

# CHARLES E. ROPER.

## Threshing Cylinder & Concave.

116356

PATENTED JUN 27 1871

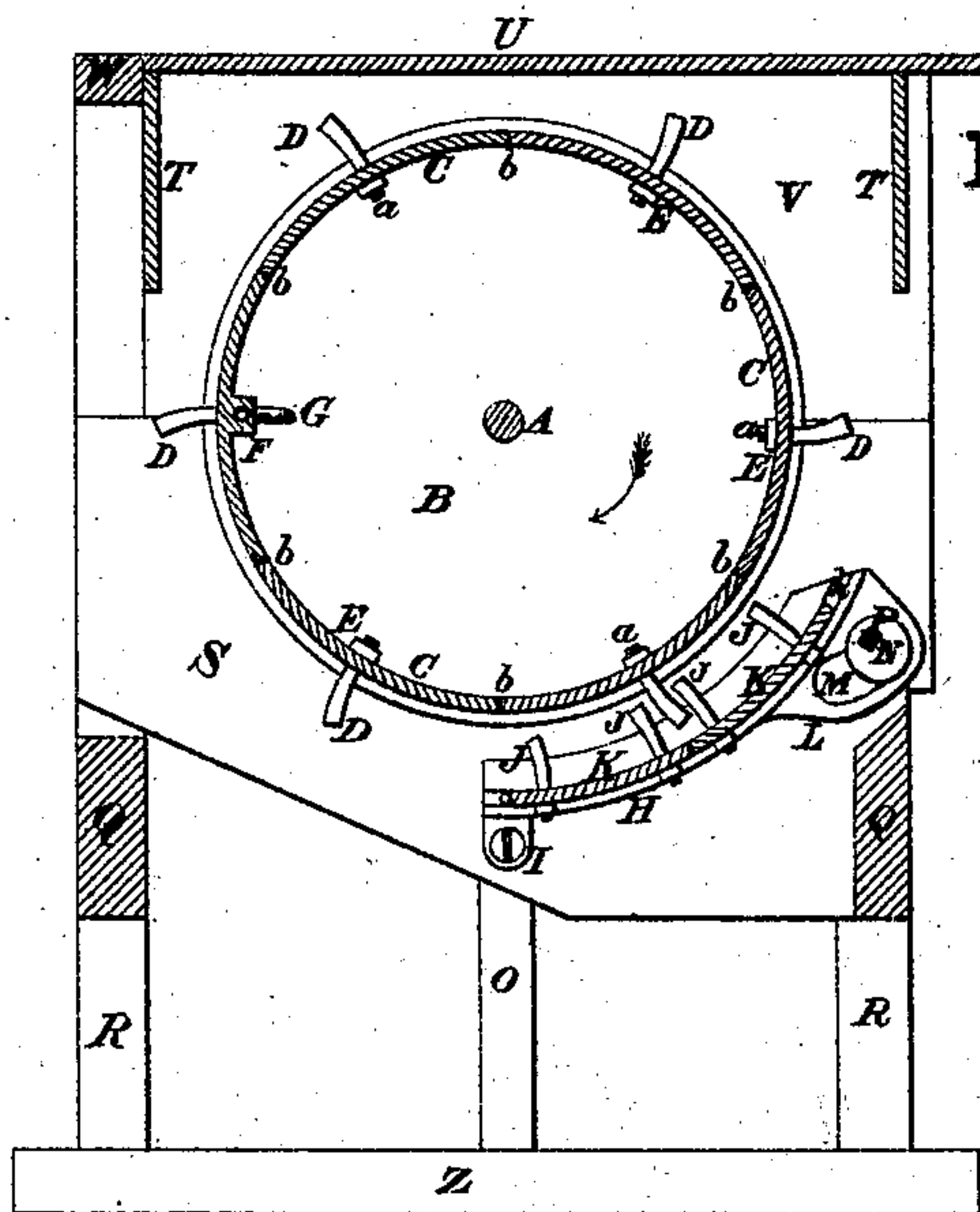


Fig. 1.

