grating D^3, prevents the wrapping of the band-cutter shaft, gives a top as well as a bottom resistance to the action of the knives, and renders the knives self-clearing. The fact that the fingers of the feed-carrier F′ work through the grating F, insures a definite bite on the stock, and renders the teeth *f* self-clearing. The co-operation of the feed-board E and the feed-carrier F′, as shown and described, I have found, by actual usage, to give a very satisfactory feed of the stock. The fact that the feed-carrier frame F^3, is pivoted, as shown, enables the same to be thrown backward on its pivotal bearing, at any time, to afford access to the thrashing cylinder or feed-board, and the fact that its front end is free, causes the same to float on the stock and rise and fall with the volume thereof, if the same should exceed the minimum capacity of the throat-way or passage between the said feed-carrier and feed-board at their forward ends.

Referring now to the construction for folding up the band-cutter and feeder-frame, when not in use, it has already been stated, that the two sections B and B′ are pivotally connected at *b*, and that the upper section B′ is pivotally connected to the separator-frame by the journals of the rollers C^2. A pair of ropes or other flexible connections L, are attached, one to each of the standards D^2, and pass backward through suitable guides, such as eyes a^2, on upper extended parts a^3, of the separator-frame, and thence to a wind-up or hoisting device (not shown) or into position for convenient operation in any suitable way, by hand or otherwise.

When it is desired to fold up the band-cutter and feeder, for any reason, such as moving the machine, the feed-carrier frame F^3, is thrown back onto the deck of the separator into the dotted line position, as shown in Fig. 1; and then by drawing on the ropes L, at a point back of the eyes a^2, the frame B B′ may be folded up into the dotted line position shown in Fig. 1. The free end of the frame section B, may then be locked by a hook M or otherwise, to the separator-frame, and the pivoted legs B^5 be thrown up into the dotted line position, shown in Fig. 1, and be held by a pin B^6, or otherwise. When the parts are in this position, the machine can be moved from place to place, without inconvenience from the band-cutter and feeder attachment. The section B′ is narrower than the mouth of the separator and when the parts are thus folded up, the section B′ turns front end downward into the mouth of the separator. The fact that the feed-carrier F′ and its frame F^3 are thrown back onto the separator-deck gives the necessary clearance, to permit the section B′ to fold into the mouth of the separator.

From inspection of the driving connections, it will be seen, that the band-cutter runs relatively fast, as compared with the bundle carrier C and the feed-carrier F′; and that the feed-carrier F′ runs relatively slow, as compared with the thrashing cylinder; but much faster than the bundle-carrier C. These relative speeds insure the proper action of the respective parts on the stock.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. The combination with the bundle-table, of the dividing-board pivoted to the table at its forward end, and provided with a centering lug on its pivotal bearing, of a flat or leaf spring having its ends secured to the face of the front end of the bundle table and bearing at its center against said centering lugs, to hold said dividing-board in its normal position, substantially as described.

2. The combination with a thrashing machine, of the feed-carrier and frame pivoted to the separator at the rear or delivery end of the carrier and adapted to fold back over the separator deck, and the band-cutter and bundle-table frame constructed in two pivotally connected sections, the upper member of which is pivoted to and narrower than the mouth of the separator, whereby the feed-carrier may be thrown back on the deck and the cutter and table-frame be folded together and the upper section of the same be turned endwise into the mouth of the separator, substantially as described.

3. The combination with the thrashing machine, of the band-cutter and bundle-table frame, constructed in two pivotally connected sections B B′, the upper member of which is pivoted to the mouth of the separator, and flexible connections L applied to the top of the upper section forward of its pivotal bearings, and extended backward through the guideways on the thrashing machine frame, for folding the cutter and table frame together and into the mouth of the separator, substantially as described.

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

GUSTAV ANDERSON.

Witnesses:
JAS. F. WILLIAMSON,
FRANK D. MERCHANT.