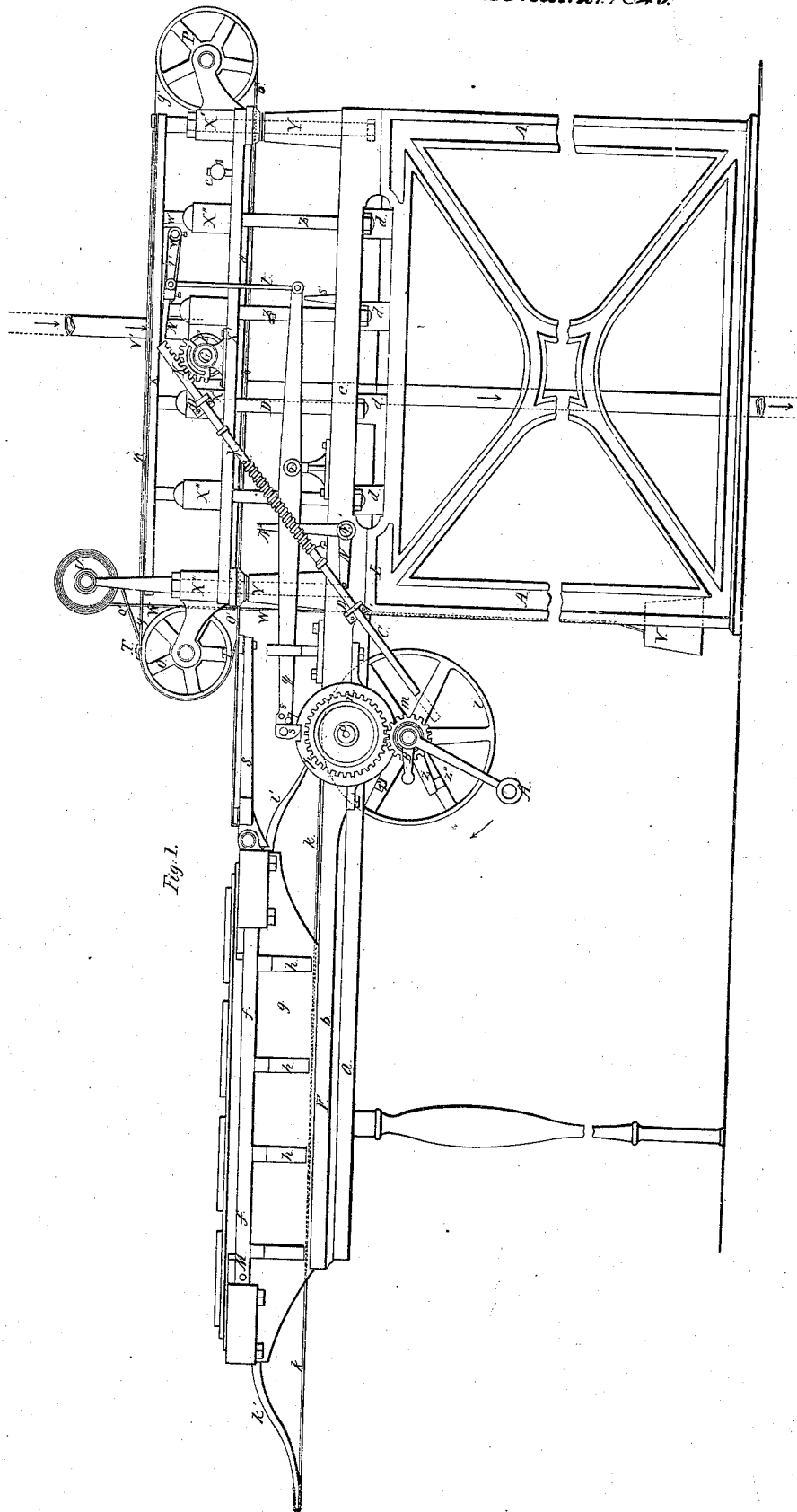


J. Saxton.  
Lithographic Press.  
No 3958.  
Patented Mar. 21, 1845.

