June 18, 1940. H. T. NEKTON 2,204,905

METHOD OF MAKING MATRICES

Filed June 15, 1939

Fig. 1.

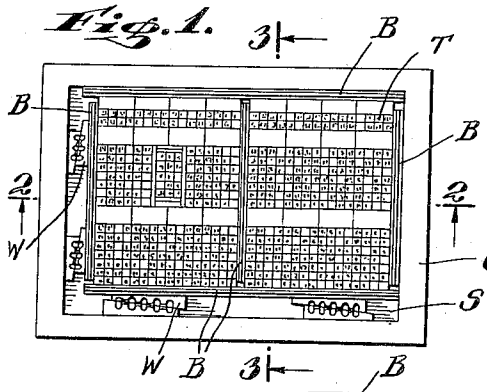


Fig. 3.

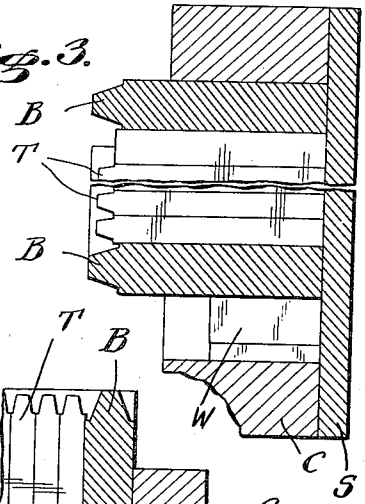


Fig. 2.

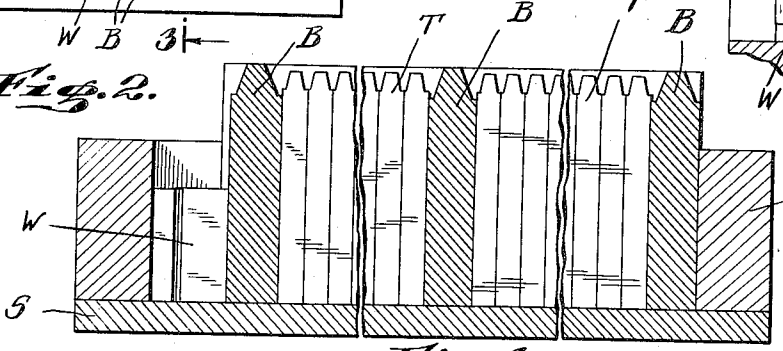


Fig. 4.

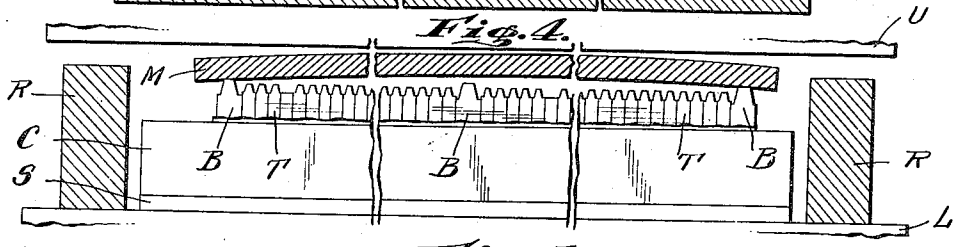


Fig. 5.

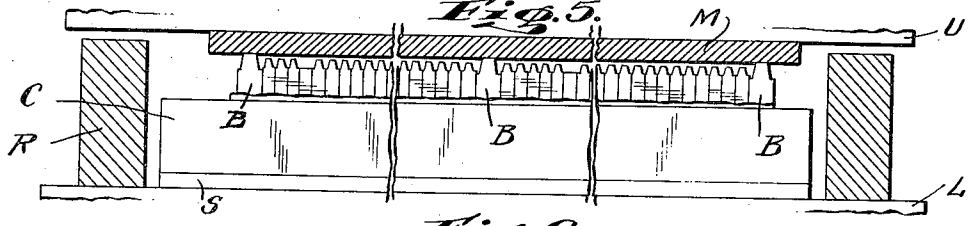


Fig. 6.



Fig. 7.

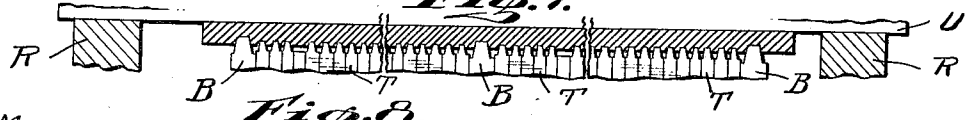


Fig. 8.



Fig. 9.



