

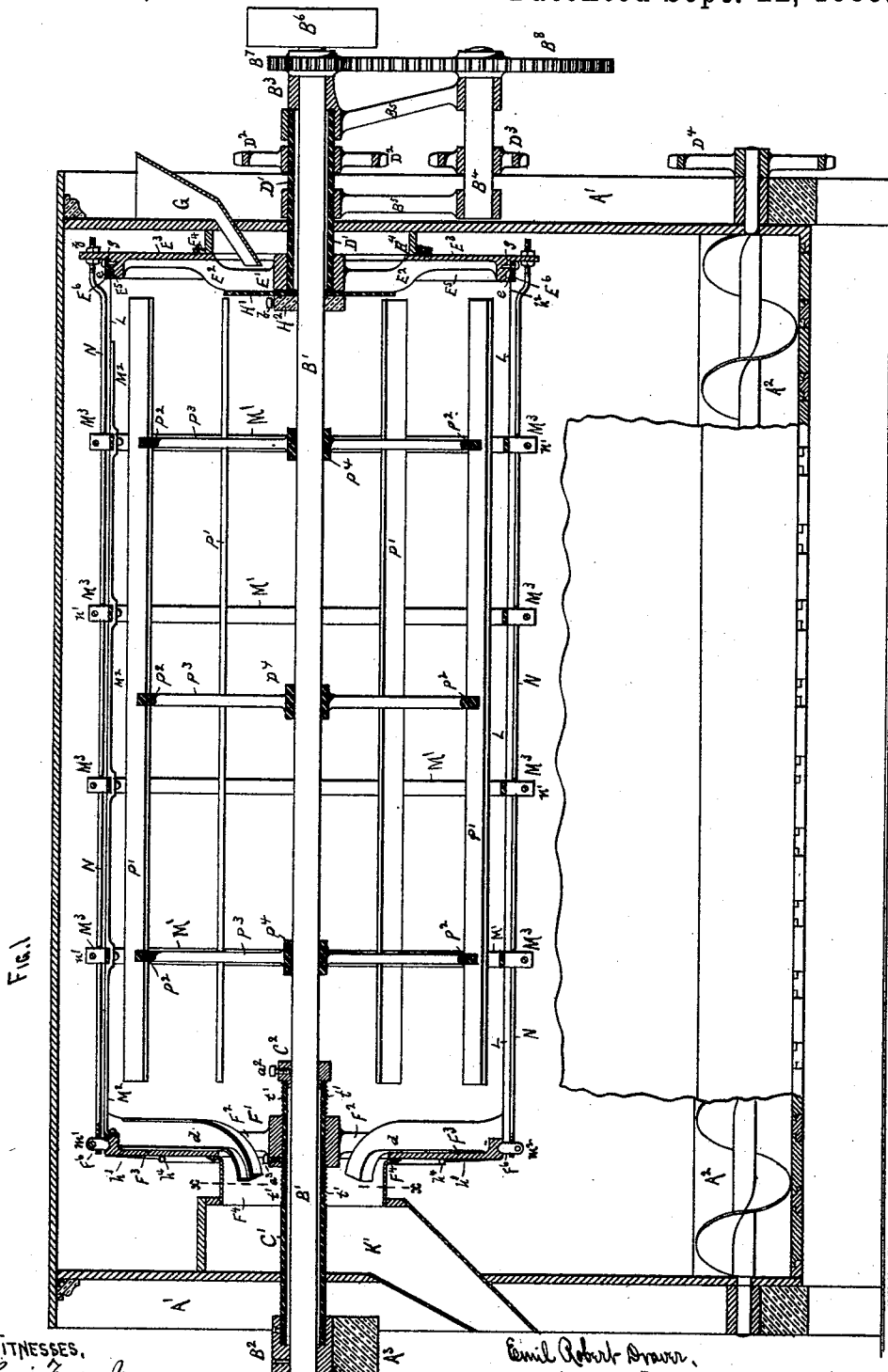
(No Model.)

