June 7, 1938. V. J. GRAF 2,120,094

APPARATUS FOR MAKING SINKS

Filed June 8, 1935 2 Sheets-Sheet 1

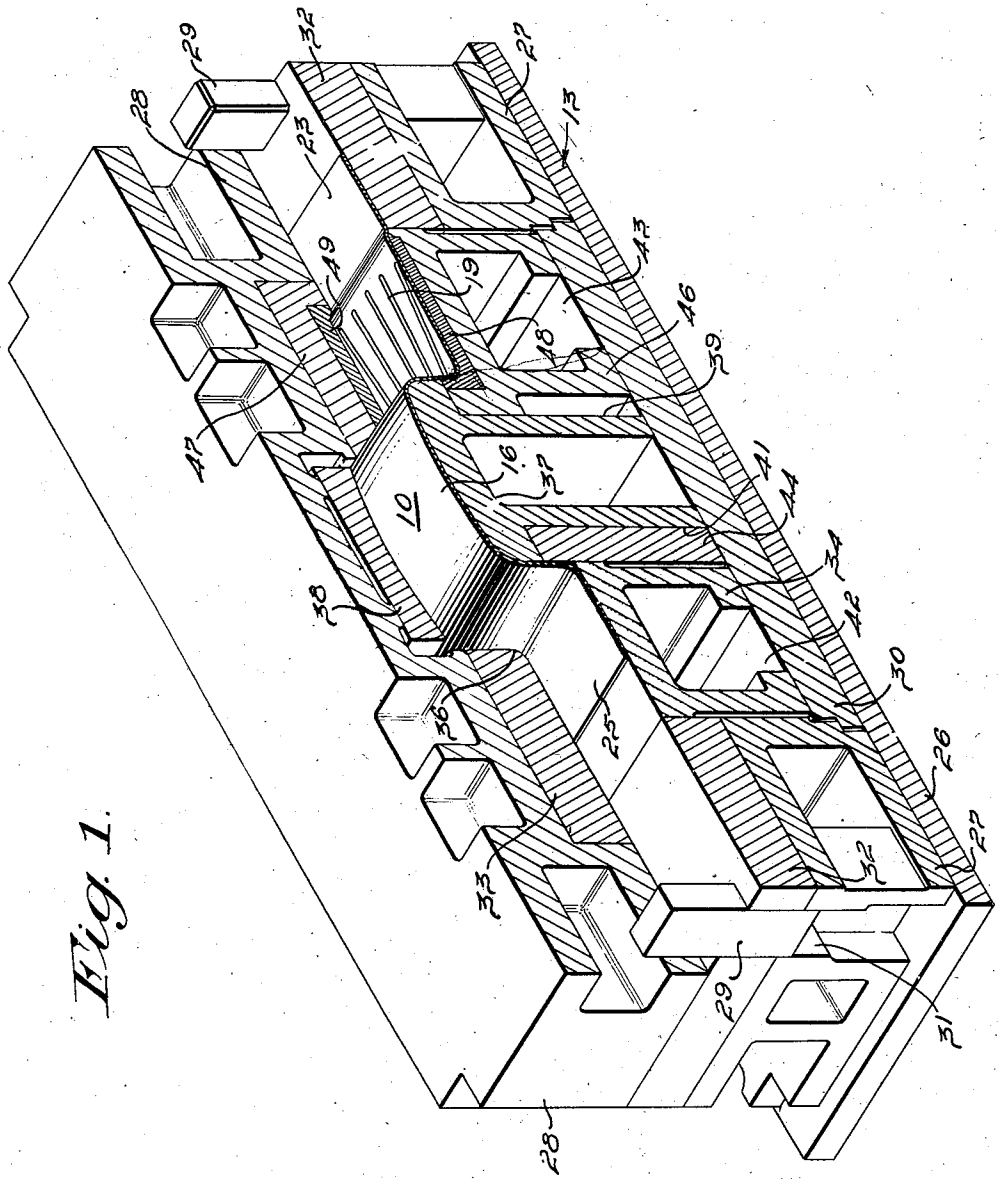


Fig. 1.

