

Sept. 29, 1953

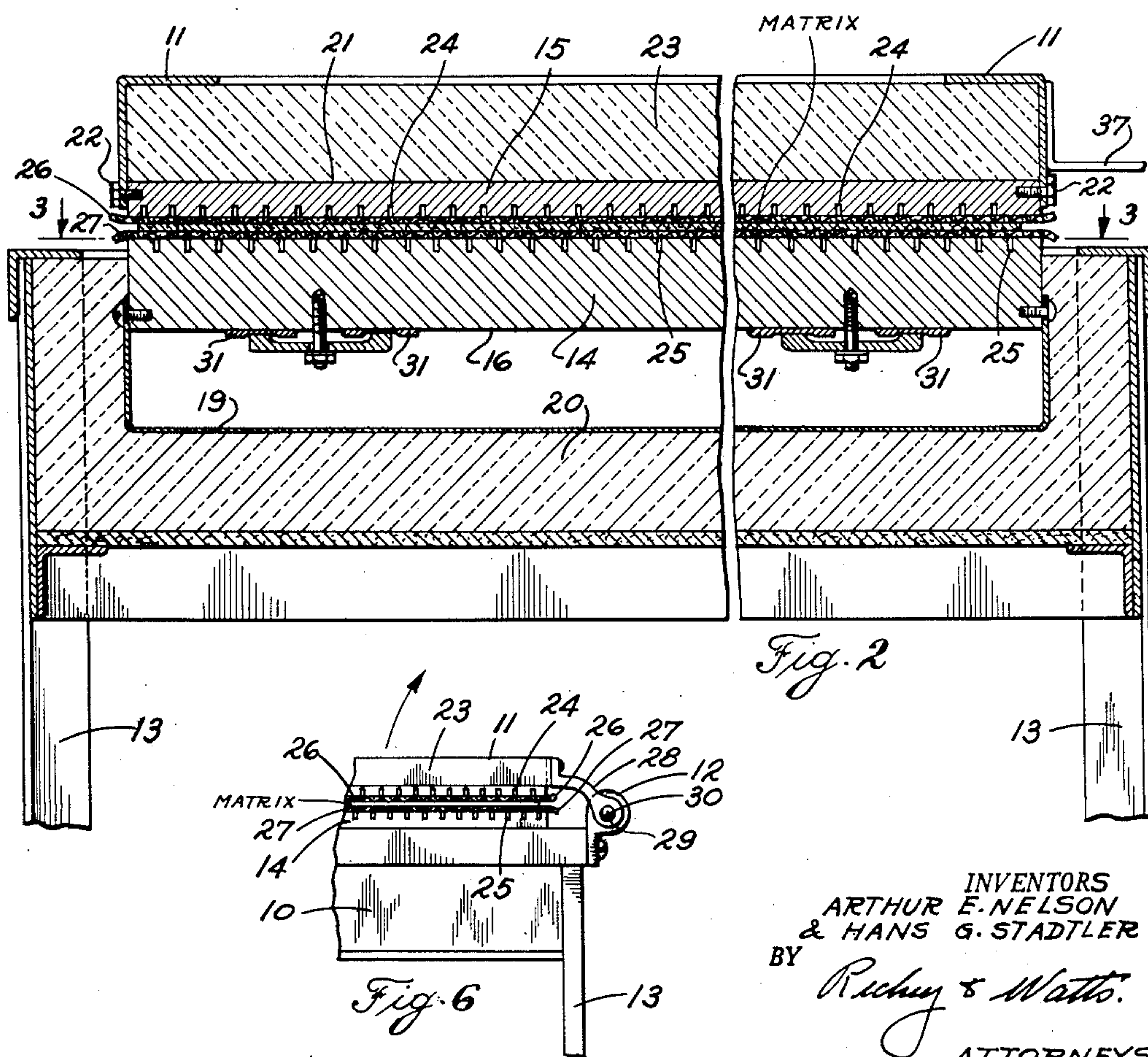
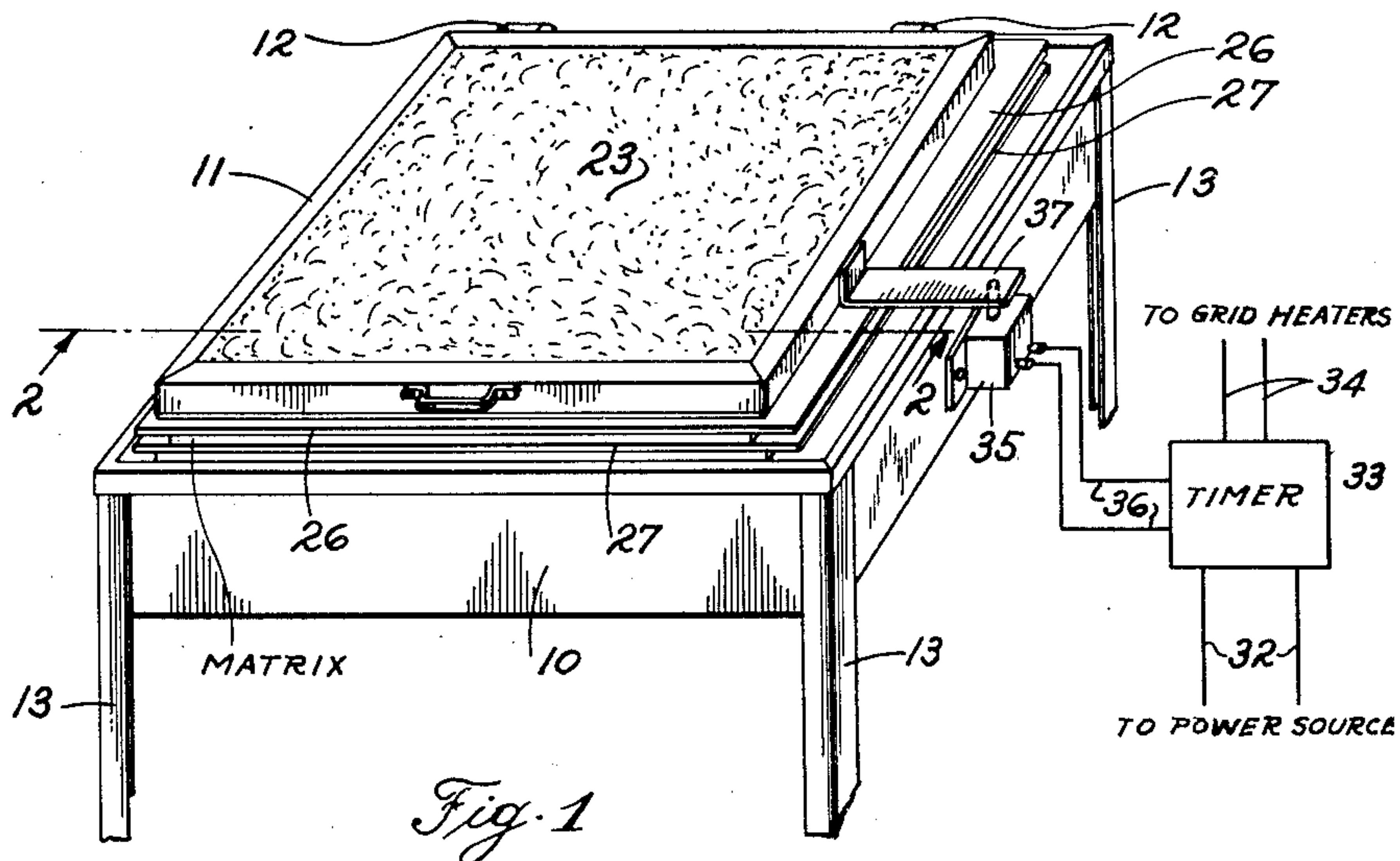
A. E. NELSON ET AL

