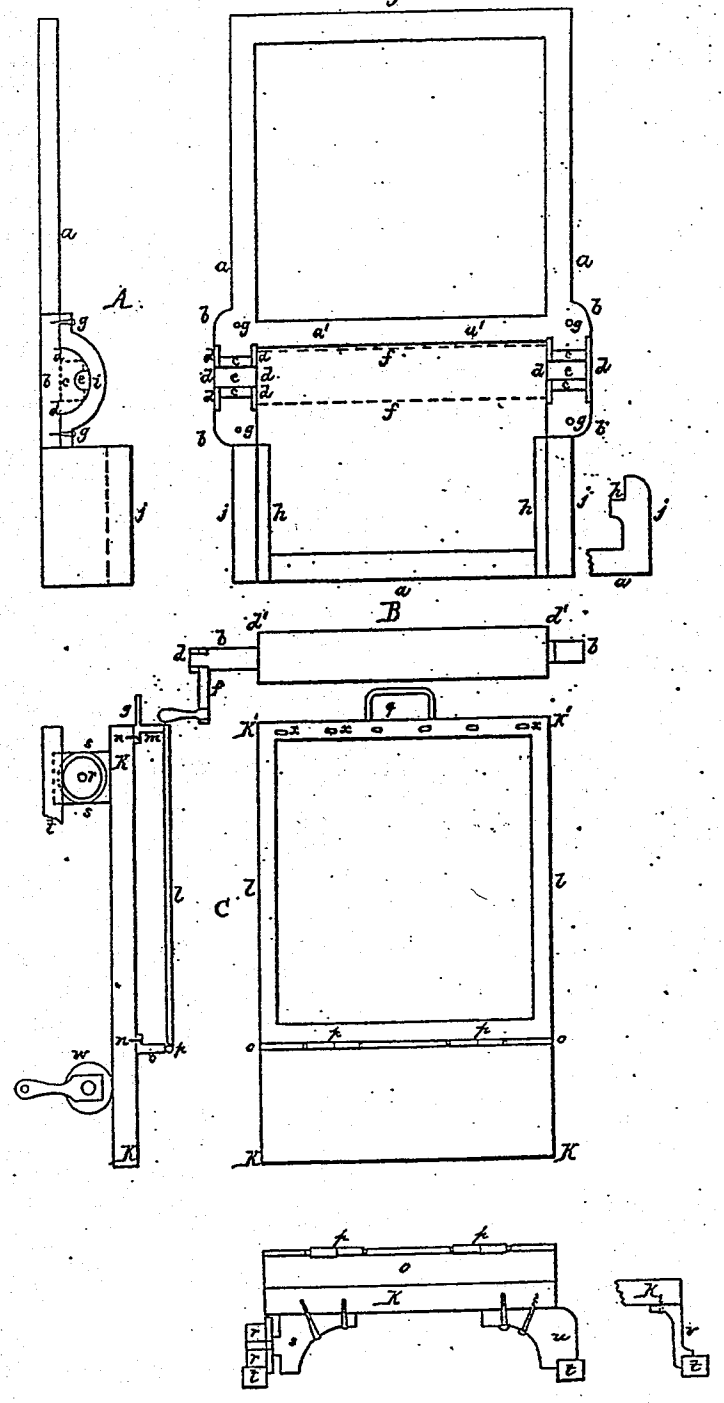
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J. Donlevy. Sheet 1. 3 Sheets.

Lithographic Presses.

No. 5283 Patented Sept. 11. 1847.

Fig. 1.



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Inventor:
John Donlevy.