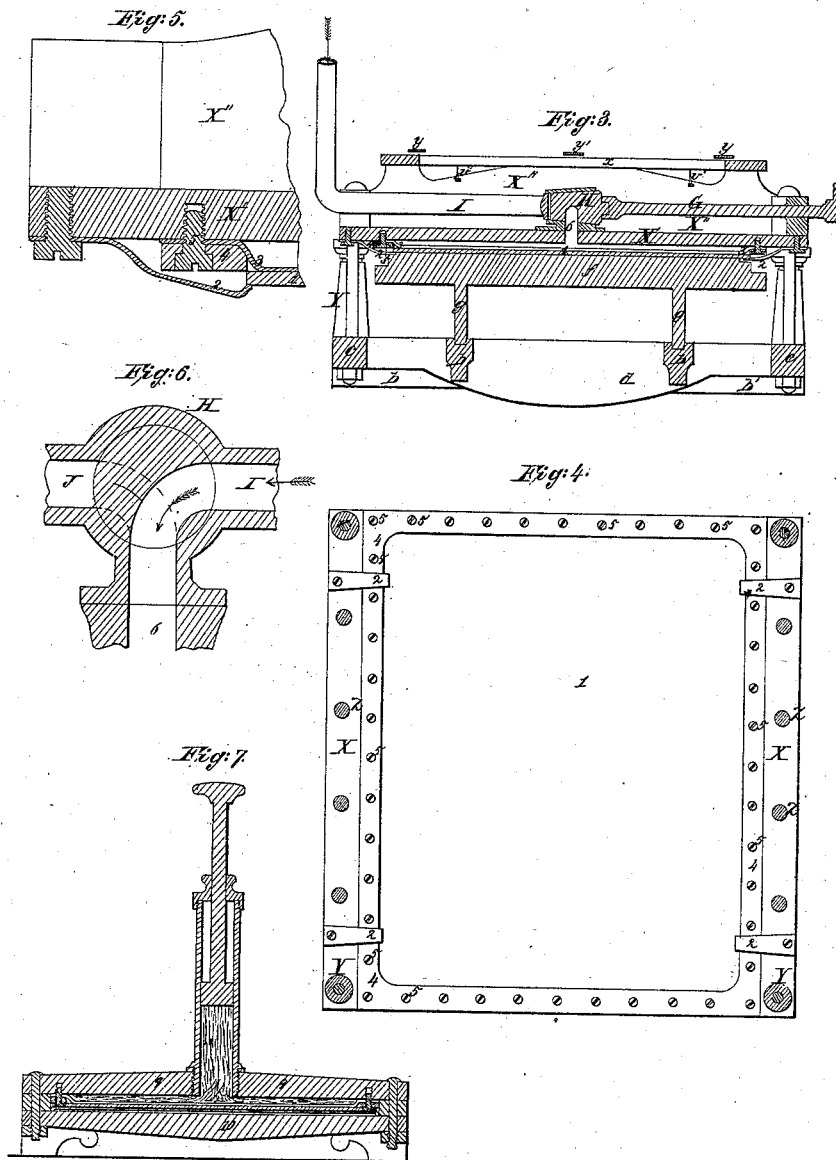


J. Saxton,

Lithographic Press,

N<sup>o</sup> 3,958,

Patented Mar. 21, 1845.



