

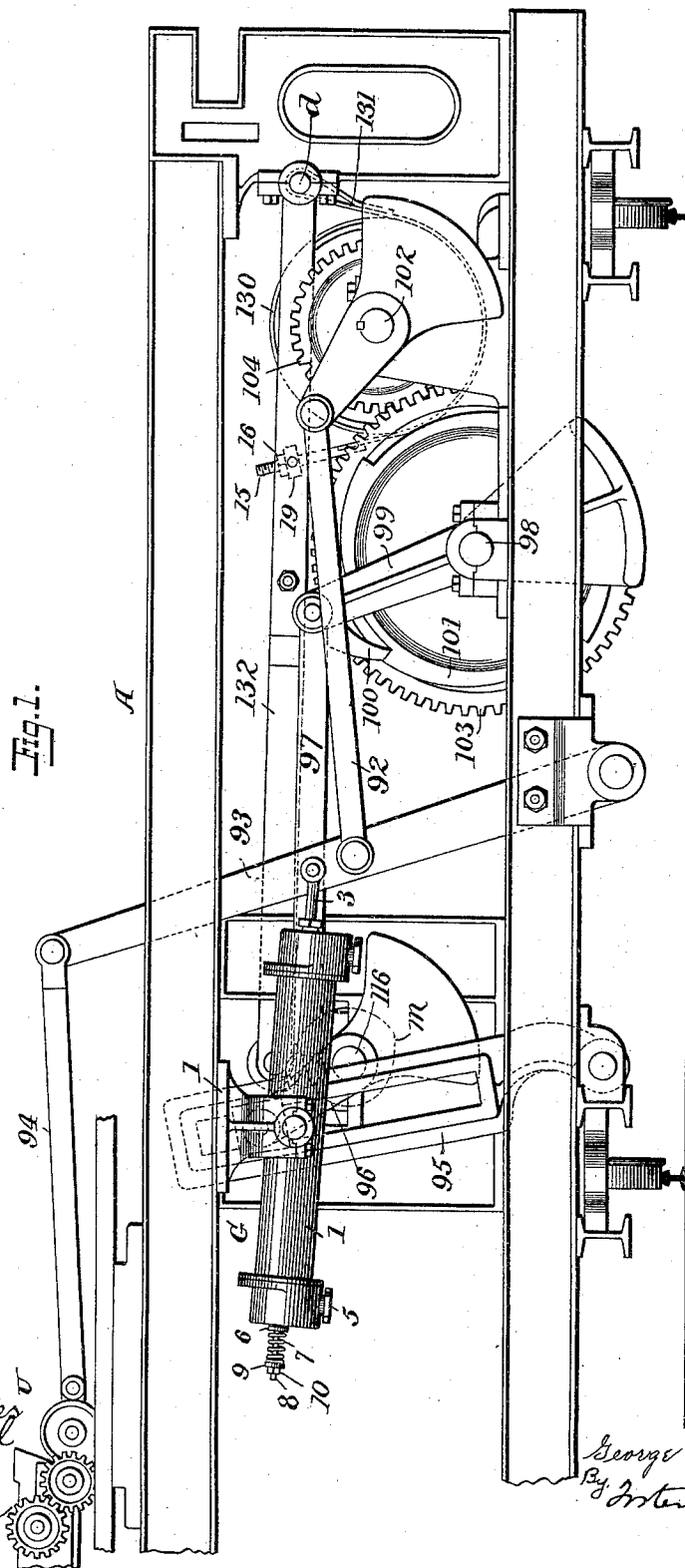
(No Model.)

3 Sheets—Sheet 1.

G. F. EISENHARDT.
OIL CLOTH PRINTING MACHINE.

No. 487,365.

Patented Dec. 6, 1892.



Witnesses
Jno. Hinkel
Allen H. Robinson

Inventor
George F. Eschardt
By Arthur C. Freeman
Attorneys

(No Model.)

