(No Model.) 4 Sheets—Sheet 1.

K. S. BLANCHARD.

PRESS.

No. 567,635. Patented Sept. 15, 1896.

Fig. 1.

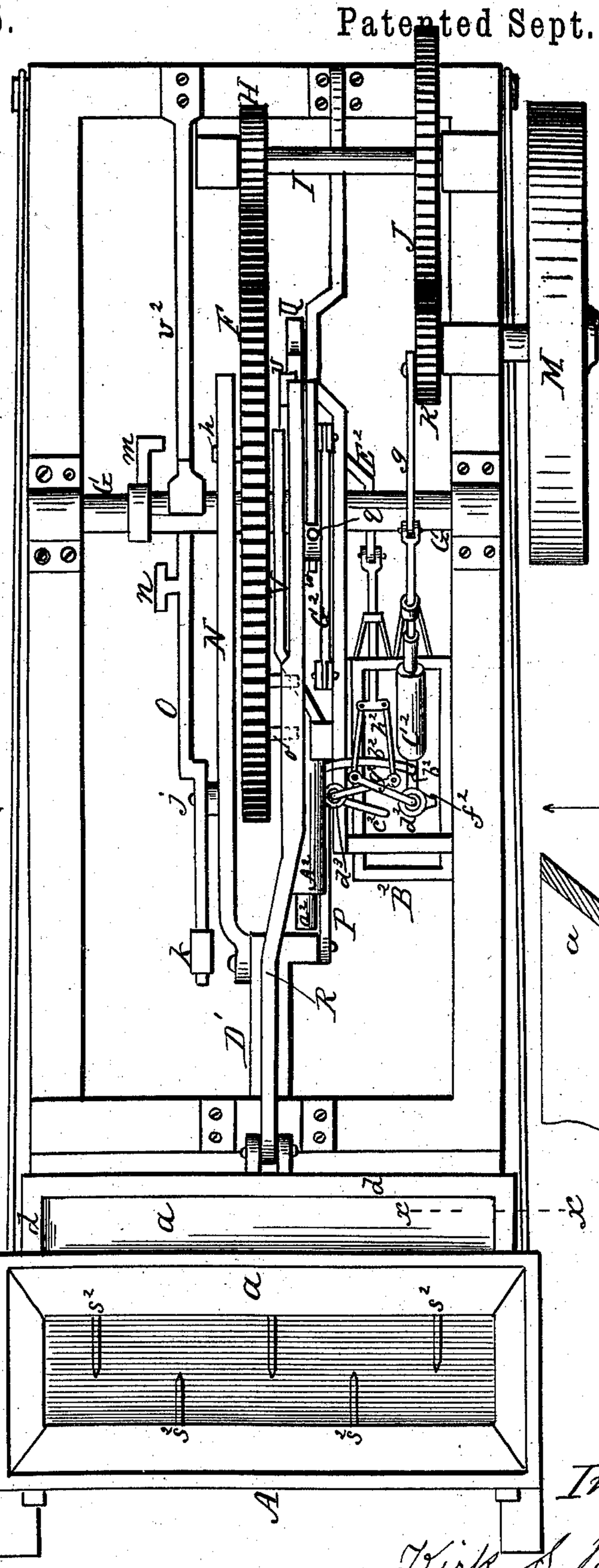
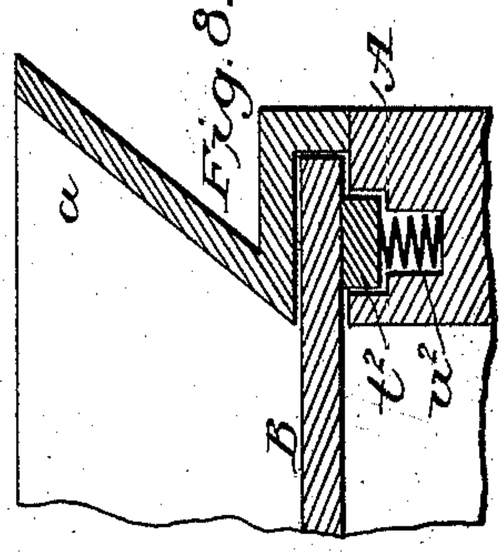


Fig. 8.



Witnesses.
C. R. Osgood.
C. G. Cramell.

Inventor.
Kirk S. Blanchard.
per R. F. Osgood.
atty.

(No Model.)

