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J. B. McCUTCHEON.
THRESHING MACHINE.

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NO MODEL.



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THRESHING-MACHINE.

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To all whom it may concern:

Be it known that I, JOHN B. McCUTCHEON, a citizen of the United States, residing at Battlecreek, in the county of Calhoun and State of Michigan, have invented a certain new and useful Threshing-Machine, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to threshing-machines, and particularly to that class of machines in which the straw after being swept over the concave is urged by the cylinder-teeth over an inclined grate and delivered to the straw-carrier and grain-separating mechanism.

The primary object of this invention is to effectually separate a considerable quantity of the kernels from the straw immediately upon the discharge of the material from the concave and to that extent relieve the remainder of the machine and the mechanism thereof, thus effecting a saving in the power necessary to drive the machine and more thoroughly separating the kernels, straw, and chaff.

In order to attain the desired result, a steeply-inclined traveling endless grate is arranged immediately behind the cylinder and in close proximity to the sweep of the cylinder-teeth, such grate constituting, in effect, an extension of the concave, while behind the grate is located a checking and directing plate which extends downwardly from a line adjacent to the upper end of the grate. The grate deflects and uplifts the straw, but not the flying kernels, the latter passing through the grate and impinging against the checking and directing plate, which intercepts them and causes them to fall into the underlying grain-pan, while the straw is carried upward by the traveling grate and delivered to the separating mechanism. The traveling grate constitutes in itself a straw-carrier and acts to rapidly advance the straw immediately upon its discharge from the concave, thus obviating the tendency of the material to accumulate upon an extended stationary grate and interfere with the continuity and smoothness of operation of the machine.

A further object of the present invention is to mount the checking and directing plate

upon a movable part of the straw-carrier or grain-separating mechanism, so that a backward-and-forward vibratory or oscillatory movement will be continuously imparted thereto, thereby automatically freeing the space between it and the grate and obviating all tendency of clogging at that point, which under certain conditions might happen by reason of the passage of a small proportion of the short straws and chaff through the grate and the accumulation of the same. The downwardly-moving rear run of the endless grate further assists in keeping the space between the grate and checking-plate clear.

The invention consists in certain novel features and details of construction and arrangement of parts, as hereinafter fully described, illustrated in the drawings, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical longitudinal section through a sufficient portion of the threshing-machine to illustrate the application of the present improvements. Fig. 2 is a similar view showing a slight modification. Fig. 3 is a detail perspective view of the checking and directing plate.

Like reference-numerals denote corresponding parts in all the figures of the drawings.

In illustrating the present invention I have shown an ordinary threshing-cylinder 10, provided with the usual threshing-teeth 11, said cylinder operating in connection with a concave 12, also provided with teeth 13 and having a slotted or grated portion 14. Beneath the concave is arranged an ordinary grain-pan 15, adapted to oscillate lengthwise and being mounted upon suitable supporting-links 16. In rear of the cylinder and above the grain-pan is shown the usual initial straw carrier or shaker section 17, swung upon suitable supporting-links 18 and adapted by suitable mechanism to be vibrated or oscillated longitudinally of the machine.

In carrying out the present invention a traveling endless grate 19 is arranged immediately behind the threshing-cylinder, said grate being in the form of an open slatted apron, preferably consisting of a pair of bands, belts, or chains 20, connected by transverse lags or slats 21 and running around

wheels or pulleys 22 on a pair of shafts 23 and 24, located, respectively, at the top and bottom of the endless traveling grate, as shown in Fig. 1. The grate 19 is steeply inclined in close proximity to the sweep of the cylinder-teeth and constitutes, in effect, an upward extension of the concave, said grate further constituting, in effect, a straw-carrier in that it serves to intercept, deflect, and uplift the straw as it is discharged from the concave.

In rear of the traveling endless grate there is located a checking and directing plate 25, which extends downward from a line adjacent to the upper edge of the grate 19. The plate 25 is mounted upon and carried by a movable part of the threshing-machine, being shown in Fig. 1 as mounted directly on the adjacent end of the initial straw carrier or shaker section 17. In this way the plate 25 is given a forward-and-backward oscillatory or vibratory movement corresponding with the motion of the shaker-section 17, the object being to automatically free or render clear the space between plate 25 and the oppositely-located and downwardly-moving run of the traveling endless grate, the said downwardly-moving run further assisting in keeping clear the space between it and the checking and directing plate.

