

(No Model.)

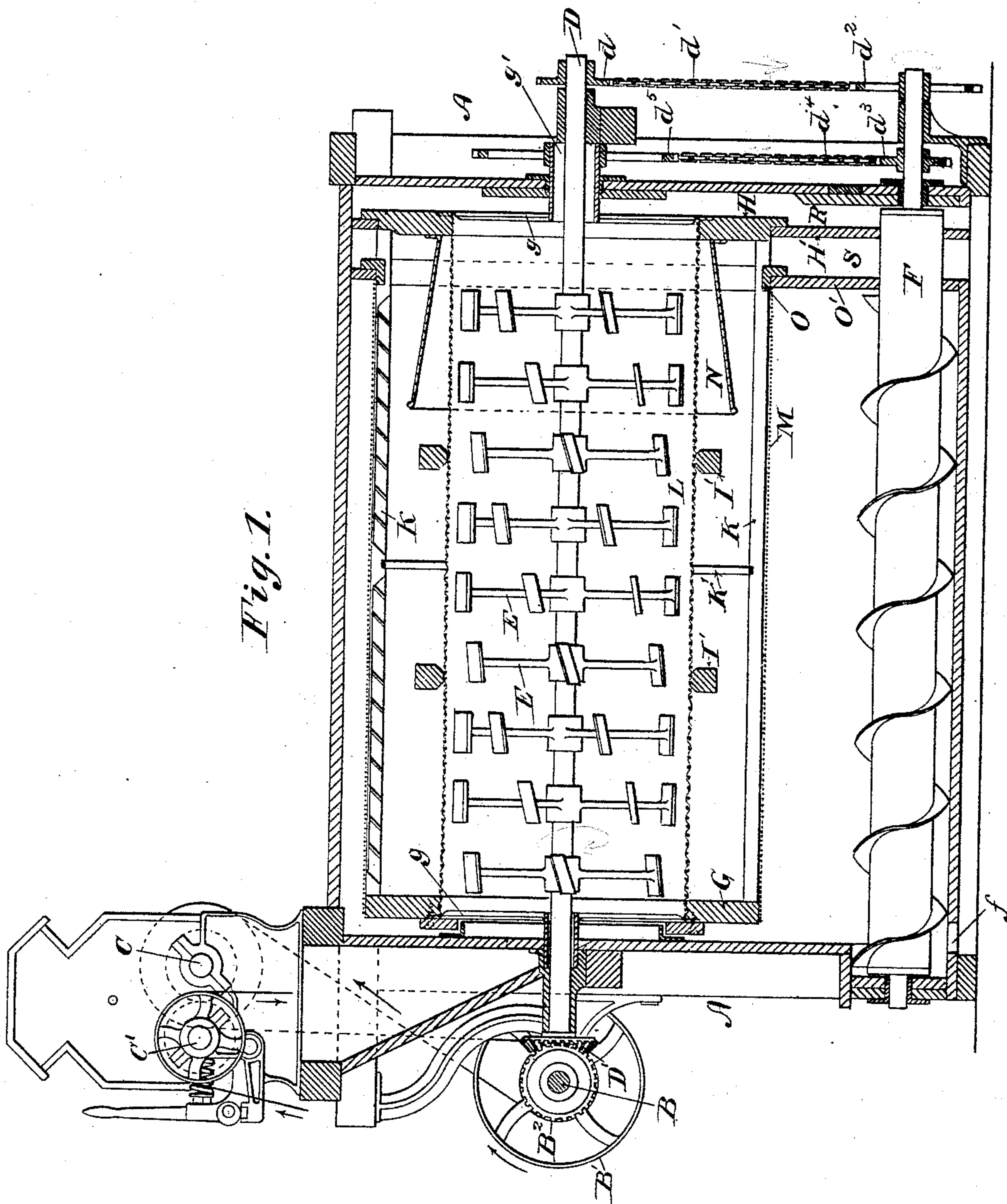
2 Sheets—Sheet 1.

J. L. WILLFORD.

CENTRIFUGAL DOUBLE SCALPER.

No. 328,268.

Patented Oct. 13, 1885.



