

UNITED STATES PATENT OFFICE.

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BUTT-ADJUSTER FOR GRAIN-BINDERS.

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To all whom it may concern:

Be it known that I, JAMES MACPHAIL, a citizen of the United States, residing at Blue Island, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Butt-Adjusters for Grain-Binders, which are fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a front elevation of a portion of a grain-binding harvester, showing a part each of the front end of the grain-binder, the front of the elevator-frame, and the front member of the upright frame; Fig. 2, an inside elevation of the butt-adjuster detached and the belt removed; Fig. 3, a plan section of the same, taken on the line 3 3 of Fig. 2, with the belt shown in dotted lines; Fig. 4, a similar section taken on the line 4 4 of Fig. 2; Fig. 5, a cross-section of the same, taken on the line 5 5 of Fig. 2; and Fig. 6, a detailed vertical section taken on the line 6 6 of Fig. 3, broken away centrally.

In the drawings, Fig. 1 is upon a scale by itself; Figs. 2 to 5, inclusive, upon another and enlarged scale, and Fig. 6 upon a scale by itself, still more enlarged.

My invention relates to the device applied to the front end of grain-binders for the purpose of guiding the butts of the grain delivered from the elevator to the grain-binder as it passes down the incline of the binder-frame to the binding devices, generally known as the "butt-adjuster."

The invention consists in certain improvements in the frame of the adjuster and the mounting and adjustment of the devices which carry the endless belt or apron of the adjuster.

A detail description of an adjuster embodying my invention, with so much of a general machine as is necessary to an understanding thereof, will now be described, and the improvements which I believe to be new, and wish to secure by Letters Patent, will then be set forth more definitely in claims.

In the drawings, A represents the main or ground wheel of the machine; B, the front member of the upright frame as found in many machines; C, the elevator-frame, and D, the incline of the binder, all parts of the

machine which may be of any ordinary construction.

The device called the "butt-adjuster" is always located at the front upper corner of the grain-binder, so that the butts of the grain as delivered from the elevator will come in contact with the butt-adjuster and be guided and at the same time evened into proper position and condition for binding as the grain passes down the incline to the binding mechanism. The device is usually made adjustable on the binder, so as to regulate the course of the grain as it passes down by the adjuster, turning it in more or less, as desired. These butt-adjusters as generally made are provided with an endless belt or narrow apron driven in a direction which makes its inner course coincide with the direction in which the grain moves.

In the present invention the main frame of the adjuster is a single piece E, which is of metal, either cast or forged, and in general form may be called "X-shaped," as it consists of a short central body e , from each end of which branch out arms e' and e'' , one pair at each end, the former of which, as shown in the drawings, being at the upper end of the frame when mounted. The upper arms e' have simple perforations e^3 , which form bearings for the journal of the upper roller F of the belt, this roller being fixed on a shaft f , the ends of which pass through the apertures in the said arms, the lower end projecting considerably beyond the arm to form an extension f' , while the upper end projects only a short distance beyond the arm, as seen in Fig. 2. The lower arms e'' are provided with extensions e^4 , extending outward at right angles to the main direction of the arms or parallel with the central body of the frame. The ends proper of these arms e'' are perforated, so as to provide through-apertures e^5 , running lengthwise of the frame, and the extensions are grooved on their inner faces, these grooves e^6 being in line with and making, to some extent, a continuation of the through-apertures in the respective arms, as seen in Fig. 6.

The lower roller G is not mounted directly in the main frame E. A small supplementary frame H is provided for this roller. This frame

It is composed of a straight bar or tongue h , from one end of which branches or arms h' spring outward in each direction, so that the frame itself may be called "T-shaped," and the branches which make the head of the T turn outward very much like the arms of the main frame and extend to about the same distance as the latter. At the extremity of each branch h' there is a short counter-arm h^2 , arranged at right angles to the branch at its extremity and extending on each side thereof. These side arms are adapted to fit the apertures and grooves at the extremities of the lower arms e^2 of the main frame, the inner portions of these arms being adapted to enter the socket-apertures in the said arms, while the ends of the branches and the outer projections of these side arms fit in the extension-grooves, so that obviously these side pieces or arms on the branches may be slid back and forth in the sockets and grooves as guideways. The outer extensions of the said pieces or arms h^2 are enlarged and of circular form, being provided with outer circular recesses, thereby making these enlargements U-shaped bearings h^3 .

