

J. KRAYER.
Lithographic-Printing Machine.
No. 216,193. Patented June 3, 1879.

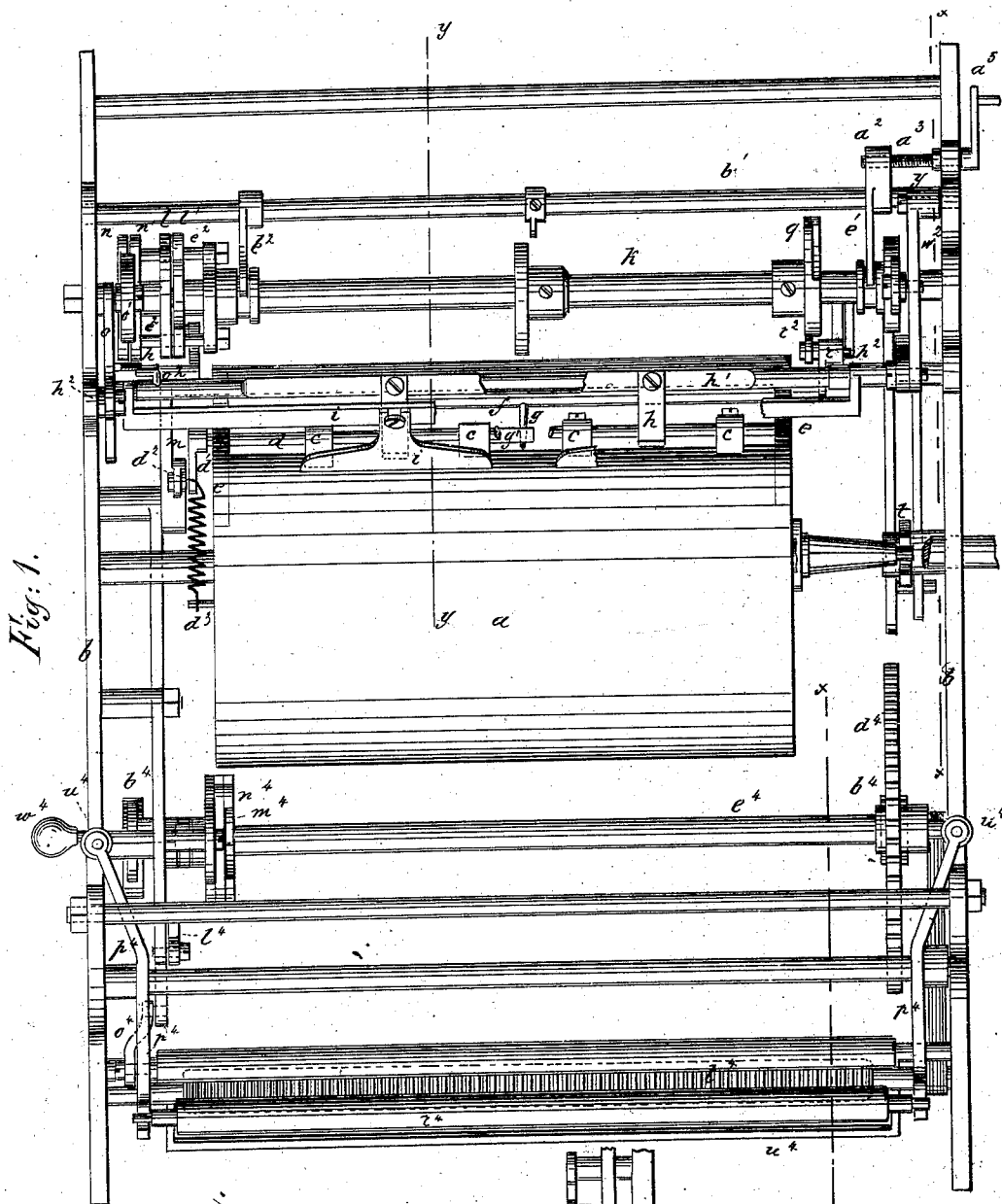
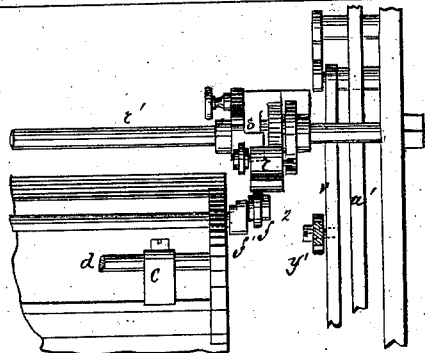


Fig. 1.

