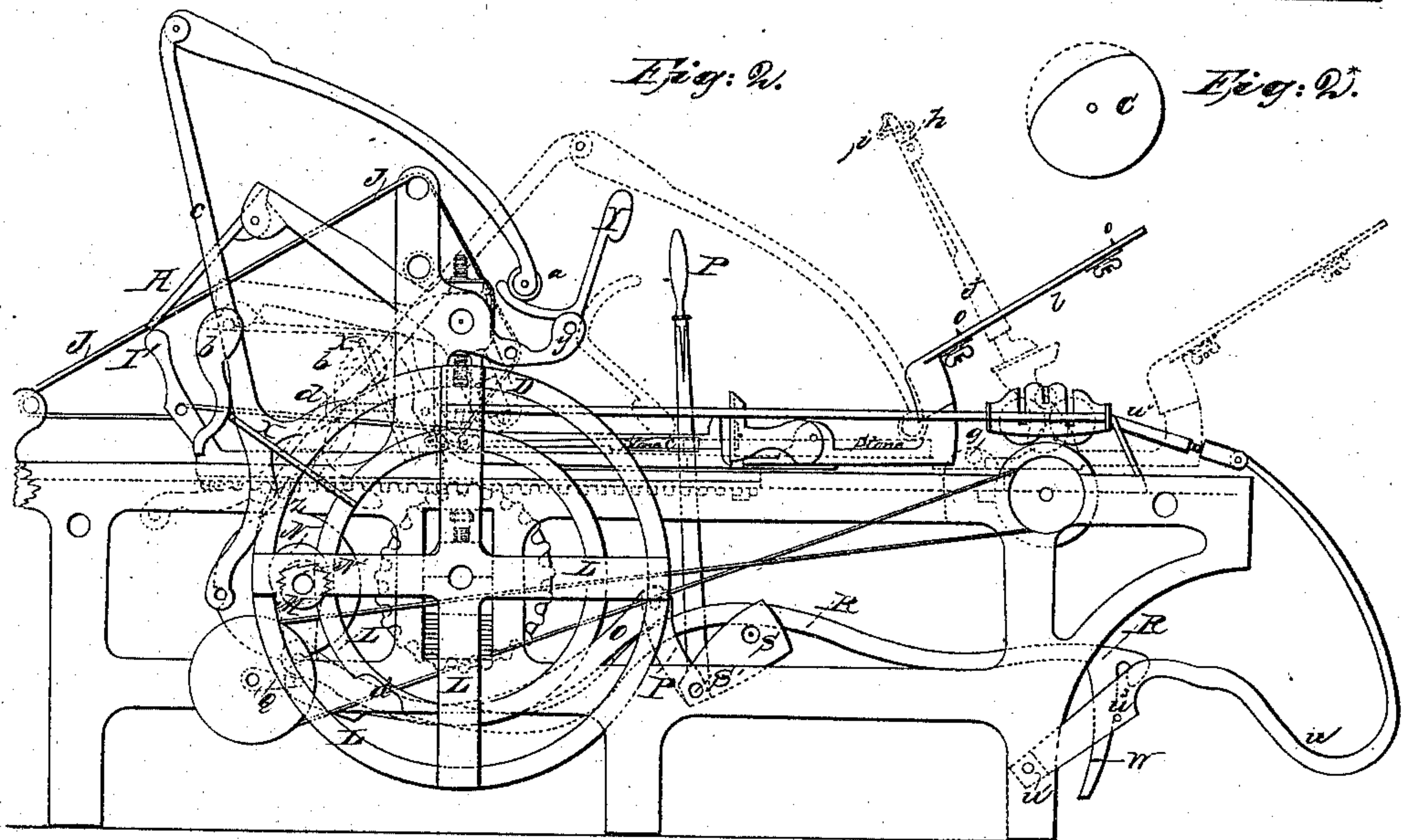