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MATRIX

Filed May 26, 1950

2 Sheets-Sheet 1



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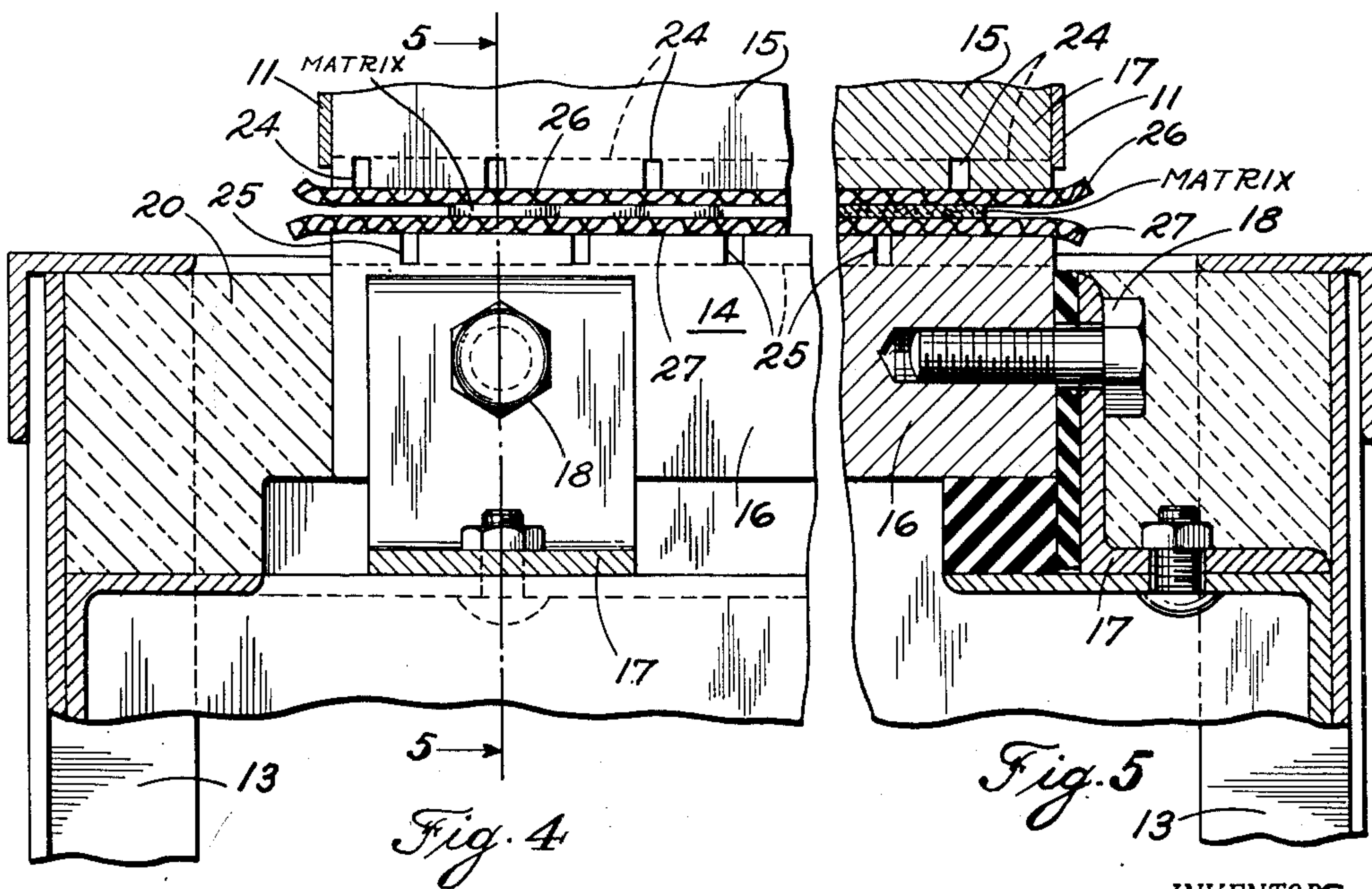
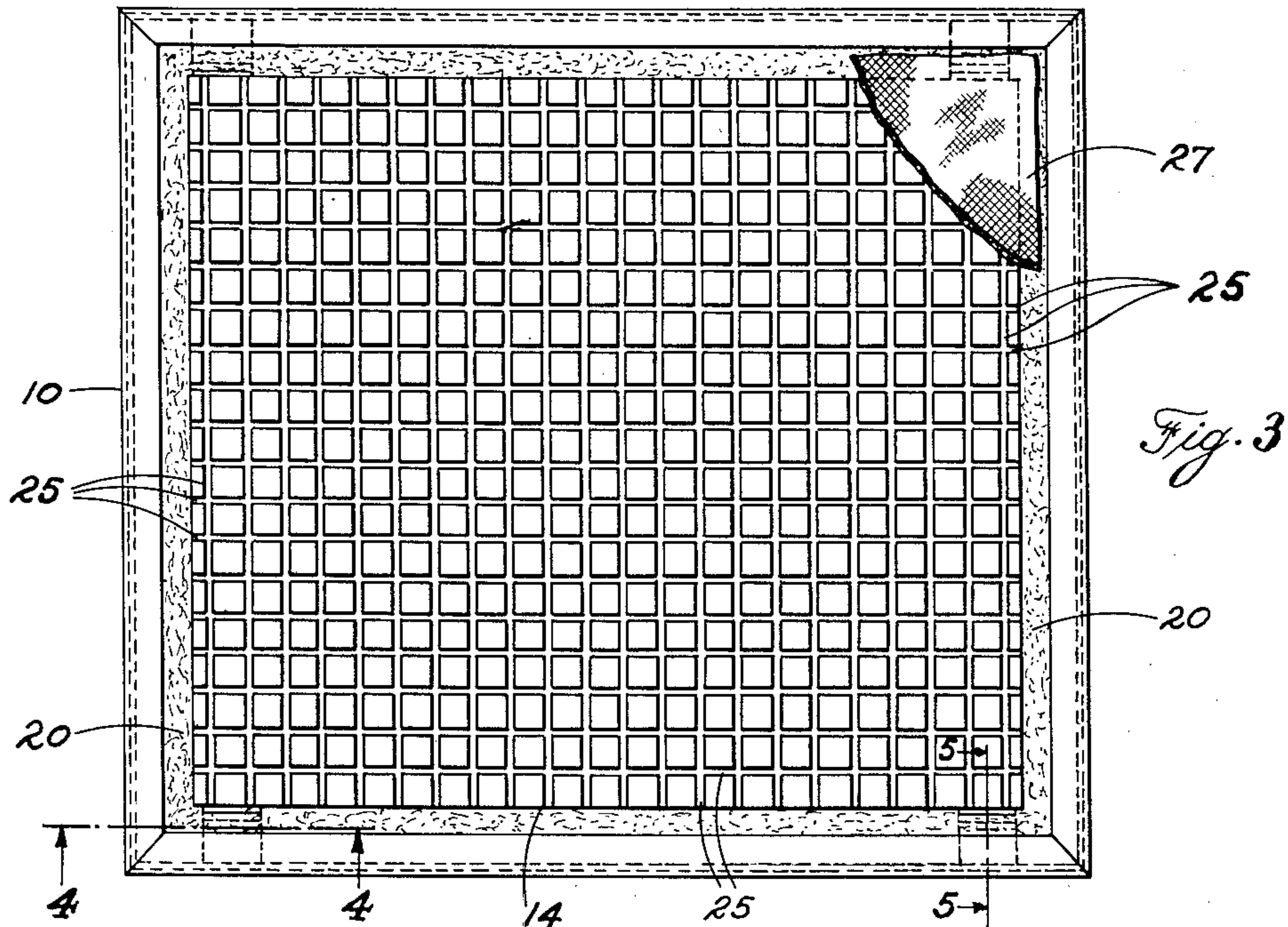
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MATRIX

