

(No Model.)

A. HEINE.

FLOUR BOLT.

No. 346,282.

Patented July 27, 1886.

Fig. 1.

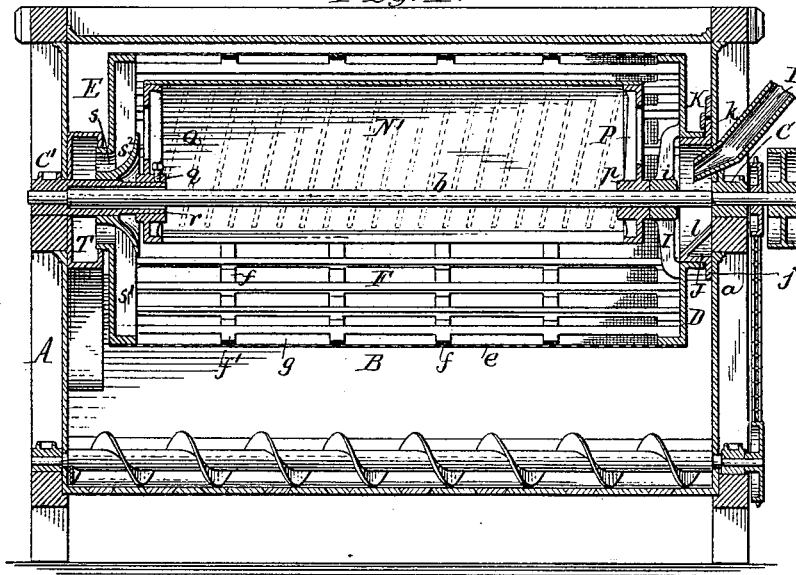


Fig. 2.

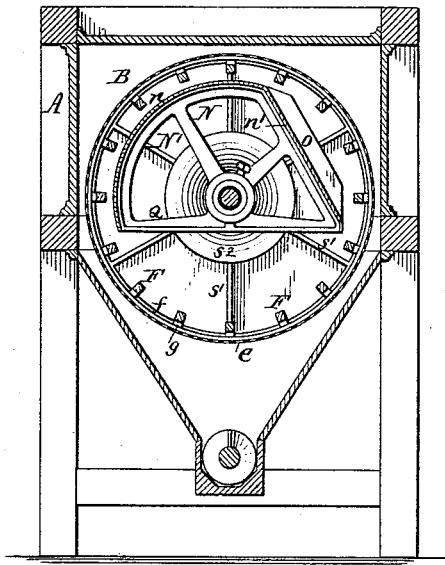


Fig. 3.

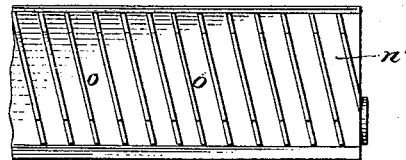


Fig. 4.

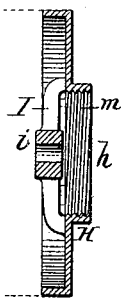


Fig. 5.

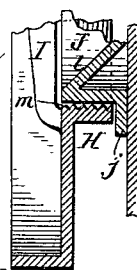
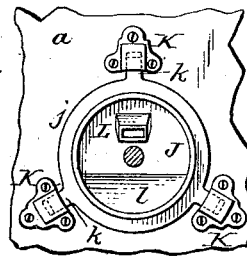


Fig. 6.



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# UNITED STATES PATENT OFFICE.

AUGUST HEINE, OF SILVER CREEK, NEW YORK.

## FLOUR-BOLT.

SPECIFICATION forming part of Letters Patent No. 346,282, dated July 27, 1886.

Application filed February 26, 1886. Serial No. 193,350. (No model.)

*To all whom it may concern:*

Be it known that I, AUGUST HEINE, of Silver Creek, in the county of Chautauqua and State of New York, have invented new and useful Improvements in Flour-Bolts, of which the following is a specification.

This invention relates principally to an improvement in that class of flour-bolts which are composed of a revolving reel provided on the inner side of its bolting-surface with elevating ribs or contrivances whereby the material under treatment is elevated and carried around with the bolting-surface, thereby distributing the material constantly over the greater portion of the bolting-surface.

