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S. C. CROSS

1,926,141

DIE FOR SWAGING MACHINES

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Fig. 1

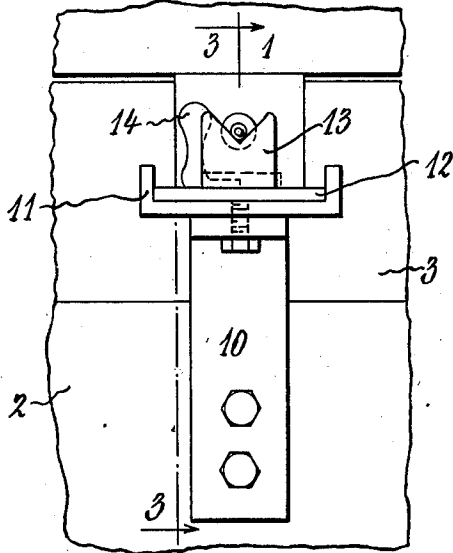


Fig. 2

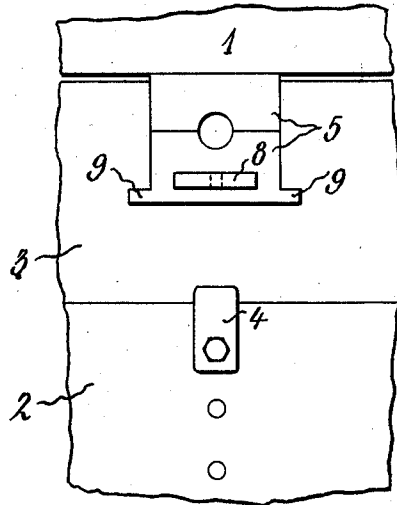


Fig. 3

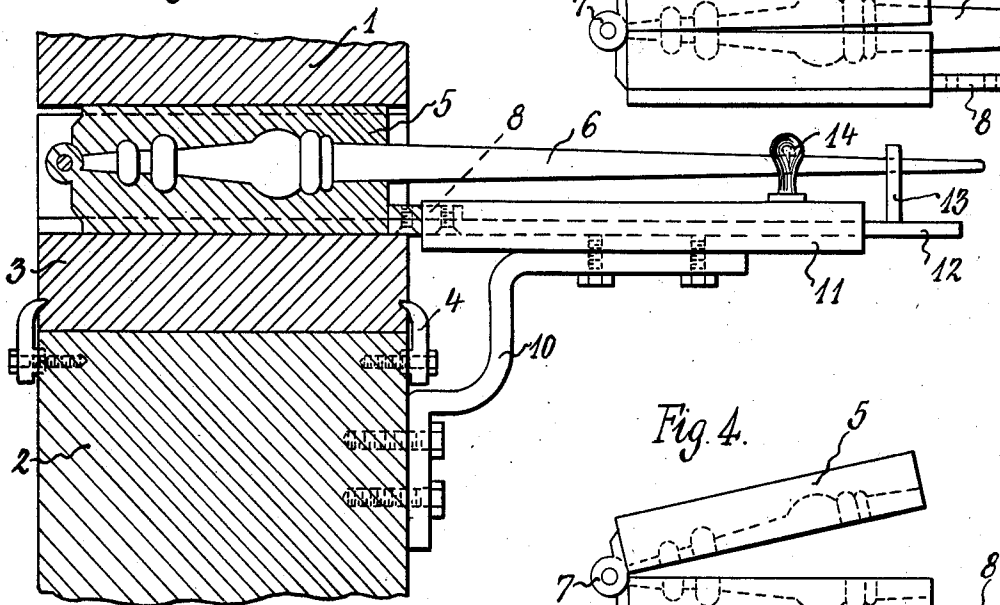


Fig. 5

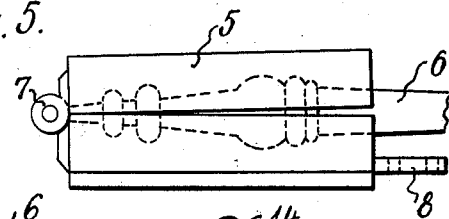
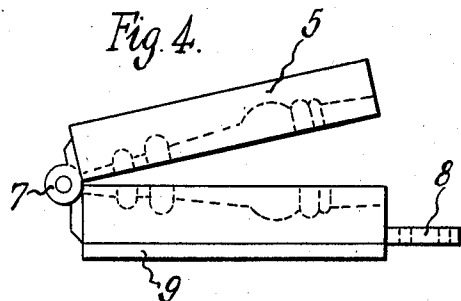


Fig. 4



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DIE FOR SWAGING MACHINES

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3 Claims. (Cl. 78—60)

This invention relates to improvements in swaging machines and more particularly in the dies thereof, the object of the invention being to extend the utility of such machines into a far greater variety of swaging operations than has heretofore been possible.