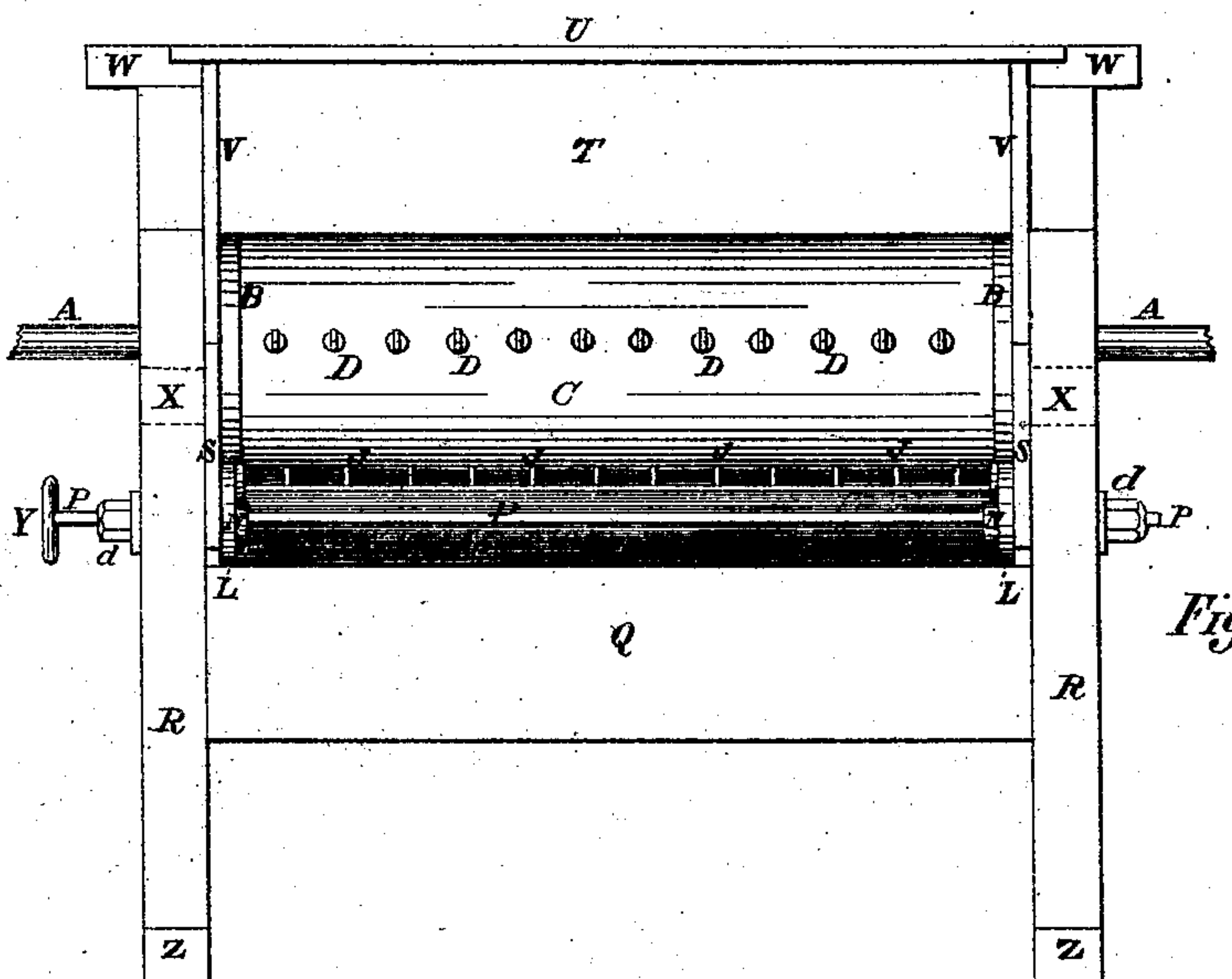


Fig. 2.

