(No Model.)

H. & W. H. CAMPBELL.

THRESHING MACHINE.

No. 567,117. Patented Sept. 1, 1896.

Fig. 1.

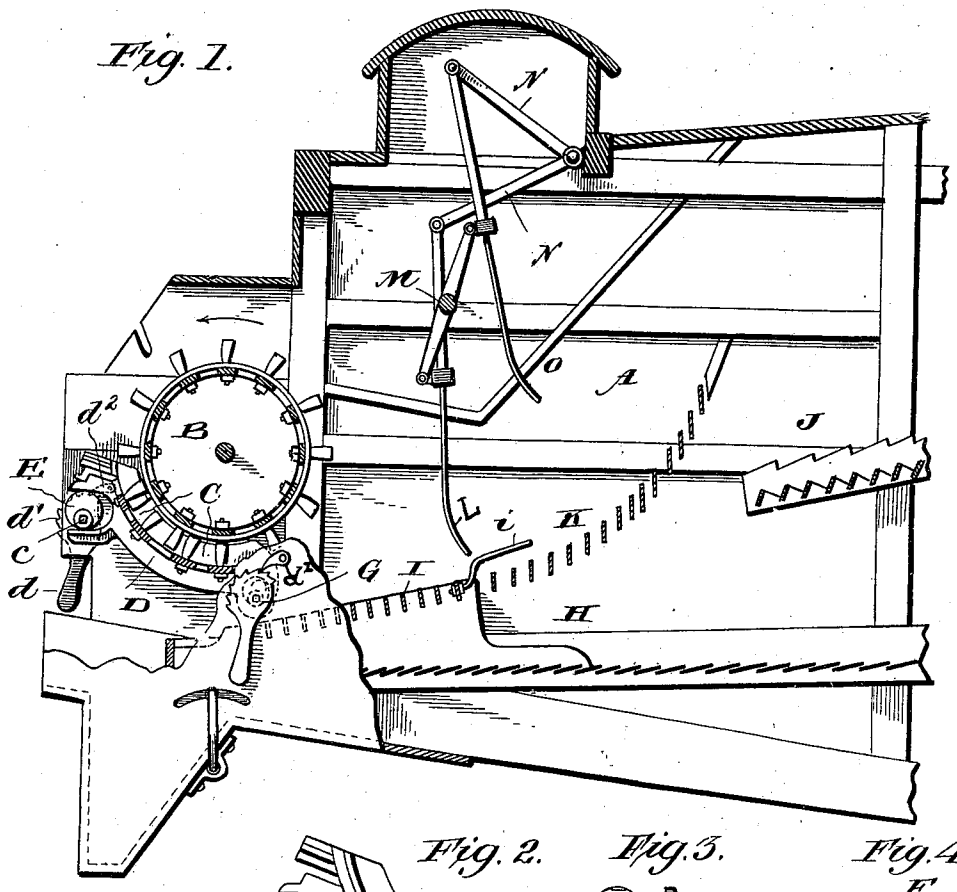


Fig. 2.

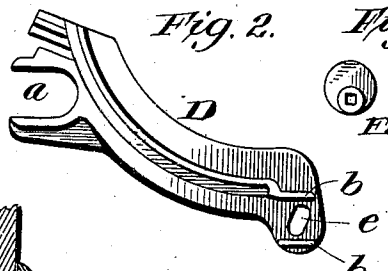
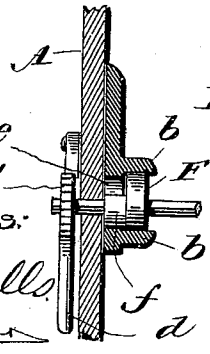


Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.



Witnesses:
L. C. Hills
H. B. Keeler

Inventors:
Howard Campbell and
William H. Campbell
by Marcellus Bailey
their Atty.

UNITED STATES PATENT OFFICE.

HOWARD CAMPBELL AND WILLIAM HEARCHEL CAMPBELL, OF RICHMOND, INDIANA, ASSIGNORS TO THE GAAR, SCOTT & COMPANY, OF SAME PLACE.

THRESHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 567,117, dated September 1, 1896.

Application filed April 17, 1896. Serial No. 587,985. (No model.)

To all whom it may concern:

Be it known that we, HOWARD CAMPBELL and WILLIAM HEARCHEL CAMPBELL, of Richmond, in the State of Indiana, have invented certain new and useful Improvements in Threshing-Machines, of which the following is a specification.

These improvements have to do with means for adjusting the concaves with reference to the threshing-cylinder, and to means for more efficiently and quickly separating the grain from the straw immediately after it leaves the cylinder.

They will be first described in connection with the accompanying drawings, forming part of this specification, and will then be more particularly pointed out in the claims.

In the drawings, Figure 1 is a longitudinal vertical central section, partly in elevation, of so much of the threshing-machine as needed for the purpose of explanation. Fig. 2 is an elevation of one of the "concave circles" or curved bearings for the concaves. Figs. 3 and 4 represent in each a side elevation and edge view of the eccentric by which the concave circles are adjusted. Fig. 5 is an elevation of one of the lever-handles for adjusting the eccentrics. Fig. 6 is a vertical cross-section through one of the concave circles at the point where the eccentric at the inner end of said concave circle is located.

A is the frame of the machine.

B is the threshing-cylinder.

The concave itself consists, as usual, of a series of sections C. These sections are supported by the concave circles or curved bearings D, one on each side of the machine. The concave-sections are held and secured in the circles in any known or suitable way. Thus far there is nothing new in the machine. The concave circles are adjusted to and from the cylinder by means of cams, or, more properly speaking, eccentrics. This, broadly speaking, is not new, but the arrangement involving the use of these instrumentalities and about to be described is believed to be new. There is for each concave circle an adjusting-eccentric at both its outer and its inner end, these eccentrics being lettered, respectively, E and F. In each circle the outer eccentric E enters a slot *a* in the circle, bearing against the top and bottom edges of the slot, while the eccentric F at the other and inner end of the circle is received between top and bottom laterally-projecting horizontal flanges *b*. The two eccentrics E at the outer end of the two circles, one on each side of the machine, are mounted upon and fast to a cross-shaft *c*, squared to enter and pass through the hubs of the eccentrics, which have a square aperture for the passage of the shaft, which fits said aperture. The shaft has its bearings in the sides of the machine, and by its rotation the eccentric can be turned so as to lift or lower the outer end of the concave at will. Any suitable appliance can be used for turning the shaft. A lever-handle *d*, fitting on the squared end of the shaft, can conveniently be used, this lever having a ratcheted hub *d'* to be engaged by a pawl d^2 on the frame of the machine for the purpose of holding the eccentrics in adjusted position.

The two inner eccentrics are mounted upon a shaft G and connected together and operated in a similar manner and by similar instrumentalities; but the hubs *f*, which are concentric with the axis *g* of these eccentrics, pass through and fit in slots *e*, one at the inner end of each circle D, these slots being struck on a circle which has the axis of motion *c* of the outer eccentrics E as an axis. By reason of this arrangement either end of the concave may be raised and lowered independently of the other, and the front or outer end of the concave can be adjusted at will without in the least affecting the position of the inner end of the concave, which, by its engagement with the eccentric F and their hubs *f*, is held in fixed position at any point to which it may be adjusted.

The ordinary shaking grain-conveyer pan is indicated at H. To this pan is secured a grate I, which is located at the end of the pan adjoining the cylinder and above the conveying-bottom of the pan. The grate is a shaking grate, which is rigidly attached to and moves with the shaking grain-conveyer pan H. The straw passing from the shaking grate I is received by a stationary grate K, from which the straw passes to the straw-rack J.

The straw is carried from the stationary grid or grate K to the straw-rack J by forks L, swiveled to the cranks of a revolving crank-shaft M, extending crosswise of the machine, as usual. The upper ends of the forks are pivoted to links N, jointed to a cross-beam on the frame of the machine. The fork-tines work between deflecting-bars O. The surface of the stationary grate K, over which the forks sweep, is curved to conform to the path of travel of the forks.