The lower roller G is fixed on a shaft g , the projecting ends of which form the journals of the roller, which are in the U-shaped bearings just described, so that these latter become the journal-bearings for this roller and the supplementary frame becomes the direct support and carrier of the lower roller. The manner of mounting the outer or branch end of this supplementary frame in the main frame has been described above. A further means for mounting and securing this supplementary frame to the main frame is provided by constructing the central portion of the main frame with a groove or channel e^7 , adapted to receive this arm, and a cross-bar e^8 is cast with the body extending across from edge to edge over the channel, thereby forming a kind of loop, under which the straight member of the supplementary frame passes, being held in place by this loop-bar, while at the same time it is free to slide back and forth in the groove. Preferably, and for convenience in making, the central body e is cut out, leaving an opening or aperture e^9 directly opposite the loop-bar, and if the straight member h of the supplementary frame is of less width than the groove in which it moves the inner end may be bent downward, as seen at h^4 , so as to rest constantly upon the wall of the groove, which forms a bearing therefor, as seen in Fig 2.

It will appear from the above description that the upper roller is mounted directly in the main frame, while the lower roller is mounted directly in the supplementary frame; but as the supplementary frame is mounted upon and carried by the main frame the lower roller is also ultimately mounted upon and carried by the said main frame, so that both rollers are on the main frame, but one is adjustable thereon. The adjuster-belt or nar-

row apron J is run around the rollers, as usual, and is preferably provided with slats, j , which is an ordinary construction in this device. Obviously when the adjuster-belt is in place if the supplementary frame is held out steadily so as to force the lower roller out against the belt firmly, the latter will be kept taut. The provision for a sliding movement of the supplementary frame provides for this adjustment, and a spring or yielding force is applied to this supplementary frame for this purpose: As shown in the drawings, this is effected by providing the straight bar h of the supplementary frame with an arm K, cast with or secured thereto at the lower edge and sprung out a little at one side, so as to pass outside of the plane of the edge flanges on the center of the main frame. This arm is bent downward and upward, as seen in Fig. 2, and is extended down below the plane of the main frame, where it terminates in a hook k . A spring L, as here shown a spring-coil, is connected at one end to this hook, and is extended thence downward toward the lower end of the main frame, where it is connected at its other end with a hook l , formed on a small circular boss e^{10} on the bottom arm e^2 , as seen in Figs. 1, 2, and 6. This lower attachment of the spring is, therefore, stationary, while the upper one is movable, being on the sliding supplementary frame. The length of the spring is regulated in relation to the belt so that when the parts are organized in working position the spring will be under tension, and therefore its normal action will produce a constant but elastic or yielding force, acting upon the supplementary frame to move it outward or downward, thereby holding the lower roller up firmly and constantly against the belt to keep the latter taut.

The mechanism described above forms a complete working butt-adjuster. However, for protection, a plate is applied both above and below the main frame, to which they are secured. The upper plate M is a sheet of thin metal secured at its respective ends to the arms of the main frame by rivets or any other suitable device. This plate forms a cover to the mechanism, and at its upper end is wider than the upper roller, but is gradually extended inward toward its lower end, so as to make a kind of protection reaching over the butts. A plate N is secured in like manner to the arms of the main frame at the bottom of the latter. This plate is of substantially uniform width and is secured to the frame near its outer edge, the inner edge being bent downward to form a narrow incline n , which facilitates the passage and evening of the grain-butts, and also has a slot n' for the arm K to move in. The adjuster is mounted in place by means of a bracket O, which is fastened to the upper edge of the elevator-frame, as seen in Fig. 1, and is provided with projecting arms o , which provide journal-bearings in which the jour-