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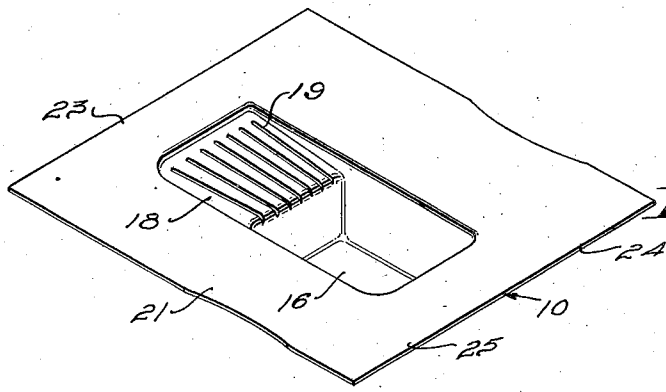
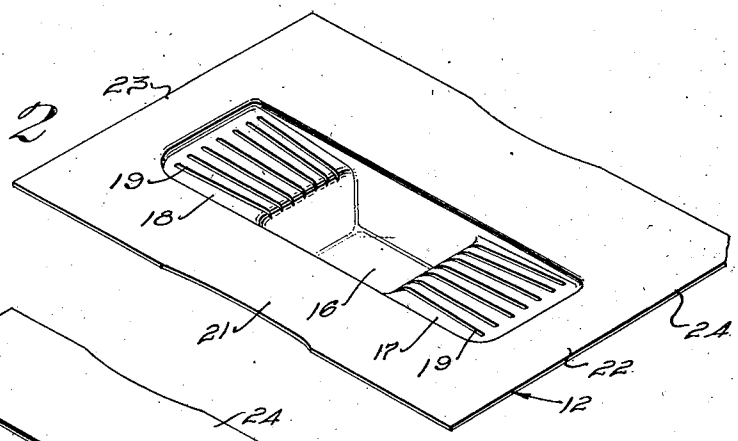


Fig 5.

Fig. 2



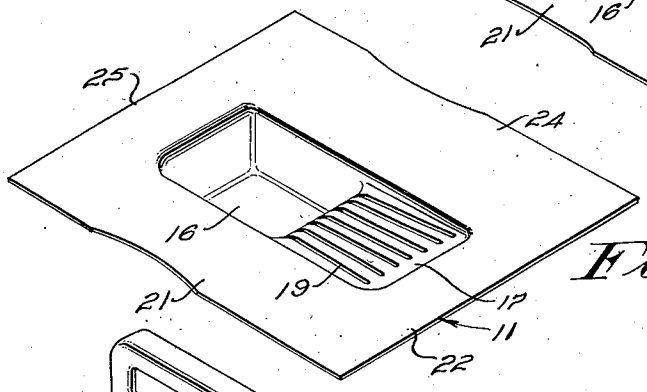


Fig. 3

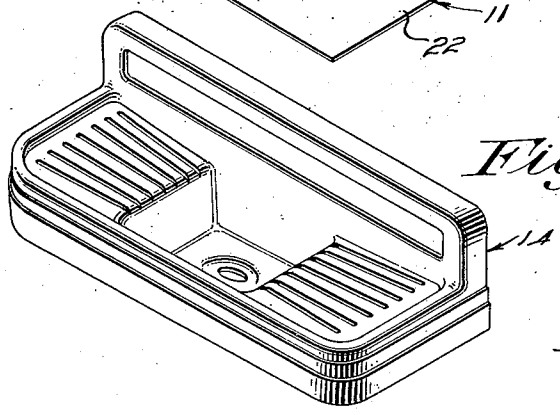


Fig. 4

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APPARATUS FOR MAKING SINKS

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Application June 8, 1935, Serial No. 25,566

5 Claims. (Cl. 113—49)

This invention relates to dies for performing stamping operations on sheet metal parts and more particularly to interchangeable dies which may be used in the production of right hand, left hand, and right and left hand sheet metal parts.