4 Sheets—Sheet 2.

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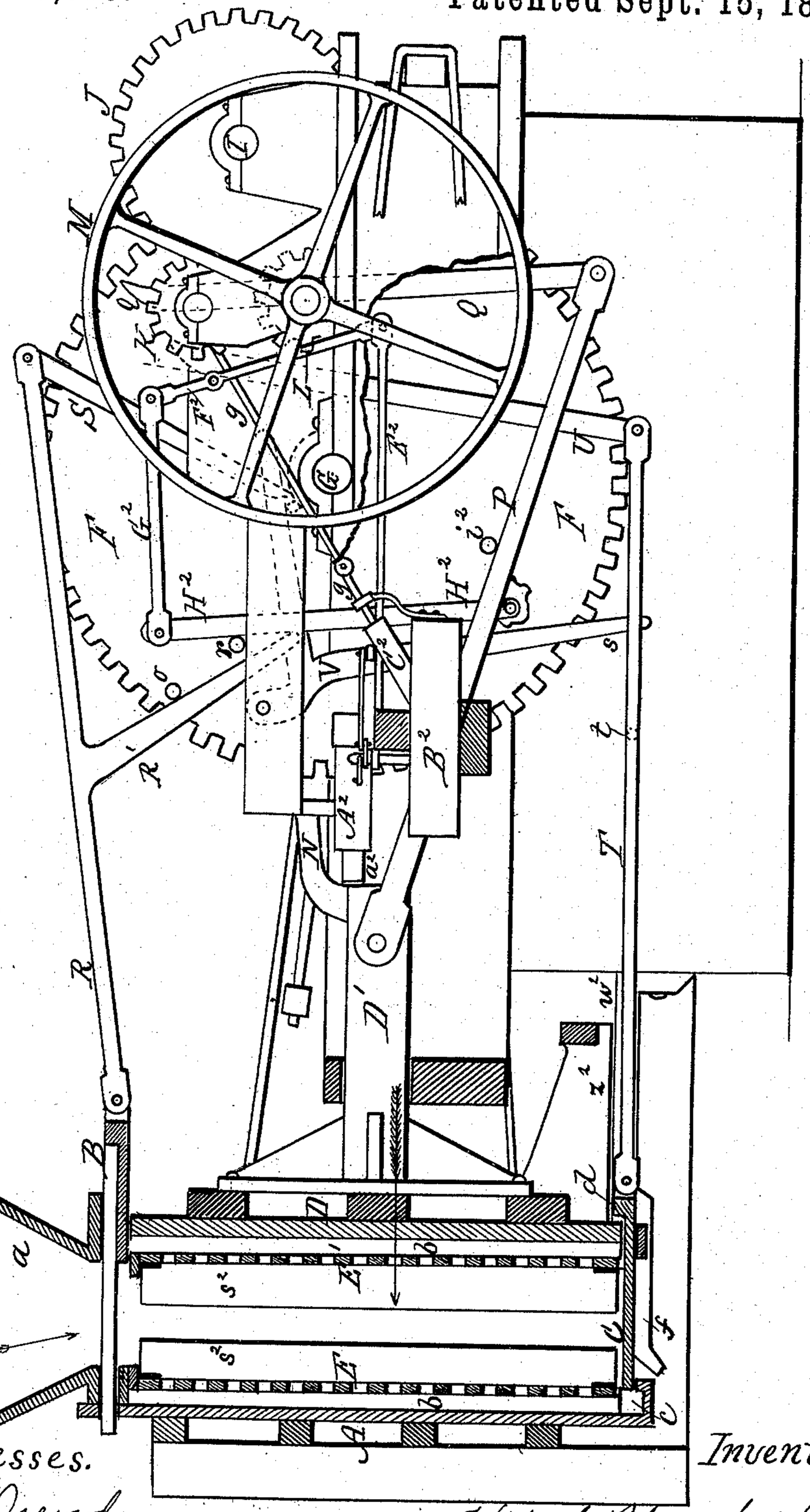

Fig. 2.

Witnesses.
C. R. Osgood.
C. G. Cranwell.

Inventor.
Kirk S. Blanchard.
per R. F. Osgood, atty.

(No Model.) 4 Sheets—Sheet 3.

K. S. BLANCHARD.

PRESS.

