

O. THOMPSON.
THRESHING MACHINE.
APPLICATION FILED OCT. 30, 1909.

970,973.

Patented Sept. 20, 1910.
2 SHEETS—SHEET 1.

Fig. 1.

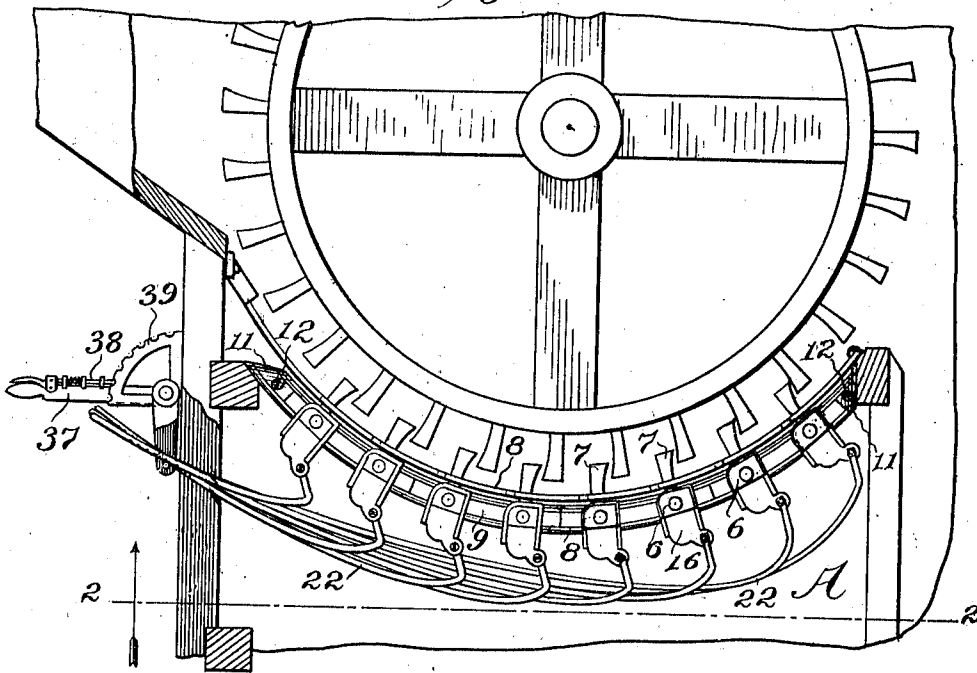
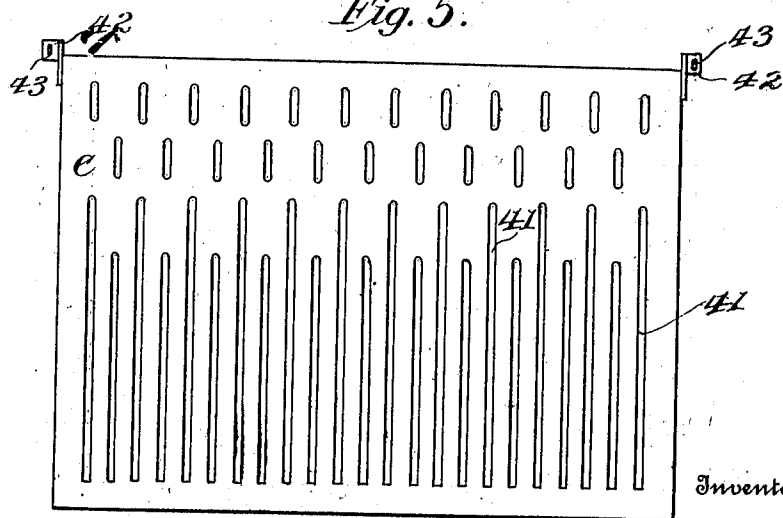


Fig. 5.



