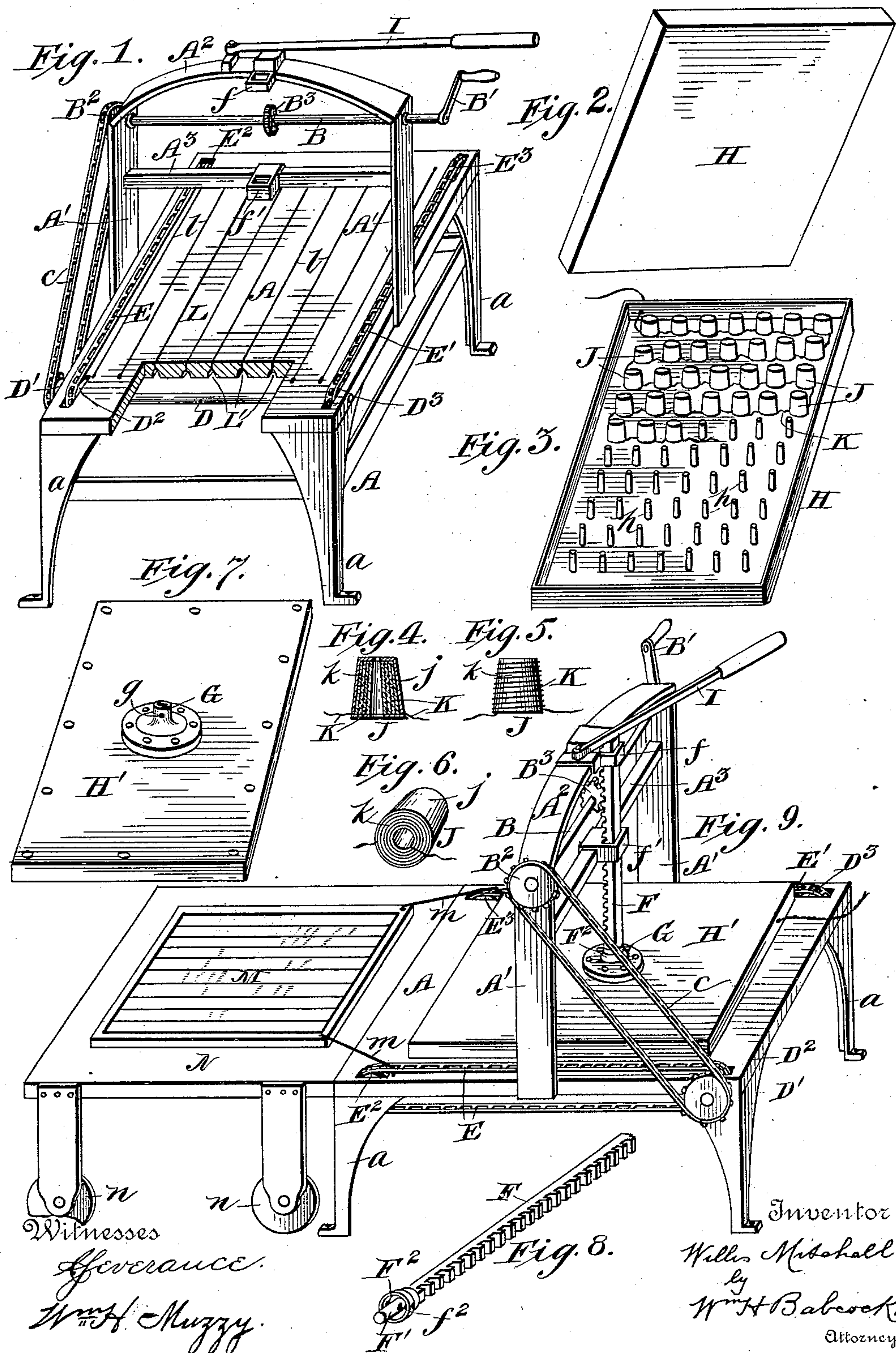


(No Model.)

W. MITCHELL.
ELECTRICALLY HEATED MATRIX PRESS.

No. 474,964.

Patented May 17, 1892.



UNITED STATES PATENT OFFICE.

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ELECTRICALLY-HEATED MATRIX-PRESS.

SPECIFICATION forming part of Letters Patent No. 474,964, dated May 17, 1892.

Application filed December 4, 1891. Serial No. 414,021. (No model.)

To all whom it may concern:

Be it known that I, WILLIS MITCHELL, a citizen of the United States, residing at Malden, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Electrically-Heated Matrix-Presses; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention has for its object to provide satisfactory means for drying matrices by the passage of an electric current and the heat which it causes. In obtaining the impression of type on a matrix for casting stereotype-plates the usual present practice is as follows: A suitable moistened paper sheet is laid upon the chase of type and rolled down until the paper has received the impression, then the chase with the matrix still on it is removed to a press, the lower bed-plate of which is heated by steam circulating through it. The heat ascends through the type and after a certain length of time reaches and dries the matrix. The incidental heating of the type is quite objectionable on account of the expansion and contraction which consequently occur. Another objectionable feature of the practice above described is the necessity for two separate operations, the rolling and the drying and pressing. My invention eliminates both of these defects, securing rapidity and perfection of work performed by one machine instead of two.

