F. E. SMITH.

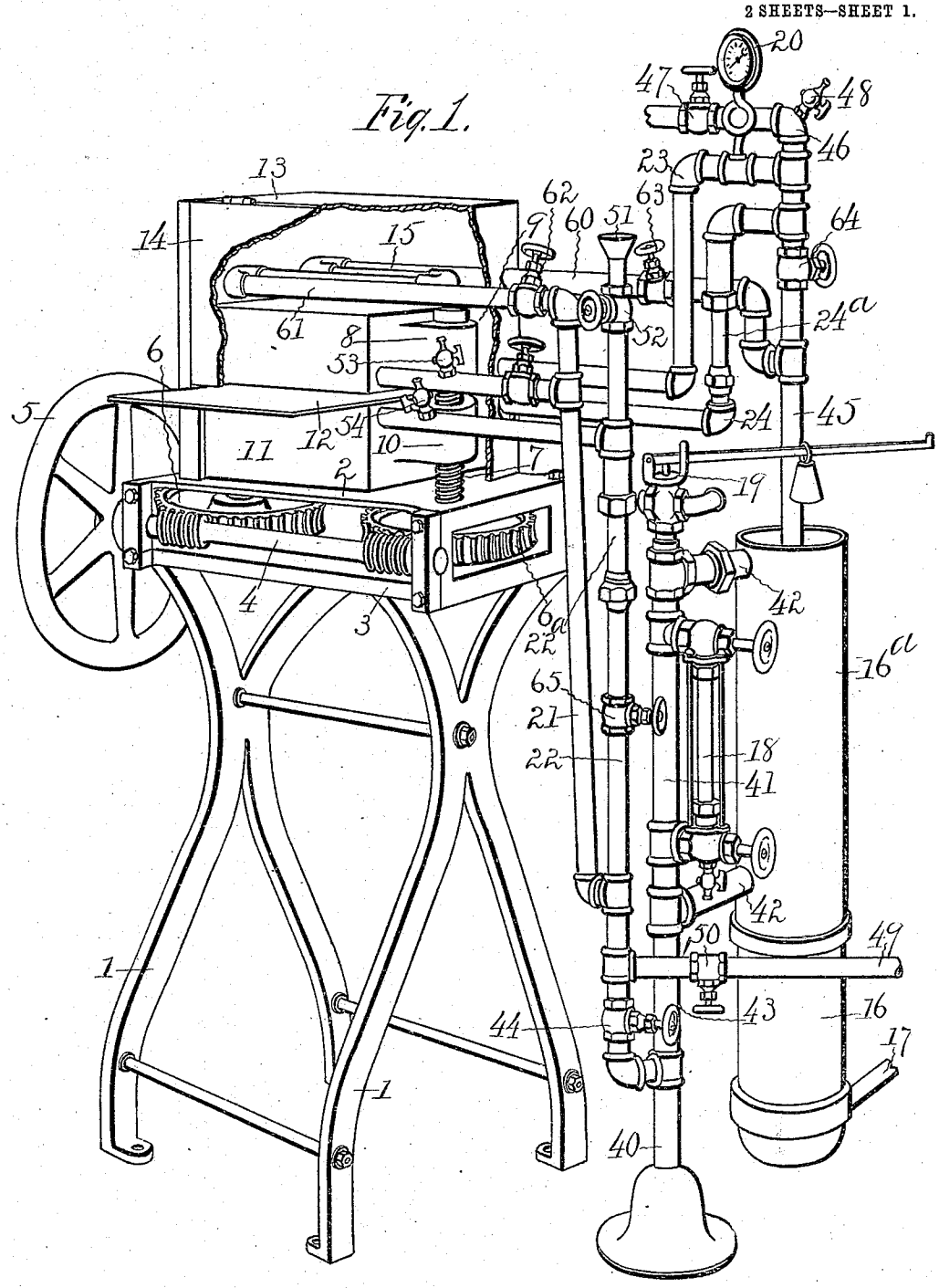
VULCANIZER.

APPLICATION FILED JULY 24, 1906.

939,342. **Patented Nov. 9, 1909.**

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2.