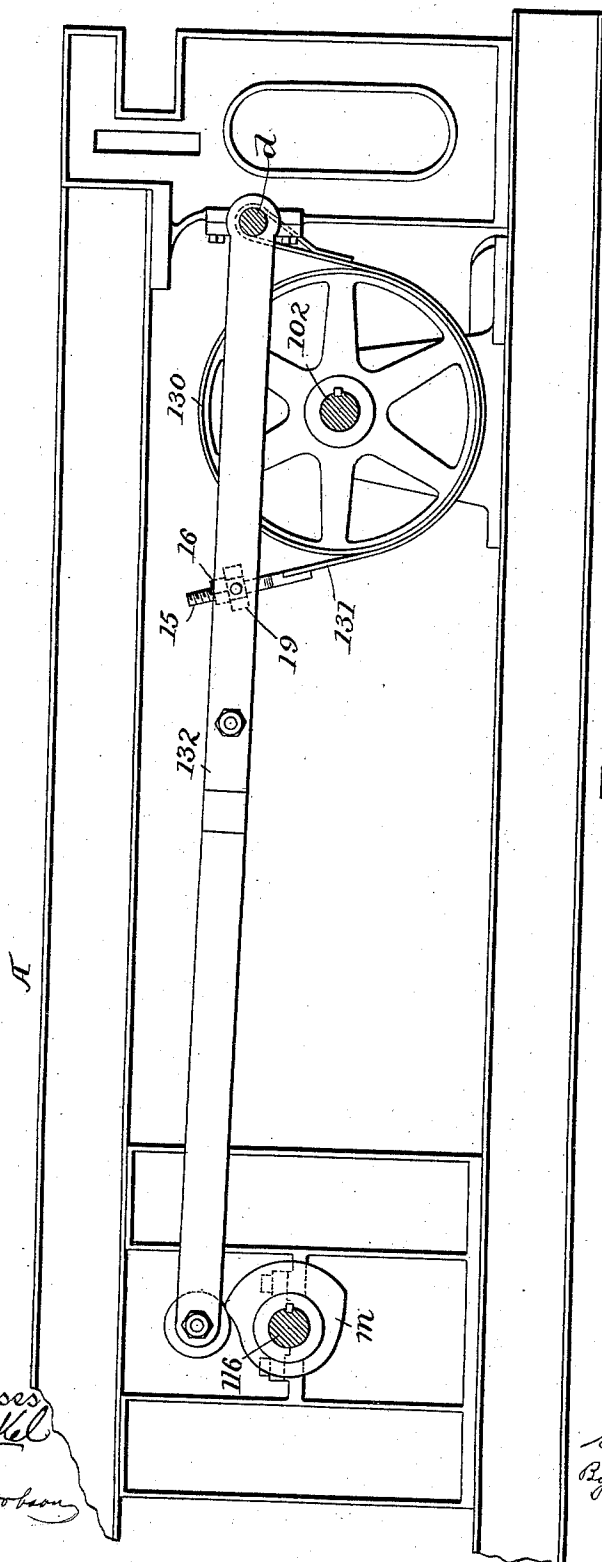
3 Sheets—Sheet 2.

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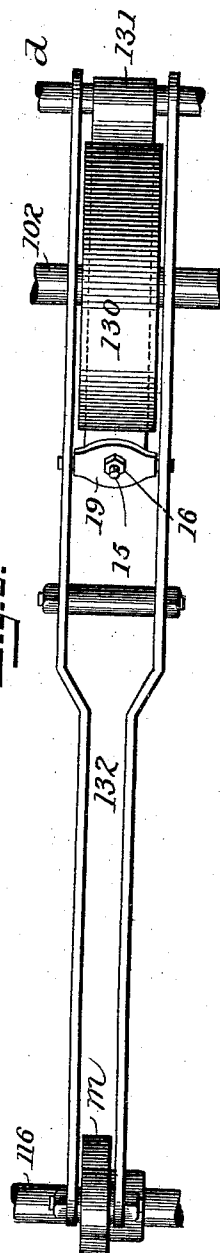
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Fig. 2.



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Fig. 3.