*Witnesses*

*R. H. Sanford.*  
*Elatus A. Pratt*

*Inventor*

*Joseph L. Willford*  
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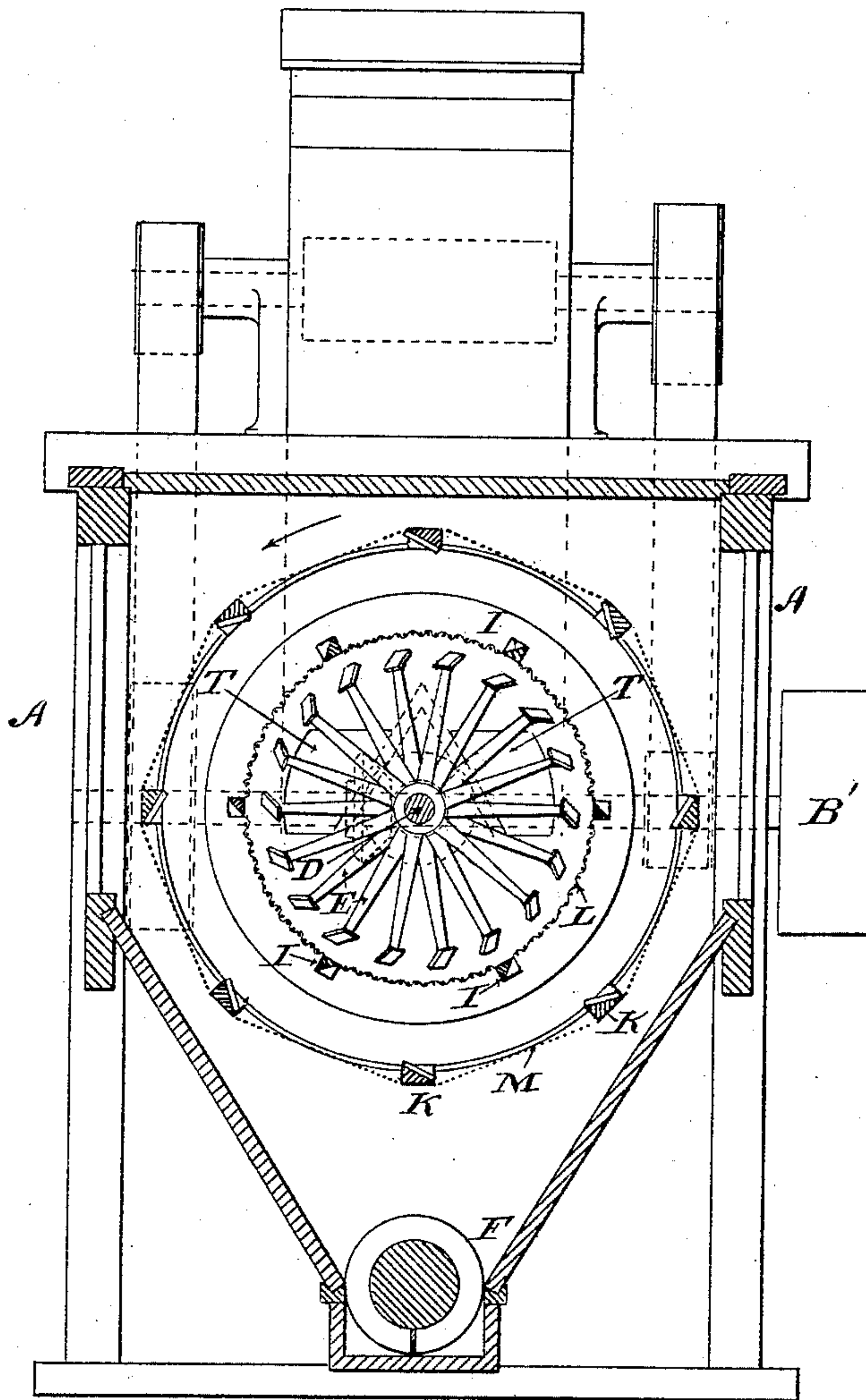
