S. Males,

Cider Mill.

No. 107,187. Patented Sept. 6. 1870.

Fig.1.

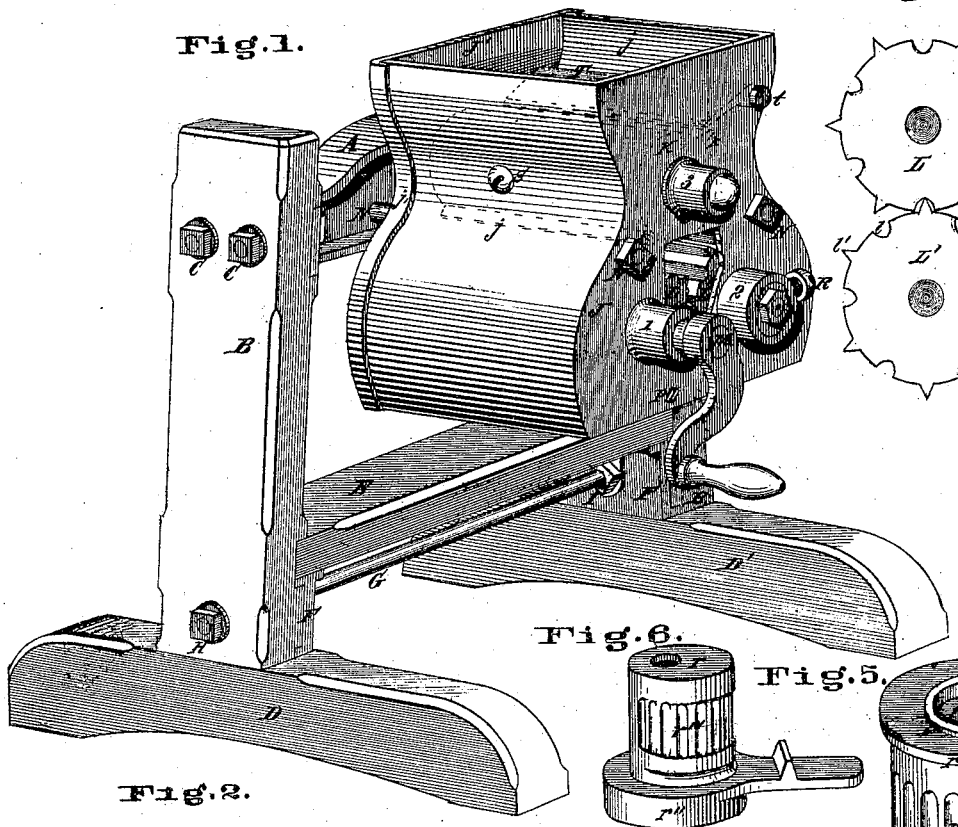


Fig.4.

Fig.6.

Fig.5.

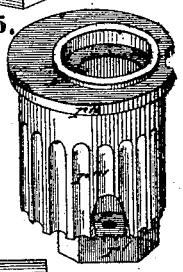


Fig.2.

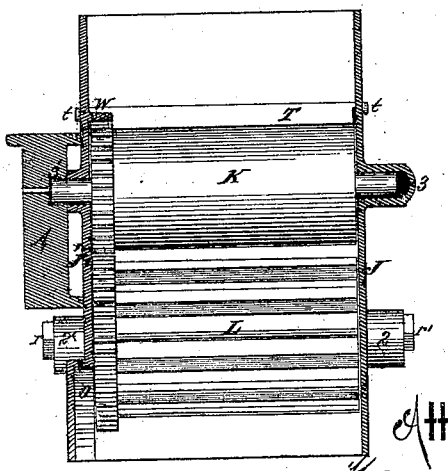
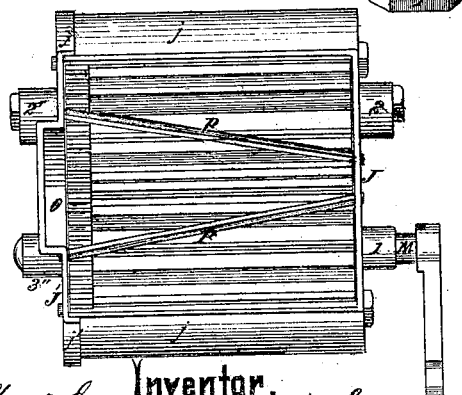


Fig.3.



Attest.

Henry Millward
Chas Lockley

Inventor.

Samuel Males
By F. Millward
Attorney

United States Patent Office.

