

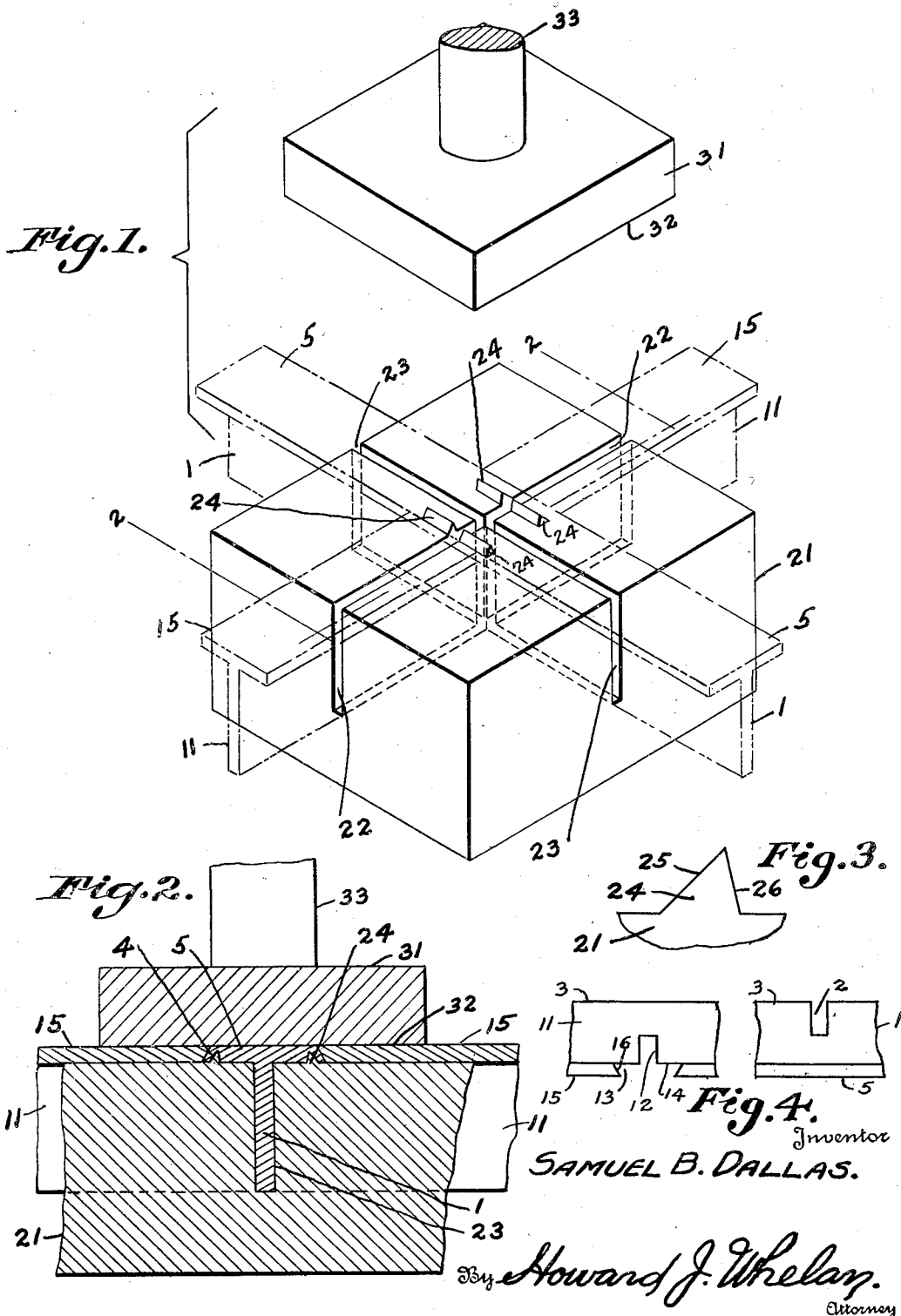
Feb. 4, 1936.