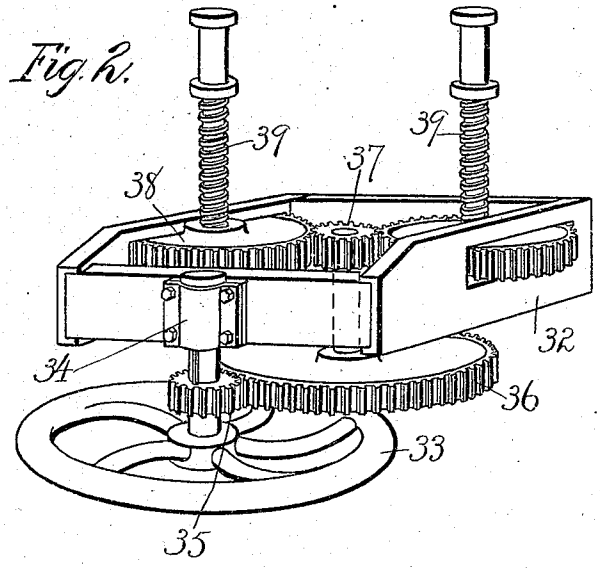


Fig. 3.

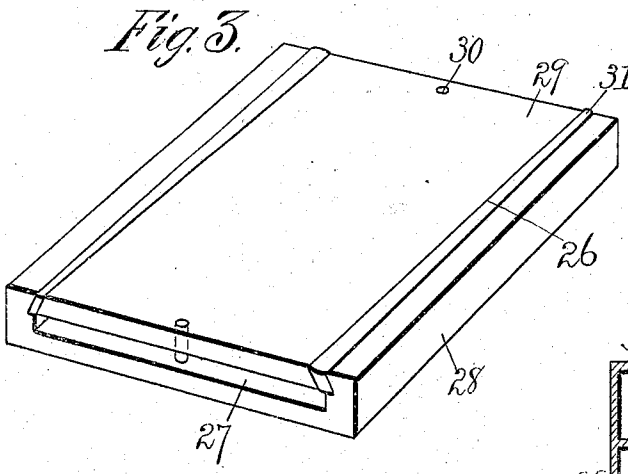
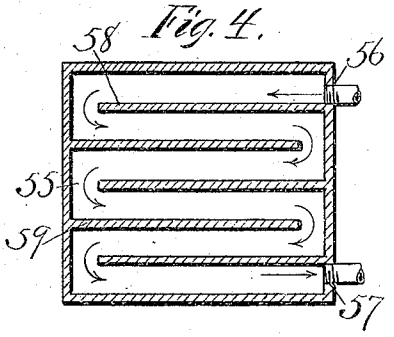


Fig. 4.



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UNITED STATES PATENT OFFICE.

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VULCANIZER.

939,342. Specification of Letters Patent. Patented Nov. 9, 1909.

Application filed July 24, 1906. Serial No. 327,553.

To all whom it may concern:

Be it known that I, FRANK E. SMITH, a citizen of the United States, and a resident of Hartford, in the county of Hartford and State of Connecticut, have invented a new and Improved Vulcanizer, of which the following is a specification.

My invention relates more especially to that class of devices in which material is treated to heat under pressure, and the object of my invention is to provide a device of this class that while being extremely efficient shall at the same time be economical in the amount of heat required for the purpose in hand; and a further object of the invention is to provide a device in which the material to be treated may be uniformly heated; and a further object of the invention is to provide a device in which the material may be quickly and expeditiously treated.

A form of device in the use of which these objects may be attained is illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of an apparatus embodying my invention. Fig. 2 is a detail view showing a modified form of the invention. Fig. 3 is a perspective view of the frame constituting part of my improved apparatus. Fig. 4 is a detail perspective view in section showing the construction of the platens.

In devices of this class prior to my invention many objections are present from the fact that much heat is needlessly expended in the performance of a single operation. This is especially true in apparatus in which celluloid is treated. Celluloid has been found to form an efficient material from which printing plates may be constructed, but in order to produce such plates the celluloid must be heated under pressure to cause it to completely fill the matrix, and it must then be cooled before the pressure is released. It is essential that the heat shall be evenly distributed on all sides of the material to be treated. In prior operations the celluloid has been placed within a press that is heated to the required degree to cause the celluloid to become sufficiently plastic to be forced into the matrix, and after the press has been heated it must then be cooled to allow the celluloid to harden. Such an operation requires the expenditure of a great amount of heat for the reason that the press must be heated to the proper degree, and after being cooled so that the celluloid may be removed must be again heated.

In the practice of my invention I heat all portions of the press uniformly and provide means whereby the press need not be cooled.

In the accompanying drawings the numeral 1 denotes the standards for the press that may be constructed of any desired material in proper form to accomplish the desired purpose. A table consisting of a top plate 2 and a bottom plate 3 is mounted on the standards, and between these plates a worm shaft 4 is mounted. The worm is preferably formed on this shaft at each end thereof, and an operating wheel 5 is secured to this shaft. Worm gears 6 are mounted between the plates 2 and 3, these gears having secured thereto screws 7, the upper ends of which are located in ears 8 of the upper platen 9. These screws fit screw threads in ears 10 on the lower platen 11, so that as the screws are rotated the lower platen may be raised or lowered. The lower platen is provided at its front side with a shelf 12.