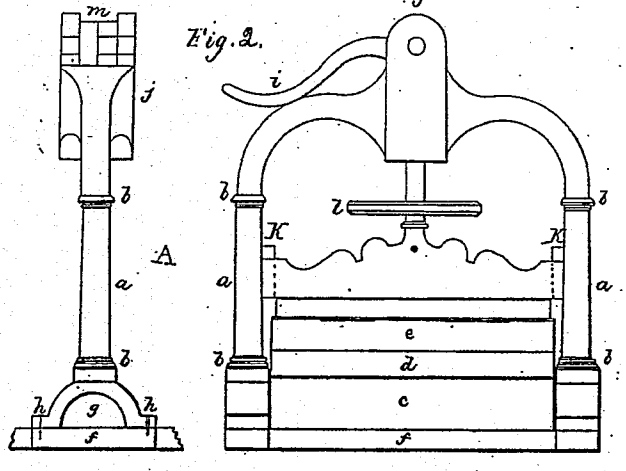
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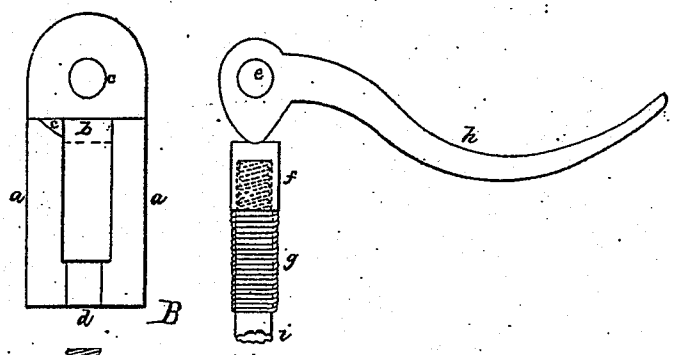
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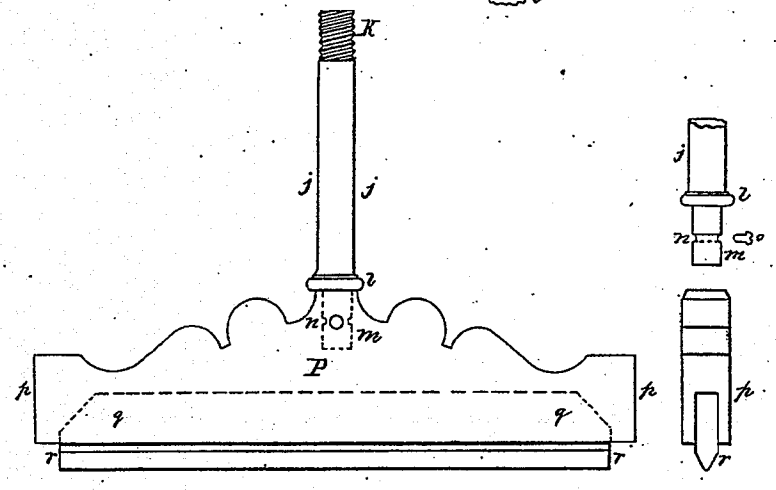
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Fig. 2.







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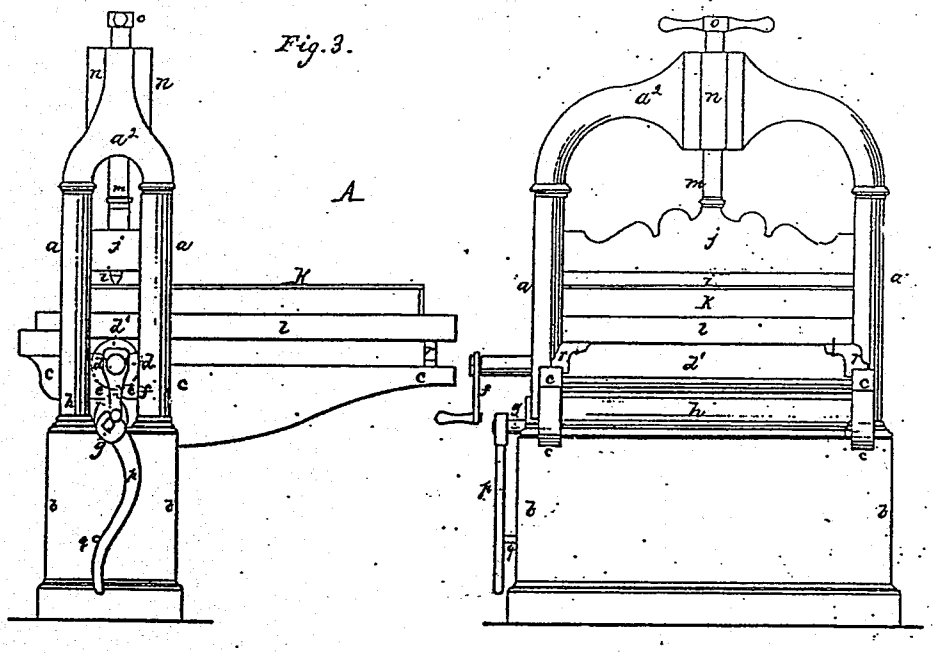
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J. Donlevy. Sheet 3 of 3 Sheets.

Lithographic Press.

No. 5283 Patented Sept. 11. 1847.

Fig. 3.



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UNITED STATES PATENT OFFICE.

JOHN DONLEVY, OF NEW YORK, N. Y.

LITHOGRAPHIC PRESS.

Specification of Letters Patent No. 5,283, dated September 11, 1847.