S. B. DALLAS

2,029,704

SWAGING AND ALIGNMENT DIE

Filed Aug. 27, 1934



UNITED STATES PATENT OFFICE

2,029,704

SWAGING AND ALIGNMENT DIE

Samuel B. Dallas, Baltimore, Md.

Application August 27, 1934, Serial No. 741,704

7 Claims. (Cl. 78—60)

This invention refers to methods for joining metal T-bars together. It has among its objects to provide a cold process for aligning, joining and locking conventional T-shaped bars of metal together; to design a die block and swage lock that will enable such process and method to be done by a conventional stamping machine; to have such method arranged that no objectional stresses or strains will be produced in the metal portion where the arrangement is used, to have the completed joint made by the method free from objectionable protrusions and defects in appearance; to provide a method of making right-angle intersections in T-shaped bars that will be strong, tight and compact. Other objects will become apparent as the invention is more fully set forth.

The usual method of securing joints for T-shaped bars, particularly such as is used in metal window construction consists in using gusset plates and welding. These methods make the joints cumbersome, adds material and provides protrusions of various kinds that affect the utility and appearance. In this invention, a swaging process joins the T-bars at the intersection and forces the metal of one part into the other causing it to fill up all spaces at the joint and lock the parts quasi-homogeneously together. The method works quickly and aligns the works so that all minor irregularities are "ironed" out and the joint finished in a strong workmanlike manner.

In the drawing which illustrates by way of example an embodiment of this invention:—

Figure 1 is a view in perspective of the die-block and swage block used in this modification of the invention, with the metal pieces to be joined indicated in dotted outlines.

Figure 2 is a sectional view of Figure 1 along line 2—2.

Figure 3 is a detail view of the swaging pyramids used for "flowing" the material.

Figure 4 is a detail view of the T-bars before being joined, indicating the manner in which they are cut.

Similar reference characters refer to similar parts throughout the drawing.

In the drawing, the preferred forms in which the T-bars are cut before being placed on the die block, are shown in Figure 4, where 1 is the web of one of the T-bars and has a square cut slot 2, extending through about one-half the length of the web from its edge 3. The other T-bar section which is arranged to cross or bridge the first at right angles has its web 11 and flange 15 cut away at 13 and 14 respectively. The sides

of the cut at 14 being dovetailed at 16 with the slanting or stepped walls as indicated. A slot 12 is provided in web 11 as shown.

The die block is shown at 21 provided with cross-cut recesses 22 and 23 adapted to receive and take the T-bars to be joined together. Swaging pyramids 24 are provided above the walls of the cross-cut recess 22 and preferable of the form indicated in the detail in Figure 3, one side 25 being slanted at an angle and the other side 26 slightly out of perpendicular. This enables the swaging to flow the metal as required in a more facile manner. When the sections are located in the die-block, the flange 5 rests on the pyramids 24 and web 1 in the cross-cut recess 22, while the second section has its web 11 and slot 12 straddling on the web 1.

While so positioned the sections of T-bar are ready for swaging together. A swaging block 31 is mounted in a press or stamping machine above the die-block and has a flat stamping surface 32 provided for striking the outer faces of the flanges 5 and 15 of the T-bars. The block 31 is provided with a suitable stem 33 or other means for securing it to the operating machine, and the die block is provided with some suitable means for securing it to the bed of the machine.

When the sections are positioned, the swaging block is brought down heavily on the outer faces of the flanges and the pyramids 24 are forced into the inside faces of the flanges 5 causing the metal of the flange in these locations to flow outwardly and fill the spaces and against the cut away portions at 13 and against the walls at 16, thereby locking the sections together. The pyramids leave slots 4 in the flanges 5 causing the "flowed" metal to enter into the dovetailed cuts in the flanges of the other section. When the swaging process is completed, it has aligned the T-bars accurately and then forced them powerfully together, causing the joints to fill tightly and securely, and where the dovetail portions are: to lock solidly therein. This results in a very secure joint and makes it free from looseness and strains that might affect the utility thereof. The process is quickly performed and requires no heat and additional metal or material to complete and reinforce the joint.

