

(No Model.)

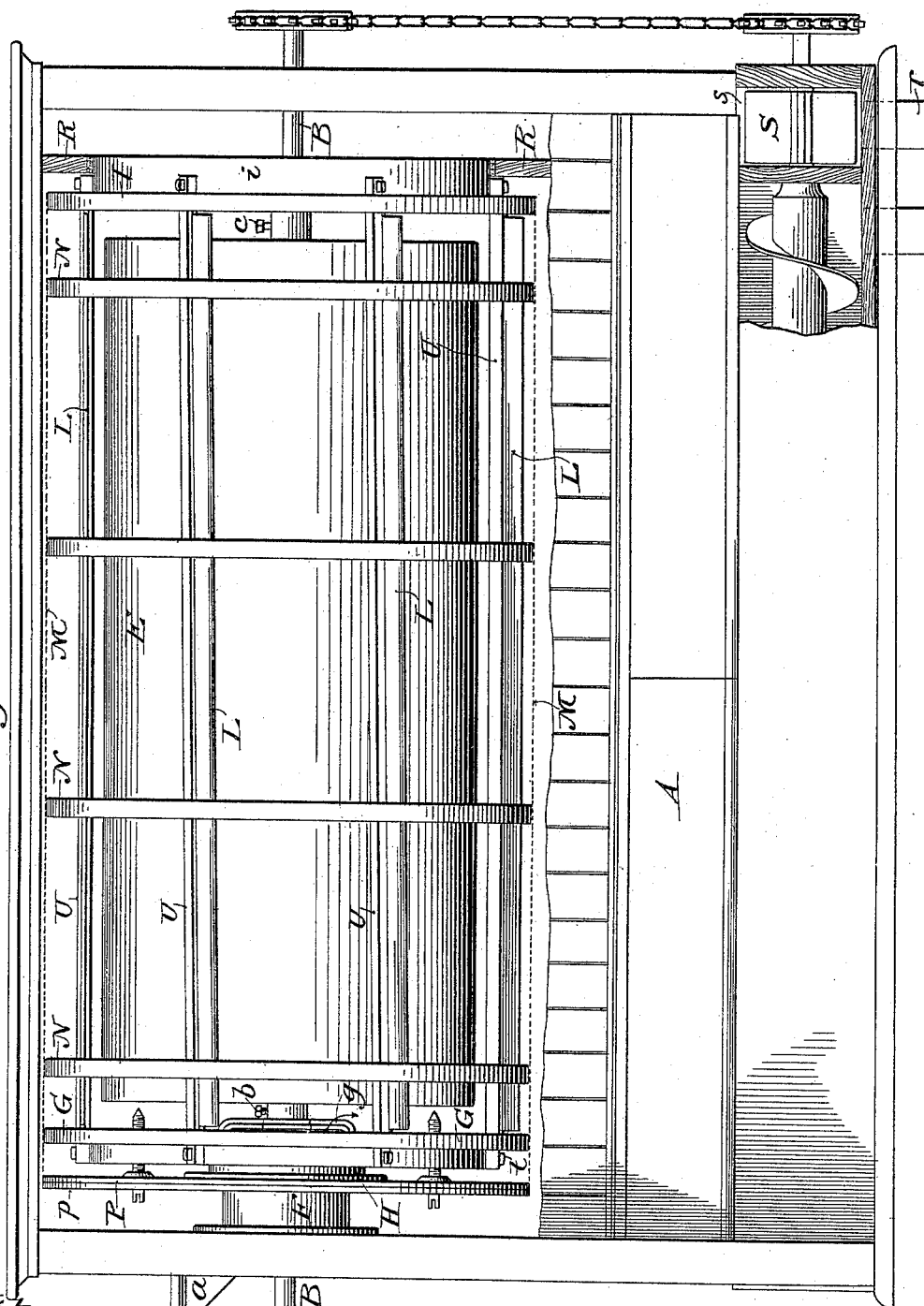
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M. W. CLARK.
FLOUR BOLT.

No. 492,270.

Patented Feb. 21, 1893.

Fig. 1.



Witnesses:

James F. Duhamel
Horace A. Dodge.

