Nov. 10, 1931. S. S. ADAMS 1,831,434

EMBOSSING MACHINE

Filed Sept. 21, 1927

FIG. 1

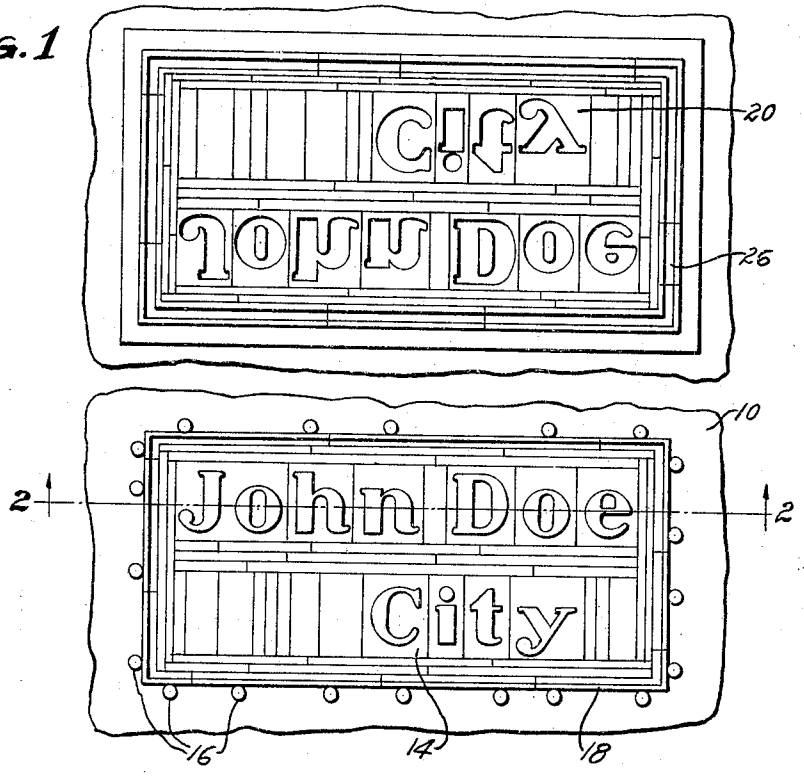
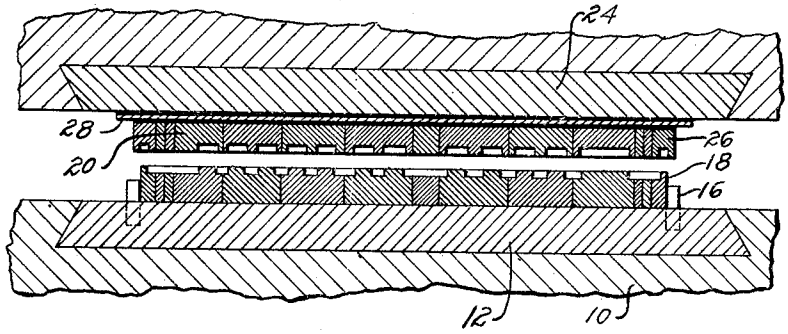


FIG. 2



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EMBOSSING MACHINE

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This invention relates to improved methods for use in securing in place the dies of an embossing machine, and is illustrated herein in connection with an embossing machine of a type adapted to produce raised portions or designs on the surface of a sheet of metal by means of heavy interchangeable dies brought forcibly to bear on opposite sides of the sheet.

An embossing machine of the foregoing type comprises, generally, a bed-plate having an upwardly facing surface for supporting, and holding rigidly, a lower die pattern of a desired design, a head located directly above the bed-plate and provided with a flat under surface for supporting and holding rigidly an upper die pattern similar to that affixed to the bed-plate, and means to effect relative movement in a vertical direction between the head and the bed-plate to cause the two die patterns to move towards or away from each other, whereby they may be moved into forcible engagement with the opposite sides of a sheet of metal inserted between them to impart to the metal sheet the design carried by them.

Formerly it was the practice in operating machines of this character to engrave upon solid blocks of steel male and female dies bearing the inscription which it was desired should be imparted to the metal sheet. It is obvious that such a method of operation was expensive in the extreme, since it required the engraving of new dies for the production of different signs, and, owing to this expense, attention was directed to the provision of a more economical method of producing embossed metal signs, with the result that of very recent years the use of large block metal type has been introduced by applicant into the art of metal embossing.