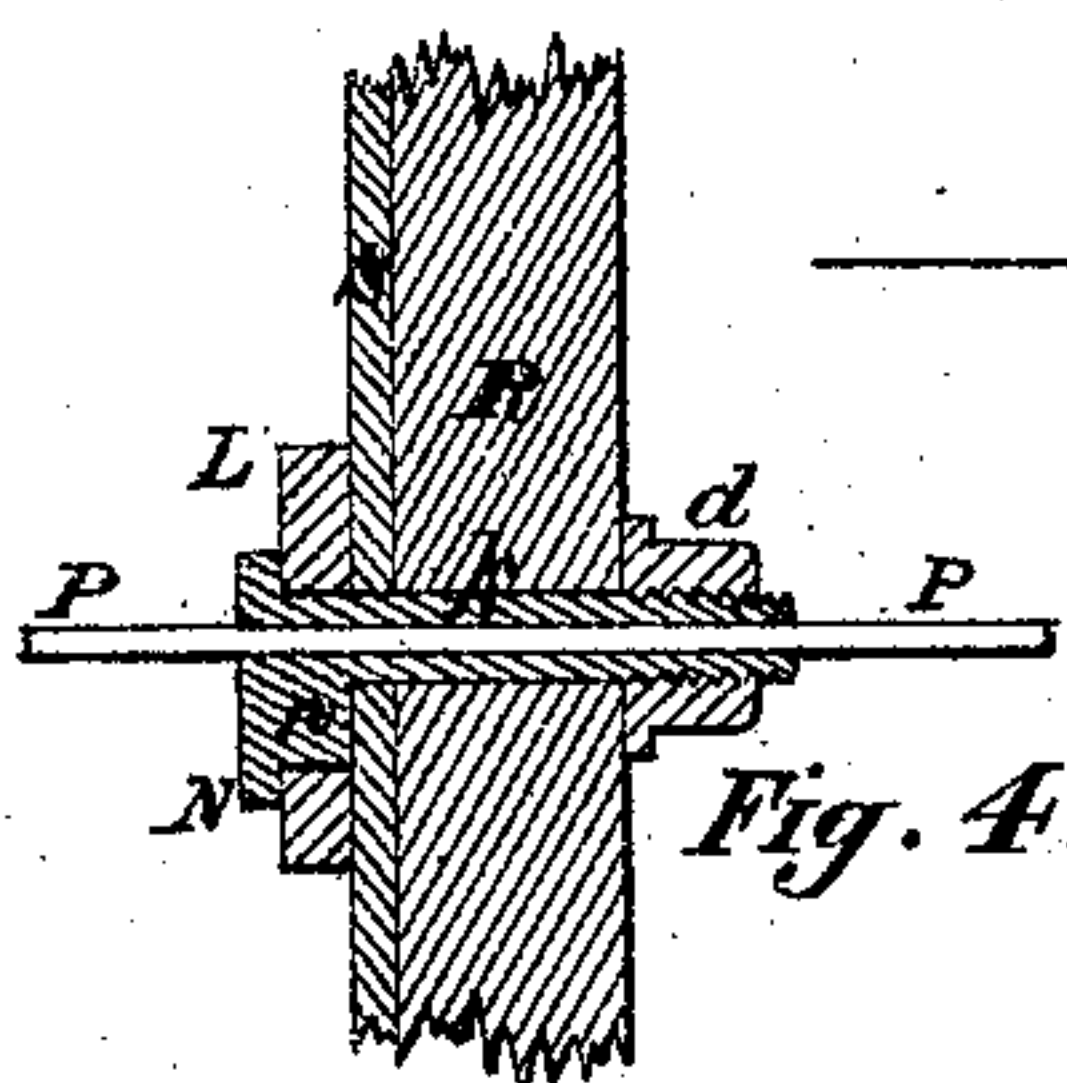


Fig. 4.