To all whom it may concern:

Be it known that I, JOHN DONLEVY, of the city of New York and State of New York, have invented certain new and useful Improvements in the Modes of Constructing Copying and Lithographic Presses; and I do declare that the following is a full and exact description.

Figure 1[A] is a plan and side view of the bed frame.

My improved press is constructed in the following manner: I prepare a metallic frame to support the machine in the form of a parallelogram composed of four bars as delineated in Fig. 1[A] of the accompanying drawings (*a*, *a*, *a*, *a*). A fifth transverse bar I add intermediate the ends of the frame generally immediately in front of the roller in order to stiffen the sides of the frame as in (*a'*, *a'*, of Fig. 1[A]). The dimensions of this frame which I term the bed frame will in general depend upon the use to which the press is intended to be applied and the character of the work intended to be done by it. As it is intended to use a portion of the side bars as ways or trains to guide the carriage the upper and inner surface of those bars should for about two thirds the length of the frame present a uniform and true surface.

Upon the outer edge of each of the side bars in corresponding positions upon each side of the frame I add a projecting piece (*i*) as a bearing to support the arch or upright frame. These projections or bearing pieces may be made in the form delineated in Fig. 1[A] (*b*, *b*, *b*, *b*). The bearing pieces should be of sufficient dimensions to give full bearing to the feet of the columns of the arch. The strength of these pieces must be determined by reference to the principles hereinafter laid down.

Upon the surface of each of the bearing pieces last described I place a metallic block of the form of a parallelogram intended to act as a half box or bearing for the cylindrical roller which blocks are seen in Fig. 1 (*c*, *c*, *c*, *c*). Each of the blocks has in its upper surface a semicylindrical groove (*e*) extending through the block, the axis of the groove being at right angles with the line of the side bars. These grooves are intended to receive the axle of the cylindrical roller. The height of the block will depend upon the degree of elevation required for the cylindrical roller desired to be employed in the machine. Where I use a roller of two inches diameter I generally make the height of the block about one inch. The dimensions of the blocks in other respects will be governed by the size of the axle of the roller, and the pressure intended to be placed upon it. Care should be taken not to make the blocks unnecessarily large as the tendency in that case would be to weaken the arch, as will appear in the description of the arch.

When a box or bearing of a different metal from that of which the bed frame is made is desired to be used the blocks may be cast independent of and detached from the bed frame, but in other respects as above described; but when the same metal is to be used in both as is generally the case in my machines, I cast the bed frame and the blocks all in a single piece.

As the diameter of the cylindrical roller is increased the height of the blocks is correspondingly diminished until they are altogether dispensed with and the semicylindrical grooves to receive the axle of the roller are made in the upper surface of the bed frame. In that case it will become necessary to increase the thickness of the bearing pieces to compensate for the portions cut away for the groove. The blocks are represented in Fig. 1[A] (*c*, *c*, *c*, *c*).

In order to secure the feet of the arch from lateral motion, as well as for the purpose of strengthening those portions of the frame which are subjected to strain from the power applied to the press, there may be attached to both the inside and outside surfaces of the blocks last described plates of metal (*d*, *d*, *d*, *d*,) or flanges of semicircular form. These plates are placed edgewise upon the bearing pieces before described, having their planes at right angles with the axis of the cylindrical roller and resting upon the bearing pieces or their bases. I allow the radius of the semicircular or guard plates *d d d d* to exceed the height of the blocks so that there shall be a projeicton of the plates beyond the blocks, both above before and behind them. The projecting portions of the semicircular plates being intended to act as guards to prevent the feet of the columns of the arch which fall between them from having a lateral motion. Any other form than that of a semicircle may be adopted for the guard plates last described, which will accomplish the end in view. Lastly I cut away such portion of the

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guard plates as may be required in order to allow the axle of the cylindrical roller to fall into the semicylindrical grooves on the top of the blocks. The guard plates are represented in Fig. 1A of the accompanying drawings (*d*, *d*, *d*, *d*).

I perforate each of the bearing pieces with two holes *g g*, one before and one behind the blocks, intended to receive bolts or screws passing through the feet of the columns of the arch. Behind the cylindrical roller I place a strain or way (*j*, *j*,) to guide that portion of the carriage which passes behind the roller. The ways or trains are of bars of metal having a rabbet (*h h*) on their upper and inner surfaces running lengthwise with the bed frame. They are elevated above the bed frame one being placed on each side in such manner as to receive and guide that portion of the carriage which rests upon them. A form which may be adopted for these trains or ways is presented in Fig. 1A (*j*, *j*, *j*, *j*).

