(No Model.) 2 Sheets—Sheet 1.

Z. C. ELDRED.

CENTRIFUGAL REEL.

No. 387,057. Patented July 31, 1888.

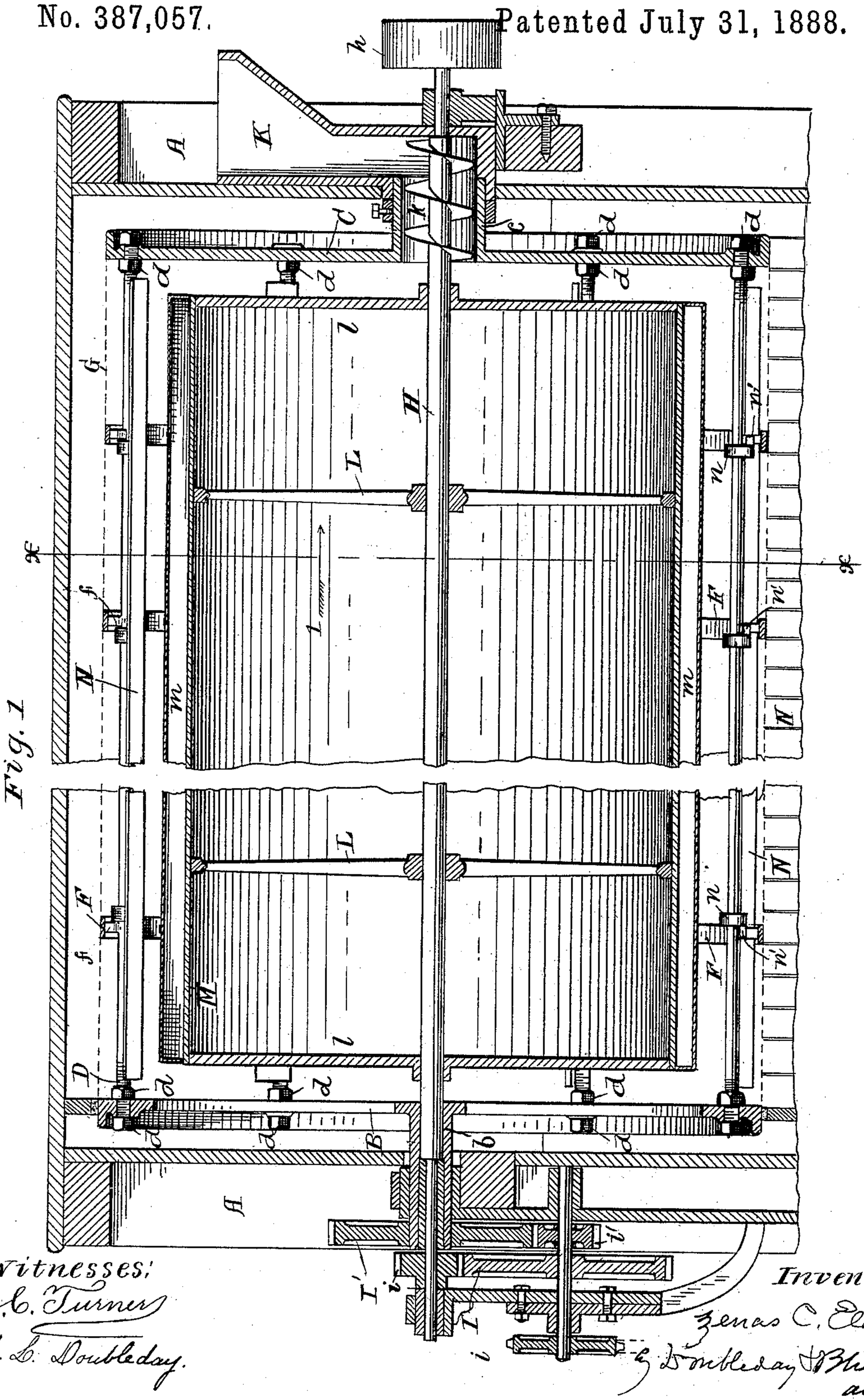

Fig. 1.