A case 13 may be mounted on the upper platen, this case being provided with a suitable door 14 by means of which access may be had to a rack 15 which may be employed for drying purposes, the heat generated in the platens being retained within the casing sufficiently to dry such articles as may be placed upon the rack within said casing. The side wall of the casing is slotted, as shown in Fig. 1 of the drawings, to allow movement of the pipes communicating with the lower platen. This rack, in the preferred form of construction, consists of a coil of pipe, this being an extension of the pipe 60 leading from the supply pipe 45 and terminating in the pipe 61 leading into the return pipe 21. Valves 62 and 63 control the flow of water through this rack or coil, and by closing the valves 64 and 65 the drier may be used without heating the platens or circulating the water therethrough.

A heater 16, of any desired form and construction, may be located in proximity to

the press as a whole, a supply pipe 17 for gas leading to the heater. This heater includes a boiler 16ª that may be supplied with a water gage 18, with a safety valve 19, pressure gage 20 and other devices as valves for shutting off or permitting a flow through the several pipes required. As the heater in itself forms no part of my invention further description is deemed unnecessary herein. In order, however, to adapt the heater for special use in connection with my improved vulcanizer I have produced special means of connection with the heater and between the heater and the vulcanizer. A standard 40, for at least partially supporting the heater and boiler is provided as a part of the heater construction, the upper part of this standard being extended into the pipe 41, extending into the heater by way of branches 42, as plainly shown. Below the lower branch I extend a pipe 43 leading downward and then extending upward and containing a valve 44. This extension 43 is branched and heat return pipes 21 and 22 extend thereto from the upper and lower platens, respectively.

The usual supply pipe 45 to the heater is branched, to especially adapt the heater to my improved vulcanizer, these branches consisting of supply pipes 23—24 which conduct the fluid to the upper and lower platens, respectively, the pipes 21—22 conducting the fluid back to the heater, where it is reheated and again supplied to the platens.

In order to enable a vertical movement of the platen 11 the pipes 22 and 24 are provided with slip joints 22ª and 24ª, respectively, and by means of this construction an extremely rigid and firm connection is maintained.

A supply pipe 46 leads into the platen supply 45, and a valve 47 may be employed as a means of controlling the supply of water through the supply pipe. A pet-cock 48 is also provided in this pipe.

An outlet pipe 49 leads from the extension 43 and the flow of water therethrough may be controlled as by means of a valve 50, this pipe leading to a sewer or other suitable source of discharge.

The supply of water to the boiler may be made through the pipe 46, or in lieu thereof water may be introduced into the enlarged end of a filler 51. This filler consists of a short length of pipe in extension of the pipe 22, and this may be controlled by a valve 52.

In order to aid the circulation of water through the platens I provide pet-cocks 53—54 as a means of supplying vent.

From this construction it will be noted that the heater is located apart from the press and the connections are such as to readily heat the platens to the proper degree and with a minimum amount of heat employed. There is no superfluous metal about the press to radiate the heat from the platens, the operative parts being minimum in number and so located underneath the platens as not to take heat therefrom.

The numeral 26 denotes a frame in which celluloid or other like material may be treated. This frame includes a bottom 27, side parts 28 and a removable cover 29. This cover is guided on pins 30, and beveled keys 31 are employed for holding the cover in position between the beveled surfaces of the sides and of the cover.

In use the matrix is placed within the frame, the celluloid or other similar material in its hardened commercial condition is placed upon the matrix, and the cover placed upon the guide pins 30. This frame is then placed between the platens 9 and 11 and when it has been heated to the required degree the proper amount of pressure is applied thereto by means of the apparatus for closing the platens together, the frame and cover being so arranged that the platens will come in contact with these parts and move the cover and bottom toward each other. This will cause the celluloid in its now plastic condition to thoroughly fill the matrix, and the tapered keys 31 are driven to place, the frame being of a size to enable ready access to be had to the keys for the purpose. It will thus be seen that the frame may now be removed from the platen and placed to cool, and that another like frame may at once be inserted within the platens, and the operation repeated, the pressure being retained upon the celluloid by means of these frames after they are removed from between the platens. Heretofore in the practice of this process the celluloid has been pressed into the matrix, and the platens have then required to be cooled so that the celluloid would become hardened before removal from between the platens. This necessitated the expenditure of a large amount of heat, and had a greater disadvantage in that a great amount of time was consumed in performing each operation.