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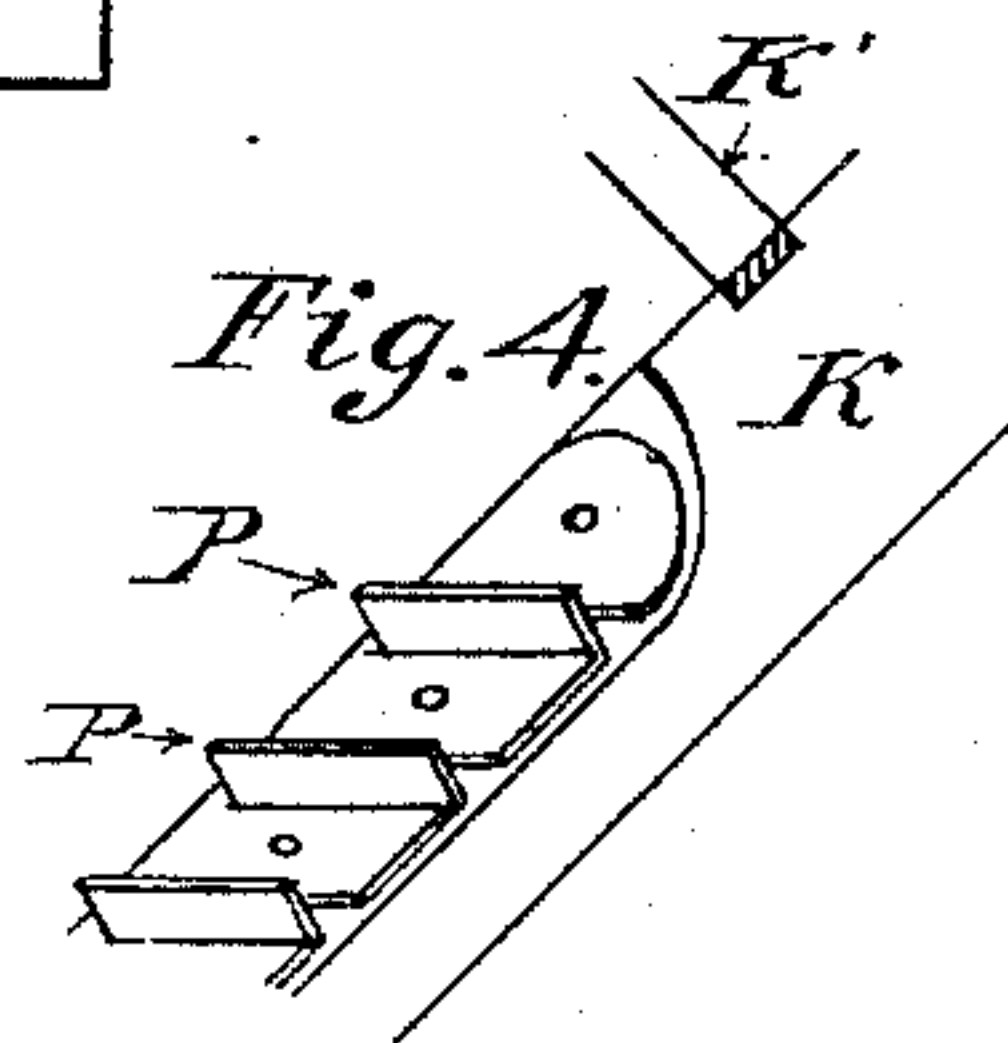
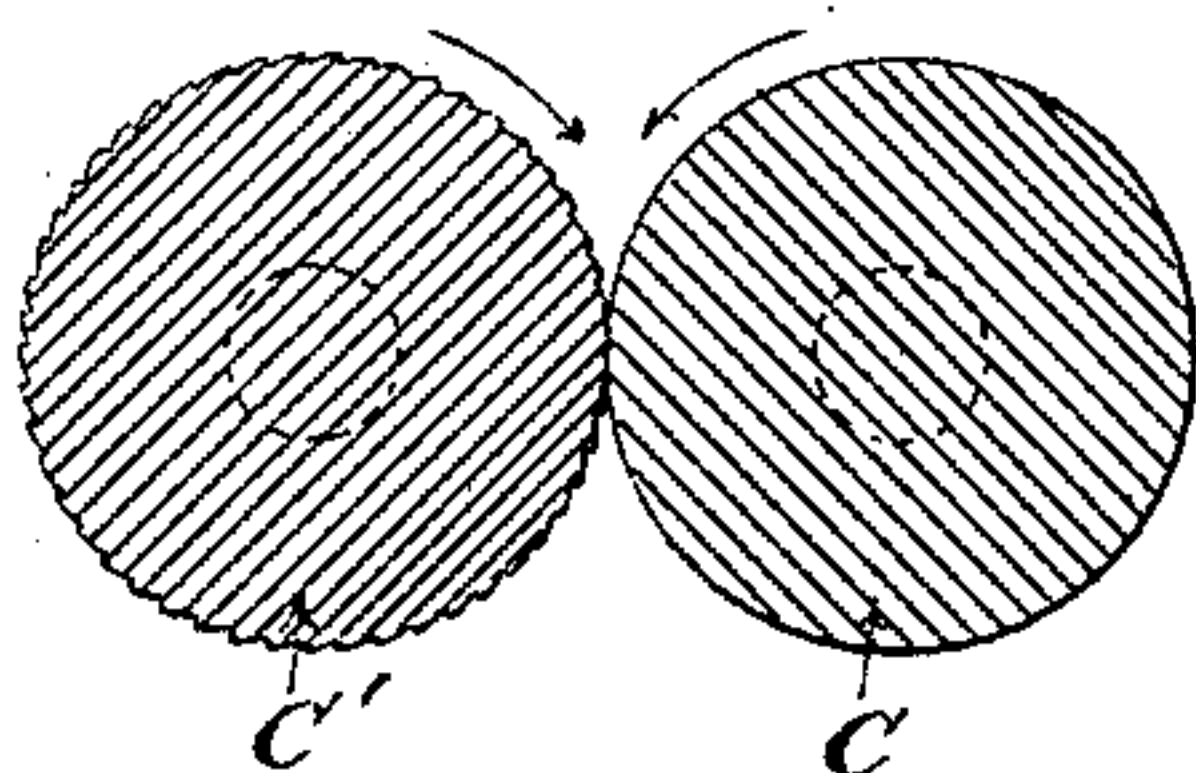
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*Fig. 2.*