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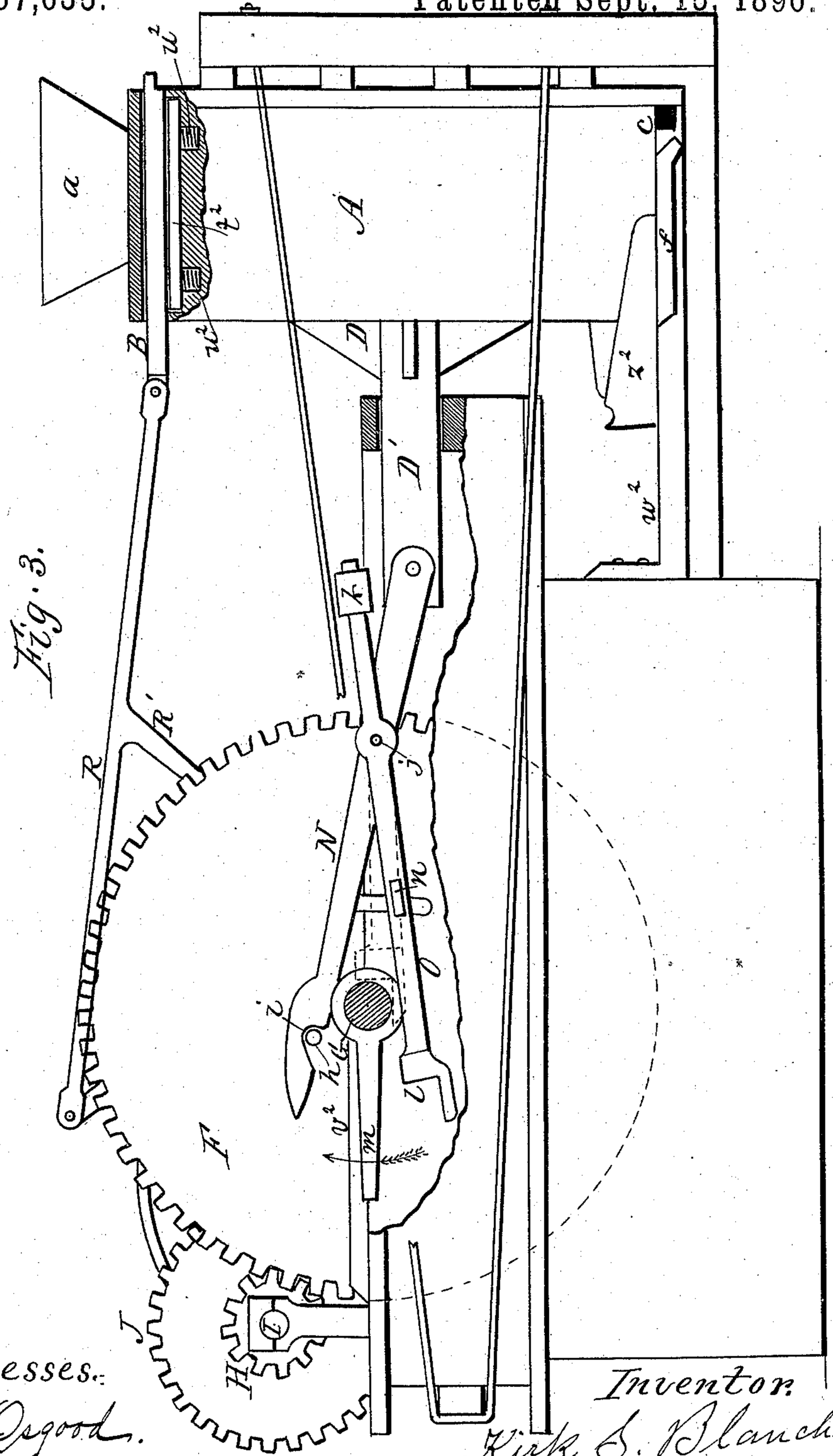


Fig. 3.

Witnesses:
C. R. Osgood.
C. G. Cramell.

Inventor:
Kirk S. Blanchard,
per R. F. Osgood,
atty.

(No Model.) 4 Sheets—Sheet 4.

K. S. BLANCHARD.

PRESS.

No. 567,635. Patented Sept. 15, 1896.