For convenience in understanding my invention I shall refer to a specific sheet metal article and the specific die for operating thereon, such for example, as a sheet metal sink which has a basin and a drainboard located on the right or left side thereof. So-called "double drainboard" sinks have a single basin flanked on either side by a drainboard.

It will be noted that a double sink unit of the type herein shown is not a complete combination of a right hand and a left hand sink, but represents a combination of the outer or drainboard portions of each of the single units with only a single intermediate basin.

Hence the die design problem is not the same as is generally encountered in the manufacturing of right or left hand or complete double stampings.

Dies for performing operations on articles of the type here referred to are extremely expensive, not only because of the many operations required in the manufacturing of right, left and double drainboard sinks, but also because of the size of the dies required, the dies having to be made big enough to accommodate a single blank. Such a blank comprises not only the basin and drainboard portions, but frequently also a splash board, an apron, and suitably located flanges surrounding these several parts.

Because of the expense involved, it is extremely desirable to reduce the number of dies required for the production of articles of this nature, and this is, broadly, a primary purpose of the present invention.

An object of my invention is to provide a die or die block which can be used to perform similar operations on sheet metal articles such as a sink, having a single common element such as the basin, flanked on one or both sides with similar but differently located portions, such as the drainboards.

Another object of my invention is to provide a die block having interchangeable die inserts which can be used to perform stamping operations selectively on a portion of a right hand, a left hand, and a double unit such as a sink.

A further object of my invention is to provide a die block for performing stamping operations on right, left or double articles such as sinks, in which a single basin-engaging die having a fixed location, is flanked with interchangeable die inserts for performing a stamping operation on a portion of the sink which may be on the right or the left or on both sides of the basin.

Still another object of my invention is to provide a die block for performing stamping operations on a sink, in which the basin die is centrally located, the die block having recesses on either side of the basin die for the reception of interchangeable die inserts for performing selected operations on the other portions of the sink.

Other objects of this invention will appear in the following description and appended claims, reference being had to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

Fig. 1 is a perspective view of a die having portions cut away to illustrate my invention, a sheet metal article also being shown in operative position in the die;

Fig. 2 is an illustration in perspective of a double drainboard sink blank after being subjected to the stamping operation performed by the die illustrated in Fig. 1;

Fig. 3 is a similar illustration of a right hand drainboard sink blank;

Fig. 4 is an illustration in perspective of a finished double drainboard sink; and

Fig. 5 is an illustration in perspective of a left hand drainboard blank after having been operated on by the die shown in Fig. 1.

Before explaining in detail the present invention it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation, and it is not intended to limit the invention claimed herein beyond the requirements of the prior art.

Referring to the drawings exemplifying one embodiment of the invention, 10 illustrates a left hand drainboard sink, 11 a right hand drainboard sink, and 12 a double drainboard sink as the metal thereof emerges from the die illustrated generally at 13 in Fig. 1. The finished sink 14 shows in Fig. 4.

It will be noted that each sink, after the operation of the die 13, comprises a basin portion 16, and right hand or left hand drainboard portions, 17 and 18 respectively, having drain beads 19

therein. The several flanges which yet remain in the sheet metal blank may be called the apron flange 21, the right hand drainboard flange 22, the left hand drainboard flange 23, the splash board flange 24 and a basin flange 25.

The die shown in Fig. 1 is intended to perform an operation which may be called "reform basin, form drainboard and drain beads." My invention is, however, not limited to a die for performing this specific operation nor to the fabrication of a sink of the particular design herein illustrated.

A consideration of the blanks 11 and 12 will show that, except for the flanges which may be used in drawing operations for holding the metal, the drainboard and basins are identical, although differently arranged with respect to each other and with respect to the metal of the flanges. Hence I have found it possible to provide a die block having a basin-engaging portion and removable die inserts adapted to be placed on either side of the basin die members for the manufacture of stampings of the general type illustrated in Figs. 2, 3 and 5.