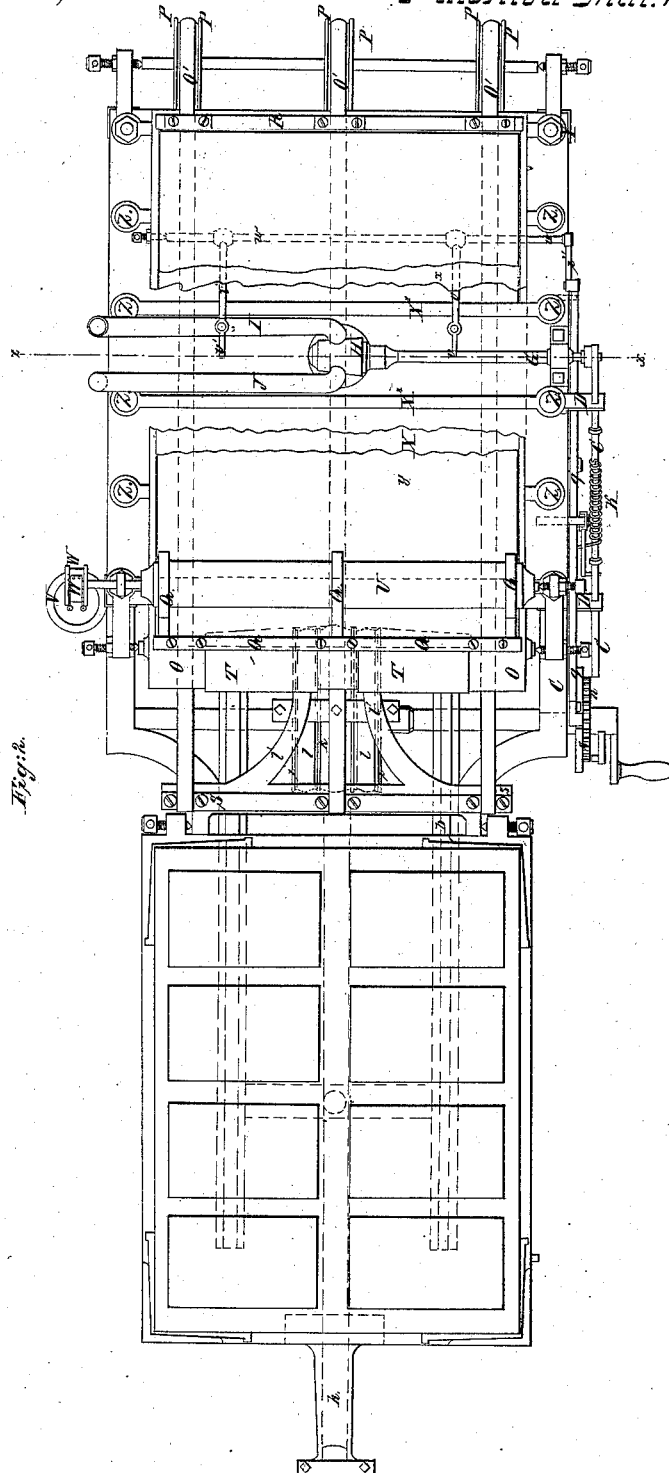
*J. Saxton.*

*Sheet 3-35 sheets*

*Lithographic Press,*

*Nº 3,958,*

*Patented Mar. 21, 1845.*



# UNITED STATES PATENT OFFICE.

JOSEPH SAXTON, OF WASHINGTON, DISTRICT OF COLUMBIA.

## PRINTING-PRESS.

Specification of Letters Patent No. 3,958, dated March 21, 1845.

*To all whom it may concern:*

Be it known that I, JOSEPH SAXTON, of the city of Washington and District of Columbia, have invented sundry new and useful  
5 Improvements in Presses; and I do hereby declare that the following is a full, clear, and exact description thereof reference being had to the accompanying drawings, in which—

10 Figure 1 is an elevation, Fig. 2 a plan, Figs. 3, 4, 5 and 6 sectional parts, Fig. 7 a modification.

My invention and improvements consist first, in the use of a flexible or elastic platen instead of a rigid or inflexible plate of metal as a platen. Secondly in the application  
15 of pressure to such flexible or elastic platen by means of a liquid or aeriform fluid in the manner herein described; and thirdly, in the arrangement of machinery in printing presses, copying presses and lithographic and zincographic presses for the purpose of  
20 applying such pressure to such flexible or elastic platen.

25 The object and effect of using a flexible or elastic platen with the pressure by means of a liquid or aeriform fluid is that the platen is equally pressed or acted upon over its whole surface and which may there-  
30 fore be employed in any position to press upward, downward or sidewise. The said flexible or elastic platen is to be of the necessary size for the press in which it is to be used as in the case of the ordinary platen  
35 and is to be a thin plate of brass or other suitable metal varying in thickness from that of a sheet of foolscap paper to about half an inch according to the dimensions of  
40 the platen and of the vacant spaces between the columns or pages of types or figures technically in printing called "the white." The mode of application of the said flexible or elastic platen and of the pressure by means of such liquid or aeriform fluid will  
45 be best shown by the description of the machinery delineated in the drawing hereto annexed which I shall now particularly describe, by which any competent workman will readily be able to carry my invention  
50 into effect.

*Description of the drawing.*—Figure 1 represents an elevation of a printing press with my improvements applied thereto. Fig. 2 is a plan of Fig. 1 with a part of the  
55 middle of the tympan and table broken off in order to show the situation of some of

the parts below them. Fig. 3 is a transverse section of some of the parts taken at the dotted line between the \* \* in Fig. 2. Fig. 4 is a plan of the underside of the flexible  
60 platen as combined with the inflexible head of the press. Fig. 5 represents an enlarged section of the left side of the head of the press and parts attached underneath it as given in Fig. 3.