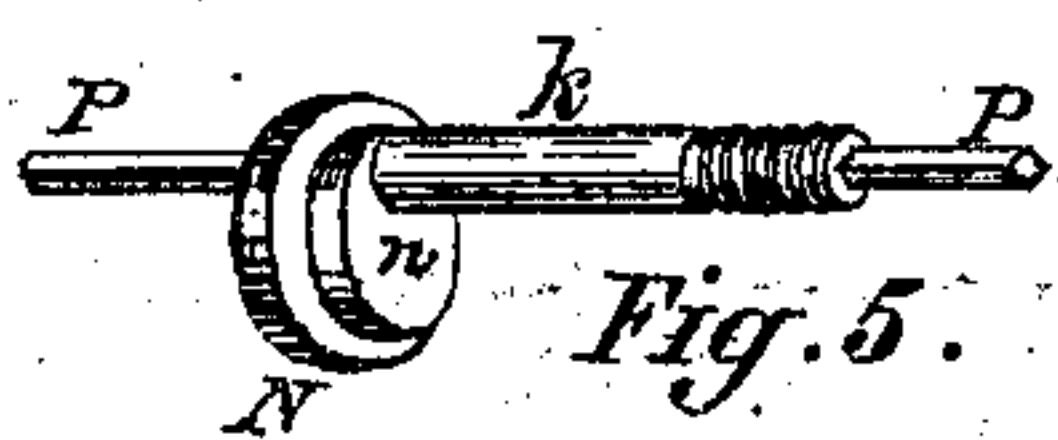


Fig. 5.