In detail, the die 13 comprises a base 26 adapted to be placed on the bed of a press. On the base is mounted a lower die block 27 and an upper die block 28 adapted to be attached to the ram of a press in the well-known manner. Guide pins 29 carried by one die block register with suitable guideways 31 in the other die block as is well known in the art.

Each die block carries opposed flange-holding dies, or dies for supporting the stamping in position prior to and during the stamping operation. These dies may be made up in part by the die blocks themselves, or they may be inserts, as desired. As shown in Fig. 1 where a left hand drainboard sink is shown after having been operated on, the drainboard flange 23 is held between the upper die block 28 and an insert 32 fixed in the lower die block 27 and supported at the proper height by a spacer 30. The basin flange 25 is shown as being held between an upper die insert 33 and a lower die insert 34 carried by the upper and lower die blocks respectively. The illustration does not show the apron or splash board holding dies as these are not considered essential to an understanding of this invention.

It will be noted that the upper die insert 33 overlaps the edge of the holding insert 32 and also has a curved inner corner 36 for reforming, by cooperation with the lower die insert 34, the lip of the basin adjacent the basin flange 25.

The basin portion 16 of the sink is reformed by the basin-reforming die 37, the upper die 38 carried by the upper die block being the mating portion of die 37. It will be noted that the basin-engaging die 37 is located substantially centrally of the die block 27 whereby undue strain on the press may be avoided.

As one of the factors making it possible to use interchangeable dies, I provide recesses 39 and 41 in the sides of the basin die member 37, these recesses extending upwardly on each side of the die to a point above the edge of the basin lip. These recesses cooperate with apertures or spaces 42 and 43, formed in the lower die block 27, to receive either a block insert member 44 and a stamping-supporting die 34 or a die member 46 adapted to perform a stamping operation on the remaining portion of the sink. The aperture 43 and the recess 39 are identical in size with the aperture 42 and the recess 41 so that the lower die block may be changed from a left hand sink-forming member to a right hand sink-forming member simply by reversing the positions of the dies 46 and 34, the inserts in the upper die block being shifted accordingly.

Broadly speaking, the operation performed by the die 46 may be any operation which must be performed on the sink 10 which differs from the operation performed by the block 34. As shown, the die insert 46 and its cooperating insert 47 perform the operation of forming the drainboard and the drain beads, steel inserts 48 and 49 preferably being used to produce a sharp bead contour. The die insert 46 extends circumferentially of the curve between the drainboard and the basin and extends upwardly into the recess 39 far enough to form this curve in its entirety. This curve, it will be noted, differs from the curve on the opposite side of the basin and this is the reason for extending the recesses 39 and 41 upwardly beyond the horizontal portions of the die insert 34.

As shown in Fig. 1 and as previously referred to, the die blocks and die inserts are arranged to form a left hand drainboard sink. If a double drainboard sink is desired, the inserts 34 and 44 are removed and an insert identical with 46 is installed in their place, the insert 33 being removed and another insert identical with insert 47 being substituted therefor.

The apron and splash board flanges 21 and 24 being of different widths, the front and rear portions of the die blocks are differently shaped to receive these flanges. These portions of the die blocks may be designed in any suitable manner well known in the art.

The several die inserts may be described in the following manner.

The dies 37 and 38 may be said to be a unit adapted to engage with or operate on the basin 16 of a sink, or on any recess or protuberance or other sheet metal part forming the central portion of a so-called double unit such as a sink. This unit may be called a recess-engaging means.

The dies 34 and 33 may be said to form a unit which may be called a stamping-supporting means insertable in the aperture 42 or 43 provided in the die blocks. The block insert 44 may be considered as a part of this means, and the recesses 39 and 41 may be considered as a part of the apertures or cavities 43 and 42.