Witnesses:
J. C. Turner
J. L. Doubleday.

Inventor:
Zenas C. Eldred.
by Doubleday & Bliss
attys.

(No Model.)

2 Sheets—Sheet 2.

Z. C. ELDRED.

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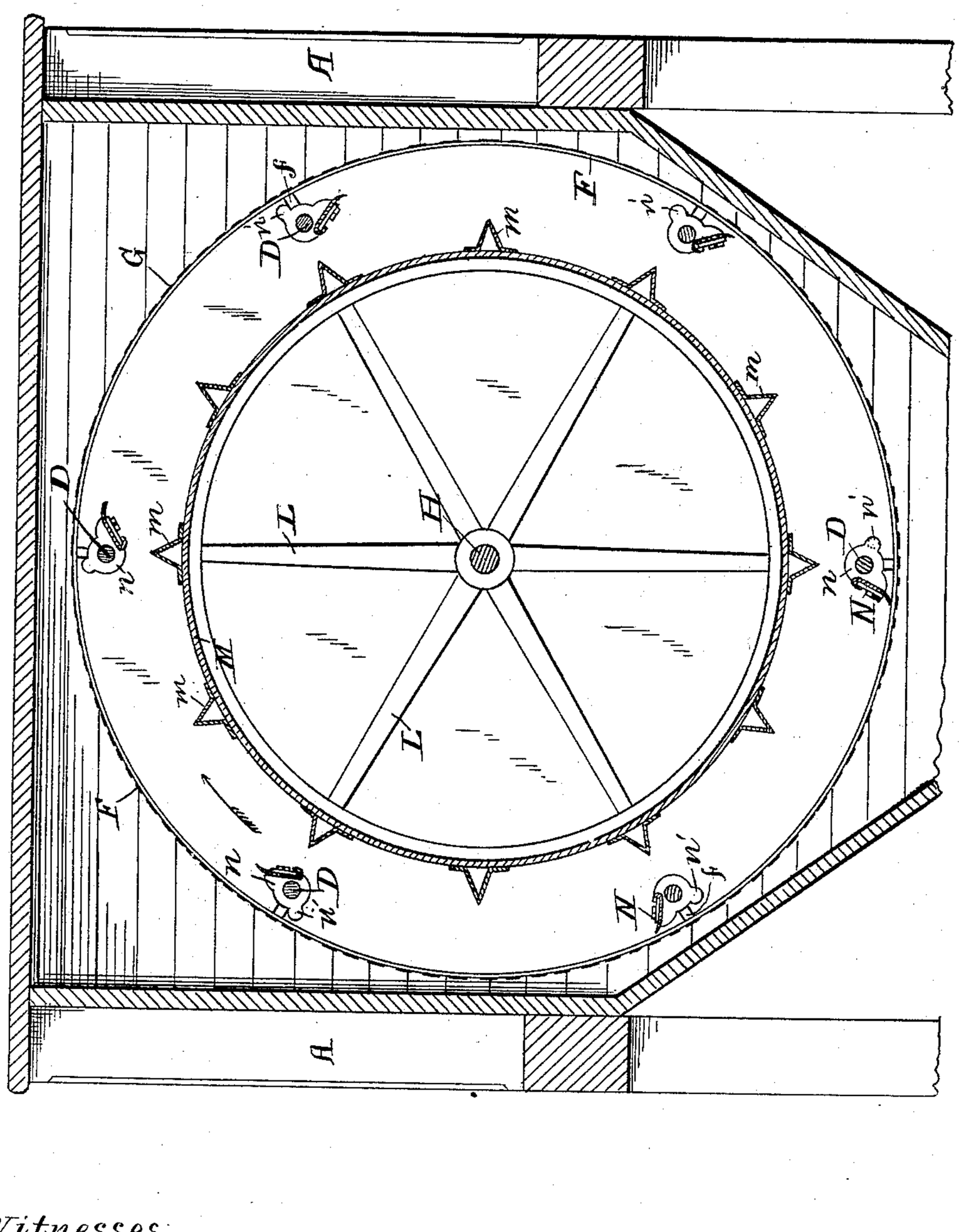

Fig. 2.