3 Sheets—Sheet 1.

E. R. DRAVER.
CENTRIFUGAL REEL.

No. 326,901.

Patented Sept. 22, 1885.



WITNESSES,
Louis Decker Jr.
C. H. Woodward

Emil Robert Draver,
INVENTOR, BY
Louis Fraser & Co., Attys.

(No Model.)

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FIG. 3

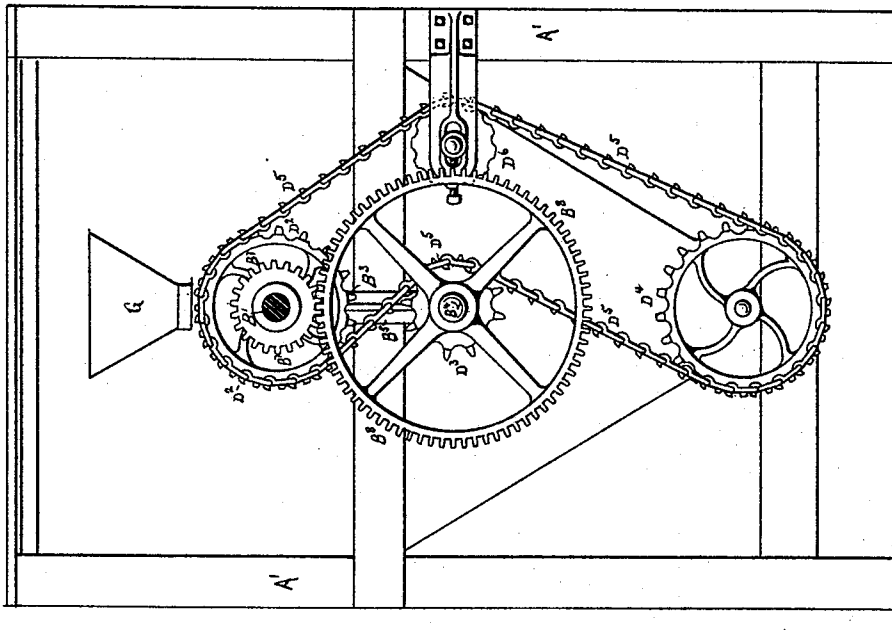
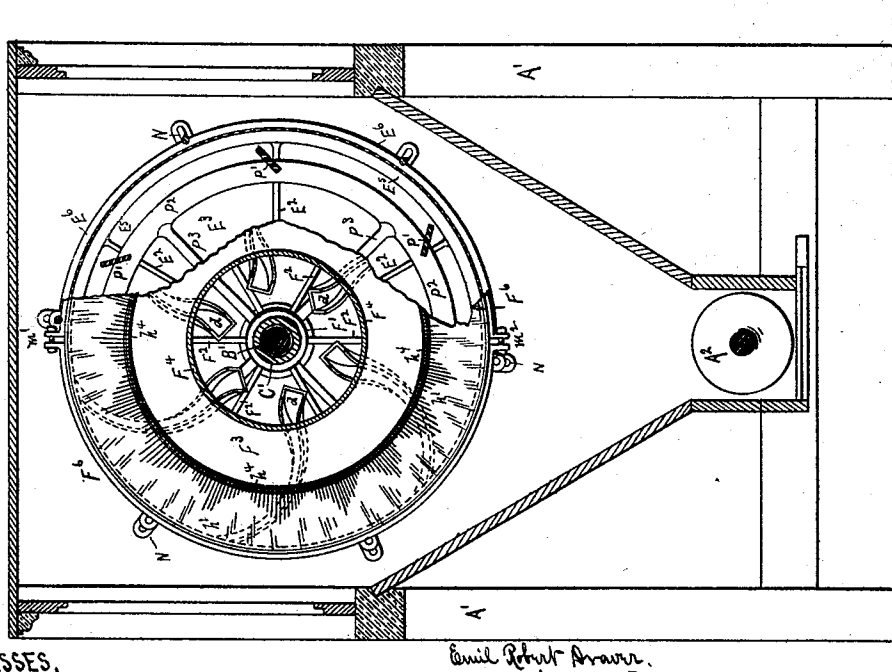


