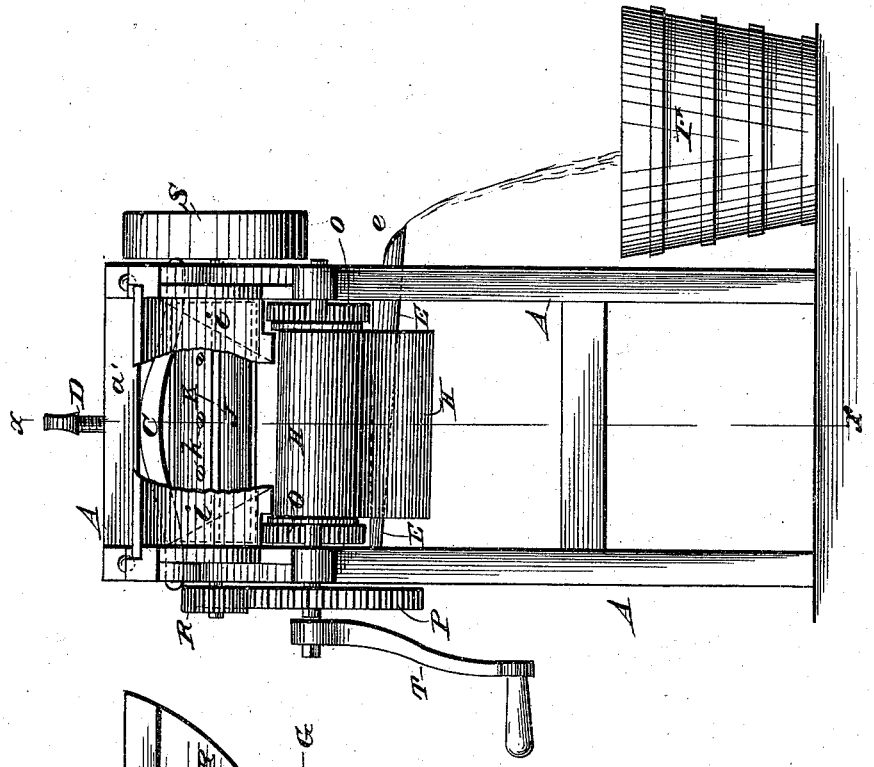
(No Model.) 2 Sheets—Sheet 1.

C. W. BOYLE.

CIDER MILL.

No. 382,408. Patented May 8, 1888.

Fig. 2.



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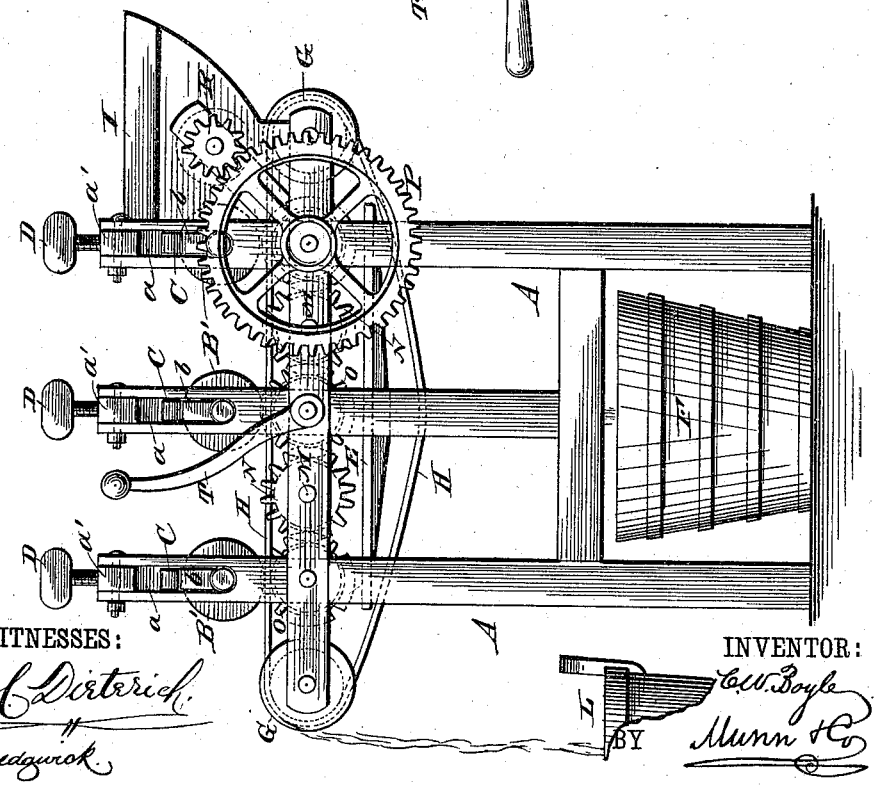