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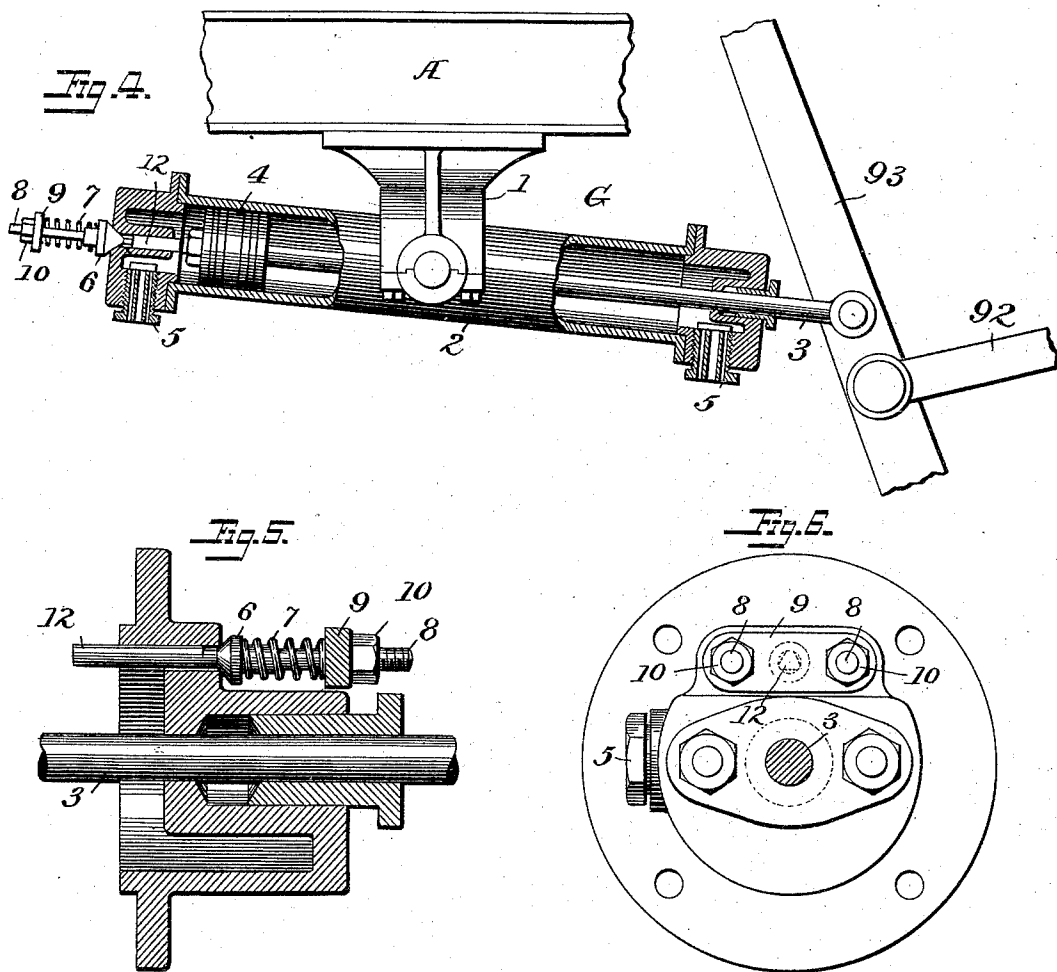
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UNITED STATES PATENT OFFICE.

GEORGE F. EISENHARDT, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
DIENELT & EISENHARDT, OF SAME PLACE.

OIL-CLOTH-PRINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 487,365, dated December 6, 1892.

Application filed May 26, 1892. Serial No. 434,457. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. EISENHARDT, a citizen of the United States, and a resident of Philadelphia, Philadelphia county, Pennsylvania, have invented certain new and useful Improvements in Oil-Cloth-Printing Machines, of which the following is a specification.

My invention relates to that class of machines employed for printing oil-cloth, and has for its object to secure the utmost precision in the movement of the parts and to avoid accidents from the failure of the troughs to be arrested at the proper times. To which end I construct the parts of the machine as fully set forth hereinafter, and as illustrated in the accompanying drawings, in which—

Figure 1 is an elevation of sufficient of an oil-cloth-printing machine to illustrate my improvements. Fig. 2 is a view illustrating the arrangement of the friction device. Fig. 3 is a plan view of the friction device. Fig. 4 is a view illustrating the governing device in part section. Fig. 5 is a sectional view of part of the governing device. Fig. 6 is an end view of the same.

The frame A is suitably constructed to support the operative parts and has bearings for the shafts 102, 98, and 116, the latter being one of the driving-shafts and imparting motion to a slotted lever 95 through the medium of a crank 96, the said lever 95 being connected by a rod 97 with a rocking arm 99 upon the shaft 98, and the arm 99 having a pawl 100, which engages the teeth of a ratchet 101, connected with a gear 103, which meshes with the teeth of a gear 104 upon the shaft 102. A crank-arm on the shaft 102 is connected by a rod 92 with the rock-arm 93, which is connected by a connecting-rod 94 with the adjacent trough U of a series of troughs connected together, these troughs being paint-troughs in which to revolve paint-rolls E', as fully set forth hereinafter.

The reciprocation of the arm 95 imparts movement to the pawl-lever 99 and feeds the ratchet-wheel 101, and thereby imparts movements to the connected parts and to the troughs. As these troughs are very heavy, there being sometimes eight, ten, or twelve of them, and as they reciprocate back and forth

from ten to fifteen times a minute, it is important to overcome the momentum, because a very slight extra movement will be sufficient to put the parts out of time. Thus if the trough is not carried from beneath the printing-block exactly at the right time the latter may descend upon it and cause the destruction of some of the parts. To prevent such a result, I combine with the moving parts—for instance, with one of the swinging levers 93, of which there may be a pair—a governor in which a fluid is made the means of gradually arresting the movement of the parts at the exact point. Preferably this is a compressed-air governor, and, as shown, the construction I prefer to employ embodies an oscillating cylinder 2, having trunnions rocking in brackets 1, connected to the frame, and in this cylinder slides a piston 4, the rod 3 of which is connected to the arm or lever 93. At each end of the cylinder 2 is a port closed by an inlet-valve 5, lifting inward or upward, and another port closed by an outward valve 6, against which which bears a spring 7 with any suitable means for regulating the pressure of the spring. As shown, the spring 7 bears upon a shoulder of the valve 6 and also upon a cross-head 9, through which extend two screw-bolts 8 8, and nuts 10 10 on the threaded ends of the latter serve to set in the cross-head 9 to compress the spring to any desired extent. The stem 12 of the valve 6 projects inward to such an extent that it will be struck by the piston or a part thereof as the latter approaches the limit of its movement.