FIG. 2



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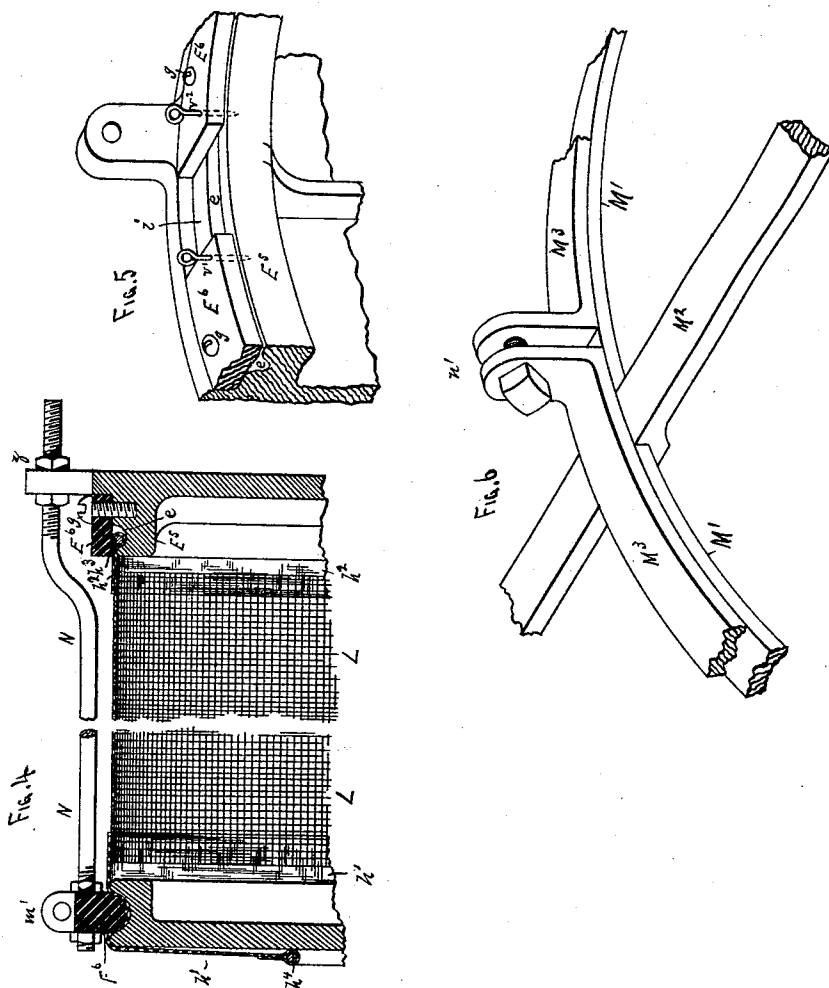
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UNITED STATES PATENT OFFICE.

EMIL ROBERT DRAVER, OF STILLWATER, MINNESOTA.

CENTRIFUGAL REEL.

SPECIFICATION forming part of Letters Patent No. 326,901, dated September 22, 1885.

Application filed May 2, 1885. (No model.)

To all whom it may concern:

Be it known that I, EMIL ROBERT DRAVER, a citizen of the United States, and a resident of Stillwater, in the county of Washington, in the State of Minnesota, have invented certain new and useful Improvements in Centrifugal Reels, of which the following is a full, clear, and exact description, reference being also had to the accompanying drawings.

This invention relates to centrifugal reels in which milling products are treated in the course of their reduction into flour, &c.; and it consists in the construction and combination of parts, as hereinafter shown and described, and then specifically defined in the claims.

