

(No Model.)

G. D. COOPER.

COMBINED CIDER MILL AND PRESS.

No. 286,265.

Patented Oct. 9, 1883.

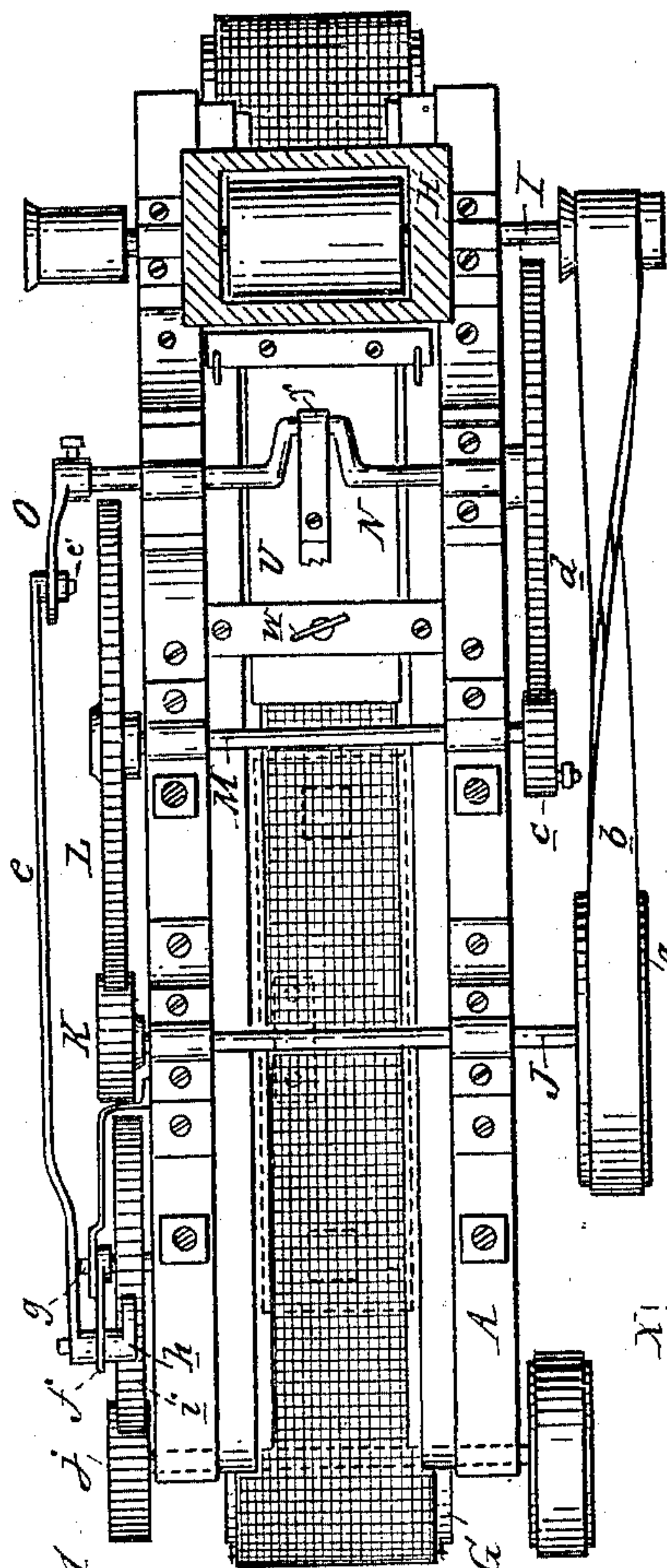


Fig. 1.  $\dot{J}_1$

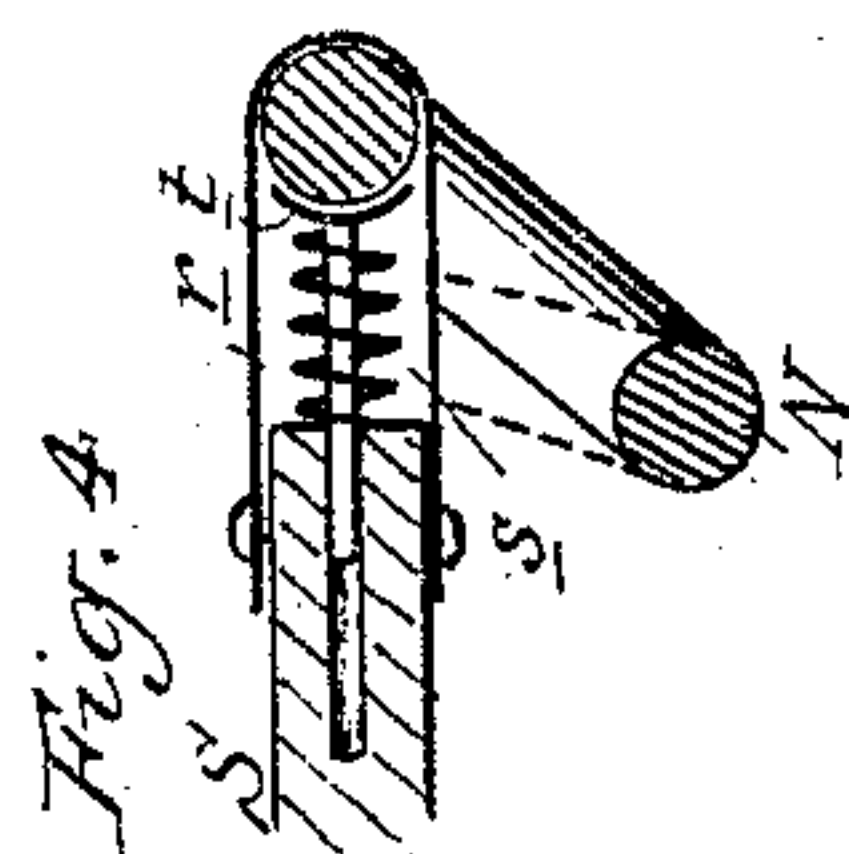


Fig. 4

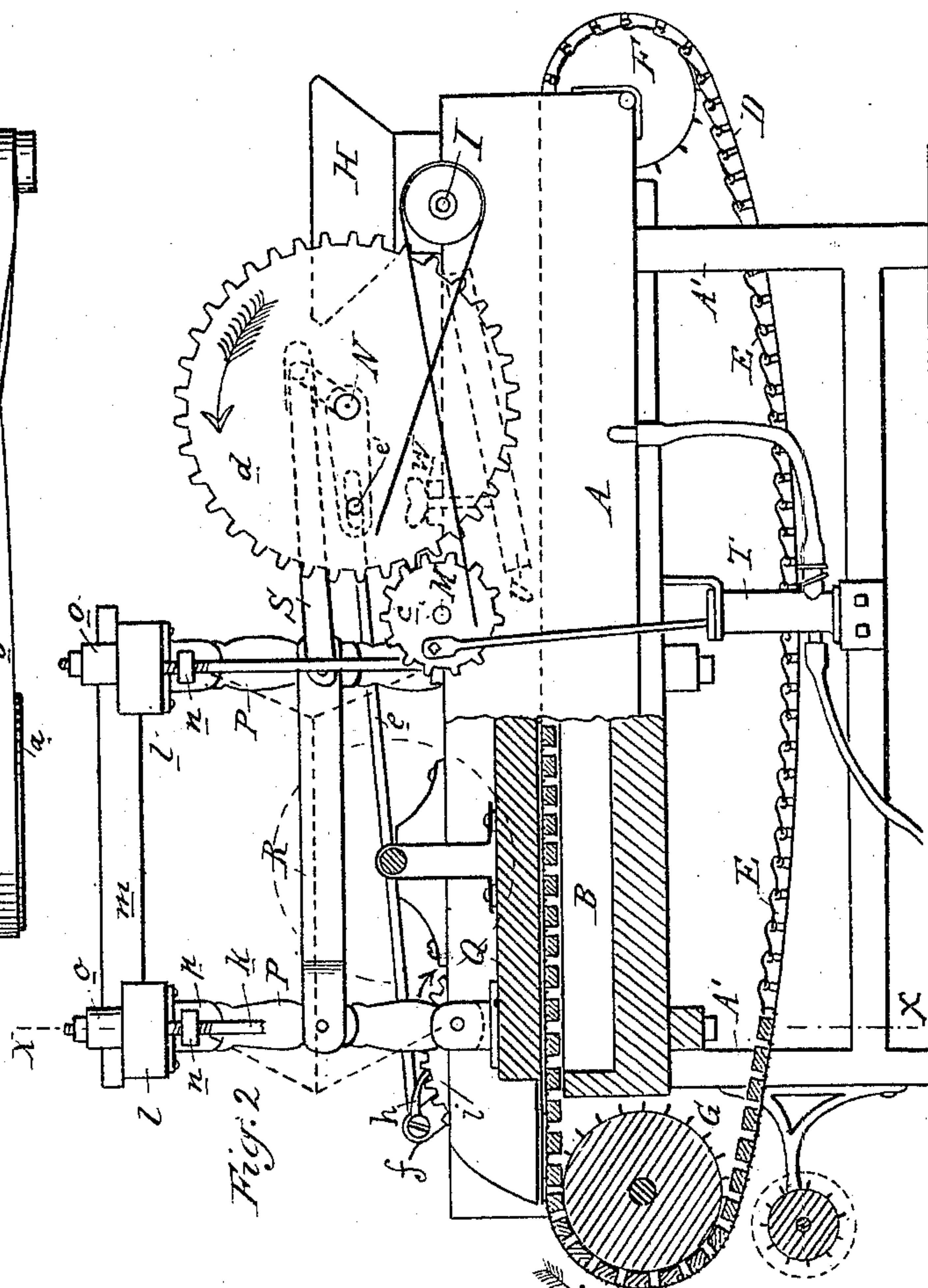


Fig. 2

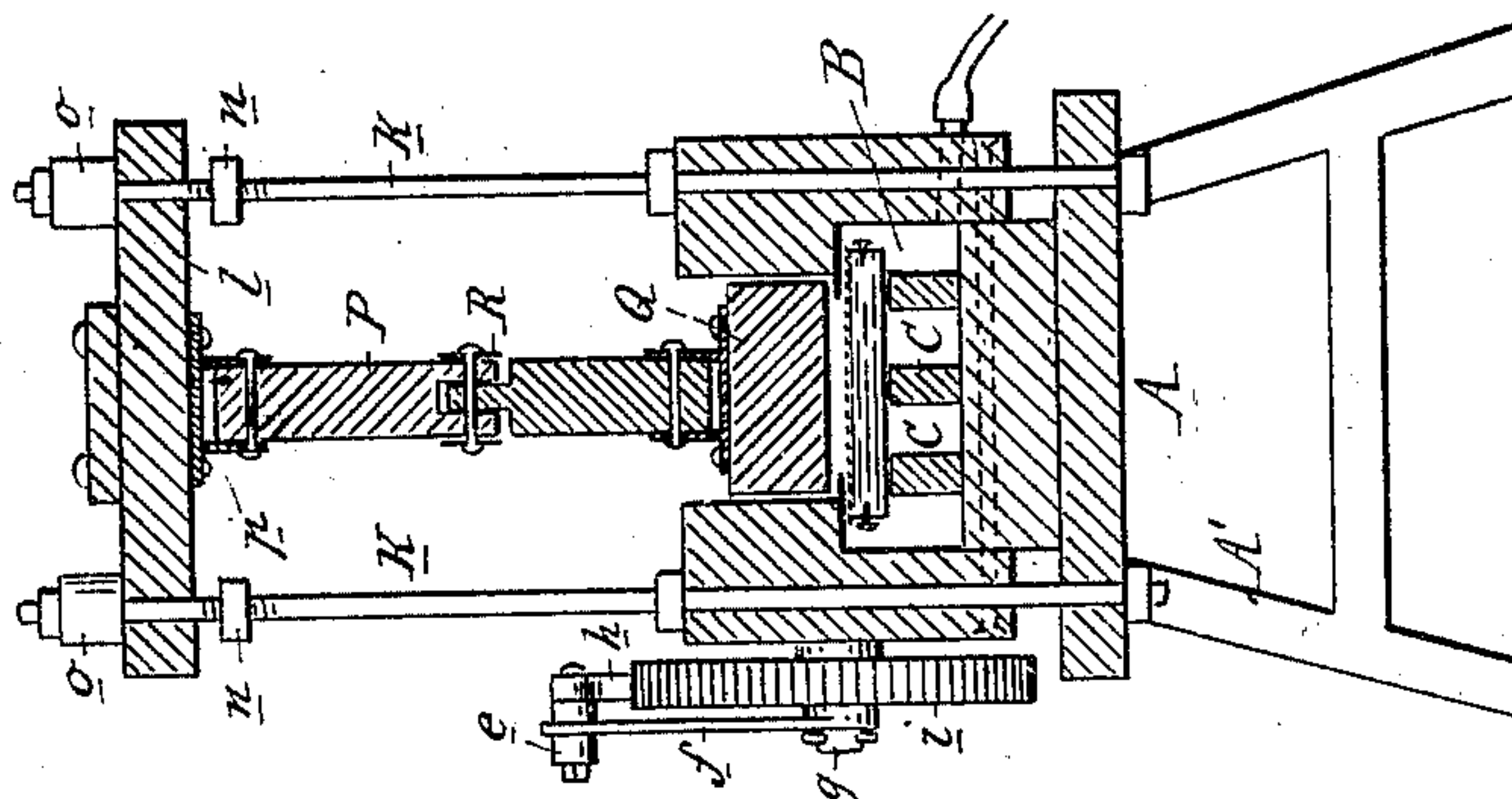


Fig. 3

Attest:

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# UNITED STATES PATENT OFFICE.

GEORGE D. COOPER, OF SHEPARDSVILLE, MICHIGAN.

## COMBINED CIDER MILL AND PRESS.

SPECIFICATION forming part of Letters Patent No. 286,265, dated October 9, 1883.

Application filed February 23, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE D. COOPER, of Shepardsville, in the county of Clinton and State of Michigan, have invented new and useful Improvements in Combined Cider Mill and Press; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to certain new and useful improvements in the construction of a combined cider mill and press, the object of the invention being to construct a machine for the purpose which will avoid the necessity of frequent handling of the pomace and cheese, as is necessary in the employment or use of the ordinary cider-presses; and to that end the invention consists in the peculiar construction and combination of a mill for grinding apples, and cider-press