In Fig. 2 of the drawings I have shown a modified form of the invention in which the numeral 32 denotes the table having the shaft of the hand wheel 33 mounted in a bearing 34 at the front of the table. The pinion 35 on the shaft of the hand wheel meshes with a gear 36 to the shaft of which is secured a pinion 37, the shaft being suitably mounted in the table. The pinion 37 is in mesh with gears 38 secured to the screw shafts 39. The screw shafts are in mesh with the platens as shown in Fig. 1. This form of the device may be found desirable in some instances, as it will enable extreme pressure to be given to the platens by means of the wheel 33, and the gear 36 is so located that should quicker movement of the platens be desired this gear may be grasped for the purpose of operating the platens.

In Fig. 4 of the drawings the special construction of the platens is shown. These platens are constructed preferably of cast metal and a continuous passage 55 from the inlet opening 56 at one end to the outlet opening 57 at the opposite end is provided. This passage is formed by means of partitions each of which extends from one side of the platens to a point near the opposite side, the passage extending around the end of each partition, the partitions 58 extending from one end and the partitions 59 extending from the opposite end of the platen and each terminating short of the end opposite to that from which it projects, and each of the partitions 59 lying between a pair of the partitions 58. These partitions extend from top to bottom of the platens and are of particular advantage in that while the platen is constructed practically hollow for the reception of the heating medium, as water, yet the partitions provide an extremely rigid structure that successfully resists the pressure of the fluid from within the platen, as well as the pressure applied to the outer surface of the platen.

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

1. Two platens, means for varying the space between the platens, means for supplying heat to the platens, a frame adapted to fit between said platens, a cover for said frame, and means accessible when the frame is between the platens for locking the cover in position.

2. Two platens, means for varying the space between the platens, means for supplying heat to the platens, a frame to be located between said platens, a cover for said frame, and means movable on said frame and accessible from without the platens to lock the cover in position.

3. Two platens, means for moving the platens one toward another, means for supplying heat to the platens, a casing providing a chamber above the platens, and a rack consisting of coils of pipe located within said chamber.

4. Two platens, means for moving the platens one toward another, means for supplying heat to the platens, a casing surrounding the platens and providing a chamber thereover, and a rack consisting of a coil of pipes located within said chamber.

5. In a vulcanizer, a heater, platens, means for applying force to the platens, pipes extending from the heater to the platens, a casing providing a chamber overlying the platens, and a rack including coils of pipe extending from said heater and located within said chamber.

6. In a vulcanizer, two platens, a heater, a delivery and a return pipe from said heater, said delivery and return pipes being connected with said platens to provide a circulation therethrough, a casing providing a chamber overlying the platens, and a rack including a coil connected with said delivery and return pipes.

7. Two platens, a heater, a delivery and a return pipe for said heater, connections between said delivery and return pipes and said platens for providing a circulation in the latter, a casing providing a chamber over said platens, a rack including pipes connected with said delivery and return pipe to the heater, and means for shutting off the flow through said platens or through said rack.

8. The combination, with platens, one of which is movable toward and from the other, of a drying-rack located over the upper platen; a hood or casing surrounding the platens; means for supplying fluid to said platens; and a telescopic connection uniting the platens and constituting part of said fluid supplying means.

9. The combination, with platens, one of which is movable with relation to the other, of telescopic pipes communicating with the platens, and adapted to convey the heating agent to said platens, a heating device; means for supplying water to said device; piping connecting the heater with one of the platens; and a hood or casing surrounding the platens.

10. In a vulcanizer, in combination with an upper and lower platen with means for supporting them, means for closing the space between the platens, a standard constructed independently of the platen support with a pipe rising therefrom, connections between said pipe and a platen, a heater supported by said pipe, and connections between said pipe and heater.

11. In a vulcanizer, an upper and lower platen, with means for supporting them means for closing the space between the platens, a standard constructed independently of the platen support having a pipe rising therefrom, a heater supported by said pipe, connections between said heater and pipe, connections between said pipe and platens, and communicating pipes between the platen and heater.

12. In a vulcanizer, in combination with an upper and lower platen, means for closing the space between the platens, a standard with a pipe rising therefrom, a branch extending laterally from one side of said pipe, a heater supported by said branch and connected therethrough with said standard, and a pipe extending from the opposite side of the standard to a platen.

13. In a vulcanizer, in combination with upper and lower platens, means for closing the space between the platens, a standard having a pipe rising therefrom, a branch extending from one side of the standard and communicating with a heater, the heater se-

cured to said branch, a pipe leading from the standard to a platen to receive water from the latter, and a pipe communicating directly between the heater and a platen for delivering water to the latter.

14. In a vulcanizer, in combination with upper and lower platens, means for varying the distance between the platens, a standard with a pipe rising therefrom, connections between said standard and each platen, a heater supported by the standard, connections between the heater and standard, and connections between the heater and each of the platens.

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