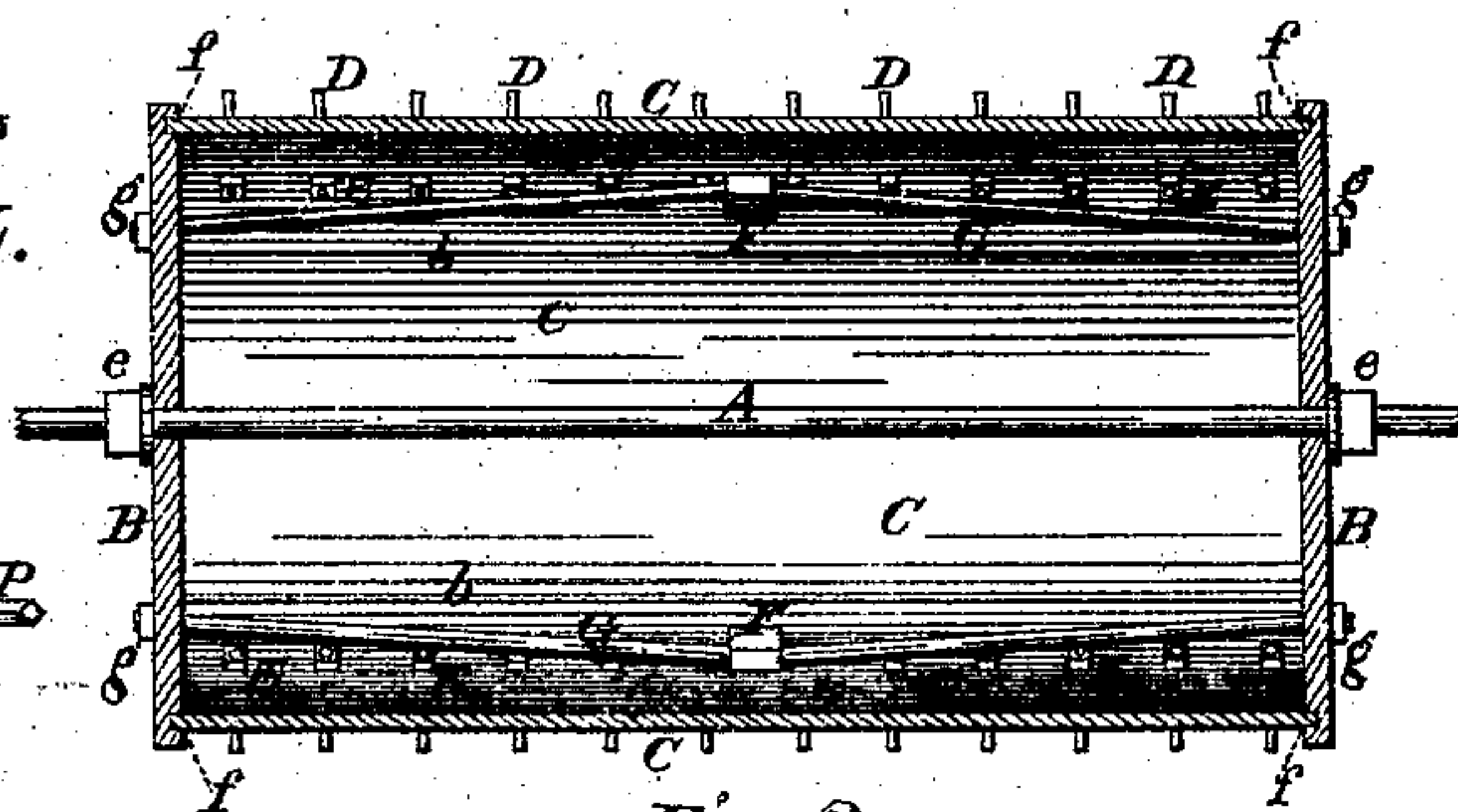


Fig. 3.

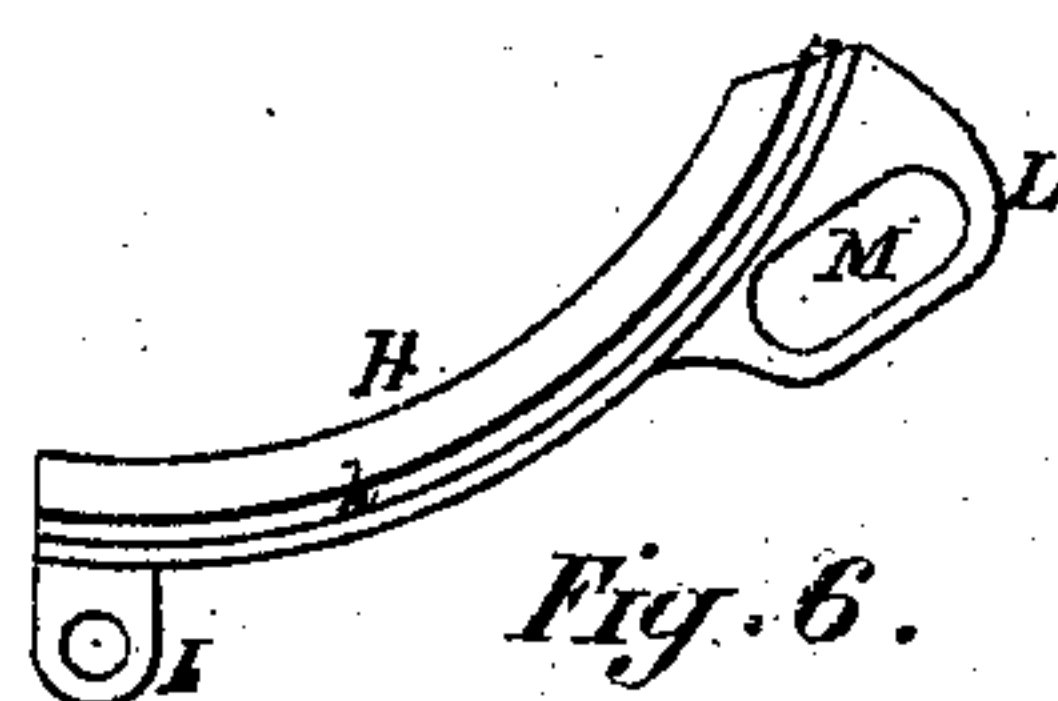


Fig. 6.

Andrew Choffin  
Ruth H. Abbott

Witnesses.

Charles E. Roper, Inventor.  
by Job Abbott, Attorney.



# UNITED STATES PATENT OFFICE.

CHARLES E. ROPER, OF CANTON, OHIO.

## IMPROVEMENT IN THRASHING-MACHINES.

Specification forming part of Letters Patent No. 116,356, dated June 27, 1871.