SAMUEL MALES, OF CINCINNATI, OHIO.

Letters Patent No. 107,187, *dated September* 6, 1870.

IMPROVEMENT IN CIDER-MILLS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, SAMUEL MALES, of Cincinnati, Hamilton county, State of Ohio, have invented certain new and useful Improvements in Cider-Mills; and I hereby declare the following to be a sufficiently full, clear, and exact description thereof to enable one skilled in the art to which my invention appertains to make and use it, reference being had to the accompanying drawings making part of this specification.

My invention consists—

Firstly, of a peculiar construction of hopper and grinding-chamber, by which two bolts alone suffice to connect the parts together and to the frame of the machine.

Secondly, in the provision of a knee and bolt for connecting the frame of the machine together at the bottom.

Thirdly, of a certain construction of case by which the "pomace" collected in the interdental spaces of the gear-wheels, at the ends of the grinding-rolls, is scraped off and conducted to the general discharge.

Fourthly, in the provision of peculiarly-constructed cam-shaped journal-bearings, for one or both of the lower rollers, for adjusting the distance between the rolls.

Description of the Accompanying Drawings.

Figure 1 is an exterior perspective view of a cider-mill embodying my invention.

Figure 2 is a vertical central section of the same.

Figure 3 is a plan of the under side of the mill.

Figure 4 is a view showing the configuration of the grinding-rolls.

Figure 5 is a perspective view of the cam-shaped journal-bearing.

Figure 6 is a modification in the construction of the cam-shaped journal-bearing.

General Description.

The cross-head A, to which the mill is secured, is formed with heavy flanges at the ends, which are housed into the posts B B′, and firmly secured to the posts by means of bolts C. A stiff and strong connection is thus formed between the cross-head and posts.

The posts B B′ are mortised into the sills D D′, the sills forming a firm foundation for the mill.

E is a cross-sill, housed into the posts B B′ at the ends, for supporting the customary "press-curb" under the cross-head A, the latter being so constructed that it may receive a press-screw to work in the curb.

The press-screw and curb are not shown, as they are of ordinary construction, and may be seen in the Letters Patent No. 52,583, for improvement in cider-mills, granted to me February 13, 1866.

The sill E is firmly supported at the ends by the knees F F′, which rest upon the sills D D′, and are fitted into the posts B B′ in the manner shown.

The posts B B′, knees F F′, and sill E are firmly connected together by means of a single bolt, G, which is screw-threaded at both ends, and fitted with tightening-nuts H and lock-nuts I. The nuts H are used to draw the parts together, and the nuts I to prevent the displacement of the knees F F′.

The case of the mill, which comprises the grinding-chamber and hopper, is made in two parts, J and J′. The part J′ may either be detachable from the cross-head A, or cast in one piece with it.

The sides *j* may be cast in one piece with either of the ends J or J′.

K is the feeding-roller of the mill, situated immediately below the mouth or hopper, and L L′ are the grinding-rollers.

The lips *j′* on the end J′ are provided to inclose the end of the sides *j*.

The end J is cast with an open-ended journal-bearing, 1, for the driving-shaft M; an open-ended socket, 2, for the reception of the cam-shaped journal-bearing of the roller L′, and a journal-bearing, 3, for the outer end of the upper roller K, which is inclosed, as shown, to form an oil-chamber, the closed end being centrally perforated for the insertion of oil.

On the end J′ is formed a bearing for the opposite end of the roller L′, of the same construction as bearing 2, and two inclosed centrally-perforated bearings, of the same construction as bearing 3, for the ends of the rollers K L.

The bearings on the end J′ are marked 2′, 3′, and 3″.

Two bolts, N, suffice to connect the cross-head A and the case J J′ *j* firmly together.

The gear-wheels connecting the rollers K L L′ are all inside the case, and have teeth formed flaring, as shown in my patent of February 13, 1866, in order that the pomace collected in the interdental spaces of the gear-wheels may be forced out, by the opposing teeth, in the direction of the end plate J′.

The pomace is scraped off the teeth, as it is forced out, by the sharp sides of the cavity O, the cavity having an open vent at the bottom for the free discharge of the pomace.

Holes are cast in the plates J J′ for the reception of the knives or scrapers P, which are set in diagonally, and fit against the rollers L L′ spirally. These scrapers serve to remove the pomace from the rollers more perfectly than if set in line with the rollers, and direct the discharge to one point.