Inventor

Witnesses

Horace Lybrand
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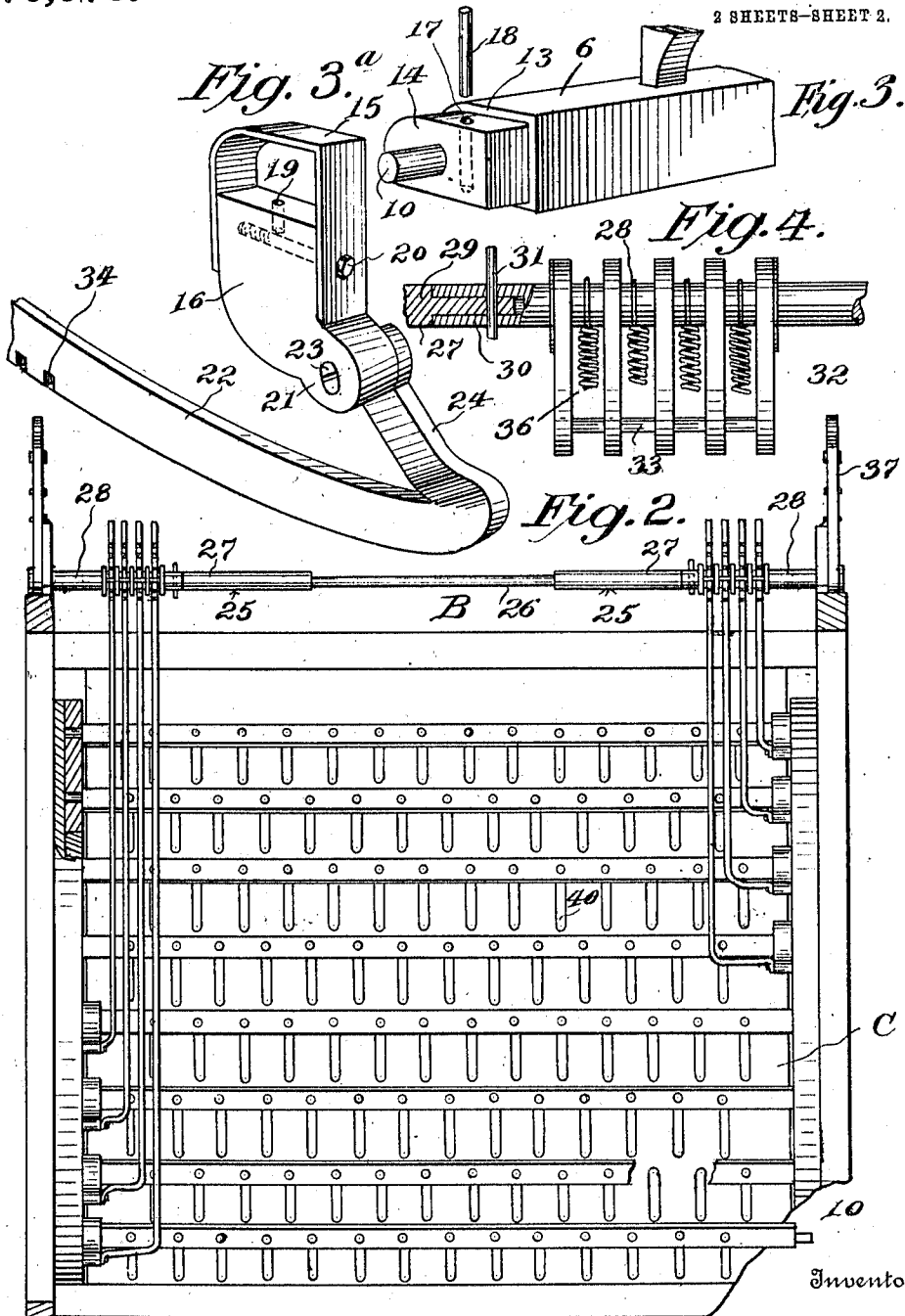
Ora Thompson
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UNITED STATES PATENT OFFICE.

ORA THOMPSON, OF EARL PARK, INDIANA.

THRESHING-MACHINE.

970,973.

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To all whom it may concern:

Be it known that I, ORA THOMPSON, a citizen of the United States, residing at Earl Park, in the county of Benton and State of Indiana, have invented new and useful Improvements in Threshing-Machines, of which the following is a specification.

This invention relates to threshing machines and it has particular reference to certain improvements in the construction of that portion of the threshing mechanism which includes the concave and adjacent parts.

The invention has for its object to simplify and improve the construction of the concave and to provide simple and improved means, whereby the teeth of the concave may be adjusted to various positions.

With these and other ends in view which will readily appear as the nature of the invention is better understood the same consists in the improved construction and novel arrangement and combination of parts which will be hereinafter fully described and particularly pointed out in the claims.

In the accompanying drawings has been illustrated a simple and preferred form of the invention; it being however understood that no limitation is necessarily made to the precise structural details therein exhibited, but that changes, alterations and modifications within the scope of the invention, may be resorted to when desired.

In the drawings: Figure 1 is a view showing in elevation, the end of a cylinder and concave constructed in accordance with the invention, the supporting frame being shown partly in section. Fig. 2 is a sectional view taken on the plane indicated by the line 2—2 in Fig. 1 looking upwardly in the direction of the concave. Fig. 3 is a perspective detail view, showing one end of a tooth-carrying bar. Fig. 3^a is a perspective detail view of a portion of the adjusting rod for the tooth-carrying bar, together with the connecting clip or member. Fig. 4 is a detail elevation partly in section showing a portion of the rock shaft whereby a plurality of the tooth carrying bars may be simultaneously adjusted. Fig. 5 is a detail plan view showing one form of a screen or shield used in connection with the invention.

Corresponding parts in the several figures are denoted by like characters of reference.