*To all whom it may concern:*

Be it known that I, CHARLES E. ROPER, of Canton, Stark county, Ohio, have invented certain Improvements in Thrashing-Cylinders and Concaves; and that the following is a full, clear, and exact specification thereof:

My invention relates to certain improvements in the manner of constructing the thrashing-cylinders and concaves of thrashing-machines, and to an improved means of adjusting the concave. The first part of my invention consists in the construction of a thrashing-cylinder composed of two circular heads having grooves formed in them to receive the ends of the cylinder-staves, and of two or more cylindrical spike-staves of such aggregate widths as to form a closed cylindrical surface, the said parts of the cylinder being united by tensional truss-rods, which pass through the cylinder-heads and through lugs or loops at or near the centers of the staves, and which are bent up at the center at said lugs or loops, so as not only to draw the heads together, but also to draw down on the centers of the staves, and thus act as truss-rods to strengthen the staves against the action of the centrifugal force to which they are subjected when the cylinder is rapidly rotated. The second part of said invention consists in the combination, with the side pieces of a hinged thrashing-machine concave, of two eccentric disks or wheels working in slots in said side pieces, and each having a neck journaled in or on the frame of the machine, the said disks being operated simultaneously by a rod passing through their necks, and having a handle or other suitable device for turning it at one end, so that by turning said rod the loose end of the concave may be moved toward or from the thrashing-cylinder, as may be required. The third part of said invention consists in the combination, with the side pieces of a hinged thrashing-cylinder concave, of an eccentric disk working in a slot in said side pieces, and having a rim or collar on the inside of the side pieces, and a neck journaled in or on the frame of the machine, and having a clamping-nut at its outer end, so that said disk serves both as a means of raising and lowering the loose end of the concave, and of clamping it securely in such position after it has been brought to the proper point.

In the accompanying drawing, Figure 1 represents a cross-section of an apparatus embody-

ing my invention. Fig. 2 is a front elevation of the said apparatus. Fig. 3 is a longitudinal section of the thrashing-cylinder. Fig. 4 is a sectional detail, showing the arrangement of the eccentric disk and rod in the side piece of concave and frame of apparatus. Fig. 5 is a perspective view of the said disk and its rod. Fig. 6 is an elevation of the inner face of the side piece of the concave.

The apparatus shown is the cylinder-frame of a thrashing-machine, (the grain-board on the front side and the separator mechanism on the rear being omitted, as they form no part of this invention,) and consists of the uprights R R, united by the sill-pieces Z Z and cross-pieces W Q Q, and having the frame-pieces X X (shown by dotted lines in Fig. 2) secured between them, with uprights O extending from said frame-pieces to the sill-pieces Z. The end frame-boards S S are secured on the uprights R O R, and the cover T T U V V is placed on the upper edges of these boards and between the front uprights R, with its rear end against the rear uprights R R, as shown. The thrashing-cylinder B C B is mounted on the shaft A, which is journaled in boxes on the frame-pieces X X. This cylinder consists of the two circular heads B B, in each of which are cut or formed the grooves *f*, as shown in Fig. 3, and of the staves C C, the ends of which fit in the grooves *f*, as shown. In the example shown the staves C are six in number, and fit closely together at *b*, as shown in Fig. 1, so that the cylindrical surface of the cylinder is completely closed and no grain or straw can get into it, as is readily seen. The thrashing-spikes D are made with a rounded end, *a*, which extends through the staves C, and has a nut, E, on the under side of said staves, as shown in Figs. 1 and 3. The heads B B and staves C may be conveniently made of cast-iron, or the heads may be made of cast and the staves of wrought-iron, or any other suitable material may be used. The number of staves may be also varied to suit the number of rows of thrashing-spikes required; or, if desired, two or more rows of spikes may be secured in the same stave, which would then be made of a greater width; but it is preferable to use a separate stave for each row of spikes, as shown in drawing. The spikes are secured in the staves before they are placed in the cylinder, and it is readily seen that they can be easily removed and replaced, when bent or broken, by simply taking