MYRON W. CLARK.

Inventor,

by *Rodger Lons*
Attys.

(No Model.)

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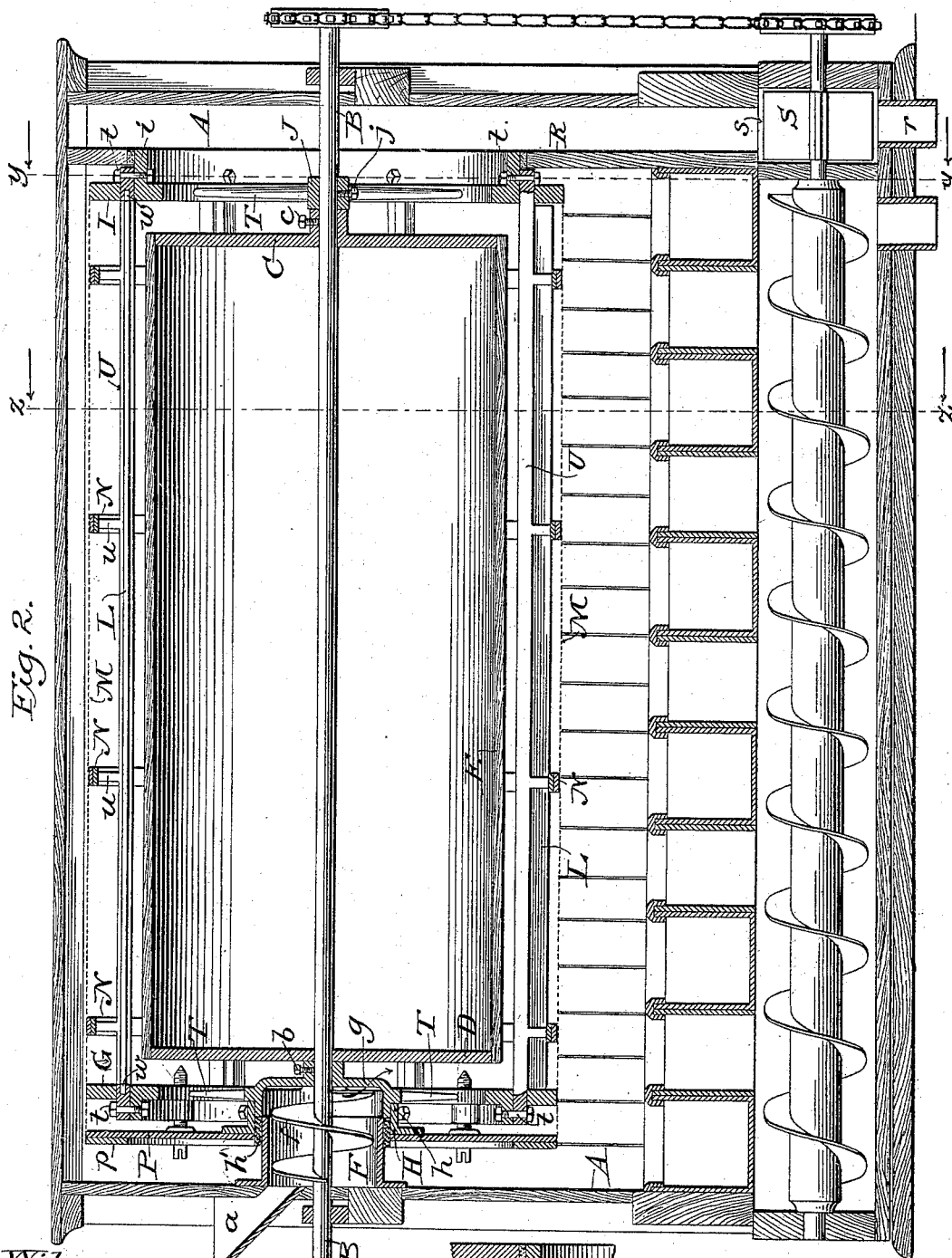
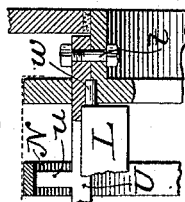


Fig. 2.