In the drawings, Figure 1 is a longitudinal sectional elevation. Fig. 2 is a cross-sectional elevation on the line *x x* of Fig. 1, and with a portion of the "head" broken away to show the interior construction of the reel. Fig. 3 is an outside elevation of the feed end of the machine. Fig. 4 is an enlarged detail illustrating more fully the manner of connecting the bolting-cloth to the heads of the reel. Fig. 5 is an enlarged perspective view of a portion of the rim of the feed-end head of the reel, illustrating more fully the manner of securing the cloth thereto. Fig. 6 is an enlarged perspective view of a portion of the reel-frame, illustrating more fully its construction.

A' is the frame-work of any suitable construction and having the usual conveyer, A², in its lower part.

B' is the main horizontal driving-shaft journaled at one end in bearing B² on a bridge-tree, A³, and at the other end in a hanger or bridge-tree, B³.

C is a hollow sleeve or tubular shaft encircling the shaft B' and journaled at one end outside the casing A' in a socket formed for it in the bearing B² and projecting into the casing for some distance.

C² is a collar encircling the shaft B' at the inner end of the tubular shaft C' and adapted to be fixed to the shaft by a set screw, a², for bearing against the inner end of the said tubular shaft and preventing an inward movement or displacement thereof.

D' is another sleeve or tubular shaft encir-

cling the other end of the shaft B' and journaled outside the casing A' in a socket formed for it in the hanger B³ and passing inward through the frame, as shown. This hanger B³ will be constructed in any desired manner and attached to the casing A' by a bridge-tree or other means, and will support a short horizontal shaft, B⁴, by arms B⁵.

On the extreme outer end of the shaft B' is a driving-pulley, B⁶, through which motion is imparted to the shaft from the source of power in the mill in any suitable manner. Inside this pulley B⁶ on the shaft B' is secured a pinion, B⁷, engaging with a gear-wheel, B⁸, on the countershaft B⁴, this countershaft being provided with a chain-pinion, D³, in line with a chain-wheel, D², on the sleeve D'.

On the shaft of the conveyer A², in a line below the pinion D³, is a chain-pulley, D⁴, around which a chain, D⁵, runs, and from thence around a tightener-pulley, D⁶, to the chain-pulley D², fast on the sleeve D', and from thence around one side of the chain-pinion D³, fast to the shaft B⁴, and thence back to the conveyer-shaft. By this means the conveyer is driven from the shaft B' by the chain D⁵, while at the same time, by its passage around the pulley D², the same chain imparts motion to the reel in the same direction as the beater-shaft.

By forming the pinion B⁷ smaller than the gear B⁸ the shaft B⁴ runs at a slower speed than the shaft B', and by forming the chain-wheel D² larger than the chain-pinion D³ the reel will run slower than the beater-cylinder, but in the same direction.

E' is a hub fast upon the sleeve D', inside the casing A', and connected by radiating arms E² to a disk, E³, while a similar hub, F', with an internal screw-thread, fits on a corresponding screw-thread, *t'*, on the sleeve C', and is connected by radiating arms F² to a disk, F³, the two disks, respectively, forming the "head" and "tail" ends of the "reel," as hereinafter shown. The hub F' is adapted to be fastened to the sleeve C' by a set-screw, a³, when required, as hereinafter shown.

The central portion of the disk E³ is wanting, and is surrounded by a ring, E⁴, which closes the space between the disk and the end

of the frame A', as shown. The ring E' may be attached to the disk E³, as shown, or to the frame A', as preferred.

G is the feed-spout leading through the open center of the disk E³, as shown.

H' is a disk surrounding the shaft B', just inside the hub E', and held in place and secured to the shaft by a collar, H², having set-screw b, as shown, this disk serving as a "stop" to the inflowing material from the spout G, and causing it by its revolution to spread the material outward and throw it against the cloth just at the moment it enters the reel, and thereby insure the contact of the material with all parts of the surface of the cloth.