off or slipping back one of the cylinder-heads and taking out the stave in which the spike to be removed is secured. The heads B B may be held up to the staves C by nuts *e e*, or one nut and a collar or shoulder on the shaft A, as shown in Fig. 3; but, for the purpose of greater security, the rods G are run through the heads B B and a lug, F, on the staves C, and are drawn up, by nuts *g g* on their ends, outside the heads B B, as shown in Fig. 3. The ends of these rods G are nearer the shaft A than the middle of the rods at the lug F, so that when they are drawn up by the nuts *g g* they have a tendency to hold the centers of the staves C from any movement away from the shaft A, as is readily seen, and thus act, in connection with the grooves *f*, in preventing any danger of the staves being thrown from the cylinder by centrifugal force during its rapid rotation. The concave H K H consists of the two cast side pieces H H, each having a groove, *h*, in its inner side, and having the arms I and L at its ends, the latter arm having a slot or elongated hole, M, therein, as shown in Fig. 6. The staves K K are cast in a curved form, and fit in the grooves *h h* in the side pieces H H, and in each of them are secured one or more rows of spikes, J, in a manner similar to that shown for securing the spikes D in the cylinder-staves C, or by cutting a thread in the holes in the staves K and screwing the shanks of the spikes J into such holes. The side pieces H H can be drawn up to the staves J by rods run through them, if required; but such rods will usually be unnecessary, as this holding of the parts together is effected by making the concave of such length as to fit closely between the frame-boards S S, as shown in Fig. 1. The eccentric disks *n n* are of a diameter equal to the width of the slot or hole M, and have the neck *k* cast on them, as shown in Fig. 5. This neck is inserted in a hole in the board S and frame-piece R, and forms the axis of the disk *n*, which works in the slot M of the arm L of the side piece H of the concave, as shown in Fig. 4. There is an angular hole made through the necks *k* of the disks *n*, and through these holes is passed the rod P, which has the handle Y at its end. The lower ends of the side pieces H H of the concave are pivoted to the frame-pieces O O by screws or bolts through the arms I, from which it is seen that, by turning the disks *n n* by means of the handle Y on the rod P, the upper end of the concave can be raised or lowered, in order to bring it at any required distance from the cylinder. In order to hold the concave at any desired point, the rim or collar N is formed on the disk *n* and bears upon the inner face of the arm L, as shown in Figs. 4 and 5, and the clamping-nut *d* is placed on the neck *k* outside of the frame-piece R, so that by drawing up the nut *d* the side pieces H can be clamped firmly to the frame, as is readily seen.

The advantages of the improved construction of thrashing-cylinder herein described are: First,

that its cylindrical surface, being completely closed, keeps the straw which is being thrashed down between the spikes and prevents it from working into the cylinder, as it is liable to do in cylinders with narrow spike-ribs, unless they are placed close together, so that a less number of rows of spikes is required to do the work effectually. Second, it is much easier to balance than the old forms of cylinders. Third, it can be made lighter and still have the same strength. Fourth, it offers superior facilities for removing the spikes when in need of repairs.

The concave and the attachments for adjusting it are of very simple and economical construction, and are arranged so as to make it very easy to adjust the concave and secure it in any desired position.

I am aware that eccentrics have been before used to adjust a thrashing-cylinder concave, hence I lay no broad claim to the use of such eccentrics; nor do I claim operating such eccentrics simultaneously by a rod which serves as the axis or shaft for their support; nor do I claim the use of two eccentrics provided with necks which are journaled in or on the frame, and serve as the shafts of support for the said eccentrics, except when said eccentrics are arranged to operate simultaneously by a key-rod passed through their necks, and work in slots in the side pieces of a concave which is hung on pivot-joints at one end, and is capable of no lateral movement, but only of a motion about said pivot-joints.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A thrashing-cylinder, composed of two circular heads and of two or more cylindrical spike-staves, when said parts of the cylinder are united by tensional truss-rods which are bent up at the center so as not only to draw the heads together, but also to draw down on the centers of the staves, substantially as and for the purpose specified.

2. The combination, with a thrashing-machine concave, hung on pivot-joints at one end, of two eccentric disks working in slots in the side pieces at its other end, and each having a neck journaled in or on the machine-frame, said disks being operated simultaneously by a key-rod passing through their necks, and the several parts being constructed and arranged to operate substantially as is herein specified.

3. The combination, with the side piece of a hinged thrashing-cylinder concave, of an eccentric disk with a rim or collar on its inner end, a neck journaled in or on the machine-frame, and a clamping-nut on said neck, said disk with its several parts being constructed substantially as specified, and being arranged to support, adjust, and secure the movable end of said side piece, substantially as is herein set forth.

Witnesses: CHAS. E. ROPER.

RUTH K. ABBOTT,  
ANDREW CHOFFIN.