Witnesses:

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Fig. 5.



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(No Model.)

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Fig. 4.

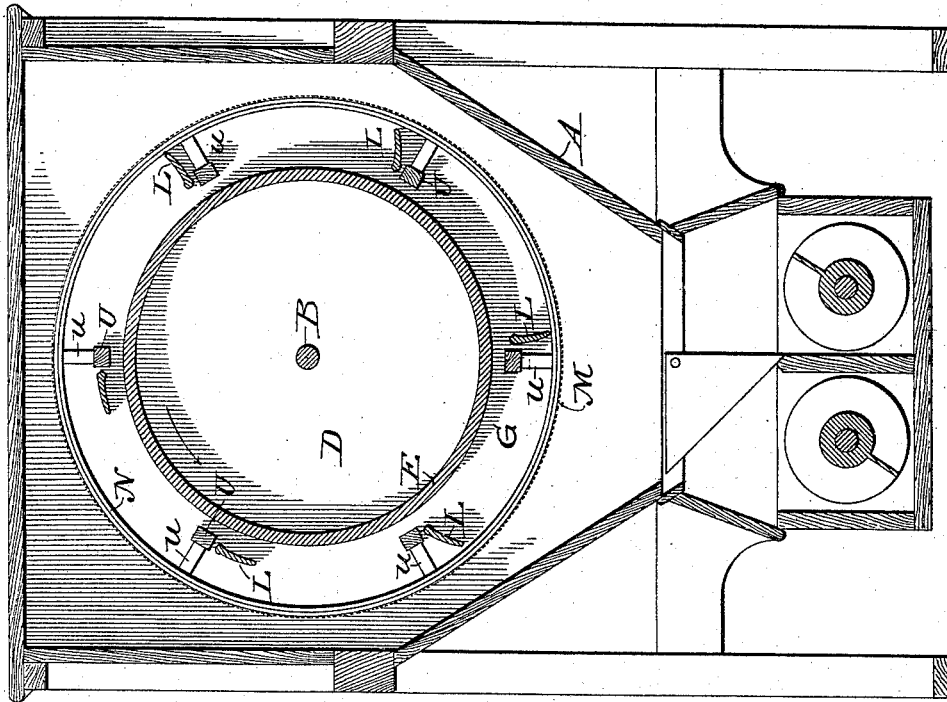
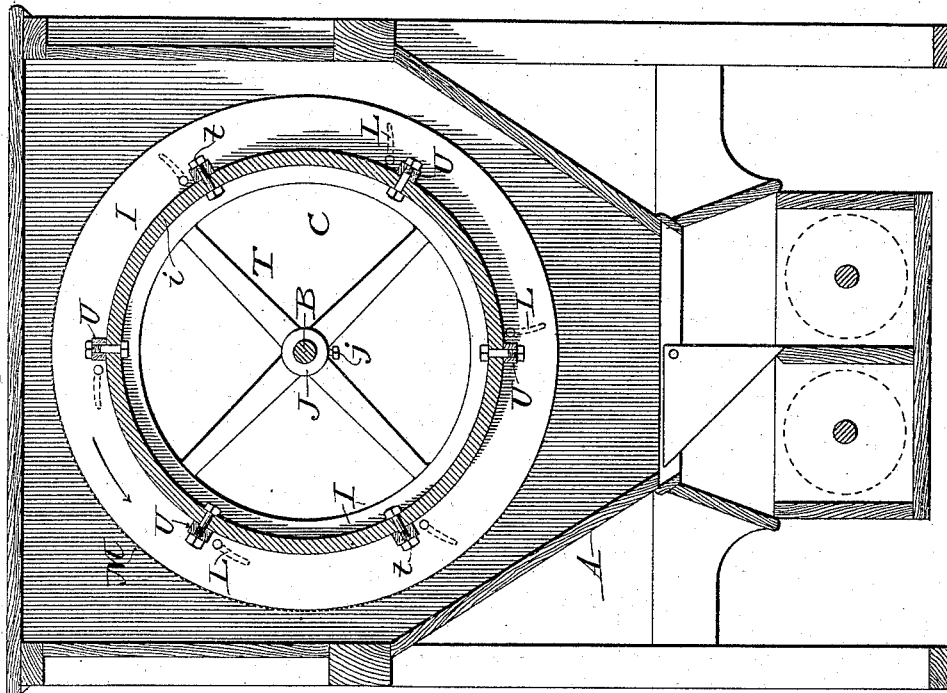


Fig. 3.