Fig. 2.



WITNESSES:

Chas. N. Kray
C. Seaguir

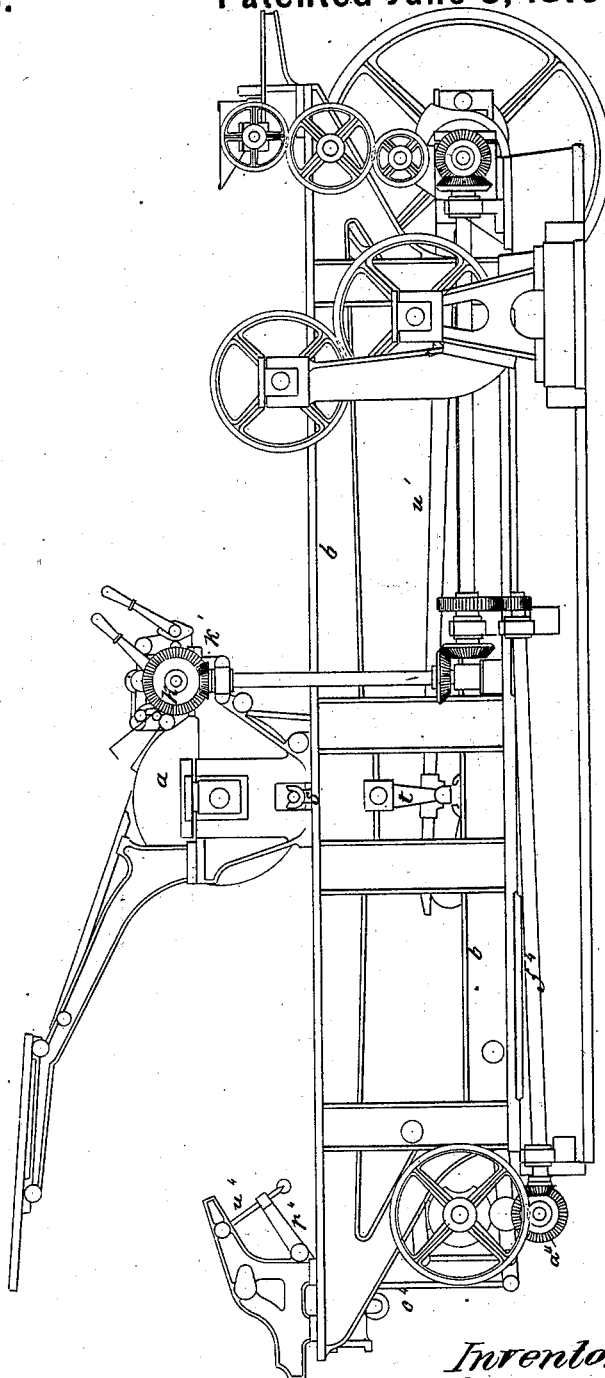
INVENTOR:

J. Kray
BY *Munroe*

ATTORNEYS.

J. KRAYER.
Lithographic-Printing Machine.
No. 216,193. Patented June 3, 1879.

Fig. 6.



Witnesses:
Chas. Nida
C. Sedgwick

Inventor:
J. Krayer
Mumford
Attorney.

UNITED STATES PATENT OFFICE.

JOSEPH KRAYER, OF JOHANNISBERG-ON-THE-RHINE, WIESBADEN, GERMANY.

IMPROVEMENT IN LITHOGRAPHIC PRINTING-MACHINES.

Specification forming part of Letters Patent No. 216,193, dated June 3, 1879; application filed October 10, 1878.

To all whom it may concern:

Be it known that I, JOSEPH KRAYER, of Johannisberg-on-the-Rhine, Wiesbaden, Germany, have invented new and useful Improvements in Lithographic Printing-Machines, of which the following is a specification.

The invention will first be described in connection with the drawings, and then pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view of the cylinder and frame of a lithographic press having my improvements applied thereto. Fig. 2 is a section plan at one end of the cylinder on the line $z z$. Fig. 3 is a side elevation with the side frame removed on line $x x$. Fig. 4 is a cross-section of the cylinder and paper-regulating devices, taken on line $y y$. Fig. 5 is a detail view, separately referred to; and Fig. 6 is a side elevation of a press, showing the connection of my improvements with the other parts of the press.