*Fig. 3.*



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# UNITED STATES PATENT OFFICE.

JOSEPH L. WILLFORD, OF MINNEAPOLIS, MINNESOTA.

## CENTRIFUGAL DOUBLE SCALPER.

SPECIFICATION forming part of Letters Patent No. 328,268, dated October 13, 1885.

Application filed February 2, 1885. Serial No. 151,744. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH L. WILLFORD, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Centrifugal Double Scalpers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in machines for making the first break in wheat and in separating the middlings from the split wheat and dusting the black flour from the middlings.

My invention consists, generally, in the construction and combination of devices hereinafter described, and particularly pointed out in the claims.

In the drawings, Figure 1 is a central vertical section of my improved machine, the central shaft and the beaters being shown in section. Fig. 2 is a vertical transverse section looking toward the feed end of the machine. Fig. 3 is a section of the rolls. Fig. 4 is a detail showing the conveyer-flanges.

A is the main frame of the machine. At its forward end a counter-shaft, B, is supported, provided with a driving-pulley, B', a bevel-gear, B<sup>2</sup>, and belt-pulleys, as indicated by dotted lines in Fig. 2. At this end of the machine grinding-rolls C C' are provided. These rolls are mounted in a suitable supporting-casing, and are driven by belts from the shaft B. The roll C is preferably smooth, while the roll C' is corrugated, as shown in Fig. 3.

D is the beater-shaft of the machine. It is supported in suitable bearing-blocks at the ends of the machine, and is provided with a bevel-gear, D', which meshes with the similar gear, B<sup>2</sup>, on shaft B.

E represents the beater-spiders, which are secured to the shaft D, and arranged substantially as shown in Figs. 1 and 2. Each of these spiders comprises an independent hub adapted to be secured to the shaft D, a series of independent arms radiating from said hub, and independent angularly-placed beater heads or faces on the ends of said arms. The several hubs are placed so that the beaters are arranged spirally throughout the reel, with the

angular faces of the beater-heads in spiral rows around the beater-shaft, as shown, so that they both serve as beaters, and as conveyers propel the material through the cylinder from one end to the other.

At the tail end of the machine, outside the bearing-blocks, the shaft D is provided with a sprocket-wheel, d, from which motion is communicated through chain d' and sprocket d<sup>2</sup> to the shaft of a spiral conveyer, F, located in the lower part of casing A. The material removed by the conveyer passes out through an opening, f. From the conveyer-shaft motion is communicated through wheel d<sup>3</sup>, chain d<sup>4</sup>, and wheel d<sup>5</sup> to the separating-reel, the body of which consists of the circular ends G H, supported by arms g g upon sleeves g' g', and connected by the longitudinal bars I and K. The end H is rabbeted, and forms a close joint with a cross-partition, H', in the casing. Secured to the ends G and H and to the bars I is a wire-cloth cylinder, L, and the bolting silk or wire M is secured to the longitudinal bars K, as indicated by dotted lines in Figs. 1 and 2. Rings I' surround and stiffen the wire-cloth cylinder and the bars I, and a ring, K', serves to strengthen the bars K.