The object of my invention is to provide means for separating and removing the light floating impurities from the more valuable particles, thereby improving the quality and color of the bolted material, to increase the bolting capacity and to render the machine more efficient in other respects.

My invention consists in that end of the improvements which will be hereinafter fully set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a longitudinal sectional elevation of a flour-bolt provided with my improvements. Fig. 2 is a cross-section of the same. Fig. 3 is a fragmentary elevation of the inclined portion of the deflector. Fig. 4 is a sectional view of the reel-head located at the feed end of the reel. Fig. 5 is a fragmentary sectional view of said reel-head and connecting parts on an enlarged scale. Fig. 6 is an elevation of the movable ring at the head of the machine.

Like letters of reference refer to like parts in the several figures.

A represents the stationary case of the machine; B, the revolving reel, and *b* the shaft on which the reel is mounted, and which is journaled in bearings C C'. The reel-frame consists of a head, D, located at the feed end of the reel, a head, E, located at the tail end of the reel, and longitudinal ribs F, connecting the heads D and E on the inner side of the bolting-cloth *c*. The latter is stretched around rings *f*, which rest against short projections *f'*, formed on the outer sides of the ribs F, so that open spaces *g* are formed be-

tween the ribs F and the bolting-cloth *c*. The head D at the feed end of the reel is provided with a central opening, *h*, which is surrounded by a forwardly-projecting collar, H.

I represents a spider or arms, which connect the head D to a hub, *i*, by which it is secured to the shaft *b*.

J represents a ring or collar, which fits snugly within the collar H, and which is attached to the rear side of the front wall, *a*, of the case of the machine. The ring J is provided with a flange, *j*, which rests against the wall *a*, and with radial arms *k*, seated in sockets K, which are secured to the wall *a*. The sockets K are somewhat deeper or longer than the arms *k*, so that each arm is capable of a certain longitudinal movement in its socket, whereby the ring J is enabled to adjust itself on the case to the position of the reel-head D when the relative position of the reel and case becomes altered by shrinkage of the wood or from other causes. This adjustability of the ring J prevents the parts from binding on each other, and insures a snug fit of the collars H and J at all times.

L represents the feed-spout, which delivers the material to be bolted into the chamber formed by the ring J, which latter is provided with an inclined bottom, *l*, whereby the material is directed into the reel through the opening *h* of the head D.

*m* represents an internal screw-thread formed in the collar H in such manner that the rotation of the screw-thread with the reel will cause any particles entering between the collars H and J to be worked backward into the reel.

N represents a deflector or bridge arranged lengthwise in the upper portion of the reel and made convex on its upper side and concave on its lower side, so as to form on its under side a passage or chamber, N'. The deflector N is preferably curved on one side concentric with the ascending side of the reel, as shown at *n*, and is inclined at its opposite side, as shown at *n'*. The inclined portion *n'* is provided on its outer side with inclined deflecting-boards *o*, whereby the material falling on this inclined portion is deflected toward the tail of the machine. The front end of the deflector N is

supported on the shaft *b* by arms *P* and a hub, *p*, in which latter the shaft *b* revolves. The rear end of the deflector is provided with arms *Q* and a hub, *q*, which latter is secured by a set-screw, or otherwise, to an extension, *r*, of the bearing *C'*. By this means the deflector *N* is held stationary within the reel.

The head *E* at the tail end of the reel is provided with a central discharge-opening, *s*, elevating ribs *s'*, and a deflecting cone, *s''*, whereby the tailings are discharged from the reel and delivered into the discharge-spout *T* in a well-known manner.