Fig. 4

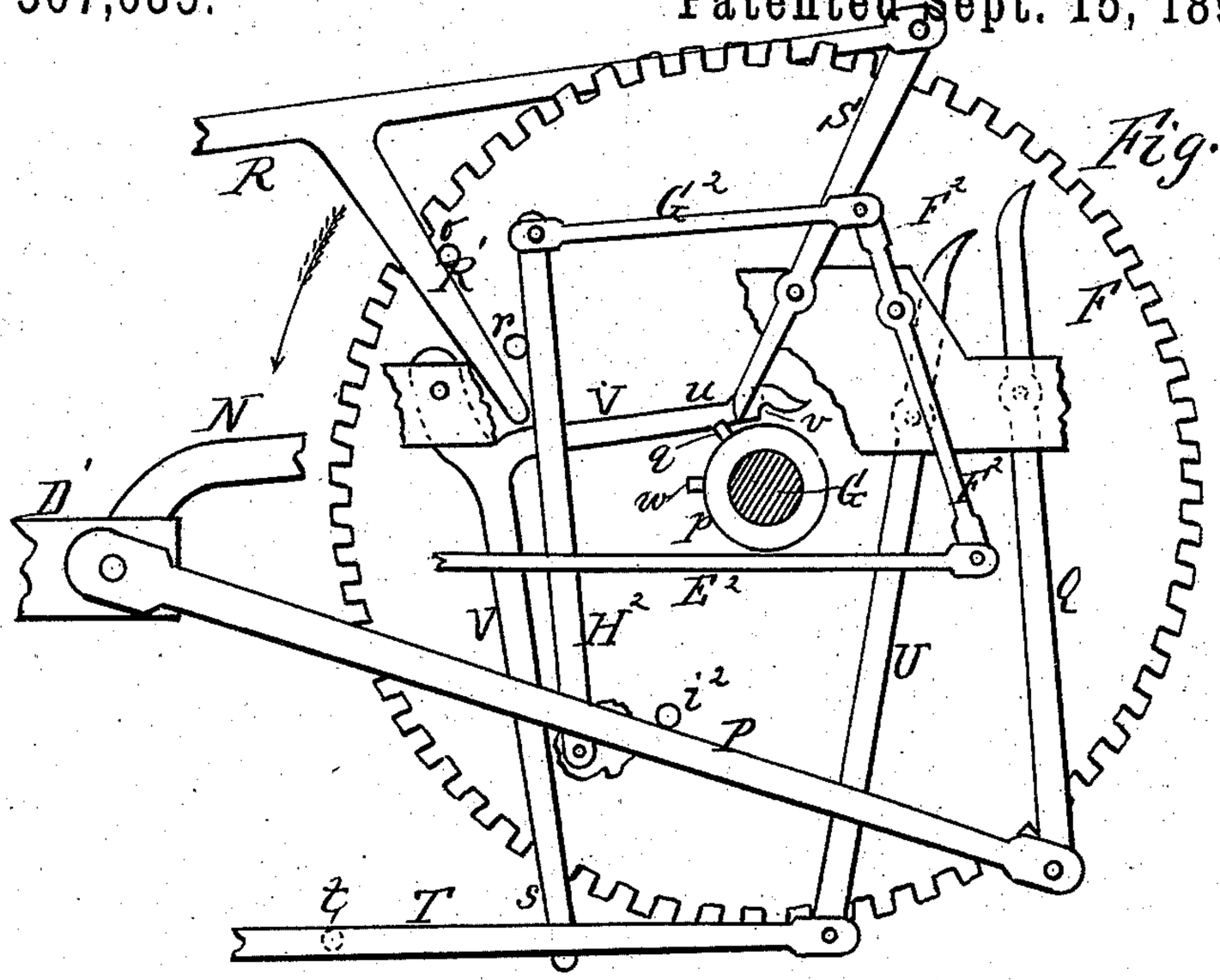
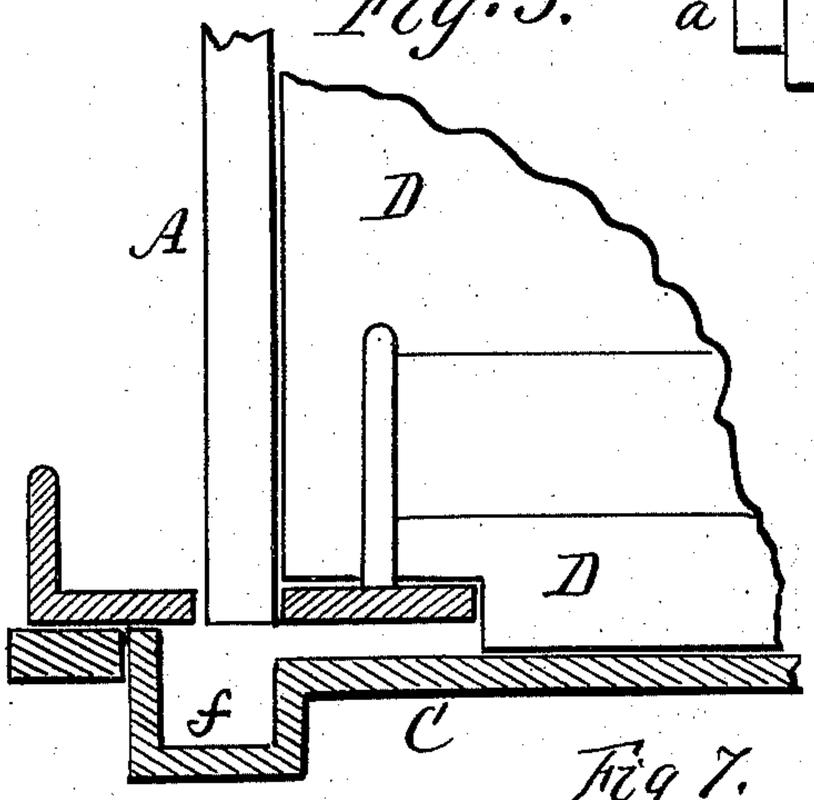