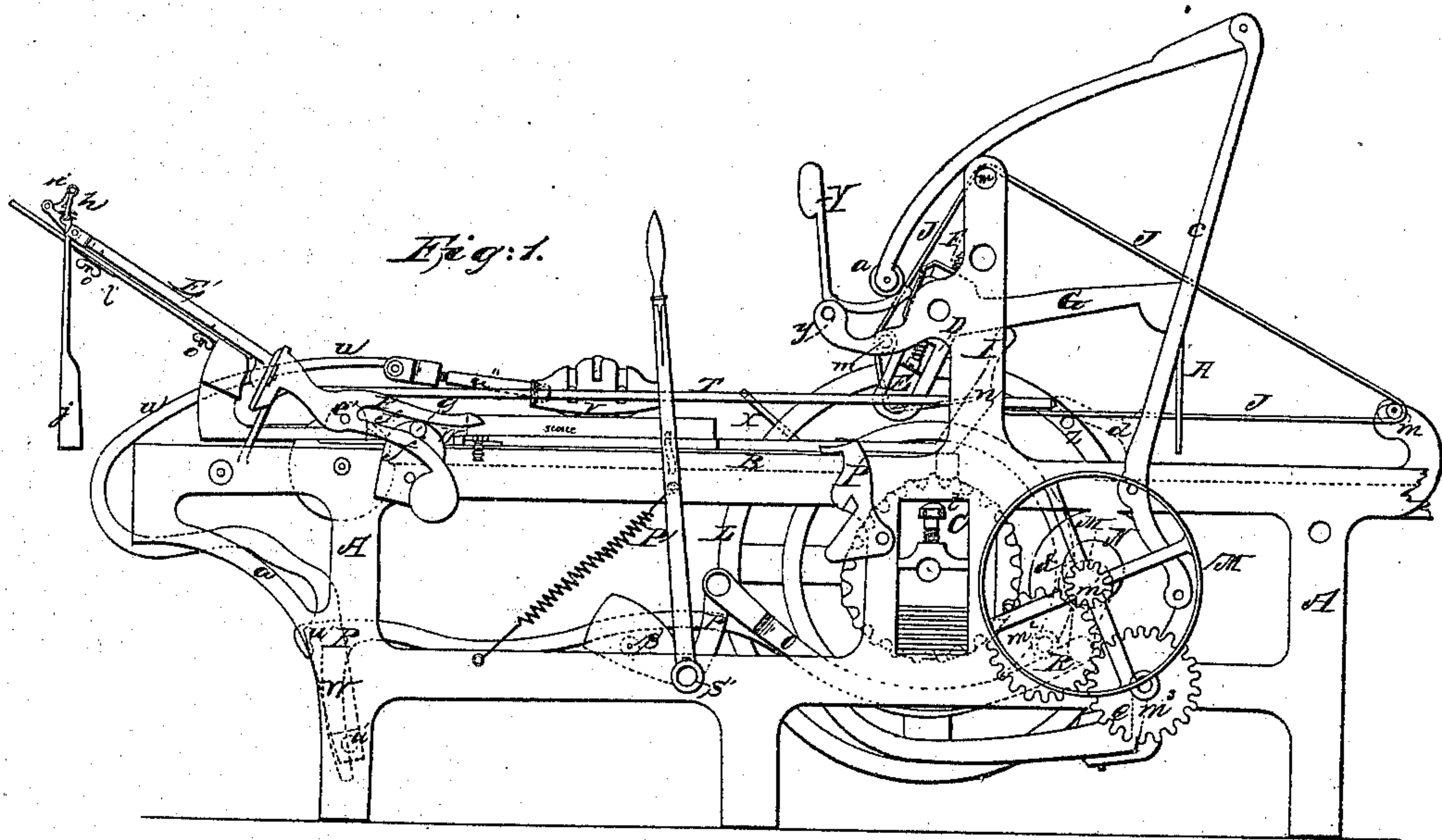