In the accompanying drawings, Figure 1 represents a perspective end view of a machine embodying my invention, the platen and its supporting-bar having been removed and a part of the bed broken away. Fig. 2 represents a detail view of the platen. Fig. 3 represents a similar view of the hollow interior thereof, showing the conical studs which receive the electric-heating cylinders, the cover having been removed. Fig. 4 represents a detail view of one of the said heating-cylinders in vertical section. Fig. 5 represents a detail view of the same in elevation with the covering removed. Fig. 6 represents a view of the same in horizontal position, the

end cap of the covering alone being removed. Fig. 7 represents a perspective detail view of the cover of the platen. Fig. 8 represents a detail view of the rack-bar for raising and lowering the said platen; and Fig. 9 represents a side perspective view of the entire machine, also showing the movable table on which the chase of type is brought to it.

In the said drawings, A designates the frame of the press, provided with legs a and raised standards A' , the latter being connected by an arched top piece A^2 and a bracing cross-bar A^3 . In these standards a transverse driving-shaft B is journaled, which is provided at one end with a crank-handle B' , at the other end with a chain-wheel B^2 , and near its middle with a pinion B^3 . An endless chain c runs from the said chain-wheel to a similar chain-wheel or pulley D' on a transverse shaft D, journaled in one end of the said frame A. This shaft is provided near its ends with two more chain-wheels or pulleys D^2 D^3 , which receive endless horizontal chains $E E'$ for feeding the chase into position to impress the matrix. At the other end of the said frame these chains pass around the chain-wheels E^2 E^3 , journaled therein.

The pinion B^3 meshes with a vertical rack-bar F, which moves up and down in guides $f f'$, attached to the said arched top piece A^2 and cross-bar A^3 . The lower end of this bar is provided with a stud or reduced extension F' , which is perforated from side to side at f^2 , a collar F^2 being formed on the said bar just above it. This stud fits into a socket G, which is attached to the top plate or cover of platen, the said socket being also perforated at g , so that a pin may be passed through both the said stud and the said socket, fastening them together.

The platen is hollow, and consists of a top plate or cover H' and a hollow body H, the latter having tapering studs h raised thereon, each of which receives one of the electrical heaters hereinafter described. When these two parts H and H' are put together and bolted or otherwise fastened, they constitute a shell inclosing the electric-heating devices, the said shell being also of sufficient weight for service as a platen. The pressure of it on

the matrix is chiefly produced by so turning the crank-handle B' as to lower the said rack-bar and platen. This pressure may be increased by a lever I, which is pivoted at one end to the said top piece and arranged to bear on the top of the said rack-bar when the said lever is depressed. J designates the electrical heaters employed for the said platen. Each of these consists of a conoidal shell *j*, having within it a series of concentric insulating partitions *k* of corresponding shape. A wire K, forming part of an electric circuit, is wound about the innermost partition from end to end of the latter. Then the next outer partition is slipped over it and the wire is wound on this from end to end in the reverse direction. This is repeated with each partition until the outer one is similarly wrapped, when the wire is carried to the next heater and the same procedure is repeated. Thus all the wire helices of all the heaters are in the same electric circuit, and the passage of the current through them heats the studs *h*, on which the said heaters are fitted, and also the body of the platen. The wire K may have an insulated coating or be wound so tightly into the material of the partitions that its individual coils or windings cannot come in contact with each other, or strips or pieces of insulating material may be inserted between them. Any of these plans will avoid short-circuiting. The material of the partitions is preferably asbestos. Their shape and that of the studs *h* and heaters J as entireties need not be conoidal. Cylindrical studs and heaters would answer, but the conoidal ones fit more securely.

To permit the escape of moisture from the matrix through the bed L of the press under pressure, the said bed is provided on its under side with a series of longitudinal grooves L', and each groove of this series has a sawkerf *l*, running lengthwise of it and extending to the surface of the said bed.

As shown in Fig. 9, the chase M of type is brought in from the composing-room on a movable table or truck N, running on wheels *n*. The end of this table or truck fits against the end of the frame A, as shown. The said chase is provided with hooks *m*, which catch into the endless horizontal chains E E'. The shaft B is then operated to lower the said platen, and at the same time cause the said chains to feed the said chase under it. When the chase is fully in position under the platen, the hooks *m* are released by hand from the horizontal chains E E'. Before the platen is fully low-

ered the moistened matrix is placed on the type, a blanket or layer of soft felt or equivalent material is placed on the matrix, and on the blanket a sheet of asbestos mill-board. The electrically-heated platen is then brought down on the mill-board, and additional pressure, if needed, is applied by the lever I or any equivalent device which may be substituted therefor.

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

1. In a matrix-press, the combination of a platen having studs formed on it with electric heaters fitting on the said studs, each of the said heaters being formed of a wire wound on successive cylindrical or conoidal walls, and the said wire being in an electric circuit, substantially as set forth.

2. In a matrix-press, the combination of a hollow platen with a series of electrical heaters arranged within it, each heater consisting of several concentric layers, and a wire wound thereon in successive helices, the same wire extending throughout the series and forming part of an electric circuit, substantially as set forth.

3. In combination with a shaft, pinion, and rack, a platen raised and lowered thereby, a lever arranged to apply additional pressure to the said platen, a matrix-supporting bed, and electrical-heating devices arranged within the said platen, for the purposes set forth.

4. In combination with a platen having studs *h* raised within it, a series of electrical-heating devices formed of a wire which is in an electric circuit, the said wire being wound on successive concentric cylindrical or conoidal layers of asbestos and properly incased for each electric heater, the said heaters fitting on the said studs and all being in the same electric circuit, substantially as set forth.

5. A platen provided with a raised stud, in combination with an electric-heating device adapted to fit on the said stud, the said device consisting of a concentric series of insulating partitions properly incased, and a wire which forms part of an electric circuit and is wound successively on these partitions, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIS MITCHELL.

Witnesses:

EDWIN W. PIERCE,
PELATIAH R. SRIPP.