Fig. 5.



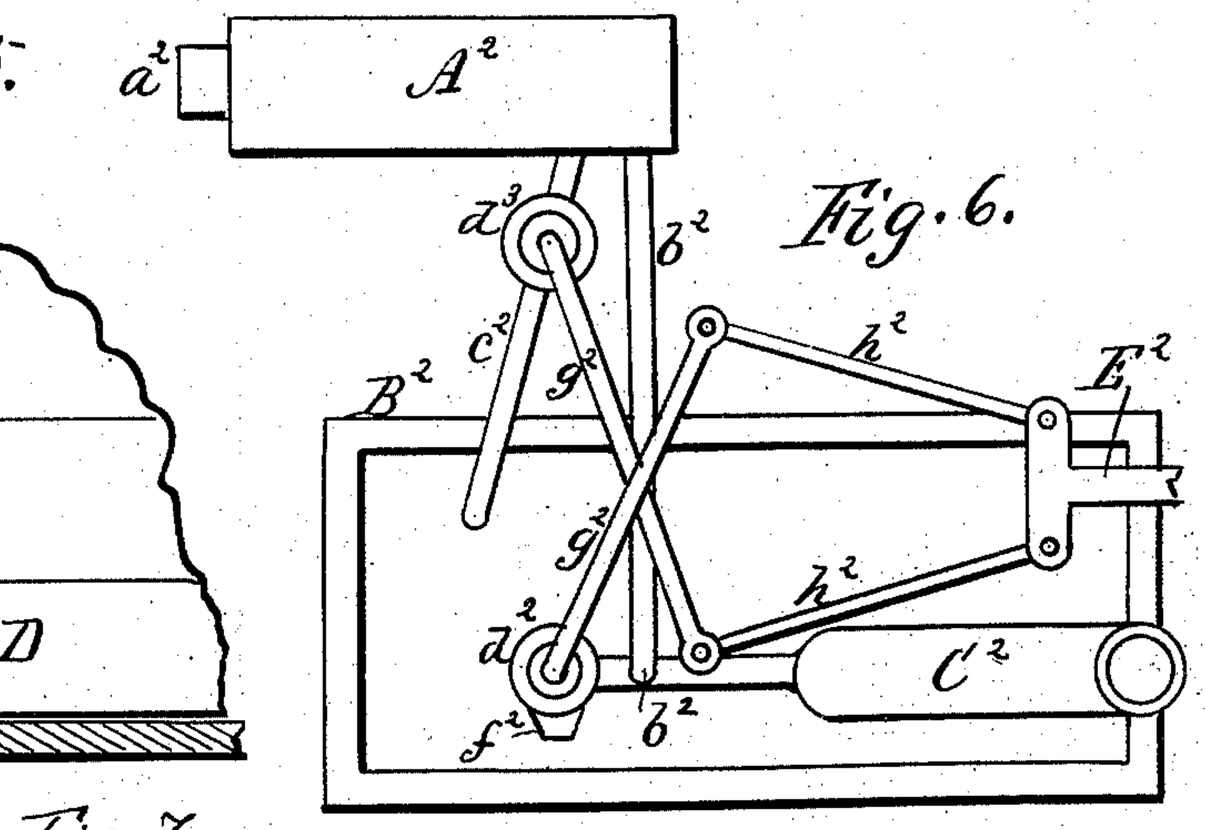
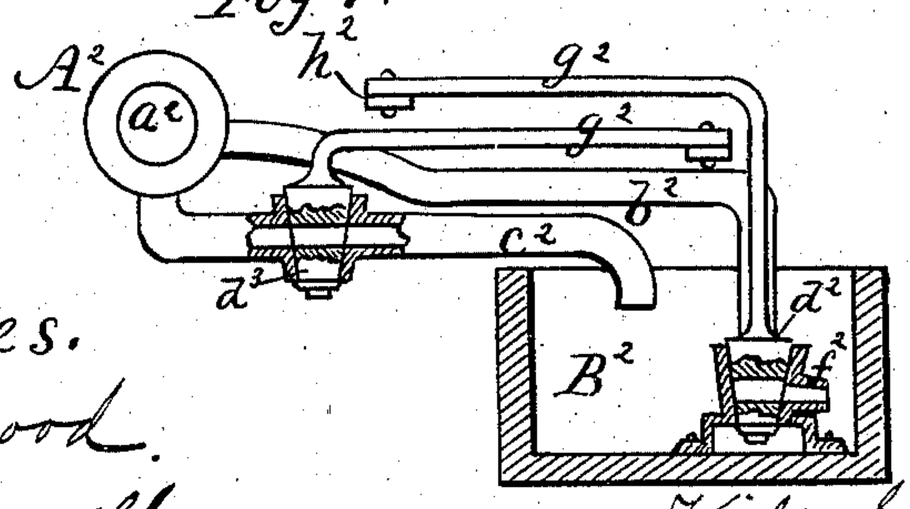