Inasmuch as the shaking grate I in its movement advances toward and recedes from the stationary grate K, there will be at each recession of the shaking grate an interval left between it and the stationary grate. To prevent too much straw and chaff from dropping through this opening or interval, the movable grate I has attached to its end adjoining the stationary grate a series of fingers *i*, which at all times overhang the stationary grate and thus bridge any opening that there may be from time to time between the two grates. By this arrangement quick and very perfect separation of the grain from the straw is obtained immediately upon its leaving the cylinder. The shaking grate I has large openings or spaces between its grids or bars and vibrates rapidly directly beyond the cylinder and concave, and thus by the mere momentum imparted by the cylinder there will be forced through said openings onto the vibrating conveyer-pan H below a large part of the grain or chaff which otherwise would pass rearward with the straw to the separating devices farther along. The rapid shaking of the grate I prevents the clogging with short straw and other foul stuff, which is apt to occur where a grate is stationary in that position. It will be understood that the ratchet-levers *d* are typical of any suitable instrumentalities for operating the shafts on which the eccentrics are mounted. It will also be understood that the hubs *f* on the eccentrics F are typical of any device, whether on or part of the eccentrics or their shaft *h*, engaging the slots *e* in such manner as to prevent longitudinal movement of the concave, while permitting its adjustment to and from the cylinder. Therefore we do not limit ourselves to the precise structural details hereinbefore described in illustration of our improvements; but

What we claim as new, and desire to secure by Letters Patent, is as follows:

1. In a threshing-machine, the combination of a concave circle; an eccentric and operating-shaft therefor, engaging the outer end of said circle and adapted to adjust the same to and from the cylinder; another eccentric and operating-shaft therefor engaging the inner end of the concave circle; a hub on said last-named eccentric concentric with its operating-shaft, and a slot *e* in the concave circle entered and engaged by said hub, whereby longitudinal movement of the circle is prevented, while each of its ends can be adjusted to and from the cylinder independently of the other, substantially as hereinbefore set forth.

2. In a threshing-machine, and in combination, a concave circle; an adjusting-eccentric and a bearing therefor in the outer end of said circle; another adjusting-eccentric and a bearing therefor in the inner end of the said circle; a slot in the inner end of the circle concentric with the axis of motion of the eccentric at the other end; and a hub on the inner eccentric or its shaft entering and engaging said slot, substantially as and for the purposes hereinbefore set forth.

3. A concave circle formed with the outer slotted seat *a*, the flanges *b* projecting laterally from the circle at or near the inner end thereof and the slot *e* between said flanges in combination with the eccentrics E, F, the one engaging the seat *a*, and the other received between the flanges *b* and engaging the slot *e*, and operating mechanism for said eccentrics, substantially as set forth.

4. In a threshing-machine and in combination with the cylinder and its concave, the shaking grain-conveyer pan H, the shaking grate I mounted upon and moving with said conveyer-pan and arranged in rear of the cylinder and its concave in position to receive the straw as it passes from the latter, the straw-rack J, the stationary grate K, interposed between said straw-rack and shaking grate I, and arranged upon the prolongation of, and in substantially the same plane with, the shaking grate I, and means located above and moving over the face of grate K whereby the straw received by the latter is transferred therefrom to the straw-rack.

5. In a threshing-machine and in combination the cylinder and its concave; the shaking grain-conveyer pan H; the stationary grate K; the forks L and operating mechanism therefor; and the shaking grate I interposed between the stationary grate and the cylinder, and mounted upon and moving with the shaking grain-conveyer pan substantially as and for the purposes hereinbefore set forth.

In testimony whereof we have hereunto set our hands this 14th day of April, 1896.

HOWARD CAMPBELL.
WILLIAM HEARCHEL CAMPBELL.

Witnesses:
S. S. STRATTAN, Jr.,
GEO. E. DUIS.