for expressing the juice from the pomace, and endless traveling pomace-rack, which delivers the pomace to the action of the press, and in the peculiar construction, arrangement, and combinations of the various parts, all as more fully hereinafter set forth.

Figure 1 is a plan view of my improved device. Fig. 2 is a sectional side elevation. Fig. 3 is a vertical cross-section on the line X X in Fig. 2. Fig. 4 is a detached section through one end of the connecting-rod.

In the accompanying drawings, which form a part of this specification, A represents the bed of my improved device, which is supported upon suitable legs, A'. Upon this bed is constructed the chamber B, water-tight on sides, bottom, and end, but open at top, and rigidly secured in the bottom of this chamber B are the bed-blocks C, which run longitudinally the entire length, or nearly so, of the chamber.

D represents an endless pomace-rack, upon the edges of which is secured a suitable endless chain, E. This endless pomace-rack passes over a pulley, F, properly journaled at one end of the machine, while at the opposite end of the machine are properly journaled sprocket-wheels G, by means of which motion is communicated to the said endless pomace-rack, as hereinafter described.

Mounted upon one end of the device is a hopper, H, which conveys the apples to be ground to any suitable metal roll, which is operated by the shaft I, which receives its motion from any convenient power. J is another shaft, journaled in proper bearings across the top of the chamber B, and carries upon one end a pulley, a, to which rotary motion is communicated by means of the belt b from a pulley upon the end of the shaft I. The opposite end of this shaft J carries a pinion, K, which meshes with the gear-wheel L upon the corresponding end of the shaft M, likewise journaled across the top of the chamber, while the opposite end of this shaft M carries a pinion, c, which meshes with a gear-wheel, d, upon the end of the crank-shaft N, which is journaled across the device, as shown. The opposite end of this shaft N carries a slotted crank, O, in which works a pin, e', secured in one end of the connecting-rod e, the opposite end of which is pivotally secured to the outer end of the arm f, which is properly sleeved upon the stub-shaft g, which is rigidly secured to and projects from the side wall of the device. The upper end of this arm f carries a gravity pawl or dog, h, which receives a reciprocating motion through the crank O and rod e, and engages with the gear-wheel i, loosely sleeved upon the stub-shaft g. As the dog h travels idly in one direction over this gear-wheel i, the latter has no motion at this time; but on the return motion of the dog it takes into the teeth of said wheel, and thus gives it an intermittent motion, which is transferred to the pinion j, keyed or otherwise secured upon the corresponding end of the shaft which carries the sprocket-wheel G. From this arrangement it will be seen that, as the pawl is traveling idly over the wheel i during one-half of the revolution of the shaft N, there is a cessation of motion of the pomace-rack during the motion of the toggles, which cessation is increased by the pin e' sliding in the slot in the crank O. (Shown in Fig. 2.) By this construction and arrangement of parts it will be seen that the apples fed into the hopper are ground and fall upon the endless pomace-rack, which conveys the pomace to the press hereinafter described, and that in a continued rotation of



the main shaft, or that which drives the mill, an intermittent movement is given to this pomace-rack, between the movements of which the press is brought into operation by the crank-shaft N; and after the pomace has been operated upon by the press the pomace-rack is again put in motion, which conveys the pomace out at the end of the machine, at the same time delivering fresh pomace to be operated upon by the press.