The springs 7 are adjusted to exactly the tension desired, so that as the troughs approach the limit of their movements in either direction the air in the governor will be compressed to the exact extent required to overcome the momentum of the troughs and bring them to rest at the exact points required. At the instant when the troughs come to rest the piston 4 will strike the stem 12 of the valve 6, thereby opening the same against the pressure of the springs 7 and at once relieving the governor of the internal pressure, so that there will be no tendency upon the part of the compressed air to react and force the piston in an opposite direction.

The opening of the cylinder and the escape of the compressed air at the instant that the trough reaches its proper position is of the utmost importance, because if the reaction of the air should throw the parts back to a very slight extent the printing-trough would be brought beneath the cross-head and something would be broken.

By means of the governor constructed as set forth hereinbefore I am able to secure such precision and exactness of action that it is possible to drive the machine at a much higher rate of speed than has ever been practicable before. If the ratchet-wheel and the connected parts were to move even to a very slight extent short of or beyond their proper positions, the cross-head might be brought down to mash the printing-blocks upon the troughs. To prevent such a result, I make use of a braking mechanism that will clamp the parts in place as soon as they reach their proper positions. Thus I secure a band-wheel 130 to the shaft 102, and I carry a braking-strap or band 131 around a portion of said wheel, one end of the strap being secured to a shaft *d* or at any other fixed point and the other end being fastened to an adjustable screw-bar or bolt extending through a bearing on a long lever 132, pivoted to the bar *d* or other suitable point, the said screw-bolt carrying a nut 16, by means of which it may be adjusted. By moving the bar 132 at the proper time the band may be applied to the brake-wheel so as to bring the latter at once to rest. Any suitable means may be employed for actuating the lever 132; but, as shown, I make use of a cam *m* upon the shaft 116, which engages with an antifriction-wheel at the end of the lever 132, so as to raise the latter and apply the brake-strap the moment the arm 99 and pawl reach their forward position. Preferably the lever 132 is made in the form of two parallel bars connected together by proper cross-bolts and carrying the cross-piece 19 between them, upon which bears the nut 16.

Without limiting myself to the precise construction and arrangements of parts set forth, I claim—

1. The combination, in an oil-cloth-printing press, of a series of troughs, devices for reciprocating the troughs, and a fluid-governor connected with said devices, and means for relieving the governor of pressure when the troughs reach the limit of their movement in either direction, substantially as set forth.

2. The combination, with the reciprocating troughs and operating devices of an oil-cloth-printing machine, of a fluid-governor comprising a cylinder and piston and means for relieving the same of pressure when the troughs reach the limits of their position in either direction, substantially as set forth.

3. The combination, with the reciprocating troughs and operating devices, of a fluid-governor consisting of a cylinder-piston and piston-rod connected to a reciprocating part of the machine, inlet openings and valves at the opposite ends of the cylinder, outlet openings and valves at the opposite ends of the cylinder, springs bearing upon said outlet-valves, and means for opening the valves as the piston reaches the limit of its movement in either direction, substantially as set forth.

4. The combination of reciprocating troughs and operating devices, a cylinder provided with a piston connected with part of the operating devices and having inlet and outlet openings and valves, springs bearing against the outlet-valves, and means for compressing the springs, and stems projecting from the outlet-valves in position to be struck by the piston, substantially as set forth.

5. The combination, with the reciprocating troughs and operating parts, of an oscillating cylinder having a piston connected with one of the reciprocating parts of the machine, inlet ports and valves, outlet ports and valves, and springs for varying the pressure upon the outlet-valves, substantially as set forth.

6. The combination of the troughs, the ratchet-wheel and pawl, and connections for moving the troughs, shafts 102 and 116, a band-pulley on the shaft 102 and gears between the latter shaft and the ratchet-wheel, a band adapted to said pulley and carried by a lever, and a cam on the shaft 116, operating upon the free end of said lever to reciprocate the same, substantially as set forth.

7. The combination, with the devices for reciprocating the trough, of a band-wheel, a lever composed of two parallel connected bars and provided with a band arranged to bear upon said wheel, and a shaft provided with a cam arranged to operate the outer end of said lever, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE F. EISENHARDT.

Witnesses:

WM. F. SIEGENER,
WM. H. DOERING.