A. HOEN.  
LITHOGRAPHIC PRESS.

No. 89,997.

Patented May 11, 1869.



Witnesses:  
B. A. Pettit  
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by *[Signature]*  
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# United States Patent Office.

AUGUST HOEN, OF BALTIMORE, MARYLAND.

Letters Patent No. 89,997, dated May 11, 1869.

## IMPROVEMENT IN LITHOGRAPHIC PRESSES.

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, AUGUST HOEN, of the city and county of Baltimore, and State of Maryland, have invented a new and improved Chromo-Lithographic Power-Press; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figures 1 and 2 are side elevations, representing opposite sides of the press.

In the drawings—

A A is the frame, on which the bed B travels, supported throughout its whole movement by the eccentric cylinder C, fig. 2\*, the circumference of which is equal to the distance travelled by the bed;

D is an oscillating cross-beam; and

E, a scraper-holder, supported by the cross-beam, and provided with a screw, F, to adapt it to the various heights of the different stones, and also to regulate the pressure.

G G are two arms, connected with the cross-beam, and provided with dogs H, which strike the studs I, fastened to the bed, in its forward movement, and thereby raise the arms G G, bringing the scraper to a perpendicular position, and in contact with the stone, at that moment and at that point where the pressure ought to commence.

At the same time the highest part of the eccentric cylinder C has arrived at the same point of the perpendicular line, and thereby, in connection with the above-described cross-beam, forms a toggle-joint, producing a powerful pressure.

The bed continues to move forward, carrying the stone and paper through under the pressure of the scraper, and thereby producing an impression.

Between the paper and the scraper a tympan-leather, J, passes over a system of rollers, *m m m*, in the shape of an endless apron, fastened at one point to the bed at *n*.

When the entire stone has passed under the scraper, the motion of the bed is reversed, (as hereafter to be described,) and the oscillating cross-beam and scraper at once recede from their perpendicular to an oblique position, thereby relieving the stone from its pressure, and it is free to pass back.

L is a large driving-wheel, attached to the shaft of the eccentric-cylinder, and having two rims, one of which has an inside, and the other an outside cog, or friction-gearing.

Between the two rims, the pinion M is placed, and is moved to either of them by means of the eccentric bearing N' of the shaft N.

This shaft N is moved by the lever P, to which it is joined by the connecting-rod O.

Power is supplied by a pulley, M', attached to the axle of the pinion.

By means of gearing *m' m'' m'''*, motion is imparted from the same pulley, to a crank, Q, to which is attached the connecting-hook R.

This hook R is supported and rests on a roller, S, attached to a rock-bar, S', which serves as the fulcrum of the lever P, and is thereby either raised or lowered, as the lever is moved to the right or left.

P is a lock, or catch, the function of which is to hold the lever P in place and keep the hook R raised while the impression is being taken.

The roller carriage V, containing the inking-rollers, moves on guiding-rods T, which are fixed to the frame, and is propelled to and fro, from the end towards the centre, and parallel with the sides of the press, by means of the crank Q and the hook R, the connection between the hook R and the carriage V being effected by means of a bent lever, *u*, pivoted to the frame at *u'*, and a connecting-rod, *u''*.

When the arm S is down, the hook engages with the lever, and operates the carriage, but, when up, the hook vibrates back and forth, without engaging with the lever, and the carriage remains stationary.

The toe W, on the hook R, serves to push back the roller-carriage always to its place over the ink-fountain, if it should happen that the disconnection was made at any other point.

The damping-apparatus consists of a roller, *a*, covered with soft material, and the tilting distributing-table Y, covered with flannel, buckskin, or other similar material. It is worked by the backward motion of the large driving-wheel, by means of two pins, X and Z. The first, X, strikes a dog, *b*, attached to a lever, *c*, and presses it forward until it passes over it, carrying the lever *c* and damping-roller forward, when the next pin, Z, strikes the projection *d* upon the lever *c*, and throws the latter and the damping-roller back to their original position.

The registering-frame and paper-grippers consist of an iron frame, E', and a tail-piece, *f*, working on a pivot-joint, *e'*, fastened to the bed, but projecting over the sides of the frame A.

The projecting portion has an open slot, *f'*, which fits to a pin, *g*, fastened in the side of the frame A.

By the forward motion of the bed this registering-frame will close down on the stone through the operation of the slot *g'*, and pin *g*, and by the back motion, it will open and raise the impression.

The grippers will close on the paper automatically, as soon as the frame makes an acute angle with the bed, and will open their hold when it approaches an obtuse inclination, by means of the joint *i* and the weighted lever *j*.

The pointing-apparatus *l*, with the adjustable points *o o*, serves, also, as a rest for the registering-frame, while the paper is being fed.

All the parts appertaining to the registering, as the frame, the grippers, the points, and also the stone, being fastened to one and the same piece, (the bed B,) no variation can occur, but the most perfect register is obtained.

The journals of the large cylinder which bears the pressure of the scraper, rest on a bed of alternate layers of metal plates, *r r*, and an elastic material, *s s*.



such as gum, or any similar substance, held together by a screw-arrangement, *t*, whereby any amount of rigidity may be obtained.