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METHOD OF MAKING MATRICES

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5 Claims. (Cl. 41—25)

The present invention deals with matrices and more particularly is concerned with a novel and improved method of making matrices utilized for casting or shaping sheets of rubber under heat and pressure although in its broader aspect the invention is not limited in this respect. Heretofore matrices or moulds of the character referred to initially were placed in a press on type bars held fixed in a chase or frame having bearers comprising upper supporting surfaces at the same elevation as the type. Thereafter the usual heat and pressure were applied and the impressions of the type were cast into mould or matrix. In carrying out this method I have discovered that certain disadvantages arise since the type is at the same elevation as bearers. One such disadvantage is realized in failing to present the lower surface of the body of the matrix to be impressed by the type bars uniformly to the type of these bars. This defective action sets up an uneven distribution of stress in the body of the matrix after suitable pressure is applied thereto and in actual practice I have discovered that a matrix treated in this manner often cracks. Another serious disadvantage arose in that the impressions cast into the matrix were at times distorted and lacked uniformity in respect to contour and definition due to the fact that the type bars often became bent. These and other disadvantages arose in that the type bars had to withstand substantially the entire pressure exerted between the upper and lower platens of the press.

In carrying out the method according to my invention, bearers clamped in a chase are utilized but these bearers have upper matrix supporting surfaces in a plane above the upper surface of the type bars and hence they not only function to support the matrix and take up the larger proportion of the pressure exerted by the press but they serve as means to facilitate straightening out of the matrix preparatory to the latter reaching the type at which time the lower surface of the matrix uniformly reaches and contacts the upper surface of the type of the several type bars fixed in the chase. Hence bending of the type or distortion thereof is avoided thus insuring casting or the penetration of the true contour of the type into the matrix with the fidelity and accuracy as required. With these objects and other objects of a similar nature, my invention consists in the improved method of making matrices and in the construction, combination and arrangement of parts set forth and falling in principle within the scope of the appended claims and to facilitate a clearer understanding of the invention attention is directed to the following detailed description considered in the light of the accompanying drawing wherein:

Fig. 1 is a plan view of a chase containing the usual type bars held appreciably clamped amongst so called inside bearers according to the invention.

Fig. 2 is an enlarged longitudinal and sectional view taken along the line 2—2 of Fig. 1.

Fig. 3 is a transverse sectional view on the line 3—3 of Fig. 1.

Fig. 4 is a schematic illustration showing the chase mounted on the lower bed or platen of a suitable press and depicting the condition of the matrix on the outside inner bearers and before casting an impression therein.

Fig. 5 is a view similar to Fig. 4 but showing the matrix fully straightened out and situated on all of the inside bearers before receiving its impression from the type or from these bearers.

Fig. 6 is a schematic view illustrating the impressions applied to the matrix by the inside bearers before the impressions of the type are cast.

Fig. 7 is a schematic view illustrating the completion of the casting operation to the matrix at which time the upper platen of the press is against the outside bearers.

Fig. 8 is a sectional view of the matrix after having been cast and,

Fig. 9 illustrates the use of the matrix to produce other matrices.

According to the invention, bars of metal type T are mounted on a steel plate S and between steel bearers or bars B which are clamped to the type bars by wedges W in the chase or frame C. It will be observed that all of the bearers B have their upper surfaces at the same elevation which is above the elevation of the upper surfaces of the type bars T.

The chase together with the steel plate S is mounted on the bed or lower platen L of a suitable press schematically shown which is adapted to be charged with heat in a manner well known in the art. Thereafter a relief solution is applied to the type bars. This solution may be of a suitable liquid graphite compound of the type well known in the art and dries readily in the heated press.

Subsequently a sheet M which may be of Bakelite M and which has been preheated before being placed in the press is positioned on the bearers B (Fig. 4). In this connection it will be observed that the outer bearers B in the chase at this time support sheet M. These bearers are now ready to receive the pressure of the upper movable platen U of the heated press having therein positioned stops or outside bearer bars R which limit downward displacement of the upper platen U. Although the sheet M has been specified as of Bakelite it is within the province of the invention to employ sheets of other plastic or cementitious material as is well understood.

Having preheated and positioned sheet M on the longitudinally and transversely arranged bearers B and having positioned the outside metal bearers or relatively heavy bars R on the bed L as shown, the upper platen is brought down against sheet M which at first is merely supported by the outside bearers B in the chase but which upon the application of pressure and heat straightens out (Fig. 5) until it is supported evenly by all of the bearers B in the chase. Consequently the lower surface of sheet M is on the top surface of all the bearers B but is still spaced from the upper surface of the type bars. It follows therefore that the initial pressure applied to sheet M by the upper platen U of the press is absorbed by the bearers B independently of the type bars.