WITNESSES:

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C. Sedgwick.

INVENTOR:

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BY Munn & Co

ATTORNEYS.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 4.

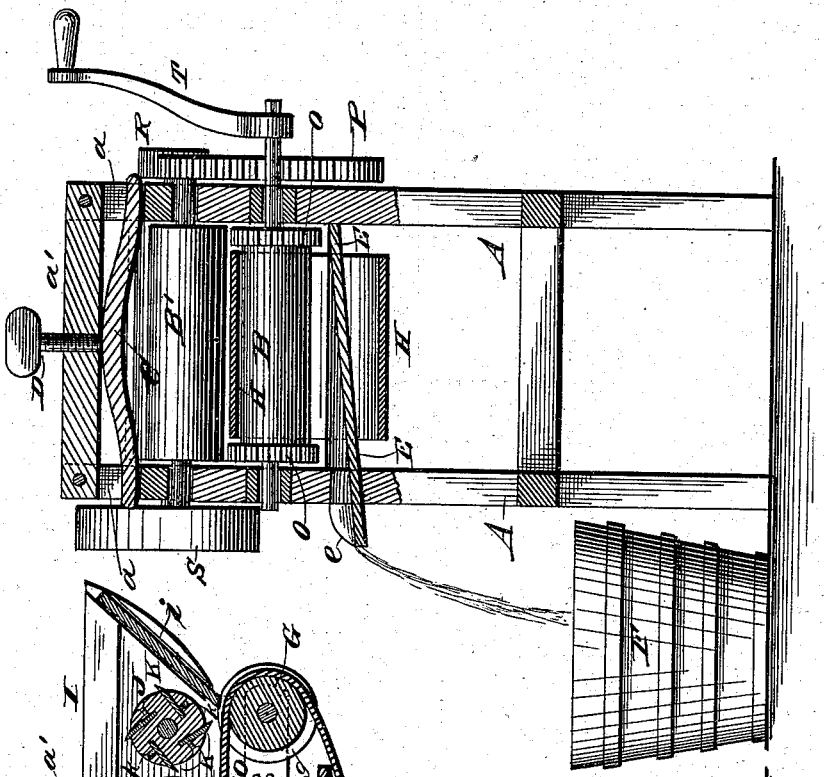
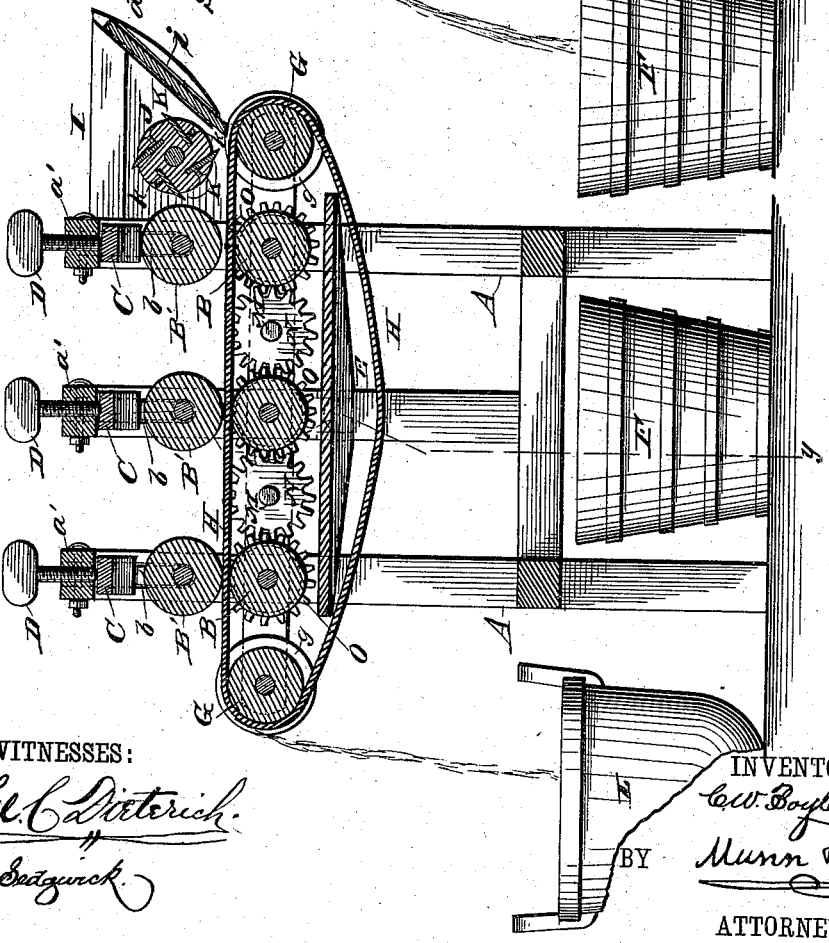