Witnesses:

James F. Duhamel
Horace A. Dodge.

MYRON W. CLARK,
Inventor,

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Attys.

UNITED STATES PATENT OFFICE.

MYRON W. CLARK, OF PARMA, MICHIGAN, ASSIGNOR, BY MESNE ASSIGNMENTS, OF ONE-HALF TO THE EDWARD P. ALLIS COMPANY, OF MILWAUKEE, WISCONSIN.

FLOUR-BOLT.

SPECIFICATION forming part of Letters Patent No. 492,270, dated February 21, 1893.

Original application filed November 18, 1886, Serial No. 219,319. Divided and this application filed November 25, 1892. Serial No. 453,075. (No model.)

To all whom it may concern:

Be it known that I, MYRON W. CLARK, a citizen of the United States, residing at Parma, in the county of Jackson and State of Michigan, have invented certain new and useful Improvements in Flour-Bolts, of which the following is a specification.

This invention relates to flour bolts, and the present application is a division of another filed in my name on the 18th day of November, 1886, designated by Serial No. 219,319.

The leading feature of the invention as covered by the original application is the combination of a bolting cylinder, a drum within the same, and intermediate elevators, serving to elevate material to and deposit it upon the drum; and this application is intended to cover specifically one construction, or mode of supporting the elevators and the cloth-hoops.

In the accompanying drawings,—Figure 1 is a side elevation of a flour bolt embodying my invention, parts of the casing and bolting cloth being omitted to show the structure more clearly; Fig. 2 is a horizontal sectional view of the same; Figs. 3 and 4 are transverse vertical sections, on the lines *y-y* and *z-z*, respectively; and Fig. 5, a detail view showing the cloth-hoop supports and the elevator journals.

A indicates the framework and casing, within which the operative parts of the bolt are located.

B is the central driving shaft, mounted in suitable bearings and having a belt pulley fastened upon it. Within the bolting cloth there is a drum or hollow cylinder which I will describe. Of this drum, C is the head nearest the tail end, that is the discharge end of the bolt. The drum head has a central sleeve with a set screw *c* for securing it to the central shaft B. D is a similar head at the other end, that is, the receiving end of the bolt, and which may be secured to the shaft B, when desired, by a key or set screw.

E is a shell mounted upon the drum-heads, which it fits closely at either end. This shell may be sheet metal, wood, or other suitable

material; and its surface may be circular in cross section, or ribbed or corrugated as shall be desired or found advantageous, according to the circumstances of the case.

I will describe the structure of the reel which surrounds the drum.

F is a short cylinder section or tube, supported at the head end of the bolt, into which opens a hopper or feed spout, *a*.

f is a worm mounted on shaft B to feed the material from the hopper *a*, through the tube section F and thence into the reel.

G, *g* is the reel head at the receiving end of the bolt, *g, g* being arms which connect the centrally open flange portion G, with a hub surrounding the shaft B and secured thereto by a set screw *b* or other equivalent device.

At the tail end of the reel there is a ring, flange, or centrally open disk I, with a rearwardly-projecting flange *i*, the outside diameter of the parts being the same as the outside diameter of the reel head G, *g*; thus the part I is adapted to serve as a supporting ring for one end of the bolting cloth.

J is a hub mounted on shaft B, to which it is secured and preferably made adjustable thereon by a set screw *j*; for a purpose which will be hereinafter explained. Of course the hub and flange I are connected by means of spokes, thus forming spiders T.