65 In each of these figures the same letters and numbers indicate the same parts. *a a* the frame or supports of the press, *b b* the ribs thereof, which consist of two parallel bars having each a longitudinal groove  
70 formed in their upper surface, which acts as guides to the carriage that carries the form of the type (these two ribs together with the two side rails *c c* the six transverse  
75 beams *d d* and a cross bar *b'* I prefer being of cast iron and formed in one piece) the carriage on which the form of type is placed consists of the horizontal plate or bed *f f*,  
80 &c., and of the longitudinal pieces *g g*, &c., which slide in the grooves of the ribs, and the bed is further strengthened by the transverse beams *h h*, &c., all of which I likewise prefer to be cast in one piece. This carriage is run under and withdrawn from be-  
85 neath the platen by turning the barrel *i*, the axes of which revolve in suitable bearings affixed to the press frame, as shown by dotted lines at Fig. 2. The strap *k* affixed to the lengthening arm *k'* being that by which the carriage is run in, and the straps  
90 *l l* affixed to another lengthening piece *l' l'* being those by which the carriage is drawn out.

It should be stated that the barrel *i* is not made fast upon its axle, but the axle  
95 is capable of turning a short distance within the barrel say about one sixth of a revolution, both in the running in and drawing out of the carriage, before the barrel is caused to turn; the object of which  
100 will be hereafter described.

On the axle of the barrel *i* is affixed the toothed pinion *m* which takes into and turns the toothed wheel *n* turning on the stud *o*  
105 affixed to the side rail *c*.

To the wheel *n* is affixed a circular plate *p* having a notch cut in its periphery.

*q* is a lever having its fulcrum at *r*. On one end of this lever *q* is hinged the detent  
110 *s* which falls into the notch in the circular plate *p* as will be hereafter described. *t* is a connecting rod attached to the other end

of the lever *g*. This connecting rod moves the arm *t'* and with it the axis (*w*) on which are mounted the arms *v*, *v*, carrying the register points *v'* and which axis turns in the bearings *w' w'*. The register points *v'* rise through the wooden table *x x*, &c., and tympan *y y*, &c.

The table *x* is supported by the transverse beams of the head of the press as is shown in Figs. 1 and 3.

On the axle of the barrel *i* is affixed the arm *z* which comes alternately against the stops *z' z''* affixed on the spokes of the barrel, and on the axle of the barrel is affixed the winch or handle *A* for working the press and which at the same time also moves the arm *B*. This arm *B* carries a stud which in its revolution pushes up the diagonal sliding rod *C* which moves through guides *D D*, affixed to the press frame. On the upper end of the sliding rod *C* is formed the toothed rack *E*, which takes into and works the toothed segment *F* affixed upon the axis *G*, which turns the plug of the cock *H*.

The cock and plug are so formed that they will alternately admit water (which is the fluid I prefer in this case) from the pipe *I* and permit it to flow in upon the flexible platen and then to stop or cut off such flow of water and at the same time open a passage from above the platen in order that the water may flow off by the pipe *J*. The peculiar construction of this cock will be hereafter described.

On the rod *C*, is placed the helical spring *K* one end of which is affixed to the rod and the other end to the framing of the press. The object of this spring is to draw back the rod *C* when released and thereby turn the plug of the cock. On the under side of the rod *C* is formed a notch at the point *L* which catches against the lower guide *D* at that point and thereby the rod *C* is retained in the position shown in Fig. 1 so long as is required. On the bed *f* is affixed the stud *M* which comes in contact with the cranked and bent lever *N* which has its fulcrum at *N'*. By this means the rod *C* is lifted out of its catch or notch at *L* and the spring immediately pulls it down and thereby opens the cock *H*, in order that the water may flow in above the platen.

At that end of the press-head which is next to the carriage when drawn out from under the platen is placed a cylinder *O O*, &c., revolving in bearings attached to the press-head; the diameter of this cylinder is equal to the distance between the upper side of the table and the under side of the platen and at the other end of the press head is placed in similar bearings a revolving axis carrying three pulleys *P, P, P*, Fig. 2 each of the same diameter as the cylinder. The ends of the tympan are fastened to two wooden bars as stretchers *Q* and *R*, and at

that end of the carriage next to the platen when the carriage is drawn out is hinged a frame *S S*, &c., which is retained in a horizontal position by means of stops under the hinges abutting against the carriage in order that it may pass in and out under the platen without touching it. But when the carriage is drawn out into the position shown in Figs. 1 and 2 the end of the frame may rise and come in contact with the bottom of the cylinder to prevent any oblique strain of the straps.