The bed frame with the parts attached thereto which I have described and designated as the transverse bar, the bearing pieces, the blocks, the guard plates, the trains, and the braces that support the trains, I make of cast iron, brass or any other metallic substance appropriate for the purpose, in a single piece of casting. When it is required to depress the bearings of the cylindrical roller below the bed frame and also when for any other reason it is desirable to extend the columns of the arch below the bed frame, I dispense with the bearing pieces blocks and guard plates. The manner in which the bed frame is in that case retained in its proper position will be explained in the latter part of the description of the arch.

The cylindrical roller.—The cylindrical roller *d'* B Fig. 1 I prepare in the usual form, of such dimensions as to revolve in the blocks. To one side of the axle of the roller I attach a crank *f* to turn the roller. I usually place the roller upon the bed frame so as to leave two thirds of the frame before the roller and the remaining third behind.

The arch.—Fig. 2A, front and side elevation. The arch a^2 I construct in the form of a flattened arch resting on two columns as is seen in Fig. 2A. The arch should be of sufficient strength to resist the pressure that is intended to be put upon the press. Having placed the axle of the roller *d'* in the semicylindrical grooves *e* I form the feet of the arch with indentations or cavities corresponding in size and form with the blocks and axle on which it is intended to fit as a cap and of such form and size in other respects as to be received between the semicircular plates *d d* extending before and behind sufficiently these feet are perforated with holes to receive bolts or screws *h* Fig. 2A to secure the feet of the columns of the arch in any manner well known. The holes in the feet of the columns of the arch I make to correspond with the holes in the bearing pieces.

When it is intended to place the press upon a solid wooden surface, screws may be used to pass through these holes and enter the wood, or bolts may be used when most convenient provided with a nut and thread. A portion of the arch over the middle of the frame I make in the form of a box *j* Fig. 2A with cavities or openings *b*, *d*, Fig. 2B similar to those used in the ordinary lithographic press to receive the end of the bar or screw *j* Fig. 2B which communicates the pressure from the lever to the scraper box, and also the nut and spiral spring frequently attached to the bar. I also make projections on the upper side of this part of the arch in the usual form for the purpose of attaching the lever as at *e* Fig. 2B.

To the inner surface of each of the columns of the arch, I affix a train to conduct a slide upon the scraper box. The length of the slide will depend upon the elevation and depression required for the scraper box. A view of the arch and of the parts described as I usually construct them is presented in Fig. 2, of the accompanying drawings, and are explained by the references upon the drawings.

Any other form than that described and delineated whether ornamented or plain which is convenient for casting and which unites the general properties of the form described, may be adopted for the arch. I make the arch of cast iron, brass, or other appropriate metal in a single casting. When I extend the arch below the bed frame, as stated in the concluding description of the bed frame, I make the feet of the columns of the arch in such manner, as to rest with an even bearing in a solid surface, without the openings or cavities above described.

Across the inner side of each of the columns at the height of the bed frame I make a rectangular groove of the size of the side bars of the bed frame, in which the bed frame is intended to be secured. I also make in the inner side of each of the column of the arch openings or cavities fitted to receive the axle of the cylindrical roller without boxes, or with a half box or boxes made in any usual or other appropriate form, to serve as bearings to the cylindrical roller. When it is required in this form of press, braces running from the under side of the frame to the lower part of the columns of the arch may be used to assist in sustaining the bed frame. The cylindrical roller in this form of constructing my machine I make detached from the axle which

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passes through the roller and is secured by an ordinary groove and key.

In some cases when the machine is to be permanently attached to a uniform plane surface having the requisite solidity, the bed frame and the rectangular grooves to hold it may be dispensed with and in that case I attach bars or strips of wood or of iron or other appropriate metal or material to the platform to serve as ways elevated behind the roller by means of arms or braces as before described in the description of the bed frame or I make longitudinal grooves to serve as ways to guide the wheels which are attached to the carriage: When a machine is to be constructed with the usual appendages of a screw and eccentric to elevate each end of the roller, I form the arch with suitable cavities to receive these fixtures.

In Fig. III, A and B presents a view of my arch with cavities *r r* to receive a screw and eccentric. The several parts of these forms of my machine are explained in the references attached to the drawings.