The improved concave of this invention is composed of a plurality of bars 6—6 each of

which is equipped with a plurality of teeth 7 which may be set or mounted in said bars in any suitable and convenient manner; it being intended to use teeth of any of the various constructions employed in threshing machines now in use.

The frame of the threshing machine, a portion of which is shown at A supports at the sides thereof pairs of concentrically disposed flanges 8 each of which affords supporting means for a plurality of arcuate supporting members or shoes 9 in which the tooth carrying bars 6 are pivotally supported by means of pivots or trunnions at the ends of said bars. Each of the shoes may be made to support the ends of one or more pivoted bars 6; in the drawings hereto annexed, the ends of two tooth carrying bars have been supported in each shoe, as will be clearly seen in Fig. 1. By this arrangement, the pairs of shoes having the ends of the tooth carrying bars adjusted therein may be very readily introduced between the supporting flanges from the front end of the machine, and when the desired number have been introduced to complete the concave, suitable means may be employed for the purpose of securing them in position, such as blocks 11 secured by screws or other fastening means 12.

The tooth carrying bars of the concave may be of any desired shape in cross section but they are preferably provided with curved or rounded front edges as will be clearly seen in the drawings. Each of said bars is recessed adjacent to one end so as to form a shoulder 13 and an offset 14 upon which latter a stirrup 15 is fitted, the upper, front and rear faces of said stirrup lying flush with the surface of the bar. The stirrup serves to support a block 16, the upper surface of which abuts upon the underside of the offset 14; the latter being provided with an aperture 17 for the reception of a connecting pin 18 which is dropped through said block into a recess or socket 19 in the upper side of the block 16; the latter is firmly secured adjacent to the underside of the tooth carrying bar by means of the stirrup which latter is connected with the block 16 by means of a bolt 20 extending there-through; it is preferred that the threaded end of the bolt shall be threaded into the stirrup so that the nut upon the end of the bolt may be utilized as a lock nut. The block 16 connected with each of the tooth

carrying bars has a rearward extension 21; and said block may be regarded as constituting a crank with which an operating rod 22 is pivotally connected by means of a pin, 5 bolt or screw 23, said operating rod being provided adjacent to its rear end with a suitably curved upward extension 24 whereby the body of said rod, which extends forwardly in the direction of the mouth of the 10 machine will be disposed a suitable distance below the concave. It is preferred that the clips and operating rods of one-half of the tooth carrying bars be disposed adjacent to the right-hand side of the machine and the 15 other half adjacent to the left-hand side of the machine as will be very clearly seen in Fig. 2 of the drawings. It is obvious that the rear terminals of the operating rods are to be suitably curved so as to enable 20 the side rods to be disposed in different vertical planes alongside one another so that each may be operated independently to rock or oscillate the tooth carrying bar with which it is connected without disturbing the 25 remaining ones.

It will furthermore be seen by reference to Fig. 1 of the drawings that the operating rods 22, that is to say, the bodies of said rods, are preferably curved or arcuate to 30 correspond approximately with the curvature of the concave.

Suitably supported transversely of the frame of the machine adjacent to the mouth of the latter is a rock shaft B consisting of 35 two independently movable end sections 25 connected by an intermediate portion 26. Each of the end members 25 is composed of two separate sections 27 and 28 the former of which has a pintle 29 extending into a 40 socket 30 of the latter, the two being connected by means of a break-pin 31 extending transversely therethrough. The shaft member 28 at each side of the machine has a plurality of radially extending arms or cranks 45 32 located in a common plane and suitably spaced apart, said arms being connected adjacent to their outer ends by means of a rod 32 extending therethrough. The terminal 50 ends of the operating rods 22 of the tooth carrying bars are extended between the arm 32 and are provided with notches 34 engaging the rod 33, each of the rods or arms 22 being preferably provided with from four to eight such notches, enabling the tooth 55 carrying bar to be held or secured with its teeth presented at as many different angles. Tension springs or other suitable means may be employed for the purpose of maintaining the notched arms 22 in adjusted 60 position with relation to the crank arms 32 of the rock shaft members, thus preventing accidental displacement, such springs being shown at 36 in Fig. 4 of the drawings. Each 65 of the rock shaft members 25 is provided with an operating lever 37 having a stop

member 38 adapted to engage a quadrant or rack segment 39 suitably mounted upon the frame of the machine, thereby enabling the said rock shaft sections or members to be oscillated for the purpose of simultaneously 70 rocking or oscillating the several tooth carrying bars connected therewith so as to present the teeth of said bars at the desired angle. By this mechanism, the adjustment is obviously facilitated and the range of ad- 75 justment is increased.