Machine swaging operations have been usually confined to cylindrical or conical surfaces. It is customary to introduce the work to be swaged and withdraw it during the continuous operation of the machine, and consequently the work has been limited to such shapes as will readily pass into the opening formed between the continuously reciprocating dies or hammers of the machine. Heretofore, only work of uniform or tapering cross section could be conveniently swaged in the manner described and in machines of the press type an operator conveniently turns the work while being operated upon.

The present invention contemplates making the dies separable from the hammer members of the swaging machine for the purpose of permitting relative travel therebetween either for introducing or removing the dies with the work during the continuous operation of the machine. By this means, work pieces having portions of irregular cross section (viz., having enlargements between their ends) may be swaged in a swaging press. A typical piece of work which may be swaged in a press machine is that of a shifter lever for automobiles which has several spherical-like protuberances between the ends of its tapered portion.

Further objects and advantages of the invention will become apparent from the following more detailed description, taken in connection with the accompanying drawing, in which:

Fig. 1 is a partial front elevation of so much of a swaging machine of the press type as is necessary for the understanding of the invention;

Fig. 2 is a view similar to Fig. 1, with the work guiding support removed to more clearly show the position of the dies in the machine;

Fig. 3 is a side elevation, partly in section, of the apparatus shown in Fig. 1, also showing the dies with finished work therein;

Fig. 4 is a detached side view of the dies in open position;

Fig. 5 is another detached side view of the dies in closed position with a piece of unfinished work therein ready for introduction in the press.

Referring to Figs. 1, 2 and 3, the hammer members of the press comprises the reciprocable upper member 1 operated in the usual manner of

such machines, and the stationary anvil member 2 with attached anvil head 3. Jaws 4 detachably secure the anvil head 3 in position so that it may be replaced to provide for dies of different dimensions.

The die aggregate 5 (as shown in Fig. 3 and also in the detached illustrations Figs. 4 and 5) consists of two members, a lower and an upper die, preferably hinged together as at 7. The two dies may thus open like jaws (see Fig. 4) to receive the work piece 6 between their work engaging faces and, when the work is placed therein, they will stand apart by a small angle as can be seen from Fig. 5.

The dies have back portions (upper and lower) for slidably fitting in a bearing provided therefor in the anvil head 3 of the press. Preferably the main portion of said bearing is formed in said anvil head 3 (as shown in Fig. 2) so that the greater portion of the die aggregate is received in said lower member of the press.

A dovetail engagement by means of lateral flanges 9 on the lower die and grooves in the anvil head is preferred for holding the die aggregate firmly down on the anvil head 3 during the swaging operation. This kind of attachment renders it very easy to introduce the dies with the work therein and secures a straight travel relative to the hammer members while the press is operating.

The introduction and withdrawal of the work pieces is further facilitated by a guiding support (as shown in Figs. 1 and 3). A bracket 10, fastened to the anvil 2, carries a channel guide rail 11. A bar 12 is slidably mounted in the guide rail 11, one end of this bar being attached to a front ledge portion 8 of the lower die and the other end carrying an exchangeable work support 13 and a handle 14. These latter parts are appropriately so arranged that the left hand of the operator will rest on the handle and his right hand grip the work piece for conveniently manipulating the dies and work piece in and out of the machine.

Though in the illustrations hinged dies are shown, dies held together by pins depending from the upper die and registering in holes of the lower die may be used instead. I have found the hinged dies preferable in connection with the press type of swaging machine. They are easily inserted between the hammer members of the machine, and the swaging operation proceeds gradually from the rear end to the front end of the die, whereby highly finished work pieces may be produced. It is evident that in this way

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pieces of almost any form can be swaged in the press type of machine.

It will be understood that various modifications of the structure shown may be employed to equal advantage and that my invention is not to be limited to the details or the exact embodiment illustrated. With slight modifications the principle employed may be adapted to the well known rotary type of swaging machine.

10 What is claimed:

1. A swaging machine which comprises a stationary horizontally grooved hammer member, an elongated channeled horizontal support in alignment with said groove, a vertically reciprocable hammer member, upper and lower die sections hinged at their ends opposite said support and a handle secured to said die members whereby said dies may be advanced along said support into said groove for engagement with said hammer members.

2. The combination with a swaging machine comprising relatively reciprocating hammer members of upper and lower die members hinged together at one end and adapted to be loosely

assembled about the end of a work piece and to be progressively advanced therewith between the hammer members to cause the hammers and dies to act on the work progressively from the hinged end of the dies towards their free ends, the loose assemblage of the dies permitting axial movement of the work piece between the dies during the intervals when the pressure of the hammer members is relieved.

3. The combination with a swaging machine which comprises a stationary hammer member and a reciprocating hammer member, of upper and lower die members hinged together at one end and adapted to be loosely assembled about the end of the work piece and to be progressively advanced therewith across the stationary hammer member to cause the reciprocating hammer to engage the upper die progressively from its hinged end toward its free end, the loose assemblage of the dies permitting axial movement of the work piece between the dies during the intervals when the reciprocating hammer member is out of engagement with the dies.

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