The plate 25 intercepts the flying grains or kernels which pass through the grate 19, causing such kernels or grains to fall into or upon the grain-pan 15. In order to facilitate and insure this operation, the checking and directing plate is provided on its forward face with a series of deflecting-slats 26, which are pitched at such an angle as to cause the flying grains impinging against the same to be deflected downward into the grain-pan. By preference a space 27 is left between the inner edge of each slat and the adjacent surface of the plate 25 to permit the grains or kernels which lodge upon the slats 26 to escape and gravitate to the pan beneath. A convenient way of providing for the space 27 is to mount each slat upon a pair of supporting-brackets 28, the latter connecting the extremities of the slats with the edge portions of the plate 25, as illustrated in Fig. 3. The checking and directing plate may thus be said to comprise a plurality of inclined surfaces which act to deflect the flying kernels in a downward direction. 29 represents a brace interposed between the plate 25 and the straw carrier or shaker section 17, on which said plate is mounted.

Instead of mounting the checking and directing plate 25 on the shaker-section 17 said plate may be mounted on and carried by the grain-pan 15, as shown in Fig. 2, and further supported thereon by means of one or more braces 30. In the latter event an oscillatory or vibratory movement will be imparted to the plate 25 corresponding with the movement of the grain-pan.

Located above the upper edge of the traveling endless grate 19 is the usual beater 31,

while between the beater and cylinder is interposed a transverse guard-board 32.

It will be understood that the loose grains or kernels separated from the straw by the direct action of the cylinder and concave will be thrown against or through the traveling endless grate, which intercepts the straw, but not the kernels, said grate serving not only to intercept the straw, but also to deflect and uplift the straw until it is discharged with the aid of the beater upon the adjacent straw carrier or shaker section. The flying kernels or grains after passing through the grate impinge against the checking and directing plate and the inclined surfaces thereof and are thereby intercepted, deflected, and directed downward into the grain-pan.

By reason of the fact that the rear run of the grate is moving downward and the checking and directing plate is oscillated forward and backward the space between the plate and grate is automatically kept free, said feature becoming of considerable importance at certain times on account of the condition of the straw and the liability of short straws and litter finding their way through the traveling grate and lodging against or upon the deflecting-slats 26. Thus at the very outstart a considerable quantity of grains or kernels are separated from the straw, and to that extent the remainder of the mechanism is relieved of its burden. This adds appreciably to the continuity and smoothness of operation of the machine and incidentally effects more thorough separation of the grain, straw, and chaff.

The traveling endless grate may be varied considerably in its construction, and any desired pitch or inclination may be given to the deflecting-slats 26, while the checking and directing plate as a whole may be mounted on any conveniently-located movable part of the threshing apparatus as long as it is arranged in the proper relation to the grate. I therefore reserve the right to make such changes or modifications as properly fall within the scope of this invention.

Having thus described the invention, what I claim as new is—

1. The combination of a toothed cylinder, a concave comprising a concave portion and a grate steeply inclined in close proximity to the sweep of the cylinder-teeth and adapted to deflect the straw while permitting flying kernels to pass therethrough, and a checking and directing plate arranged behind the grate to intercept such kernels and a plurality of inclined surfaces upon the receiving side of the plate to deflect the kernels.

2. The combination of a toothed cylinder, a concave comprising a concave portion and a traveling endless grate steeply inclined in close proximity to the sweep of the cylinder-teeth and adapted to deflect and uplift the straw while permitting the flying kernels to fly therethrough, and a checking and directing plate arranged behind the grate and pro-

vided upon its receiving side with inclined slats which are connected with the plate but offset to leave spaces for the downward escape of the kernels therefrom, substantially as described.

3. The combination of a toothed cylinder, a concave comprising a concave portion, and a traveling endless grate steeply inclined in close proximity to the sweep of the cylinder-teeth and adapted to deflect and uplift the straw while permitting flying kernels to pass therethrough, and a checking and directing plate arranged behind and in proximity to the grate and mounted to oscillate toward and away from the grate to intercept the flying kernels.

4. The combination of a toothed cylinder, a concave comprising a concave portion and a traveling endless grate steeply inclined in close proximity to the sweep of the cylinder-teeth and adapted to deflect and uplift the straw while permitting flying kernels to pass therethrough, and a checking and directing plate mounted on and moving with the straw-carrier and extending upward into proximity to the upper portion of the grate.

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

JOHN B. McCUTCHEON.

Witnesses:

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