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This invention relates to stereotypy and, more particularly, to improvements in drying tables for stereotype matrices.

In the production of stereotype matrices, the matrix is formed by pressing a paper blank or flong upon a form bearing a relief of the impression to be reproduced. The flong has a relatively high moisture content so that the pressure of application to the form produces an exact replica of the surface of the form. The flong or green matrix is then baked dry or cured in order to produce a permanent matrix of sufficient mechanical strength for the subsequent stereotype plate casting operation.

It has, heretofore, been customary to dry the green matrix by placing the form and superimposed matrix in a steam drying press or "steam table" immediately following the press-forming operation. Such procedure has, however, certain disadvantages. A considerable amount of time is required to satisfactorily dry the matrix, normally in the order of six to eight minutes. During this time, the form upon which the matrix is impressed is tied up in the drying press and is not available for further production. Drying blankets must be utilized to absorb the moisture from the matrix, and since a lengthy drying period is required after each use of a blanket, a large number of blankets are required for continuous operation. The forms must be cooled after each drying operation, and further, warping produced by the heating and cooling cycles necessitates a high rate of form replacement. The nature of the drying process is such that many defective matrices are produced, by reason of relative shift between the matrix and the form in transferring the form from the forming press to the drying press. Finally, the shrinkage of the matrices is not uniform. It will thus be seen that the disadvantages of the steam table reside in factors of production time, and in equipment and personnel requirements.