Figs. 5 or 6 illustrates the cam-shaped journal-bearings for the bearings 2 and 2′. The one represented in fig. 5 is formed with a centrally-perforated inclosed end, 1′, which terminates in a hexagon head, *r′*, by

which the bearing is revolved for adjustment. This adjustment serves to change the distance between the rollers L and L′, so that the rollers may be either run in close contact or a little distance apart. The latter adjustment is necessary, when the mill is used to mash grapes, to prevent crushing the seeds or stems.

The bearing, fig. 5, is also formed with a flange, *r″*, which rests against the inside face of the plate J or J′, and thus prevents displacement of the bearing.

It is also provided with grooves *r‴* on its periphery, for the purpose of forming indentations for the point of the set-screw R, fig. 1, which serves to retain the bearing in any position to which it is adjusted.

The provision of the inclosed end *r* prevents the escape of oil from the bearing to waste. This bearing, fig. 5, may be cast on end, as the grooves extend to the outer end.

In the bearing shown in fig. 6 the grooves or channels *r‴* are on the two sides, as this bearing is cast on its side. It is designed to be used on the right or left hand of the mill, in suitable bearings, the flange *r″* alone projecting inside, through a hole somewhat larger than the flange. This bearing is provided with centrally-perforated inclosed end *r*, for retaining the oil, and compelling it to thoroughly lubricate the journal the whole length before it can escape.

The upper roller K of the mill is formed with flanges *k* on its face longitudinally, for the purpose of catching and breaking the apples between the roller K and a suitable concave throat-piece, which is secured to the inside of the hopper by screw S.

On the opposite side to the concave throat a hinged wicket or gate, T, is provided, whose journal ends *t* rest in suitable bearings cast in the plates J J′. This gate, when closed against the roller K, prevents the apples from falling in between the roller K and sides of the mill, and, when open, gives ample room for cleaning out the mill from the top, should it become accidentally choked by hard substances.

The configuration of the rollers L L′ is clearly shown in fig. 4, and is substantially the same in construction and operation as that shown in my patent of February 13, 1866.

The grooves *l* may be equidistant or not, at will, but I prefer to locate them at equal distances on the periphery.

The ribs *l′* may be V-shaped and sharp, as shown in fig. 4, or square-faced, as shown in my patent of February 13, 1866, or V-shaped with a rounded edge. The latter form will answer for large power machines.

On the end J′ of the mill-case an arching hood, W, is formed, which covers the gear-wheel of the roller K in such a way as to prevent the apples contained in the hopper from catching in the teeth of the roller K.

Operation.

The operation of the rollers K L L′, in connection with the case of the mill, is substantially the same as those shown in my Letters Patent of February 13, 1866, and is as follows;

The apples are broken up into small pieces, and fed to the rollers L L′ by the roller K *k*, and, the exterior surface of the rollers L L′ being composed of cylindrical segments and alternating ribs and grooves, the pieces are caught and carried in between the rollers, and there perfectly crushed, and discharged, the ribs *l′* serving to clean out the grooves *l* at each turn. The ribs and grooves alternating, as shown, the pieces of apple are prevented from slipping back, in the manner seen in mills in which the ribs are all on one roller, and grooves on the other. The ribs *l′* catch the pieces of apple as they fall from the roller K, and the pieces are firmly held by the rib of one roller and the grooves of the other, as in a close chamber, until they are carried between the rollers, and thoroughly crushed, the ribs meshing into the grooves so perfectly that the rib will clean out its own groove, and crush nearly as perfectly as the segmental arcs.

Mills constructed upon this plan will feed, crush, and discharge perfectly, under all circumstances, regardless of size or power, while it is well known that mills having a hollow and round configuration for the rollers will not crush without damaging the pomace, and are incapable of discharging without exterior aid.

Claims.

1. The combination and arrangement of the cross-head A, bolts N, and the parts J J′ *j j′*, composing the mill-chamber, as described, and for the purpose specified.

2. In the described connection with the posts B B′, sills D D′, and sill E, the knees F F′ and bolt G H I, as described, and for the purpose specified.

3. The scraping and discharging-cavity O, constructed as described, and arranged in the case J J′ *j j′*, substantially as and for the purpose set forth.

4. The cam-shaped journal-bearings, figs. 5 and 6, when formed with perforated inclosed ends *r* and grooves *r‴*, for the purpose specified, in the described connection with the sockets 2 2′ R of the case J J′ *j j′*.

In testimony of which invention I hereunto set my hand.

SAMUEL MALES.

Witnesses:

FRANK MILLWARD,

J. L. WARTMANN.