It is obvious that in order to enable the tooth carrying bars to be freely rocked in the manner described, and to insure the widest possible range of adjustment, the said 80 tooth carrying bars will have to be spaced a distance apart which, without provision to the contrary, would permit straw as well as grain to escape downwardly between said bars. To avoid this, I provide a combined 85 shield and screen C made of sheet steel or other material of suitable thickness and strength, said shield being provided with rows of longitudinal slots for the passage of the teeth projecting from the tooth carry- 90 ing bars. In Fig. 2 of the drawings the shield C has been provided with slots 40 for each one of the teeth; in the modified form illustrated in Fig. 5 of the drawings all the slots, here designated 41, in the rear rows 95 are extended rearwardly so that each slot will accommodate a plurality of teeth. The different forms of shields and screens will be employed according to the nature and character of the grain that is to be threshed and 100 separated; for large grain, such as wheat, oats and the like, the elongated slots are obviously preferable, while for small grain and especially for grain that requires to be 105 beaten out of its hulls, such as clover, millet and the like, the shorter slots will be found more advantageous. The size and disposition of the slots, however, may be greatly varied and no limitation is made to the particular forms illustrated in the drawings 110 hereto annexed; it being only essential to the success of the invention that a shield shall be provided which will admit of the passage of grain and prevent the passage of straw and chaff as far as practical. The 115 shield in each case is provided adjacent to its front edge with upturned bracket members 42 preferably equipped with vertical slots 43 for the passage of fastening members such as screws whereby the shield may 120 be connected with the frame of the machine in such a manner as to admit of a limited degree of vertical adjustment of the forward portion of said shield.

From the foregoing description taken in 125 connection with the drawings hereto annexed, the operation and advantages of this invention will be readily understood by those skilled in the art to which it apper- 130 tains. It is well known and understood

that not only do various kinds of grain require different treatment in order to accomplish the most satisfactory results in threshing and separating, but that weather conditions and the condition of the grain, dry or damp, straight or tangled, require different treatment. Special machines have heretofore been constructed for special work in this line, and in some cases it has been attempted to provide adjustment of various parts to meet varying conditions, but without a great measure of success.

Again it will be obvious to those skilled in the art that it is desirable to accomplish as great a degree of separation as possible in close proximity to the threshing mechanism in order that the least possible portion of grain may be projected along with the straw for subsequent separation. By this invention, provision is made for adjustment of the teeth of the concave to varying angles to meet practically every condition that may be encountered. At the moment of threshing, that is to say, at the moment when the grain is beaten between the teeth of the cylinders and the concave, a very large proportion of the grain thus loosened will be permitted to pass through the slots of the shield or screen in a downward direction where it may be received upon a shaking table or upon a conveyer or in any suitable and approved manner to be cleaned and carried toward the discharge at the tail end of the machine. Should any foreign, hard substances, such as rocks, molds or the like, be accidentally fed into the machine, breakage will not necessarily result because the pivoted tooth carrying bars will yield to such obstructions and only the break-pin 31 will give way. Adjustment of the tooth carrying bars may be effected at any time while the machine is in motion, and no time need be wasted by stopping the machine for adjustment or repairs. The general construction is simple, and the operation of the device is thoroughly efficient for the purposes set forth.

It may be mentioned that the main parts of the invention, that is to say the tooth carrying bars and related parts, are preferably to be manufactured of steel or wrought iron in order to insure the greatest degree of strength and durability.

It may be further mentioned that the member C in addition to serving as a screen,

serves an additional and very important function in constituting a shield which in the event of the break pin becoming fractured by foreign matter such as a piece of iron or stone passing into the machine will permit the teeth of the concave to swing downwardly through the slots in said screen or shield, thus passing out of the path of the foreign substance which may thus pass through the machine without incurring breakage of the teeth.

Having thus described the invention, what is claimed is—

1. In a threshing machine, a concave comprising a plurality of pivotally supported tooth carrying bars, operating rods suitably connected with said bars, means for supporting the operating rods independently at various adjustments, and means for actuating the supporting means to simultaneously shift a plurality of the operating rods thereby simultaneously rocking a plurality of tooth carrying bars to present the teeth at a different angle.

2. In a threshing machine, a concave comprising a plurality of pivotally supported tooth carrying bars, operating rods connected with said bars for rocking or oscillating the same, a rock shaft supported for oscillation and having a plurality of spaced arms between which the operating rods are guided, and means for securing the operating rods in adjusted position with relation to the arms of the rock shaft; and means for oscillating the rock shaft and for securing it at various adjustments.

3. In a threshing machine, a pivotally supported tooth carrying bar having a shoulder or offset, a block supported adjacent to said offset, a pin extending through the offset and engaging the block to hold the latter against lateral displacement, a stirrup mounted upon the offset, fastening means extending through the stirrup and the block, and an operating rod pivotally connected with said block and whereby the tooth carrying bar may be rocked or oscillated to present the teeth at different angles.

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

ORA THOMPSON.

Witnesses:

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E. F. BREADON.