The material to be bolted is introduced into the reel through the spout *L* in such quantities that the reel is kept well loaded, and the feed-spout is made so large that copious quantities of air are permitted to enter the reel with the material to be bolted. The ribs *F* elevate a large portion of the material which lies upon the bottom of the reel and distribute the same constantly over a large portion of the bolting-surface. A portion of the elevated material runs back over the bolting-surface and is bolted. Another portion is elevated above the deflector *N* and falls on the same. The deflector prevents this portion of the material from falling directly on the material which rests on the bottom of the reel and returns it to the bolting-surface; but its most important function is to form an eddy-chamber in which the light floating impurities can accumulate and separate from the heavier and more valuable portions of the material. The chamber *N'*, formed on the under side of the deflector *N*, is protected against the disturbing action of particles falling through the same, and the light floating impurities therefore remain in this comparatively quiet space and pass slowly with the air toward the tail end of the machine and escape finally through the discharge-opening *s* with the tailings. The heavier and more valuable particles which may have become suspended in the air-current passing through the reel, settle in this chamber *N'*, and are returned to the mass of material resting on the bottom of the reel. By this means the reel can be fully loaded and a large portion of the material can be constantly kept in contact with the bolting-cloth without causing specks and other light impurities to pass through the bolting-cloth, thereby increasing the bolting capacity and at the same time improving the quality of the bolted material. An air-current sufficient to remove the light impurities is caused by the revolution of the reel and its feed and discharge devices; but, if desired, a fan or other air-propelling device may be employed for the purpose. The material which falls from the elevating-ribs upon the deflector is deflected by the latter partly against the bolting-cloth and partly against the ribs, which latter in turn dash the material and throw it against the deflector, and by this repeated dashing the material is loosened, and the light impurities

are caused to become suspended in the air, while the heavier valuable particles are caused to pass through the bolting-cloth, thus enabling the upper portion of the reel to perform a large share of the operation of bolting. The concentric portion *n* of the deflector or bridge *N*, which is arranged opposite the ascending side of the reel, confines the falling material in a narrow space, where it is met by the ascending ribs and gently dashed or thrown against the bolting-cloth. Part of the material passes through the open spaces *g* between the ribs *F* and the bolting-cloth, whereby the bolting capacity of the reel is increased, and the material is prevented from accumulating on the ribs to such an extent as to interfere with the dashing action of the same. The inclined portion *n'* of the deflector, which is arranged opposite the descending portion of the reel, directs the descending material against the bolting-cloth, and the deflecting-boards *o* give the material a tendency to move toward the tail of the machine. The two parts of the deflector diverge downwardly and form a bridge resembling an arch, with its lower ends distended and separated by a wide opening, which permits all the heavy and valuable particles which may enter the space under the machine to drop upon the mass of material below, while it allows at the same time the free entrance of the floating material into the quiet space or chamber *N'* under the arch. This floating material escapes finally from the chamber *N'* through the spaces between the arms *Q*, whereby the rear end of the deflector *N* is supported, as represented in Fig. 2.

I claim as my invention—

1. The combination, with a revolving reel provided on its inner side with elevating-ribs *F*, separated from the bolting-surface by open spaces *g*, of a deflector, *N*, provided with a wall, *n*, curved concentric with the reel and separated from the bolting-surface by a narrow space, through which the ribs *F* move freely and through which the material is elevated and allowed to dash again upon the said ribs, substantially as set forth.

2. The combination, with a revolving reel provided on its inner side with elevating-ribs, of an arch-shaped deflector, *N*, composed of a concentric portion, *n*, arranged opposite the ascending side of the reel, and an inclined portion having deflecting-boards *o*, and arranged opposite the descending side of the reel, substantially as set forth.

3. The combination, with the casing *A*, provided with a bearing, *C*, and a bearing, *C'*, having an extension, *r*, the reel *B* and the reel-shaft *b*, of the deflector *N*, secured at one end to the extension *r* and supported at the opposite end upon the shaft *b*, substantially as set forth.

4. The combination, with the stationary case and the reel-head *D*, of a ring, *J*, joined to the head and supported movably on the

case, whereby the ring J can adjust itself on the case to the position of the reel-head, substantially as set forth.

5 5. The combination, with the stationary case and the reel-head D, of a ring, J, joined to said head and provided with arms k, and sockets K, secured to the case and holding the arms k loosely, substantially as set forth.

6. The combination, with the feeding-ring

J, of the reel-head D, provided with a collar, to H, having an internal screw-thread, substantially as set forth.

Witness my hand this 23d day of February, 1886.

AUG. HEINE.

Witnesses:

CARL F. GEYER,  
OSCAR SCHAUB.