L L, are elevators, extending lengthwise of the reel, between the drum body E and the bolting cloth M, which latter is secured at one end to the disk or ring I, and at the other end to an adjustable disk P, *p*, and is supported at intermediate points, when necessary, by cloth hoops or rings N N. To support and carry such intermediate cloth rings or hoops, I provide spiders T T, which are secured to the shaft B by set screws or equivalent means, and I extend bars U, *u*, from spider to spider, securing the bars to the spiders by means of bolts *tt* or equivalent fastenings. These bolts may pass radially through the ends of the bars, into the peripheral flanges of the spiders, or into lugs or arms of the spiders, in which latter case the bolts may be arranged radially, or may pass into the sides of the lugs or arms, as preferred. In either event the

bars U U should have outward projections or lugs *u* to which to bolt or otherwise secure the cloth hoops or rings.

The construction of the cloth tightener is not involved in this application, and need not, therefore, be further described.

The elevators L are provided with pivots or journals *w w*, at their ends, which are seated and turn in the flanges of the spiders; the arrangement of the parts being such that the swinging edges of the elevators engage with the cloth hoops during part of each revolution of the bolt to pick up material, and as they move upward they automatically tilt inward and discharge the material upon the drum. While I have indicated a relative arrangement of these parts that will give satisfactory results under ordinary circumstances, yet I do not wish to be limited thereto, it being apparent that the point in the rotation of the bolt at which the elevators shall tilt inward and discharge their load, may be varied by changing the positions of the pivots toward or from the axis of the reel, as may be found most advantageous under any particular circumstances or conditions.

R is a partition, a short distance inside the tail end of the casing. This partition has a central opening to receive the rearwardly-projecting part *i*, of the flange, and the space between the flange and the partition may be packed with wool or its equivalent, to prevent leakage at this point.

The space between the partition R and the tail end of the casing constitutes a tailings chamber, which is hopper bottomed, as indicated in Fig. 3, and opens into a trap, consisting essentially of revolving wings S S, which run in close proximity to the surrounding walls *s s*, in such manner that the tailings are discharged downward through the spout *r*, while the wings effectually intercept air currents which otherwise might pass through the spout.

By preference, I locate the head G, *g*, with its flange part G about five inches from the front end of the drum; and to prevent leakage I attach a ring H, *h* to the reel head. The ring is provided at its inner edge with a suitable flange *h*, for this purpose, and the space between the ring and the shell F of the feeder is packed, preferably with sheep skin with the wool on, which fills the annular space between the ring and the shell as is indicated at *h'*. When it is desired, the elevators may be arranged somewhat spirally relatively to the bolting cloth and drum, before the reel heads and rings are permanently attached to the central shaft. This spiral arrangement is a matter of considerable importance because of the more rapid travel of material through the reel from head to tail, due thereto. The elevators being farther from the axis of rotation than the surface of the drum, travel faster than the drum, and consequently material leaving the elevators and falling upon the upper side of the drum, will have a greater

speed than the drum, its movement being further accelerated by the sudden tipping of the elevators. In leaving the elevators the material moves in a direction perpendicular to the carrying faces thereof, or toward the tail, until it strikes the bolting cloth on the downgoing side of the reel, and consequently the travel of the material through the reel is hastened in proportion to the degree of obliquity of the elevators. The obliquity will be varied in extent according to the nature of the material under treatment.

While ordinarily the spiral arrangement will be adopted, I do not restrict myself arbitrarily thereto.

The spiral adjustment may be most conveniently effected by turning the flange I and its hub upon the shaft after the reel head G *g* has been secured to the shaft.

The conveyers are driven from the shaft B by means of chains or belts traversing sprocket wheels or pulleys as indicated in Fig. 1.

When the bolt is in operation, material is fed in through the hopper *a*, and thence through the shell, the worm, and the openings between the arms *g, g* of the reel head to the bolt cloth. As the cloth, the elevators, and the drum revolve in the direction indicated by the arrow in Figs. 3 and 4, part of the material is caught by the elevators on the upward moving side of the bolt and discharged therefrom on the outer surface of the drum, whence it is returned to the bolting cloth; some of it going over the drum and being delivered to the bolting cloth on the downwardly moving side of the bolt. Part of the material which is carried over the top of the drum is delivered to the bolting cloth at a comparatively short distance below the highest point of the drum, owing in part to the centrifugal action upon the material produced by the rotation of the drum, together with the acceleration due to the sudden throw or tipping of the elevators.