Rising from the bed of the device, or from the side walls of the chamber, are the standards *k*, the upper ends of which are connected together by means of the girts *l*, and these girts are connected together by means of a strap, *m*. These girts rests upon collars *n*, which are susceptible of a vertical adjustment upon the standards, and between the upper faces of these girts and the outer ends of the standards are placed suitable springs, *o*, which are held in place by suitable nuts upon the ends of the standards.

Pendent from the under faces of the girts *l* are the brackets *p*, between which are pivotally secured the upper ends of the toggle-levers P, the lower ends of which are pivotally secured to the upper face of the follower Q, and these two toggle-levers are connected together by a connecting-link, R, the inner toggle-joint being connected to the crank-shaft N by means of a pitman, S. The connection between this pitman and the crank-shaft is as follows: *r* is a strap, the two ends of which are rigidly secured to the end of the pitman, while the curve embraces or passes around the crank of the shaft, there being some little distance between the end of the pitman and the crank, and in this space is secured, in any convenient manner, a spring, *s*, which is provided with a semicircular follower, *t*, which impinges or rests against the crank-shaft.

In the operation of the device as hereinbefore described, and while the pomace-rack is still, the crank-shaft, drawing upon the toggle-joints, compels a depression of the follower Q upon the pomace beneath, the pomace-rack forming a resistance to such downward pressure by resting upon the top of the longitudinal pieces or bed-plates C. This of course expels all the juice from the pomace, such juice falling through the pomace-rack into the bottom of the chamber. In a continued rotation of the crank-shaft the crank, instead of operating directly upon the end of the pitman, compresses the follower *t* and springs *s* up against or in contact with the end of the pitman, at which time the force is then applied to the pitman, causing it to open the toggle-joint, relieving the pressure upon the pomace, while at the same time the action of the springs *s*, finding no resistance after the toggles have been opened, compel them to fly quickly into their original or open position, which admits of a prompt action on the parts in communicating motion to the pomace-rack, the object

of this movement being to allow the pressure upon the pomace to be of greater duration than would be the case if the pitman were operated upon directly, while it does not interfere with the action of any of the other parts of the device.

If desired, a pump, T, may be secured to the device, the pump-rod of which may be operated in any convenient manner and from any of the shafts of the device, said pump being employed for drawing the cider from the bottom of the chamber and for delivering or forcing it into any proper receptacle.

To regulate the thickness of the pomace which shall pass to the press, I pivotally secure one end of the apron U to the walls of the chamber above the pomace-rack, the opposite end of such apron being raised or depressed by means of the thumb-screw *w*, and the pomace-rack should be covered upon its outer face with any suitable screen or strainer which will prevent the pomace from passing through the bars which compose the pomace-rack.

By this construction and arrangement of parts it can be readily seen that I produce a device which will grind the apple into pomace, feed the pomace to the press, and press the juice therefrom and discharge the pomace at the end of the machine with but one handling—to wit, that of feeding the apples into the hopper.

What I claim as my invention is—

1. In a combined cider mill and press, the combination, with a suitable mill, of an endless pomace-rack and means for automatically imparting thereto an intermittent motion from the mill toward the press, whereby the pomace is carried from the mill to the press and then discharged from the machine, substantially as described.

2. In a combined cider mill and press, a press adapted to be intermittently operated by suitable connections with the shaft of the cider-mill, for the purpose of pressing the pomace periodically delivered beneath it, in combination with an automatically and intermittently moved pomace-carrying rack, substantially as set forth.

3. The combination of the trough B, blocks C, pomace-rack D, and suitable cider-mill, of the crank N, connecting-rod S, provided with strap *r* and spring-bearing *t*, the toggle-arms P, and suitable follower, Q, substantially as set forth.

4. The combination of trough B, the longitudinally-traveling rack D, and a suitable grinding-mill with the connecting-rod S, provided with elastic bearing *r* *t*, and suitably-actuated toggle-arms P, and follower Q, and the hinged apron U, and adjusting-screw W, substantially as set forth.

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Witnesses:

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