Fig. 3.



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UNITED STATES PATENT OFFICE.

CHARLES WILLARD BOYLE, OF BRADLEY, MICHIGAN.

CIDER-MILL.

SPECIFICATION forming part of Letters Patent No. 382,408, dated May 8, 1888.

Application filed September 17, 1887. Serial No. 249,960. (No model.)

To all whom it may concern:

Be it known that I, CHARLES WILLARD BOYLE, of Bradley, in the county of Allegan and State of Michigan, have invented a new and Improved Cider-Mill, of which the following is a full, clear, and exact description.

My invention relates to a mill or press designed more especially for abstracting the juices of apples and other fruits; and the invention has for its object to provide a simple, inexpensive, and efficient machine of this character.

The invention consists in certain novel features of construction of the mill or press, all as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of my improved cider-mill. Fig. 2 is an end view thereof, with the outer removable wall of the hopper partly broken away. Fig. 3 is a longitudinal vertical section of the mill, taken on the line *x x*, Fig. 2; and Fig. 4 is a transverse vertical section of the machine taken on the line *y y*, Fig. 3.

The mill-frame A may have any ordinary or approved construction, and to it are journaled pairs of pressing-rollers B B′, three pairs of rollers being shown in the drawings; but a lesser or greater number of rollers may be used in smaller or larger machines. The lower rollers, B, of each pair are journaled in fixed bearings in the opposite sides of the frame A, and the shaft of the upper roller, B′, of each pair is journaled in vertical slots *a*, made in the frame-posts, and over the roller-journals in these slots are placed blocks *b*, which form upper yielding-bearings for the rollers, and are normally pressed downward by springs C, which may be made of either wood or metal, and are fitted at their opposite ends in the slots *a*, and are made adjustable as to the tension or pressure they exert on the apples or other fruit or substance being pressed by means of screws D, which are threaded into top cross-bars, *a′*, which connect the opposite side posts of the frame.