The present invention relates to a method of and apparatus for performing the matrix drying operation in a relatively short period of time and with a minimum of loss due to spoilage. The embodiment of the invention herein disclosed comprises a drying table having a lower body portion or frame and a hinged cover, each incorporating a drying plate. The upper portion of the body plate and the lower portion of the cover plate are formed into grids by a mesh of grooves, the interconnecting grooves providing a continuous steam escape path from any point of the grid to the sides of the table. The grooves

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of the cover grid are relatively displaced with respect to the grooves of the body grid so that the grooves of one grid are adjacent the lands of the remaining grid when the cover is lowered into operative position. Each grid is provided with a blanket of a porous, thermal resistant material, such as asbestos, in order to provide yieldable cushioning surface for the matrix while permitting free escape of the steam generated in the drying process. A series of strip heaters are mounted adjacent the inner surfaces of the grid plates and an automatic timer is provided to control the duration of flow of electrical energy to the heaters.

An object of the invention is to reduce the cost of drying stereotype matrices.

A further object of the invention is to reduce the time required for drying stereotype matrices.

A still further object of the invention is the provision of improved means for drying matrices.

Another object of the invention is the control of shrinkage in drying stereotype matrices.

Still another object of the invention is the provision of apparatus for drying or curing moistened sheet material having impressions formed therein.

These and other objects, features and aspects of the invention will be more readily apparent from a consideration of the following detailed specification and appended claims, taken in connection with the appended drawings, in which:

Fig. 1 is a perspective view of the drying table of the invention;

Fig. 2 is a sectional view of the table of the invention taken along the lines 2—2 of Fig. 1 and illustrating particularly the construction of the drying grids;

Fig. 3 is a plan view of the lower grid of the table of the invention;

Figs. 4 and 5 are sectional views showing mechanical details of the lower grid mountings; and

Fig. 6 is a partial view showing particularly the construction of the cover hinges of the table.

Referring now to the figures, the drying table of the invention comprises a lower body or frame 10, a cover 11 connected to the frame by means of hinges 12, and legs 13 for supporting the entire assembly. The drying table may be of fabricated construction, the exemplary design comprising welded sheet metal and angle stock.

The frame 10 and cover 11 serve as mountings for a lower drying grid 14 and an upper drying grid 15. As is shown particularly in Figs. 2, 4 and 5, the lower drying grid 14 comprises a plate 16 of substantial bulk and supported from the

frame 10 by means of angles 17 and capscrews 18. A sheet metal shield 19 is attached to the under side of the plate 16 so that an insulating air space is provided at the under surface of the plate. An insulator 20 is further provided between the plate 16 and shield 19 and the frame 10 to minimize the loss of heat by conduction and radiation. The insulator 20 may be of any suitable non-heat conducting material, although the commercial material known as "Transite" is used in an exemplary embodiment of the table. The upper drying grid 15 comprises a plate 21 mounted in the cover 11 by means of cap screws 22. The plate 21 is also insulated against heat loss by an insulator 23 of a material similar to the insulator 20.

The grid plates 16 and 21 are formed of a material which is a good heat conductor, such as aluminum, and of sufficient massiveness that the heat storage capacity of the plate will be sufficient to accommodate the operational cycles without rapid transient fluctuations of temperature. The inner surfaces, that is, the working surfaces, of the upper and lower plates are formed with grooves 24 and 25 respectively. As is shown particularly in Fig. 3, these grooves are interconnected so as to form meshes opening at the sides of the plate. The grid thus formed provides a continuous escape path from any part of the plate to the sides for steam generated during the matrix drying process. The grooves are so oriented that upon the vertical juxtaposition of the top grid plate and the bottom grid plate, the grooves of the top plate are in opposition to the lands of the bottom plate and the grooves of the bottom plate in opposition to the lands of the top plate. By positioning the grooves opposite the lands, the moisture is required to travel only half as far to an escape passage as would be required if the grooves were in a position opposite each other. Further, the areas outlined by the grooves are reduced to one-fourth, and the drying time is reduced accordingly.