It will be readily understood from an examination of Fig. 4, that the relative positions of the elevators and of the surface of the drum are such as greatly to facilitate the bolting or sifting action, because they assist in properly directing the material around the inner surface of the bolting cloth and in contact therewith, not only upon the upward moving side of the reel, but also upon its downward moving side.

Owing to the fact that the elevators do not and cannot make contact with the bolting cloth because of the interposition of the cloth hoops or rings, or other stop, a narrow space is left between the elevators and the cloth on the ascending side of the reel, through which space a portion of the material escapes and travels over the bolting cloth between the elevators.

In operating this bolt, it will be found that with a proper speed of rotation, say about thirty revolutions per minute for a reel of thirty-six inches in diameter, the material

will be sifted through the cloth on both the upwardly-moving side and the downwardly-moving side, up to a line drawn horizontally through the reel about half way between its 5 axis and its highest point. Thus nearly the whole area of the cloth will be made available for bolting purposes.

While on some accounts I prefer to use a cylindrical drum without projections or depressions, I do not wish to be restricted there- 10 to, because the surface might be corrugated, ribbed or troughed, as is sometimes done in this class of bolts. Nor do I wish to be limited to the use of a drum which rotates in the 15 same direction with the reel; nor to one that moves at the same speed therewith.

The smooth drum I deem materially better than a ribbed or corrugated one, not only because of its greater cheapness and ease of 20 manufacture, but because of the greater facility with which the stock glides over its surface when delivered from the elevators, whereby it is caused to preserve the speed and direction of movement imparted to it by 25 the elevators.

Having thus described my invention, what I claim is—

1. In a bolting reel, the combination of a bolting cylinder, a central shaft, a drum within the cylinder, spiders carried by the shaft, 30 and elevators extending lengthwise of the reel between the bolting cylinder and the drum, and having their ends directly supported by the spiders.

2. In a bolting reel, the combination of a bolting cylinder, a central shaft, a drum within the bolting cylinder, and elevators between the bolting cylinder and the drum, said elevators having journals seated in the spiders, 35 whereby they are enabled to rock or tip.

3. In a bolting reel, the combination of a bolting cylinder, a central shaft, a smooth drum within the bolting cylinder, spiders carried by the shaft, and tipping elevators located between the bolting cylinder and the 45 drum and journaled in the spiders, substantially as and for the purpose explained.

4. In a bolting reel, the combination of a bolting cylinder, a central shaft, a drum within the bolting cylinder, spiders carried by the 50 shaft, bars connecting the spiders and provided with studs or posts, cloth hoops or rings secured to said studs, and elevators extending lengthwise of the reel between the bolting cylinder and the drum and having their ends 55 directly supported by the spiders.

5. In a bolting reel, the combination of a bolting cylinder, a drum within the cylinder, a central shaft, spiders carried by the shaft, rods connecting the spiders and provided with 60 studs, cloth-hoops secured to said studs, and elevators having journals seated in the spiders.

6. In combination with a bolting cylinder, a drum within the cylinder, a central shaft, and spiders carried by the shaft, bars connecting the spiders, cloth rings carried by the bars, and elevators journaled in the spiders and adapted to swing outward against the cloth rings and inward toward the drum. 65

7. In a bolting reel, the combination of a 70 bolting cylinder, a drum within the cylinder, a central shaft, spiders T, T, carried by said shaft, and elevators L having journals *w* seated in said spiders.

8. In a bolting reel, the combination of a 75 bolting cylinder, a drum within the cylinder, a central shaft, spiders T, T, carried by said shaft, and elevators L having journals *w* seated in the spiders, one of said spiders being capable of adjustment about the shaft to 80 cause the elevators to stand oblique to or parallel with the axis of the shaft as required.

9. In a bolting reel, the combination of a bolting cylinder, a drum within the cylinder, a central shaft, spiders carried by said shaft, 85 bars U connecting said spiders, and elevators L having journals *w* seated in the spiders.

In witness whereof I hereunto set my hand in the presence of two witnesses.

MYRON W. CLARK.

Witnesses:

W. L. DUNBAR,
R. H. DUNBAR.