The use of the cylinder pulleys, stretchers, and frame is to stretch the tympan and pass it in under the platen upon the types and again to draw it out and lay it evenly upon the table, to effect which purpose the two broad straps *T T* are fastened to the rising end of the frame *S*, and to the stretcher *Q* passing around the cylinder *O*. The length of the straps will be rather more than the semicircumference of the cylinder, in order that the stretcher *Q* may lie clear of the form of type, when under the platen and allow the paper to be accurately applied upon the form.

Three narrow straps *O' O'*, &c., are fastened to the other stretcher *R*; they are brought over the 3 pulleys *P P P* and pass under the platen and are made fast with proper tension to the frame *S* near its hinged end, and thus the tympan is kept uniformly stretched in all parts of its course. A sheet of paper laid upon the tympan is kept in contact with it during its course by means of two, three, or more frisket tapes *Q', Q', Q'* (Fig. 2) according to the number of pages of type in the form which are made fast to the stretcher *Q* and wound upon a cylinder *U* turning in bearings elevated above the end of the table. These tapes are kept in a proper state of tension by means of a weight *V* hanging on a tape *W* which winds around a pulley on one end of the cylinder *U* and thus the paper is held between the tapes and the tympan during its passage under the platen and its withdrawal therefrom; the tapes also performing the office of lifting the paper off from the types as the carriage is drawn out after the impression has been made.

I now proceed more particularly to describe my improvements on the platen. *X* shows the inflexible as resisting head of the press which is supported in its place by the four pillars *Y Y*, &c., which have screw bolts through them in order to retain the parts securely together and there are additional screw bolts, *Z Z*, &c., for the same purpose by which the pressure transmitted from the platen to the type on the bed *f* is resisted as will be evident on inspecting the drawing.

The frame or inflexible head of the press is composed of the cast iron plate *X'* having the strong ribs *X'' X''*, &c., on the top

of it and I prefer that these ribs and the plane should be cast in one piece. In the Figs. 3, 4 and 5, 1 is the flexible platen having its under surface or face which gives the impression flat and smooth. The face of this plate or platen 1 is shown in plan at Fig. 4, and is held up in its proper position by 4 springs 2 2 2 2 which also assist in lifting the platen off the type when the water is flowing away. 3 is a flexible shallow bag which I usually make of water proof cloth, or leather made water proof which is made fast to the head of the press by means of the quadrangular frame 4 which is bound fast on the edges of the water proof cloth or leather by means of the screws 5 5, &c., and thus the whole inclosure is made water tight. 6 (Figs. 3 and 6) is the opening in the plate of the head for the passage of the water into and out of the inclosure.

I now proceed to describe the construction and action of the detent *s* in falling into and rising out of the notch in the periphery of the circular plate *p*. The detent *s* turns on a stud fixed in the end of the lever *q*. Near the detent are two stops 7 and 8 also fixed in that lever, the stop 7 holds the detent in a vertical position while the upper part of the periphery of the plate *p* is traveling from left to right and the stop 8 allows the detent to take an oblique position in order that it may rise out of the notch when the plate turns in the reverse way. The intention of this motion of the detent is, that the register points shall be suddenly thrust up through the table and tympan at the moment the tympan comes to a state of rest. The gearing or wheel work that turns this circular plate must be so arranged that the plate shall never make an entire revolution. Fig. 6 represents a section of the cock H showing a curved water way in the plug by turning of which the water is allowed to flow into the inclosure by one pipe and out through the other. At any convenient part in the inflexible plate of the head X a small stop cock must be placed to be occasionally opened to allow the escape of any air, which may have entered the inclosure.

Having described the nature of my improvements in printing presses I now proceed to describe the manner of action. It will however in the first place be desirable to remark that the degree of pressure to be given to the platen is to be regulated by the height and pressure of the column of the fluid in the supply pipe I; and the quantity of pressure may be regulated according to the nature of the work to be performed, but as the nature of the pressure of fluids is well understood, it will not be necessary to go into any description thereof and I would further remark that it may be desirable to have the pipe J ten or more feet long in order to insure a quick flow of the water from

above the platen. The lower end of this discharge pipe may be placed in a vessel of water to prevent the entrance of air.