According to this more recent practice, which is analogous in some respects to the art of printing, applicant employs heavy steel blocks which are engraved to portray individually one of the letters of the alphabet, or some other similar character, and in setting up the machine the individually lettered blocks (which are, in fact, dies) are arranged in a desired assemblage and secured in place within the embossing machine so as to provide a surface similar to that which was formerly obtained through the use of a single steel block having the entire sign or legend engraved thereon. Thus it will be seen that, by virtue of providing the individual letter dies, the patterns which are comprised of the dies may be disassembled at the completion of an embossing operation and the dies may subsequently be used interchangeably in other and different patterns. With interchangeable dies, as with the solid steel dies, it is customary to compose the lower pattern of male dies and to assemble the upper pattern of female dies located in vertical alinement with the male dies of the lower pattern.

In setting up the heavy interchangeable dies of the embossing machine it is generally customary to assemble in proper relation on the bed-plate the die blocks which are to constitute the lower pattern, and to hold them, by means of dowel pins, against lateral movement across the face of the bed-plate; the dowel pins being positioned at intervals around the periphery of the assembled die pattern, and having their lower ends inserted into holes formed in the bed-plate and their upper ends extending above the surface of the bed-plate in engagement with the side edges of the pattern.

While fastening the heavy interchangeable dies of the lower pattern by means of dowel pins constitutes an entirely satisfactory method of holding in place the lower interchangeable dies, it is to be appreciated that dowel pins cannot serve to hold the heavy interchangeable dies of the upper pattern in place on the under surface of the head of the machine. In view of this fact various devices have been introduced and employed for use in fastening the heavy interchangeable dies of the upper pattern in place, and these have ranged from vises located on the under surface of the head to metal bars or straps arranged to be secured to the under surface and to support the separate dies by engagement with shoulders or similar projections formed on the dies. Although such mechanical means as the foregoing have been extensively

used in the embossing art, they have in all instances been found subject to numerous objections, such, for example, as the tendency on the part of the mechanical devices to get out of order; the difficulty of simultaneously holding the plurality of heavy interchangeable dies in engagement with the under surface of the head, manipulating the mechanical fastenings and alining the upper die pattern with the lower one; and the expenditure of considerable time in securing the dies in place.

With the foregoing considerations in view, the present invention has for an object thereof the provision of a novel method which may be practiced with ease and expediency to assemble and secure the interchangeable dies of a die pattern in place in a metal embossing machine.

An important feature of the invention which aims to the accomplishment of the recited object comprises first assembling and securing in place the dies of the lower die pattern, placing on top of the lower pattern, in interfitting engagement therewith, the interchangeable dies of the upper pattern, interposing between the upper pattern and the under surface of the head of the machine means effective to secure together the interchangeable dies of the upper pattern and the head upon the dies and the head coming into contact with one another, and imparting relative movement to the interchangeable dies of the upper pattern and the head to move the upper pattern into engagement with the head.

Repeated experiments, conducted with a view to discovering some manner of satisfactorily securing in place the heavy interchangeable dies of the upper die pattern which would eliminate the necessity of providing mechanical devices, have disclosed that a liquid or other suitable form of cement, or magnetic currents, may be beneficially employed to this end, and it is to be recognized that a further feature of the invention consists in the provision of a novel method of securing a pattern in place, which contemplates the use of cement as a securing means.

These and other features and advantages of the invention will become apparent from a consideration of the following specification and accompanying drawings of an illustrative embodiment of the invention, in which

Fig. 1 is a view showing in superimposed relation the upper and lower patterns of an embossing machine, and

Fig. 2 is a view in front elevation showing in section a head and a bed-plate of an embossing machine having upper and lower patterns, respectively, secured thereto.

As shown in the drawings, the numeral reference 10 indicates a bed-plate of an embossing machine having a slidable table 12 dovetailed therein. Secured to the upper surface of the table 12 is a lower die pattern composed of a plurality of interchangeable dies 14 secured in place by means of dowel pins 16 engaging the side edges of margin blocks 18. As shown in Fig. 2, the dowel pins 16 have their lower ends inserted in holes formed in the upper surface of the table 12, and their upper ends are arranged to extend above the surface of the table to engage the side edges of the margin blocks 18. The dowel pins serve to hold the interchangeable die blocks of the lower pattern in proper assembled relationship and further act to prevent lateral movement of the pattern across the face of the bed-plate 10 or the table 12.

To cooperate with the lower pattern in embossing a metal sheet there is provided an upper pattern composed of heavy interchangeable die blocks 20 secured to the under face of a head 22. As illustrated, a slide 24 is mounted in the head of the embossing machine in a manner similar to the mounting of the table 12. By virtue of providing the table 12 and the slide 24 it is to be noted that the interchangeable dies of the upper and lower patterns may be conveniently assembled when the table and slide are removed from the machine, thereby avoiding the necessity of assembling the dies of the patterns within the confine between the bed-plate and the head of the embossing machine.