Fig. 6.

Fig. 7.



Witnesses.
C. R. Osgood.
C. G. Clamell

Inventor.
Kirk S. Blanchard.
per R. F. Osgood.
Atty.

UNITED STATES PATENT OFFICE.

KIRK S. BLANCHARD, OF ALBION, NEW YORK.

PRESS.

SPECIFICATION forming part of Letters Patent No. 567,635, dated September 15, 1896.

Application filed April 5, 1895. Serial No. 544,647. (No model.)

To all whom it may concern:

Be it known that I, KIRK S. BLANCHARD, of Albion, in the county of Orleans and State of New York, have invented a certain new and useful Improvement in Presses; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the drawings accompanying this application.

My improvement relates to that class in which the material to be pressed is fed into a press box or curb and subjected to the action of a follower which moves intermittently in and out, the action being constant.

The invention consists in the combination and arrangement of parts hereinafter described and claimed.

In the drawings, Figure 1 is a plan view of the machine. Fig. 2 is an elevation, partially in section, looking in the direction of the arrow at the bottom in Fig. 1. Fig. 3 is a similar view looking on the reverse side and in the direction of the arrow at the top in Fig. 1. Fig. 4 is a diagram showing a face view of the main gear and the connections that operate the machine. Fig. 5 is an enlarged cross-section at one corner of the press box or curb in line *x x*, Fig. 1. Fig. 6 is an enlarged plan view of the mechanism for driving the hydraulic pump. Fig. 7 is a front sectional elevation of the same. Fig. 8 is a detail view.

This apparatus is primarily designed as a cider-press, but is adapted to many other purposes.

A indicates the press box or curb in which the material is placed to be pressed, the same being fed downward through a hopper *a*, and after being subjected to pressure dropping out at the bottom by its own weight. B and C are two sliding valves, one at the top and the other at the bottom of the box. When the material is fed in, the top valve is open and the bottom one closed, as shown in Fig. 2. The follower D is then forced inward to produce the pressure, after which the bottom valve is drawn out to release the charge, is then forced in again to close the bottom of the box, and the top valve is drawn out to admit a new charge, the whole being done without intermission. Inside the press-box are two racks E E′, one at the back of the box, the other attached to the follower, and both provided with cross-slats, between which the liquid escapes into spaces *b b* back of the racks and runs down and is discharged at the bottom. The main portion of the expressed liquid runs from the surface of the lower valve C into a spout *c* at the bottom of the box, and is discharged laterally into suitable receptacles placed at the sides of the box. The valve C has an upright marginal flange *d* at the back and ends, which prevents the liquid from running off except in front, and at the ends said valve has depressed spouts *f f*, Fig. 5, which catch the drainage as the valve moves back, and also discharge the liquid into tanks at the sides of the machine. The racks have packings at the edges closely fitting the sides of the box and preventing the escape of any sediment around the racks. The racks are covered with cloth in the usual way.