However as the upper platen U continues to move towards the lower platen, the bearers B in the chase first cast their impressions into the sheet M as illustrated in Fig. 6 in which event the upper platen U is still spaced from the stops or outer bearers R by a distance substantially equal to the height of the type of the type bars R. In this connection attention is directed to Fig. 6 where it will be noted that the lower surface of sheet M is uniformly in contact with the type bars in the chase and at the completion of the down stroke of the upper platen the type impressions are uniformly cast (Fig. 7) into sheet M which may be considered as the master matrix which as is well understood may be utilized in a press under heat and pressure to make corresponding impressions in the sheet of unvulcanized rubber V which becomes vulcanized during heating thereof. Thus by the present method the type bars are relieved of the pressure required in the matter of straightening out of the matrix and therefore the bearers in the chase penetrate the matrix first and thereafter the type bars uniformly penetrate the matrix until limited by stop action of the bearers R.

Many modifications of my invention will be apparent to those skilled in the art without departing therefrom or from the scope of the claims and since the foregoing disclosure has been given by way of example for clearness and understanding only, no unnecessary limitations should be inferred and the appended claims should be interpreted as broadly as the state of the art permits.

I claim:

1. The herein described method of making a matrix which comprises, arranging type bars between inside bearers having an elevation higher than the elevation of said bars, arranging said inside bearers between outside bearers having an elevation higher than said inside bearers, positioning a plate of a thermoplastic synthetic resin such as Bakelite on said inside bearers only and between said outside bearers, subjecting said plate to pressure to eliminate longitudinal and widthwise curvature in the body thereof, further subjecting said plate to heat and pressure to permit said inside bearers to penetrate said plate without however permitting penetration of said plate by said bars, and continuing said heat and pressure to allow said bars to penetrate said plate.

2. The herein described method of making a matrix which comprises, arranging type bars between inside bearers having an elevation higher than the elevation of said bars, arranging said inside bearers between and spaced from outside bearers having an elevation higher than said inside bearers, positioning a plate of a thermoplastic synthetic resin such as Bakelite on said inside bearers, flattening said plate to eliminate lengthwise and widthwise curvative in the body thereof, subjecting said plate to heat and pressure to permit said inside bearers only to penetrate said plate without however permitting penetration of said plate by said bars, and continuing said heat and pressure to allow said inside bearers to be further impressed into said plate and concomitantly allowing said bars to penetrate the latter.

3. The herein described method of making a matrix which comprises, arranging type bars between inside bearers having an elevation higher than the elevation of said bars, arranging said inside bearers between and spaced from outside bearers having an elevation higher than said inside bearers, positioning a plate of a thermoplastic synthetic resin such as Bakelite, between said outside bearers and on said inside bearers only straightening said plate to eliminate longitudinal and widthwise curvature in the body thereof, subjecting said plate to heat and pressure to permit said inside bearers only to penetrate said plate without however permitting penetration of said plate by said bars, continuing said heat and pressure to allow said bars to penetrate the said plate, and limiting the penetration of said bars into said plate.

4. The herein described method of making a matrix which comprises, arranging type bars between inside bearers having an elevation higher than the elevation of said bars, arranging said inside bearers between and spaced from outside bearers having an elevation higher than said inside bearers, positioning a plate of a thermoplastic synthetic resin such as Bakelite on said inside bearers only, eliminating longitudinal and widthwise curvative in the body of said plate, subjecting said plate to heat and pressure by a platen to permit said inside bearers to penetrate said plate without however permitting penetration of said plate by said bars, continuing said heat and pressure to allow said inside bearers to be further impressed into said plate and concomitantly allowing said bars to penetrate the latter, and positively limiting the penetration of said inside bearers and bars into said plate upon contact of said platen and with said outside bearers.

5. The herein described method of making a matrix which comprises, arranging type bars between inside bearers having an elevation higher than the elevation of said bars, arranging said inside bearers between and spaced from outside bearers having an elevation higher than said inside bearers, positioning a plate of a thermoplastic synthetic resin such as Bakelite on said inside bearers only, eliminating longitudinal and widthwise curvative in the body of said plate, subjecting said plate to heat and pressure by a movable platen to permit said inside bearers to penetrate said plate without however permitting penetration of said plate by said bars, continuing said heat and pressure to allow said inside bearers to be further impressed into said plate and concomitantly allowing said bars to penetrate the latter, limiting the penetration of said inside bearers and bars into said plate upon engagement of said platen with said outside bearers, and removing said pressure to permit removal of said plate from said inside bearers and bars.

HERMAN T. NEKTON.