The disk H' may be cast fast to the hub E', if preferred.

Attached to the inner face of the disk F³ is a series of curved spouts or carriers, d, converging toward the center and turned outward through the central opening in the disk, as shown.

F⁴ is a cylindrical sheet-metal ring surrounding the central opening in the disk F³ and projecting toward the end of the frame A', and adapted to revolve with the reel in the side of the discharge-spout K', as shown.

By means of the co-operation of the curved spouts d, ring F⁴, and discharge-spout K', the "tailings" or the material which fails to pass through the meshes of the cloth will be caught up by the spouts d as the reel revolves, and fed into the spout K', the ring F⁴ serving to prevent these tailings from falling into the conveyer A².

On the inner face of the disk E³ is formed a ring or annular rib, E⁵, having a groove, e, in its outer edge, as shown more clearly in Figs. 3 and 4, and covered by a metal band, E⁶, secured to the annular rib by screws g. This band E⁶ covers the groove e, except at the ends of the band which do not quite touch, leaving an open space, i, as shown in Fig. 5.

The outer edge of the rim E⁵ is of a less diameter than the rear part, so that a small space will be left between the band and the rim, as shown in Fig. 5, in order that the cloth or the binding may not be pinched between the band and rim.

The groove e may be made partially in the band E⁶ and partially in the rim E⁵, or entirely in either, as preferred.

The bolting-cloth L has a binding, h' h², on each end, of "ticking" or other heavy fabric, and cords h³ h⁴ hemmed into the ends of the bindings.

When the cloth is to be attached to the reel, one end, h², of the binding (having the cord h³ hemmed into it) is inserted into the groove e beneath the band E⁶ in the opening i between its ends, (see Fig. 5,) and drawn around the rib E⁵ until it emerges again from beneath the band in the open space i. The cloth must be just wide enough so that when thus drawn around the rib E⁵ its edges will meet. This

will leave the binding h' projecting out from between the band E⁶ and rib E⁵ all around them. The edges of the bolting-cloth and the ends of the bindings are then laced or sewed together, and the binding h' drawn over the edge of the disk F³, and drawn tightly over the disk by bringing the ends of the cord h⁴ together and gathering the binding h' around the ring F⁴ and tying the ends of the cord together.

The disk F³ has a groove formed in its outer edge, into which a strap, F⁶, is adapted to be clamped, after the cloth is stretched, to prevent the heads E³ F³ from being drawn together, as hereinafter set forth. The band F⁶ is divided into two parts, and its ends adapted to be clamped together by clamps m' m².

At suitable intervals between the disks E³ and F³ a series of metal bands, M', are placed inside the cloth-cylinder and connected together on one side by a bar, M², to retain them in their proper places, and each of these bands is surrounded outside the cloth L by another band, M³, each band M³ being clamped upon its respective band M' by a clamp, n', which draws its ends together. By this means the cloth L is firmly supported at suitable intervals.

The bar M² is attached by one end to the disk F³, as shown in Fig. 1.

The bands M³ have rods N running over them, and riveted or otherwise fastened to them, by which they are connected to the disks F³ and E³, as shown, and the rods are secured in the disk E³ by nuts z, and in the disk F³ by nuts, or by being riveted or otherwise fastened therein.

As before stated, the tubular sleeve C' has a screw-thread, t', on its exterior, on which the hub F' fits, so that by revolving the sleeve the hub F' and its attached disk F³ will be moved away from the disk E³ and thus stretch the cloth L lengthwise of the reel.

The hub F' has a set-screw, a², by which it may be fixed to the tube C' after the cloth is tightened, so that the tube and reel will be revolved together.

The collar C² is to be set up against the end of the tube C' when the cloth is to be stretched to prevent the end movement of the tube and then released to prevent unnecessary friction.

The beater-cylinder is of the ordinary construction, consisting of beater-ribs P', attached at an angle to the cloth L across the rims P² of wheels or spiders connected by arms P³ to hubs P⁴ on the shaft B'.