Below the pairs of pressing rollers B B′ a wood or metal apron, E, is held to the frame A and inclines a little toward the rear side of the frame, whereby the juice expressed from the fruit will be received on the apron and will be discharged from it into any suitable receptacle, F, placed below the nose or spout *e* of the apron. The lower pressing-rollers, B, are inclined the same way as the apron to facilitate the flow of the juice from the rollers to the lower or outer part of the apron nearest its discharge edge or spout as the work progresses, and thus prevent loss of juice at or over the other ends of the rollers and keep the machine more free and cleanly in its operation than it otherwise would be. The three successive pairs of pressing-rollers B B′ are arranged nearer to each other, so that the next following pair of rollers will press harder on the fruit than the preceding pair and thus effect a gradual and complete abstraction of the fruit-juices.

Two rollers, G G, are journaled at opposite ends of the frame A, about in the line of the bed-rollers B, and around or over these rollers G G, and between the pairs of rollers B B′, and below the discharge-apron E an endless traveling belt, H, of some suitable reticulated or foraminous material or fabric is placed, said rollers G having end flanges, *g*, which hold the belt in place or guide it as it is moved around by the friction induced by the pressing-rollers between which it passes.

The fruit or other substance to be pressed is fed into a hopper, I, at the front end of the machine, wherein it is cut up into fine pieces by a rotating head, J, provided with knives K, and falls thence onto the traveling belt H, which carries it to and between the pressing-rollers B B′, and the juice falls from the belt and lower rollers onto the apron E and into the vessel F, as before explained, while the crushed pomace or waste pulp is carried along by the belt and is discharged from its rear part into a basket or vessel, L, below, as will be understood from the drawings.

The outer end wall, *i*, of the hopper I is preferably fitted to slide into place to allow its removal for access to the cutter-head knives K, which are held in slots in the head by screws *k*, which allow the knives to be readily taken out for sharpening them, and also allows the knives to be adjusted or set out more or less to assure coarser or finer cutting, as circumstances may require.

Power is applied to the machine as follows: Between the shafts of the lower or bed rollers, B, and in opposite sides of the frame A, are journaled intermediate shafts, M, which carry gear-wheels N, which mesh into gear-wheels O on the bed-rollers B, and to the shaft of the first bed-roller is fixed a large gear-wheel, P, which meshes with a pinion, R, on the shaft of the cutter-head J K in the hopper, and at its other end the cutter-head shaft preferably carries a heavy balance-wheel, S, which assists or assures the steady motion of the entire train of gearing. It is obvious that by turning a hand-crank, T, applied to the shaft of either of the lower rollers, B, and preferably to the shaft of the center roller, B, the pairs of pressing-rollers B B′ will be rotated in like directions, and the cutter-head J K will be simultaneously rotated in the feed-hopper while the juice is being pressed from the fruit or other substance being passed between the pressing-rollers. While pressing some substances—sorghum, for instance—the endless belt H may be dispensed with.

This machine may be built in various sizes, to be run either by the hand-crank T or by a power-transmitting belt on the balance-wheel S, and in the smaller sizes will be serviceable to fruit-growers having small crops, which may be pressed as the fruit ripens, and thus avoid waste of the fruit by holding it too long to accumulate sufficient quantity to warrant the expense of carrying it to a distant press. Furthermore, by pressing the fruit immediately it ripens the best quality of juice is obtained.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a cider-mill, of a frame, pairs of pressing-rollers journaled thereon, and an endless belt passed between the rollers, and the bed-rollers inclined toward one end to incline the belt to facilitate discharge of the juice, substantially as herein set forth.

2. The combination, in a cider-mill, of a frame, A, pairs of rollers B B′, journaled thereon and provided with gear-wheels O, shafts M, journaled on the frame, gear-wheels N on said shafts and meshing with the wheels O, springs arranged above the yielding bearings of the upper rollers, B′, an apron, E, below the rollers, an endless belt, H, passed over guides and between the pressing rollers, a hopper, I, opening to the belt, a cutter-head, J K, in the hopper, a gear-wheel, P, on the shaft of one of the rollers B, and a gear-wheel, R, on the cutter-head shaft, all arranged for operation, substantially as described, for the purposes set forth.

CHARLES WILLARD BOYLE.

Witnesses:
E. W. PICKETT,
M. A. BALCH.