Similar letters of reference indicate corresponding parts.

The cylinder a and frame b are of usual construction. The press to which my improvements are applied is of the class in which the stone is carried by a reciprocating carriage. The press and its operating mechanism are represented in Fig. 6, and the application of my improvements to the same will be understood from the following description.

$c c c c$ are the grippers carried by a rock-shaft, d , that is within a cavity, a^1 , cut across the face of cylinder a , and journaled in the plates e at the ends of the cavity. One end of shaft d extends outside plate e , and is provided with a crank-arm, d^1 , and friction-roller, d^2 . (See Fig. 1.) The grippers c are kept in contact with cylinder a by a spring, d^3 , attached to arm d^1 and cylinder a .

f is a second rock-shaft within the cavity a^1 , carrying the point-spur g , (see Figs. 1 and 4,) and it has at one end the crank-arm f^1 and friction-roller f^2 . (See Fig. 3.)

$h h$ are the guides against which the edge of the sheet is to be placed. $i i$ are the planishers, which rest upon the paper that is on the cylinder a , to prevent the formation of creases and folds. The guides h are upon a rod, h^1 , that is held loosely in the sockets h^2 , held in frame b , so that these guides fall by their own

weight below the surface of cylinder a , their downward motion being limited by a pin, h^3 , that rests on shaft d . The planishers i are attached to a bar, i^1 , that is also fitted loosely in the sockets h^2 , so that the planishers rest by their own weight on the paper or cylinder.

k is a shaft mounted in an extension of frame b , in front of cylinder a . $l l^1$ are cam-disks upon the shaft k , for operating the grippers c through the medium of the elbow-lever m . Cam l has but one notch or depression, while l^1 has two notches, so that by one cam the grippers will be operated once during a revolution of shaft k , and by the other cam they will be lifted twice. The manner of shifting the cams will be hereinafter described.

The angle-lever m is fulcrumed on frame a . Its short arm carries a friction-roller that rests against the under side of cams $l l^1$, and its long arm is brought by the cams into contact with the roller d^2 on arm d^1 of griper-shaft d .

$n n^1$ are cam-disks on shaft k , which act, through the medium of elbow-lever o , to lift the planishers i and then permit them to fall. The cam n acts once during the revolution of shaft k , while cam n^1 acts twice. The lever o carries a friction-roller, o^1 , which rests on cam n or n^1 , (see Fig. 5,) and its short arm acts upon a stud on bar i^1 to turn the same in the sockets h^2 and raise the planishers.

p is a pin projecting downward from the lever o , and coming in contact with a projection, o^2 , from the rod h^1 , that carries the guides h , so that when the roller o^2 falls into one of the notches of cams $n n^1$ the guides $h h$ are thrown up.

q is a cam-disk on shaft k for operating the point-spur g through the medium of a lever, r , that is hung on the cross-bar r^1 . The lever r carries a friction-roller, r^2 , that is kept in contact with cam q by a spring, q^1 . The cam q is double, one portion of its surface having diametrically-opposed depressions, and the other portion but one depressing, so that by shifting cam q on shaft k the roller r^2 , and through it the point g , are given a multiple action during a revolution of shaft k , or the lever r may be entirely freed from contact with cam q .

The lever r acts upon the roller f^2 of crank f^1 to raise spur g above the surface of cylinder a and cause it to pierce the sheet, and the

spur is pressed down again by a spring, g^1 , as soon as the roller r^2 falls into the depressions in cam q .

The spur g is also caused to pierce a hole in the sheet after it has been seized by the grippers c and carried a short distance by means of the block s , that is fitted to swing upon the bar r^1 , and thereby be moved in or out of the path of roller f^2 . This block s is held in either position by a clamping-screw, which passes through a slot, s^1 , in block s .

The shaft k is to be revolved continuously by bevel-gearing k^1 , as shown in Fig. 6. The stoppage of cylinder a , when but one impression is to be taken during a movement to and fro of the carriage, is effected by the devices shown in Fig. 3.

t is a forked catch-lever hung at t^1 on frame b , the upper end of which engages with a pin, t^2 , on cylinder a . Its lower end carries a crank-pin, u , which engages with the connecting-rod w' . v is an arm hung at v^1 and formed with a mortise, v^2 , beneath the lower end of lever t , which mortise is connected with or relieved from lever t by the cam w on shaft k , acting upon a roller, w^1 , on the lever w^2 , that is pivoted at y , and is connected by a rod, y^1 , to the arm v . The cam w raises arm v , thereby disconnecting the rod w' from crank-pin u by means of roller y^2 , and locking the catch-lever t by means of mortise v^2 once during each revolution of shaft k .