I claim a great advantage by the manner shown of constructing the cloth-covered reel without internal longitudinal ribs except the one thin bar, M², as the material, when thrown against the cloth by the rapidly-revolving beaters P', strikes the cloth only, and is not obstructed by anything on the interior of the reel, the rings M' offering no obstruction, and the thinness of the bar M² causing the material to pass freely over it and not be affected

thereby except to a limited and immaterial extent, this bar not generally exceeding one-sixteenth of an inch in thickness.

In reels having interior longitudinal ribs, the material being thrown against them glances off and strikes the cloth with accelerated speed, and always in the same place, so that the cloth thus continuously acted upon wears faster than other portions; but with my arrangement the cloth wears evenly on all its surface, as there is nothing on the interior of the reel to cause the material to act upon it with more force at one point than at another. This form of the reel also produces a better effect on the material, as the result sought to be obtained is the separation of the particles and not their disintegration.

In reels having internal longitudinal ribs the material is driven against them with great force and the particles broken, which result I wish to avoid in my machine.

Should the cloth L become slackened by stretching, or from other causes, it may be tightened again by merely revolving the sleeve C' forward and drawing the lacings which secure the edges of cloth together closer, whereby its girth may be tightened, if required. As a matter of course, it will be understood that the bands M³, set-screws a³, and nuts z of the rods N must be loosened before the cloth can be tightened.

To assist the operator in taking up the slack of the cloth L along its longitudinal seam, either when first putting the cloth on the machine or in tightening it afterward, I provide two pins, v' v², adapted to be set down through perforations made for them in the ring or band E⁶, and through the binding h², and into the rim E³. (See Fig. 5.) When the cloth is to be tightened, one of the pins v' or v² is set down into place, and the binding h' drawn tightly around the rim E⁴. The second pin, v², is then inserted into its place through the band M⁶, the two pins thus retaining the cloth in its stretched condition until the operator can secure the edges by lacing or sewing.

Having described my invention, and set forth its merits, what I claim is—

1. In a centrifugal separator, the combination of a frame, A', a horizontal shaft, B', a beater-cylinder, tube D', surrounding said shaft B', a disk, E³, tube C', having external screw-thread, t', disk F³, having a corresponding screw-thread in its hub fitting over tube C', band E⁶, attached to disk E³, band F⁶, clamped to disk F³, bolting-cloth L, having bindings h' h², and cords h³ h⁴, hoops M', connecting-bar M² and clamping-bands M³, and adjustable rods N, substantially as set forth.

2. In a centrifugal separator, the combination of a frame, A', a horizontal shaft, B', a beater-cylinder, tube D', surrounding said shaft B', disk E³, tube C', having external screw-thread, t', disk F³, having a corresponding screw-thread in its hub and fitting over said tube C', band E⁶, attached to disk E³, band F⁶, clamped to disk F³, bolting-cloth L, having bindings h' h², and cords h³ h⁴, hoops M', connecting-bar M², clamping-bands M³, adjustable rods N, stop-plate H', at the feed-end of said machine, and curved discharge-spouts d, attached to the disk F³ at the tail end of said machine, substantially as set forth.

3. In a centrifugal separator, the combination of a frame-work, a horizontal shaft, a beater-cylinder adapted to be rapidly revolved, a pinion, B', on said shaft, a bolting-cloth-covered reel surrounding said beater-cylinder, tubular shafts or sleeves C' D', by which it is journaled concentrically around said shaft and beater-cylinder, chain-pulley D², fast on sleeve D, counter-shaft B⁴, gear-wheel B³, engaging pinion B', chain-pinion D³, on said counter-shaft, chain-wheel D⁴, the conveyor-shaft, tightener D⁶, and chain D⁵, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

EMIL ROBERT DRAVER.

Witnesses:

LOUIS FEESER, Jr.,
W. J. RODGERS.