The follower and valves are operated by the following means: F is a large gear-wheel attached to a shaft G and engaging with a pinion H on a shaft I. On the opposite end of shaft I is a gear J, smaller than F, which engages with two other pinions K and L. To the shaft of pinion L is attached the band-wheel M, by which power is imparted to the machine, and to pinion K is pivoted a connecting-rod *g*, by which the hydraulic pump is operated, as will presently be described. Pinion K serves simply as a crank-wheel to give motion to the connecting-rod *g*.

The follower D is forced inward by means of an arm N, Figs. 1 and 3, pivoted at its front end to the shank D′ of the follower, its rear end resting alongside of the gear F, and the latter provided with a projecting stud *h*, which strikes into a notch *i* of the arm and pushes it forward at every revolution of the gear.

O is a rock-arm pivoted at *j* to the arm N, provided at one end with a counterweight *k*, which tends to throw the opposite end up, and provided at the opposite end with a head *l*. When the follower is drawn back, the rear end of the rock-arm O rests under the axle G, but when the follower is forced fully forward the rock-arm is freed and rises till the head *l* rests against the axle or other stop, as shown by dotted lines, Fig. 3, thereby holding the fol-

lower in its advanced position till the material under pressure has had sufficient time to drain. The further revolution of the wheel F brings an arm *m* on its shaft G in contact with a lug *n* of the rock-arm O, depressing the arm and releasing it and freeing the follower, which is then at liberty to be moved back. The follower is drawn back by a connecting-rod P, pivoted at its front end to the shank D′ of the follower, its rear end being pivoted to a rock-lever Q, whose short arm rests near the gear F, the latter being provided with a stud *o*, which strikes the arm and throws it at every revolution of the gear-wheel. The follower is thus made reciprocal with every revolution of the gear F and when thrown forward remains stationary a given time to allow the charge to drain, after which it is drawn back and remains stationary again a sufficient time for the old charge to be dropped and a new one received in the press-box.

The upper slide-valve B is operated by means of a bar R pivoted to its rear edge, said bar extending back alongside the gear F, and pivoted at its rear end to a rock-lever S, whose lower end extends down to a hub *p* of the shaft G, and is acted upon by a stud *q* at every revolution of the wheel. This draws the valve outward. The bar R has on its under side a stiff arm R′, extending down along the wheel, which is struck by the stud *o*, before described, which throws the valve closed.

The bottom valve C is operated by a bar T, pivoted at one end to the valve and at the other to a rock-lever U, similar to the lever S, against the upper arm of which strikes a stud *r*. This throws the valve open. It is thrown closed by a right-angled rock-lever V, one arm *s* of which extends down past the bar T and strikes a stop *t*, (shown in dotted lines in Fig. 4,) the other arm *u* extending past the wheel F and provided with a notch *v*, with which engages a stud *w* of the wheel. When the valve C is drawn back, the stop *t* rests against the lower end of the rock-lever, and when the lever is thrown by the stud the valve is thrown in. The movements of the mechanisms operating the follower and valves are so timed that the upper valve opens to admit the charge, leaving the lower valve closed. The upper valve closes after the charge has been entered, the follower then moves forward, the lower valve opens to discharge the material, and this process is repeated automatically by the constant movements of the machine.

In heavy work the pressure on the follower is supplemented by a hydraulic pump constructed and operating as follows:

A^2 is the usual cylinder, provided with a piston a^2, which rests against the end of the follower-shank D′.

B^2 is a water-tank, in which is located the force-pump C^2. To the piston of the pump is attached the connecting-rod *g*, before described, said piston being operated by the crank-wheel K.

b^2 is a pipe extending from the pump to the cylinder, through which pipe the water is forced to actuate the piston of the cylinder; and c^2 is a discharge-pipe leading from the cylinder and opening into the tank, by which means water is drawn off from the cylinder.