While but one form of the invention is indicated in the drawing, it is not desired to limit this application for patent to the particular form described or in any other way, otherwise than limited by the prior art, as it is appreciated that other forms might be used that would employ

the same principles and come within the scope of the appended claims.

What is claimed is:—

1. A die for jointing cross-bars together, comprising a die block having a plurality of cross-cut recesses therein to receive and take T-bars to be joined together, swaging pyramids provided on the surface plane of the block above and adjacent to the walls of said slots and disposed to make digging contact into the flanges of the T-bars to be jointed, and means for swaging for the die block.
2. A die for jointing T-cross-bars together comprising a die block having a plurality of cross cut recesses therein to receive and take the webs of the cross-bars therein, cut and bridged over each other, a plurality of swaging pyramids mounted on the surface plane of the die block above the walls of the said recesses and adjacent to a portion of same and adapted to have their apexed edges contact the inside surfaces of the flanges of the T-cross-bars set in the recesses and bridging over each other ready for jointing, and a swaging member for striking the outside surfaces of the flanges of the cross bars and for forcing the flanges down on the said pyramids to flow the material thereof towards the jointing lines of the cross-bars and into close and tight contact therewith.
3. A die for jointing T-cross-bars together comprising a die block arranged with a plurality of cross-cut recesses therein and adapted to closely receive and take the webs of cross-bars cut and bridged over therein, swaging pyramids mounted on the block adapted to provide pressure contact with the under surfaces of some of the flanges of the T-cross-bars, and means for pressing the flanges of the cross-bars down on the said pyramids and the surface plane of the die-block and forcing the material of the cross-bars in the flanges towards the jointing lines thereof and into dove-tailed locking contact with each other.
4. A die for processing the jointing of cross bars of a window sash comprising a main body having a plurality of slots therein for the reception of cross bars, and pyramidal projects on the face of the die for contacting with portions of the cross bars, and a stamping block for striking the cross bars and forcing the same to press

on the projections and swage the material of the cross-bars out into each other into locked connections closely fitting the jointed portions into each other.

5. A die of the class described comprising a base block with cross cut slots for receiving the legs of conventional metal sections cut to bridge each other and make a flush connection, said block having a plurality of projections thereon arranged for contact with the surface portions of the sections and adjacent the joining portions thereof, and a stamping block for striking the sections in place in the slots for forcing same against the projections and thereby swage the material of the sections into the spaces at the joints and thereby fill same and lock the sections firmly together.

6. A die of the class described comprising a base block with cross cut slots provided therein at right angles to each other and adapted to receive the legs of conventional T-bars cut to bridge over each other, said block having a plurality of projections on its faces adapted to contact the faces of the flanges of the T-bars adjacent to the bridging portions thereof, and a stamping block for striking the flanges of the T-bars and forcing the same against the projections and section against each other, whereby the material of the T-bars will be flowed into each other at the joining portions into a firmly locked contact.

7. A die for jointing T-cross bars together comprising a block arranged with two cross-cut recesses therein for a pair of T-bar sections cut to bridge over each other and with the flanges and webs in the same plane and level with each other, said recesses being arranged to hold the sections closely and properly aligned, a set of pyramids arranged parallel and adjacent to one of the recesses and with their apexed edges pointing upwardly to the surface of one of the T-bar sections, and a swaging member for striking the T-bar sections and forcing them against the pyramids and thereby form depressions therein, the material from the depressions being flowed towards the webs of the sections and tightly fastening and dove-tail locking the flanges together and the webs into a semi-homogenous connection.

SAMUEL B. DALLAS. 50