In the operation of the machine, a sheet of metal is inserted between the interchangeable dies of the upper and lower patterns and thereafter relative movement between the head of the machine and the bed-plate is effected, whereby the raised faces of the die blocks come into forcible engagement with opposite sides of the sheet of metal, thereby pressing the metal out and imparting to it the design of the patterns. As illustrated in Fig. 2, the lower pattern is comprised of a plurality of male dies arranged for interfitting engagement with a plurality of female dies, and there is provided sufficient clearance between the cavities comprising the female dies and the raised portions of the male dies that all tendency to shear the sheet of metal is prevented.

As hereinbefore pointed out, the present invention has for an object the provision of a novel method of assembling and supporting the heavy interchangeable dies of the upper pattern in place on the under surface of the head 22 of the machine, and the following paragraph will be devoted to a discussion of this novel method of assembling.

In setting the machine up in accordance with the novel method the table 12 is removed from the bed-plate 10 and the male dies 14 of the lower pattern are assembled in proper registration on the table 12 and secured in place by means of the dowel pins 16. Subsequently the upper pattern, including the heavy interchangeable female dies 20 and female marginal blocks 26, are placed on top of

the lower pattern in such a position that the projections and cavities of the lower and upper dies, respectively, occupy an interfitted relation. Such an arrangement, it will be appreciated, insures that the interchangeable dies of the upper and lower patterns are in vertical alinement with each other. After the upper pattern has been placed upon the lower pattern, the rear (upwardly disposed) faces of the dies comprising the upper pattern are coated with a liquid or other suitable cement and thereafter, before the cement is allowed to dry, the table 12, with the interchangeable dies of the patterns assembled thereon, is again placed in the bed-plate 10, in which position the interchangeable dies of the upper pattern are located directly beneath the slide 24 and the head 22 of the machine. With the patterns so assembled and positioned, relative movement between the bed-plate and the head 22 is imparted to the machine, whereupon the heavy interchangeable dies of the upper pattern come into forcible engagement with the under surface of the head 22, and are maintained in this position for a short period during which the cement hardens and effectively joins together the heavy interchangeable die blocks 20 of the upper pattern and the under surface of the slide 24, or head 22.

As illustrated in Fig. 2 of the drawings, a sheet of cardboard or other similar material 28 may be interposed between the cement-coated rear faces of the interchangeable die blocks 20 and the under surface of the head 22 of the machine, in which event it becomes necessary to interpose between the cardboard sheet and the under surface of the head a second coating of cement indicated by the dark line of Fig. 2. The interposing of cardboard between the upper die blocks and the head permits ready removal of the blocks from the head whenever it is desired to change the design of the patterns; removal of the interchangeable blocks being effected by inserting a chisel between the blocks and the head, in which position the sharp edge of the chisel cuts the cardboard and severs the blocks from the head.

The invention contemplates using a water solvent cement in securing the interchangeable dies of the upper pattern to the head of the machine, to the end that upon removal of the pattern the cement and cardboard remaining attached to the rear face of the pattern may be easily removed by the application thereto of hot water.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. That improvement in methods of assembling and securing in place the interchangeable dies of an upper die pattern of a metal embossing machine which comprises first assembling and securing in place the dies of the lower pattern, placing on top of the lower pattern, in interfitting engagement therewith, the interchangeable dies of the upper pattern, interposing between the upper pattern and a support of the embossing machine to which the interchangeable dies are secured means effective to secure together the dies and the support upon the two coming into engagement with one another, and causing relative approach between the dies of the upper pattern and the support to move the pattern into engagement with the support.

2. That improvement in methods of assembling and securing in place the upper die pattern of a metal embossing machine which comprises first assembling and securing in place the lower die pattern of the machine, placing on top of the lower pattern, in interfitting engagement therewith, the interchangeable dies of the upper pattern, interposing between the upper pattern and the portion of the embossing machine which supports the upper pattern a layer of cement, imparting relative approach between the interchangeable dies of the upper pattern and the supporting member to move the dies into firm engagement with the supporting member during the hardening of the cement.

3. That improvement in methods of securing the interchangeable dies including the upper dies of a die pattern to a supporting member constituting a part of a metal embossing machine which comprises interposing a fibrous sheet between the interchangeable dies and the supporting member, coating the opposite sides of the fibrous sheet with cement, supplying pressure to maintain the supporting member and the interchangeable dies in close engagement with opposite sides of the cement-coated sheet, and maintaining that pressure during the hardening of the cement.

In testimony that I claim the foregoing I hereunto affix my signature.

STEPHEN S. ADAMS.