The pipes b^2 c^2 have two-way valves or cocks d^2 d^3, respectively, by which the water can be turned on or cut off, and the induction-pipe b^2 has a discharge-spout f^2 connected with its valve, by which, when the passage is opened through the valve, the water of the tank is drawn into and forced out of the pump C^2 without being forced up into the cylinder A^2. Therefore the pump can be kept under constant motion, pumping water into and out of the tank when it is not being pumped into the cylinder. The valves are controlled by the following means:

g^2 g^2 are two crank-arms, rigidly attached to the valves, and h^2 h^2 are two connecting-rods, connecting the ends of said crank-arms with a slide-rod E^2. The opposite end of the slide-rod is pivoted to a rock-lever F^2. To the top of the rock-lever is pivoted a pitman G^2, connected at the opposite end to a rock-arm H^2, pivoted at the bottom to some stationary part. The rock-lever F^2 is struck at every revolution of the gear F by a stud i^2, which forces the slide-rod E^2 forward, and the rock-arm H^2 is struck by the stud *r*, before described, which throws the slide-rod back again. At a given time in the forward movement of the follower the slide-rod E^2 is thrown forward by the means described, and both valves d^2 d^3 are turned so as to cut off the exit through pipes b^2 c^2 into the tank, but allowing the flow into the cylinder A^2, by which means its plunger is forced forward against the shank of the follower, thereby increasing the pressure at the last movement of the follower. When the follower has completed its stroke and has remained still a given time, the slide-rod E^2 is thrown back, turning the valves, cutting off the flow to the cylinder A^2, and allowing escape from the cylinder to the tank.

s^2 s^2 are vertical cutting-blades attached to the racks E E′, extending from bottom to top, and alternating in position, as shown in Fig. 1. When the follower is forced in to its full extent, said blades extend nearly across the inclosed space. The object of these blades is to cut the pressed material into pieces, thereby facilitating its discharge from the press-box. The press-box is made a little wider at its bottom than at its top to insure free discharge.

t^2 t^2, Fig. 3, are spring-bars, located one at each corner of the press-box, within the sides of the casing, and forced forward by springs u^2 u^2 against the valves B C. They serve as packings to prevent the liquid from passing outward at those points.

v^2 is a stay-bar resting against the axle G and holding it against the strain when the bar O rests against the axle, as before described.

w^2 w^2 are tracks or ways, on which rest slides z^2 z^2 of the follower to hold it steady as it moves forward and back.

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

1. In a press, the combination of a press-box, a follower working therein, a wheel from which power is applied, an arm extending from the follower to the wheel, a connection between the arm and wheel whereby the follower is forced forward, a locking-arm for holding the follower a given time in its forward position, and means for releasing the locking-arm and allowing retraction of the follower, as set forth.

2. In a press, the combination of a press-box, a follower working therein, a wheel for applying power, an arm extending from the follower to the wheel, a connection between the wheel and arm for forcing the follower forward, a locking-lever for holding the follower a given time in its forward position, means for releasing the arm and allowing the retraction of the follower, valves at the top and bottom of the press-box, bars extending from the valves to the wheel, and connections between the wheel and bars for reciprocating the valves, as described.

3. The combination, with the press-box A and reciprocating follower D, of the slide-valve C at the bottom of the box, the rotating wheel F, the bar T pivoted to the valve and provided with the stop t, the rock-lever U pivoted to the outer end of the bar and lying alongside the wheel, a device on the wheel for operating the rock-lever, the right-angled lever V engaging with the stop t, and a device on the wheel for operating said right-angled lever, as shown and described and for the purpose specified.

4. The combination, with the press-box A, and follower D, of the racks E E′ located within the box on opposite sides thereof and provided with the cutters s^2 s^2, as and for the purpose specified.

5. The combination, with the press-box A and follower D, of the reciprocating valve C provided with raised marginal edges and a depressed end spout, as shown and described and for the purpose specified.

6. The combination of a press-box, a follower working therein, a wheel for imparting motion to the follower, an arm attached to the follower extending to the wheel, a device on the wheel for operating the arm, a hydraulic cylinder resting against the shank of the follower, a force-pump for operating the piston of the cylinder, and tubular connections between the pump and cylinder, as described.

7. The combination of the follower, the hydraulic cylinder provided with a piston resting against the follower, a water-tank, a force-pump attached to said tank, an induction-pipe extending from the force-pump to the cylinder, a discharge-pipe extending from the cylinder to the tank, shifting valves in the induction and discharge pipes, and connections extending to the operating-wheel for opening and closing said valves, as shown and described and for the purpose specified.

8. In a press, the combination with the press-box and a valve working forward and back therein, of a bar t^2, springs u^2 u^2 for forcing same upward, the bar forming a packing located within the side of the casing and pressing against the face of the valve, as shown and described and for the purpose specified.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

KIRK S. BLANCHARD.

Witnesses:
JOS. L. HOUGHTON,
L. F. WILCOX.