The cams l , n , and w are shifted simultaneously to render the action of the devices described single or double during the revolution of shaft k by means of a screw, a^3 , fitted in frame b and working in a projection, a^2 , from a rod, b^1 , to move the rod b^1 endwise in its bearings in frame b , which endwise motion, by means of forks e^1 , that enter grooves formed in the hubs of cams l and w , moves the said cams upon shaft k . The cam l is connected by rods e^2 with cam n , so that they move together, and the screw a^3 is provided with a handle, a^5 , by which it is operated.

When the cam l is in contact with l^1 , and cam n with n^1 , the guides h , planishers i , and grippers c will operate but once during the revolution of shaft k , the single-acting cams being then the operative ones. This single action is used when but one impression is to be taken during a double movement of the carriage. The cam w will be in position at this time to stop the cylinder a , as before described.

The separation of the cams by the screw a^3 , as before described, permits the double-acting cams l^1 n^1 to operate, and moves cam w out of action.

The moistening devices will be next described. The shaft a^4 , journaled in frame b , carries a cam, b^4 , and gear-pinion c^4 , which latter meshes with the gear-wheel d^4 on shaft e^4 . Shaft a^4 is driven by gearing on a shaft, f^4 , Fig. 6, which takes its motion from the other mechanism of the press, and the connection is to be such that the shaft a^4 will revolve once during each reciprocation of the stone,

and once to every eight revolutions of the shaft e^4 . g^4 is a lever hung at h^4 , and carrying a roller, i^4 , that rests on cam b^4 . k^4 is a second lever connected to g^4 by a link, l^4 , and carrying a roller, m^4 , that rests on a portion of the three-part cam n^4 on shaft e^4 . o^4 is a rod connecting lever g^4 with one of the levers p^4 , that are on a rock-shaft, q^4 , and carry the roll r^4 . s^4 is a roller that is in contact with a roller, t^4 , which latter turns in a vessel, u^4 , for containing water. The rollers r^4 and s^4 should be covered with cloth or felt to carry the water from roller t^4 to roller s^4 and by the roller r^4 to the moistening-table and rolls. (Not shown.)

The amount of pressure of roller r^4 upon roller s^4 is regulated by the screws w^4 , which are on the outer ends of levers p^4 and take against the frame b . The cam n^4 is capable of sidewise motion on its shaft, and is caused to turn therewith by a feather on the shaft. The cam n^4 can be moved on its shaft by a pin and fork, w^4 , so as to bring the roller m^4 upon any one of the three disks of the cam or relieve it entirely from contact with n^4 , in which latter case the motion of roller r^4 will be given solely by cam b^4 on shaft a^4 . This cam b^4 is shaped so that it operates the roll r^4 once during the revolution of a^4 , and consequently the roll r^4 will be moved once during each reciprocation of the stone. On the other hand, if the cam n^4 be positioned so that the roller m^4 rests upon the disk of cam n^4 , containing four notches, the roll r^4 will be operated every second reciprocation, and if upon the disk containing two notches, every fourth reciprocation. The pin w^4 is to be clamped to retain the cam n^4 in place by a thumb-screw.

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

1. The combination, with shaft d , having grippers and arm d^1 , of the lever m , the laterally-adjustable cam l , having one notch, and the fixed cam l^1 , having two notches, as shown and described, for the purpose set forth.

2. The mechanism for operating the planishers i and guides h , consisting of the cams n n^1 , lever o , bar i , pin p , projection o^2 , and rod h^1 , combined and arranged substantially as described.

3. The combination, with the grippers, guides, planishers, and lever v , of the shaft k and fixed cams l^1 and n^1 , the movable cams l , n , and w , rod b^1 , forks e^1 , and screw a^3 , arranged for operation substantially as described, and for the purposes set forth.

4. In combination with the shaft a^4 , cam b^4 , and arm g^4 , by which the moistening-roll r^4 is operated at each revolution of shaft a^4 , the three-part cam n^4 , arm k^4 , link l^4 , and pin and fork w^4 , substantially as and for the purposes described.

JOS. KRAYER.

Witnesses:

AUG. DIESTERWEG,
JOS. KLEIN.