The operation of the press is as follows:

The stone is fastened by wedges firmly to the bed; the pressure is regulated by the screw *F*; the registering-frame adjusted to the proper height; the damping-roller and table properly moistened, and the fountain and inking-rollers charged with ink; which can all be done with the same facility as in a hand-press.

The lever *P* is raised till it comes in the lock; thereby the pinion *M* is pressed against the outer rim of the driving-wheel, and, power being applied by the pulley, this wheel consequently starts the large eccentric cylinder, and, with it the bed, in its forward motion.

By means of the pin *g* and the slot in the tail-piece, this motion of the bed will make the registering-frame turn on its pivot, and lay down the paper which has been previously fed to it.

By the further motion of the bed, the stud *I* comes in contact with the dogs *H*, which will raise the arms *G*, and turn the oscillating cross-beam and scraper-holder on its axle, at the moment when the eccentric cylinder, with the highest portion of its periphery, and the stone, have arrived under the same vertical line.

The pressure is now set, and the stone and paper continue to travel with the bed under the scraper to the end of the sheet, and to a point where an adjustable stop, *w*, secured to the bed, comes in contact with the lock *P'*, which holds the lever *P* in position.

The stop opens the lock and releases the lever, and being counterbalanced, the lever falls back, and throws the pinion *M* against the opposite, or inner rim of the driving-wheel, thereby reversing the motion of the cylinder and bed.

By this reversion, the position of the cross-beam and scraper-holder is changed from the vertical to the oblique, thereby relieving the stone of all pressure, and allowing it to pass freely out.

In the retrograde motion of the bed, when it has arrived at such a point where the stationary pin in the frame *A* has entered the slot in the tail-piece of the registering-frame, and has so far raised said frame as to allow the damping-table to tilt over, the pin *X* on the large driving-wheel strikes the dog *b* on one of the levers that hold the damping-roller, and moves it forward; in consequence, the damping-roller first passes over the damping-table, and is supplied with moisture, after which the table tilts over on its fulcrum *y*, and brings the roller in contact with the stone. The roller then passes over the stone. In the mean time the pin *X* has also passed the intervening dog *b*, then a second pin, *Z*, in the driving-wheel, comes in contact with the projection *d* on the above lever, and raises it. This will pull the damping-roller back again over the face of the stone to the table, which tilts back to its original position.

By this means the stone is damped previous to inking, and a very regular degree of moisture can be maintained, by occasionally wetting the flannel of the table with a sponge.

By this time the bed has arrived at a point where it comes to a rest; the grippers have raised the impression, and have opened their hold, and the same has been removed; the registering-frame has opened entirely, and leans back firmly on the rest and pointing-apparatus, ready to receive another sheet.

In the mean time the inking-apparatus commences to work.

The stationary position of the bed is maintained by means of a notch, *a'*, in the inner rim of the driving-wheel, into which the pinion enters, and is thereby relieved of all contact with any portion of the wheel, which necessarily comes to a stand-still.

This same contrivance also serves, at the proper moment, to throw the inking-apparatus into gear.

The pinion entering the notch, by being connected with the lever *P* and the roller *S* on which the hook *R* rests, will lower this roller sufficiently to permit the hook to take hold of the pin *w* on the bent lever *u*, which is part of the inking-apparatus.

The connection of this lever and the crank being now established by means of the hook, the lever will commence a reciprocating motion, and thereby the inking-rollers in the carriage will pass over the stone to and fro, as often as in the judgment of the printer it is thought necessary.

In the mean time, while the inking is going on, a new sheet is fed by hand to the grippers.

The lever *P* is now again raised to the lock by hand, and the press starts for another impression.

By means of the roller *S*, attached to the fulcrum of the lever *P*, the raising of the latter will also raise the hook, which is supported by this roller, and thereby sever the connection of the crank and roller-carriage, which is left standing over the ink-fountain, for a new distribution of ink, while the other operations of the press, as before described, are going on.

The position of the roller-carriage over the fountain, even if the disconnection should have been made at any other point, is always secured by means of the toe, attached to the hook, which will push it back to that point under any circumstances.

The advantages of this machine, compared with other presses, are manifold.

The time required to make an impression will vary a little, according to the size of the stone that is printed. For a double-medium sheet, twenty-four by thirty-six inches, it will take about seven seconds to run the impression through and the bed back, and five seconds for inking, twelve seconds in all for one impression, or three hundred impressions in one hour, which is about as much as a printer, with the assistance of a help-boy, will do in a whole day on a hand-press.