The press being in the position shown in Fig. 1 a sheet of paper is to be laid upon the tympan in such a manner that the register pins will penetrate about the middle of the sheet. The winch A on the axis of the barrel *i* is then to be turned in the direction of the arrow Fig. 1 in order to run in the carriage with its form of type. The first part of the motion of the handle will cause the arm *z* to travel a distance from the stop *z'* to the other stop *z''* without turning the barrel. By this motion the detent *s* is raised out of the notch formed in the circular plate *p* and thereby elevates that end of the lever *q* which depresses the other end of it together with the connecting rod *t* and consequently withdraws the register points. The continued motion of the winch A causes the barrel to run the carriage in and on the stud M on the side of the carriage coming in contact with the vertical part of the lever N it lifts the notch in the rod C off from the detaining guide D when the spring on that rod instantly pulls it down and opens the cock to admit the flow of water into the inclosure above the platen in order to give the required impression. The winch A is then to be turned in the opposite direction in order to draw out the carriage with the form of type upon it the first part of the motion of the handle for the purpose will move the arm *z* the distance from the stop *z''* to the other stop *z'* without moving the barrel *i*. At the commencement of this movement the arm B will come in contact with the end of the rod C and push it upward which will close the passage of the cock leading from the pipe I and open it to the pipe J. The water or other fluid will then be at a liberty to flow off from the inclosure above the platen; the platen will then be raised by the springs 2, 2, 2, aided by the atmospheric pressure. The notch in the rod C will then again catch at the point L and on the carriage being completely drawn out the detent *s* will fall into the notch of the circular plate *p* and the spring *s'* under the other end of the lever *q* will raise up the register points. The paper which has received its impression is now returned to the position from which it started and is to be removed and a fresh sheet substituted and the handle A turned in order to run in the carriage with its form of type and produce a repetition of the operations.

Another modification of my invention as applicable to printing presses is made by fastening a flexible metallic plate and waterproof bag to the under side of the platen of the ordinary printing press in the manner shown in Fig. 4 leaving a small space say one eighth of an inch between the ordi-

nary platen and the flexible bag and plate and filling this space with water or other liquid the use of which would be to equalize the pressure all over the surface of the types  
5 when the platen is forced down by the ordinary screws, levers or other means.

In applying my improvements to the lithographic press I modify the carriage to receive a stone instead of the form of type  
10 and omit the register points with the apparatus for moving them and I also omit the frisket tapes and when the stone is much smaller than the flexible platen, I place blocks around the stone to produce an  
15 even surface and thus prevent any undue bending of the flexible platen; and I sometimes screw down upon the bed of the carriage a quadrangular frame including a flexible plate and bag as before described  
20 leaving the space of about the eighth of an inch between the plate and the bed which I fill with water for the purpose of affording uniform resistance in case of irregularity in the thickness of the stone or in case of  
25 printing from fragile substances.

In order to apply my flexible platen to a press for copying letters, I affix it underneath an inflexible metal plate as shown in Fig. 7 at 9. This metal plate I connect by  
30 screw bolts and nuts at each side with another inflexible plate 10 beneath it leaving a space between the two plates underneath the flexible platen sufficient to introduce a portfolio with several thicknesses of paper  
35 placed above and below the writing and the damped tissue paper which is to receive the copy, as shown lying upon the plate 10.

In case of taking impressions from stone the space between the two plates must be  
40 increased, but in case of taking impres-

sions from zinc plates the same machine as is used for copying letters may be employed and the bottom plate or bed 10 may also be provided with a flexible plate and bag and fluid in which case printing might  
45 be effected by this form of press from thin glass, porcelain, and other substances.

I can bring on the pressure of the fluids either by connecting the flexible platen with a column thereof or otherwise by employing  
50 a force pump, as shown in Fig. 7 to which may be added a lever to increase the pressure.

I do not mean or intend hereby to claim as my improvement or invention any of the  
55 parts of the machine or machines, presses, or letter copying machine herein delineated as described nor do I intend or mean to limit myself to the employment of any particular material or materials in the construction thereof but to use any which are  
60 fit and proper for the purpose intended, but I do hereby claim—

The use and application of a flexible or elastic platen in the manner herein de-  
65 scribed the application of pressure thereto in printing presses, copying presses, lithographic presses, and zincographic presses by means of a liquid or aeriform fluid in the manner also herein described and the ar-  
70 rangement of the machinery or parts of the said presses as herein described for the purpose of applying such pressure of a liquid or aeriform fluid to such flexible or elastic platen.

JOS. SAXTON.

Witnesses:

J. J. GREENOUGH,  
D. R. MORSELL.