nal ends of the upper roller-shaft f are respectively mounted, the lower extension f' projecting down through the lower bracket-arm to provide for driving this shaft, and through it the belt of the adjuster, in any usual way, as indicated in Fig. 1. Obviously the adjuster may be swung upon its bearings at the upper end thereof, as may be required under various conditions. To fix it in working position, an arm or lever P is secured at one end to the lower end of the adjuster-frame, from which point it extends upward and inward above the adjuster and is fixed in position by engagement in the notch of a bracket P' on the elevator, the notch p for this purpose being shown in Fig. 1. As shown in the drawings, this lever is secured to the main frame by means of an angular stud p' , which is on the top lower arm of the main frame, the lever being provided with an aperture at its lower end adapted to receive this stud or pin p' . The lower end of this stud may be enlarged, if desired, to form a kind of boss e^{11} on this arm of the main frame, around which is fitted the cover-plate, as seen in Fig. 6, this stud-boss being similar to the hook-boss on the opposite arm. These are mechanical details, however, which are not essential to the main features of the structure. There may be many modifications in mechanical details of construction as herein shown and described, and such changes I contemplate in the application of my invention to practical use on various machines, provided, always, the essential features of the invention are retained, which are the main frame, composed of a single piece and constituting the entire support of the device; a supplementary frame, adjustably mounted on the main frame; the rollers mounted, respectively, on the main and supplementary frames, and a spring or yielding device for applying force to the supplementary frame to thrust it outward to hold the roller mounted therein out against the belt constantly with a sufficient force to keep the latter taut.

Having thus described my invention, what I claim to be new, and desire to secure by Letters Patent, is—

1. In a butt adjuster for grain binders, a main or carrying frame consisting of a single central strip running lengthwise of the adjuster centrally between the top and bottom of the latter and terminating a considerable distance from each end thereof, provided at each end with arms branching outward on each side thereof to provide an open space between the extremities of the respective ends, substantially the same as the length of the belt rollers, and having an inclosed guide-way or channel on its central strip, in combination with a supplemental frame consisting of a single straight arm constructed to fit into and slide within the said guide-way on the main frame, and having at its outer end arms branching outward in opposite directions, to points in substantially the same planes as the

outer ends of the main body arms, and mounted in the extremities of the branching arms at the lower end of the main frame by a connection which permits a sliding movement, the upper belt roller journaled in the extremities of the upper branching arms of the main frame, the lower belt-roller journaled in the branching arms of the supplemental frame so as to move with the latter, and an actuating spring connected at one end to the straight arm of the supplemental frame and at the other to one of the stationary branching arms at the lower end of the main frame, and acting normally to move the supplemental frame outward or downward, substantially as described.

2. In a butt-adjuster for grain binders, a main frame, E , consisting of a narrow central body, e , extending about half the distance between the two extremities of the adjuster; and arms, e' , branching from one end, and e^2 , from the other end thereof, the latter provided with channels at their extremities running lengthwise of the frame, and the narrow central body having a guide-way at one end; in combination with a supplementary frame, H , consisting of a straight bar, h , arranged to slide in said guide-way on the body of the main frame, and branches, h' , at one end thereof provided with side bars adapted to fit and slide in the channels in the arms of the main frame, and the belt rollers journaled one in the main frame and the other in the supplementary frame, substantially as described.

3. In a butt-adjuster for grain binders, the main frame, E , consisting of a narrow central body, e , provided with a guide-way and branching arms, e' , e^2 , at the respective ends thereof, the latter provided with channels, e^3 , e^4 , in combination with a supplementary frame, H , consisting of a straight bar, h , fitted to and sliding in the guide-way on the body of the main frame, and branching arms, h' , at the outer end of said bar, provided with side arms, h^2 , adapted to enter and slide in the grooves in the arms, e^2 , of the main frame, the belt rollers journaled respectively in the main and supplementary frames, and an actuating spring, L , connected at one end to the supplementary frame and at the other end to the main, fixed frame, substantially as described.

4. In a butt-adjuster for grain binders, a main frame, E , consisting of central body, e , and arms, e' , e^2 , branching outward at its respective ends, in combination with a supplementary frame, H , consisting of bar, h , and arms, h' , branching from one end thereof, the said bar and branching arms mounted in guide-ways on the main frame, an arm, K , fixed on the supplementary frame and bent outward therefrom to a point just outside the edge plane of the main frame, an actuating spring coil, L , connected at one end to the said projecting arm and at the other to one of the arms of the main frame, and the belt rollers journaled in the main frame and supplemen-

tary frame respectively, substantially as described.

- 5 5. In a butt-adjuster for grain binders, a metal main frame, in combination with the operative devices all mounted on and carried by said frame, and a bottom plate, N, secured to the lower edge of the main frame and provided with an inward incline, *n*, substantially as described.
- 10 6. In a butt-adjuster for grain binders, a metal main frame, in combination with the

operative devices all mounted on and carried by said frame, a plate cover, M, secured to the upper edge of the main frame, and a bottom plate, N, secured to the lower edge of the main frame and provided with an inward incline, *n*, substantially as described. 15

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Witnesses:

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