The carriage.—I make the carriage *l* of a solid piece of wood in the form of a parallellogram. The size of the carriage will necessarily depend on the nature of the work for which the press is intended, but it never can exceed the width between the inside of the columns of the arch through which it passes. One end of the carriage I allow to rest on the cylindrical roller *d'* the other end is supported at the proper height in the following manner. To the end of the carriage which is farthest from the arch I attach on the under side, in the case of a light machine two small arms (*r r*) braces, blocks, or projecting pieces of metal or wood extending downward to the side bars of the bed frames and terminating in a rabbet, or in projections having the properties of a rabbet, so formed as to slide in contact with the upper and inner surfaces of the side bars of the bed frame. When the machine is large and the carriage heavy I attach wheels in the form of rail road wheels a^3 a^3 Fig. 3^B or *r r* Fig. 1^C armed with flanges or projecting rims to guide them upon the side bars and secured by castings attached to the carriage by means of screws or in any usual method. I adopt the form of constructing the arm of metal and the form of wheels and cast sockets represented in Fig. 1.

To the upper side of the carriage so placed as to be in front of and clear from the roller when the carriage is drawn out to the full extent allowed, I place a metallic casting (*o*) the form of which may be obtained by taking a metallic plate of the form of a parallelogram and bending it along the middle lengthwise with the piece in the form of a rabbet. One of the planes of the figure thus produced I screw firmly in contact with the carriage while the other stands in a perpendicular position to the first. Upon the top of the piece as it is attached to the carriage I make two eyes *p p* Fig. 1^C or metallic rings intended to form the half of the hinge on which the tympan turns *l*. These eyes or rings are perforated each with one hole to receive a bolt. The height of the center of the eye in a machine of medium size I usually allow to be $1\frac{1}{4}$ inches above the carriage. This piece together with the eyes I make in a single casting. At the opposite end of the carriage I place a piece of metal *m* having an upright projection or projections for the tympan to rest upon; the height of these projections will of course correspond with the height of the piece last before described. This piece may also be provided with a handle to draw back the carriage. The form which I generally adopt for this piece which I make of cast metal is represented in Fig. 1^C (*m.*)

The tympan.—I make the tympan *l* of Fig. 1^C of cast iron or brass in the form of a rectangular frame. The area included between the metallic bars that compose the frame is covered with leather prepared by stretching and attached in the usual manner to three sides of the frame. To one end of the frame I attach eyes *p*, *p*, or rings of metal made in form to correspond with those attached to the carriage and so placed upon the tympan that when the tympan is in its proper position over the carriage, the eyes on the tympan will fall between and in contact with the eyes *p*, *p*, on the carriage, and the holes with which the eyes are perforated will fall opposite each other, so as to receive a bolt which I provide with a key to retain it in its place. The bar (*k'*) which forms the end of the tympan nearest the roller, I perforate with vertical holes *w* through which in stretching the leather upon the tympan frame, I pass strips of leather or strings laced between these holes and holes made in the leather. The tympan frame I make as described in one casting of iron or brass or other appropriate metal. A view of the tympan as I usually make it is seen in Fig. 1^C.

The lever-screw scraper-box and scraper.—I construct the lever or screw *m*, scraper box *j* and scraper *k* with their necessary appendages in the manner ordinarily employed in lithographic presses for which I make no claim. Fig. 2^B represents a view of these portions of the machine as I ordinarily construct them. I provide the scraper box in the usual manner with a slide *k* (see A Fig. 2) at each end to guide it upon the ways before described as attached to the inside of the columns of the arch.

When it is intended to elevate the press

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above a platform I cast legs or columns to the bed frame, one placed under each foot of the arch and one at each corner of the machine the feet of which are fitted with holes through which screws or nails may be passed to make fast to the floor table or platform on which the machine rests.

Fig. 3B presents a view in perspective of my machine in the usual form in which I construct it. The varieties of form described and delineated I regard as variations in the form of the machine to suit particular circumstances. I have added references to the accompanying drawings as well as to the description which are intended fully to designate parts in the varieties of form in which I use the press.

What I claim as my invention and desire to secure by Letters Patent is—

1. The placing a half box *c* Fig. 1A of metal to act as a bearing to the axle of the cylindrical roller upon the bed frame, either attached to it or detached from it; and the placing the same upon the platform to receive a machine, without the bed frame; without any opening, cavity, or groove in the bed frame or platform to receive it.

2. I claim the forming of the arch in the manner and variety of form described, with cavities to receive the axle of the cylindrical roller and the half box on which the same is situated or with cavities or openings to receive detached boxes, or half boxes for the axle or the axle without boxes either cast in the feet or other parts of the columns, and also to receive the screw and eccentric when used. But I do not claim as my invention the form of the cavities or projections on the crown of the arch intended for the lever box screw and spiral spring nor the use of ways attached to the inner side of the columns.

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