The impression is sharper and cleaner because the pressure is stronger than the hand-press will admit of, and at the same time less rigid.

The tympan-leather never comes in contact with the paper except the line where the scraper presses it; consequently the impressions are free from all blurs and blemishes.

The way the inking-rollers pass over the stone, to and fro, has none of the objections that are urged against the inking-process of other machines, where the rollers are stationary, and the stone merely passes under them backward and forward once, at a comparatively slow speed, in consequence of which the ink cannot be well distributed, and the picture is either clogged or not sufficiently inked.

In this machine the rollers pass over the stone much more swiftly and oftener, and will thereby keep the picture open and clean, and distribute the ink evenly. It approaches, as near as can be, the manner in which a good printer would handle his roller while inking a stone.

Another advantage is, that the stone is fully exposed to view while inking, and the printer can detect any discrepancy, or accident, and correct it in time, if it should occur.

The damping of the stone, so delicate in its nature, which has been found inefficient in most other machines, by supplying either too much moisture, or not enough, is successfully accomplished here, because the water is not directly supplied to the damping-roller, or the stone, but to an intermediate distributing-table, from which the roller receives just a sufficiency of moisture to dampen the stone perfectly.

A perfect register, so necessary in chromo-printing, has been accomplished by attaching the grippers and



pointing-apparatus securely to the same bed to which the stone is fastened, and thereby insuring the most perfect and accurate register, as no deviation from the fitting, in a linear as well as a lateral direction, can occur.

All attempts to effect the same purpose by other machines, where the form, or stone and the grippers are detached and affixed to different portions of machinery, which are connected together by gearing, or otherwise, have proved themselves unreliable.

This press will print a stone from its full capacity down to the smallest size, and without any previous preparation, as to levelling or cementing them to the bed.

Any ordinary stone that can be printed in a hand-press, even if it be not perfectly true, or level, can be worked in this machine without difficulty.

The changing from one stone to another is done with rapidity and ease.

The register in chromo-printing is adjusted with certainty, and in a few minutes.

This press is calculated to do the finest kind of work, particularly in chromo-printing, and with the greatest rapidity compatible with good work.

By prolonging the inking for a few seconds, the very best quality of work is obtained, while in other machines any additional inking can only be had by suspending the pressure, and going through the whole operation of the press, without taking an impression, thereby sacrificing one hundred per cent. in time.

The press is perfectly self-acting up to the time of inking, which is continued indefinitely, until suspended by the discretion of the printer, thereby insuring a superior quality of work.

All the operations of the press are so arranged that accident can occur to any portion of the machinery, even if worked by an inexperienced operator.

Having thus described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

1. The oscillating cross-beam D, adapted to support

the scraper-holder E, and to apply pressure to the stone at the proper time by the operation of the arms G and dogs H, in conjunction with the movement of the bed, substantially as and for the purposes described.

2. In combination with the reciprocating bed of a lithographic printing-press, I claim an eccentric cylinder, O, having its circumference equal to the distance traversed by each movement of the bed, and so constructed and arranged as to support the bed during its whole movement, and at one part of its movement to raise it, and thereby produce pressure upon the stone.

3. The driving-wheel L, with its double rim, one of said rims having the recess  $a^2$ , when employed in a printing-press, in combination with the shaft N and pinion M, to produce a forward and backward motion of the bed, substantially as described.

4. The combination of the hook R, lever  $u$ , and inking-carriage V, when constructed to operate as herein described.

5. In combination with said parts R,  $u$ , and V, constructed to operate as described, the lever P, shaft S', and arm S, substantially as and for the purposes specified.

6. In a printing-press, the combination of the reciprocating roller  $a$  with the tilting distributing-table Y, when constructed to operate substantially as and for the purposes set forth.

7. The register-frame E', pivoted at  $e'$ , having the tail-piece  $f$  and the open slot  $g'$ , in combination with the bed B, having the projection  $g$ , substantially as and for the purposes set forth.

8. Supporting the points  $o$ , the register-frame  $e$ , and the stone, upon one and the same bed, or frame B, for the purposes set forth.

To the above specification of my invention, I have signed my hand, this 23d day of January, 1869.

A. HOEN.

Witnesses:

CHARLES A. PETTIT,  
SOLON O. KEMON.