The grids are covered with blankets 26 and 27 which serve primarily as cushions in order that the relief in the green matrix not be distorted or pressed out of shape when the cover 11 is lowered into position for the drying operation. The blankets may be formed of any suitable material which is heat resistant and yet sufficiently porous to allow the free passage of steam from the green matrix into the grooves while still having sufficient mechanical cushioning ability to fulfill the intended purpose. Blankets woven of asbestos fibers have been found suitable for the purpose.

Further provision against distortion of the relief of the green matrix is incorporated in the hinges 12. As is shown in Fig. 6, the cover arm 28 of the hinge incorporates a hole 29 of larger radius than the hinge pin 30 or is of a generally oval shape so that the hinge is extensible. In use the cover then automatically positions itself so as to provide a uniform distribution of weight or pressure over the entire surface of the matrix when the matrix and cover are in a drying position.

The drying grids are heated by electrical means such as a plurality of strip heaters 31 clamped to the under side of the lower grid plate 16. The strip heaters 31 are of known commercial form and, while other forms of electrical heaters may be readily used in the practice of the invention, the strip heaters are advantageous in that they may be attached in firm heat conductive rela-

tionship to the plate and with a minimum of heat loss. The upper grid is heated by conduction from the lower grid. Electrical energy is supplied from an ordinary power line through connections 32 to a timer 33, also of known commercial type, and through connections 34 to the strip heaters 31. The initiation of the action of the timer to supply energy to the strip heaters is controlled by a switch 35 through connections 36 and actuated by a flange 37 attached to the cover 11. While the present embodiment of the table of the invention utilizes only one set of grid heaters, it is to be understood that the use of separate heaters for the upper and lower grids and their independent control is contemplated within the spirit of the invention.

In operation, the green matrix is removed from the pressing form and placed in position upon the lower grid blanket. The cover is then lowered and the switch automatically actuates the timer which allows electric current to flow to the heaters for a predetermined interval of time. In continuous operation it has been found that a drying period in the order of two minutes with the lower grid at a temperature of 465 degrees F. provides optimum drying conditions for one type of stereotype matrix such as is used in printing feature sections of newspapers.

It is to be understood that the specific nature of the present disclosure is not intended to be restrictive or confining and that various rearrangements of parts and modifications of design may be resorted to without departing from the scope or spirit of the invention herein claimed.

What is claimed is:

1. A drying table comprising a first plate having a grid formed in the top portion thereof, a second plate having a grid formed in the bottom portion thereof, the grooves defining each grid opposing the lands of the remaining grid when the plates are in vertically juxtaposed relationship, said grooves being continuous to the edges of said plates respectively, electrical heating apparatus for said plates and blankets of yieldable, porous material attached to the surfaces of said grids, said grids and said blankets defining a drying press.

2. In a drying table for stereotype matrices, a frame, a lower plate mounted in said frame and comprising a substantial piece of metallic material having an upper face and a lower face, an electrical heating element closely adjacent the lower face of said plate, insulating material disposed about said plate below the upper face thereof to confine heat generated by the heating element, an upper plate mounted in said cover, the said upper plate having a lower face opposing and cooperating with the upper face of the lower plate and said cover being adapted to be raised and lowered so as to bring the lower face of said upper plate into substantially parallel relationship with the upper face of said lower plate, grooves formed in the upper face of the said lower plate and in the lower face of said upper plate, the said grooves extending to the extremities of the said plates to permit escape of vapors, and blankets of asbestos-like material attached to the opposing faces of the said plates.

3. In a drying table for stereotype matrices, a frame, a lower plate mounted in said frame and comprising a substantial piece of metallic material having an upper face and a lower face, a heating element closely adjacent the lower face of said plate, insulating material disposed about said plate below the upper face thereof to con-

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fine heat generated by the heating element, an upper plate mounted in said cover, the said upper plate having a lower face opposing and cooperating with the upper face of the lower plate and said cover being adapted to be raised and lowered so as to bring the lower face of said upper plate into substantially parallel relationship with the upper face of said lower plate, and grooves formed in the upper face of the said lower plate and in the lower face of said upper plate, the said grooves extending to the extremities of the said plates to permit escape of vapors.

4. A drying table comprising a first plate having a grid formed in the top portion thereof, a second plate having a grid formed in the bottom portion thereof, the grooves defining each grid opposing the lands of the remaining grid when the plates are in vertically juxtaposed relation-

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ship, heating apparatus for said plates, and blankets of yieldable porous material attached to the surfaces of said grids.

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