As the material which passes through the cylinder L near the tail end would have but little distance to travel on the bolting-silk, I provide the conical ring-deflector N, which is secured to end H, and extends some distance between the cylinder L and the silk M, as shown in Fig. 1. It will be seen that the material that passes through the part of the cylinder that is surrounded by the ring N will be conveyed back and dropped upon the bolting-silk at a point under the inner end of the ring and will have considerable distance to travel on the silk before it passes out of the machine. The silk M is secured to end G, to the bars K, and to a ring, O, that is attached to bars K at a point a short distance from end H. This ring makes a close joint with the cross-partition O', as shown in Fig. 1.

The bars K are provided with the flanges P, Figs. 1, 2, and 4, which are composed of sheet metal, and are placed diagonally across the faces of the bars. By the "face" of bar K, I mean the side of the bar that is in advance when the reel is rotating. As the reel rotates these bars pass under the material in



the reel, and being arranged diagonally on the bars they act as conveyers and propel the material toward the tail end of the machine.

The bars I are beveled on their faces, as shown, so that if any material is carried up by the outer reel and dropped on these bars it will slide off their inclined faces. If these bars were not beveled, some material might adhere to them and be dropped back through the wire cylinder.

In some instances wire may be used in place of the silk on the outer bolt, and perforated metal may be substituted for wire-cloth of the inner cylinder.

The operation of the machine is as follows: The wheat is fed into the hopper and passes between the rolls C and C'. The corrugated roll is the fast roll. The grain naturally assumes a position with the berries lengthwise of the rolls, and the fast corrugated roll, rotating against the smooth slow roll, splits the kernels lengthwise in the crease and leaves them in a condition to have the crease, dirt, and germ thoroughly removed by the scalper. From the rolls the split berries pass directly to the inside of the wire-cloth cylinder. The beaters throw the split berries against the wire, from which they rebound against the beaters. This operation knocks off the crease, dirt, and germ, and much of the fuzz from the end of the berry. The beaters also create a current of air which drives the material so removed through the wire. As this material is immediately removed from the cylinder there is no danger of pasting the split wheat with this soft dark material. While the beaters are thus acting on the material in the cylinder, their spiral shape is causing the split wheat to be conveyed to the tail end of the cylinder, where it arrives thoroughly aspirated, and ready to go to the hubs or rolls. The middlings, after passing through the wire, are dropped on the silk of the outside bolt, and as they are conveyed toward the tail by the conveyer-flanges P P they are thoroughly dusted by the silk, and then passed over the tail of this bolt, ready for purification. The black flour and finer material is dusted through the silk and conveyed to the head of the reel by the lower conveyer, F, and discharged through opening f. The material which falls upon the deflector N is dropped upon the silk bolt at a point some distance from its tail and is thus thoroughly dusted before passing out of the reel.

The pitch of the spiral rows, in which the beater-faces are located, determines the speed at which the split wheat is moved through the machine, and this pitch may be changed by simply loosening and resetting the hubs.

The amount of scouring to which the wheat will be subjected depends upon the number of beaters used. A part of the spiders may at any time be removed or more may be added, as may be found to produce the best results.

I claim as my invention—

1. The combination, with the cylinder L and bolt M, of the beater-shaft D and spiders E, each of said spiders consisting of a central hub, a series of independent arms radiating therefrom, and independent angularly-placed beater-heads on the ends of said arms, said spiders being arranged with the beater-heads in spiral rows around the shaft D, all substantially as described.

2. The combination, with a revolving separating-cylinder, of the beater-shaft D and the beater-spiders E, each of said spiders consisting of a central hub, a series of arms radiating therefrom, and independent angularly-placed beater-heads on the ends of said arms, said spiders being arranged with the beater-heads in spiral rows around the shaft D, all substantially as described.

3. The combination, with a revolving separating-cylinder, of the beater-shaft D and beater-spiders E, each of said spiders consisting of a central hub, a series of arms radiating therefrom, and independent angularly-placed beater-heads on the ends of said arms, all substantially as described.

4. The combination, in a machine of the class described, with the ends G and H, of the cylinder L, ring N, bars K, ring O, and silk M, all arranged substantially as described, and for the purpose set forth.

5. The combination, with the separator M, having the interior bars, K, of the separator L, having the exterior bars, I, provided with inclined or beveled faces, as described and for the purpose set forth.

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

JOSEPH L. WILLFORD.

Witnesses:

ELECTUS A. PRATT,  
A. C. PAUL.