Witnesses:
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UNITED STATES PATENT OFFICE.

ZENAS C. ELDRED, OF JACKSON, MICHIGAN, ASSIGNOR TO THE GEORGE T. SMITH MIDDLINGS PURIFIER COMPANY, OF SAME PLACE.

CENTRIFUGAL REEL.

SPECIFICATION forming part of Letters Patent No. 387,057, dated July 31, 1888.

Application filed April 12, 1887. Serial No. 234,527. (No model.)

To all whom it may concern:

Be it known that I, ZENAS C. ELDRED, a citizen of the United States, residing at Jackson, in the county of Jackson and State of Michigan, have invented certain new and useful Improvements in Centrifugal Reels, of which the following is a specification, reference being had therein to the accompanying drawings.

Figure 1 is a vertical central longitudinal section of my improved centrifugal reel. Fig. 2 is a vertical transverse section on line *x*·*x*, Fig. 1, looking in the direction of the arrow 1, same figure.

The invention relates to a novel combination of parts, each of which, separately considered, is old, and will be particularly pointed out in the claims.

Prior to my invention the flier of a centrifugal reel had been made in the form of a closed drum circular in cross-section, and provided with longitudinal tangentially-arranged blades mounted upon the outer surface of the drum and driven at such speed as to insure that material being bolted should by the action of the flier be driven against the inner surface of the surrounding bolting-cloth in such manner that nearly the entire surface of the cloth should be utilized. Such construction is shown, for instance, in Patent No. 267,098 to Jonathan Mills.

Another well-known form of reel is that shown in Reissued Patent No. 10,617, N. W. Holt, which consists, essentially, of a closed drum within a surrounding bolting-reel and rotating at the same speed as the bolting-reel, whereby material is carried up by the outer reel, dropped upon the inner drum, and discharged thence upon the bolting-cloth of the downward-moving side of the reel. In this Holt construction the outer reel is run at such speed as to carry up material and discharge it upon the inner drum, whence it slides off against the bolting-cloth.

So, also, prior to my invention a centrifugal reel having a flier composed of a series of narrow beater-blades mounted upon the peripheries of spiders, constituting an open or skeleton flier, had been combined with a series of tilting or oscillating elevators mounted in the heads of the frame-work over which the bolting-cloth is stretched, and adapted to have their outer edges tilt into close proximity to the cloth while traversing the lower part of their path to pick up material which had accumulated in the lower part of the bolt, carry it up with the upward-moving side of the reel, and tilt inward, thus discharging their loads or portions of the same upon the flier.

My invention has for its object the construction of a reel which shall combine the advantages of both the earlier forms without being subject to the imperfections of either.

Like letters of reference indicate like parts in both the figures.

A A represent, generally, the frame-work and casing.

B C are the reel-heads, provided, respectively, with hollow trunnions *b c*, mounted in bearings on the frame-work.

D D are stay-rods connecting the reel-heads, to which they are secured by nuts *d d* on their threaded ends.

F F are cloth-rings mounted upon the stay-rods by means of interposed carriers *f f*.

The bolting-cloth is indicated by the dotted line G.

It will be seen that there is a practically unbroken bolting-surface around the entire circumference of this reel by reason of the cloth-hoops being supported upon carriers.

H is the beater-shaft, arranged concentric to the bolting-reel and its trunnions, and is driven by a band-pulley, *h*, belted to any suitable motor.

I I′ *i i′* indicate a train of gearing connecting the beater-shaft with one of the bolting-reel trunnions, whereby when the machine is in operation the beaters are driven at a higher rate of revolution than is the bolting-reel. Under ordinary circumstances I recommend the relative speeds to be twenty to twenty-five revolutions per minute for the bolting-reel and sixty to one hundred for the flier; but of course either or both of these parts may be driven at a higher speed should it be found desirable.

K is a feed-hopper, and *k* a worm on the beater-shaft.

L L are spiders keyed to the beater-shaft.

M is an inclosing-shell, circular in cross-section and fitting closely the outer peripheries of the spiders, to which it may be attached by riveting, soldering, or otherwise, as shall be found convenient.

l l are drum-heads, preferably of sheet metal, and serving to close tightly the ends of the drum. I prefer such construction of drum, but do not wish to be limited thereby, because I may employ solid drum-heads of metal or wood, and I may make the shell of the drum of wood or other suitable material.

m m are a series of longitudinal blades, ribs, or beaters attached to and carried by the drum. By preference I make them of sheet metal, V-shaped, and solder their edges to the drum, particularly when the shell of the drum is made of galvanized iron.

N N are elevators pivoted upon the stay-rods, so as to oscillate thereon. By preference I employ a series of blocks or perforated arms or hangers, *n n*, having eyes or loops which surround the stay-rods, and are provided with projecting spurs *n'*, adapted to engage with the carriers of the cloth-rings and limit the extent to which the elevators can tilt toward the drum. The object of using these stops is to prevent the elevators from swinging so far inward toward the drum as to be struck by the rapidly-revolving blades *m m*, thus enabling me to use a much larger flier than I could otherwise. Therefore the flier can be run at a slower speed and yet do its work more effectively than would be possible in case the elevators were allowed to swing without restriction.

When the machine is in operation, the elevators will assume substantially the positions indicated in Fig. 2, and will effectually prevent any undue accumulation of material in the bottom of the bolting-reel by constantly carrying up material and pouring it upon the flier, which latter in turn throws it off against the cloth, its centrifugal action being substantially the same as that of fliers in ordinary centrifugal reels, with the further advantage, by reason of the surface of the drum being continuous, that nothing can fall between the blades to the bottom of the reel, and with the further advantage that there is little or no tendency to draw air-currents in at the center of the reel through the trunnions, and with still another advantage—to wit, that the construction and combination shown insures that the lower part of the bolting-reel shall not be unduly loaded, and that, also, the material shall be distributed with great uniformity against the entire inner surface of the cloth.

I am aware of British Patent No. 7,820, 1884, to Dell, and German Patent No. 31,307, to Kreiss, and do not claim any invention shown therein; but my invention possesses many advantages in practical operation over any of the above-referred-to prior ones. For instance, by reason of the outer reel being provided with elevators it can be run at a comparatively low speed, and yet carry up material in such quantities as to effectually prevent any accumulation in the bottom of the bolt, and will carry such material farther above the axis of the reel than would be practicable with a bolt not having elevators and run at any ordinary speed. So, also, by the combination, with a reel thus provided with elevators, of an inner relatively fast-moving drum, the material carried up by the elevators will be thrown against the bolting-cloth throughout a very much larger portion of its inner surface than is possible with a drum running at the same speed as that of the outer reel, while the speed of the inner drum may be very much slower than is required with an ordinary flier consisting of spiders and blades. In fact, a reel which contains my invention can be successfully operated when running at a much lower speed than is possible with any of the heretofore known combinations of parts, whereby desirable results are attained, both as regards economy in operating and efficiency as a bolter.

It is obvious that by reason of the slow movement of the bolting reel such material as slides down over the cloth upon either the up-moving side or the down-moving side would be bolted much more rapidly than would be possible with a quickly-moving cloth. At the same time there is much less of the breaking up and reducing to fine dust of the flour with my slowly-moving ribbed drum than is necessarily effected with the rapidly-moving beaters of a flier.

What I claim is—

1. The combination, with the inner drum provided with the longitudinal blades, of the bolting-reel and the tilting elevator, substantially as set forth.

2. In a flour-bolt, the combination of an outer relatively slow-moving bolting-reel provided with internal elevators, and an inner relatively fast-moving drum adapted to receive material carried up by the elevators and discharge the same against the bolting-cloth, substantially as set forth.

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

ZENAS C. ELDRED.

Witnesses:

GEO. S. BENNETT,

WM. H. DICKEY.