The dies 46 and 47 may be said to constitute a panel-forming means or panel die means selectively insertable into the apertures 43 and 42 of the die blocks on the side of the recess-engaging means 37 and 38 opposite from the supporting means 34 and 33. Broadly, the dies 46 and 47 may be adapted to perform any deforming or drawing operations on those portions of the stampings which are different in the right or left hand types of stampings.

Thus, all that is needed, by virtue of this invention, to manufacture right hand sinks, left hand sinks, or double sinks are upper and lower blocks, a basin-engaging die means, a pair of panel-forming die means, and a single stamping-supporting means, the panel-forming and stamping-supporting die means being carried by the die blocks and interchangeable one with the other as previously set forth. The interchangeability of these inserts very greatly reduces the die expense and the time required for setting the dies in the presses.

The design of the die which I have here described makes possible a new method of performing a stamping operation on right, left or double units such as sinks, the method compris-

ing selecting a pair of die blocks 27 and 28, inserting therein interchangeable die units of the desired type and operating the press to produce right, left or double units.

I claim:

1. A die block assembly for performing a stamping operation on sheet metal sink blanks each having in its completed form a basin and a drainboard portion located alternately on the right hand or left hand side of said basin, comprising upper and lower die blocks having cooperating basin engaging die members, one of said die members having a central supporting portion terminating at its outer end in a recess engaging die portion fitting the bottom and side wall contour of the sink basin, said last named portion having extensions beyond opposite sides of the central portion to provide recesses at opposite sides of the latter, a drainboard forming die member adapted to be supported at one side of said central portion and having a part fitting into one of the recesses, a flange supporting die member adapted to be supported at the opposite side of said central portion in spaced relation thereto, and a die block insert cooperable with said last-named die member to fit into the other recess, said flange supporting die member and block insert as a unit being interchangeable with said drainboard forming die member at opposite sides of the recess engaging die member.

2. A die block assembly for performing a stamping operation on sheet metal sink blanks each having in its completed form a basin and a drainboard portion located alternately on the right hand or left hand side of said basin, comprising upper and lower die blocks having cooperating basin engaging die members, one of said die members having a central supporting portion terminating at its outer end in a recess engaging die portion having extensions beyond opposite sides of the central portion to provide recesses at opposite sides of the latter, a drainboard forming die member adapted to be supported at one side of said central portion and having a part fitting into one of the recesses, a flange supporting die member adapted to be supported at the opposite side of said central portion in spaced relation thereto, and a die block insert cooperable with said last-named die member to fit into the other recess, said flange supporting die member and block insert as a unit being interchangeable with said drainboard forming die member at opposite sides of the recess engaging die member, said die block insert extending into the sink basin along a side wall thereof and terminating in a different horizontal plane than the working surface of the flange supporting die member.

3. A die block assembly for performing a stamping operation on sheet metal sink blanks each having in its completed form a basin and a drainboard portion located alternately on the right hand or left hand side of said basin, comprising upper and lower die blocks having cooperating basin engaging die members, one of said die members having a central supporting portion terminating at its outer end in a recess engaging die portion having extensions beyond opposite sides of the central portion to provide recesses at opposite sides of the latter, a drainboard forming die member adapted to be supported at one side of said central portion and having a part fitting into one of the recesses, a flange supporting die member adapted to be supported at the opposite side of said central portion in spaced relation thereto, and a die block insert cooperable with said last-named die member to fit into the other recess, said flange supporting die member and block insert as a unit being interchangeable with said drainboard forming die member at opposite sides of the recess engaging die member, said die block insert having a portion cooperating with said recess engaging die portion and extending into the sink basin, and said flange supporting die member having a generally horizontal working surface located wholly outside the sink basin.

4. A die block assembly for performing a stamping operation on sheet metal sink blanks each having in its completed form a basin and a drainboard portion located alternately on the right hand or left hand side of said basin, comprising upper and lower die blocks having cooperating basin engaging die members, one of said die members having a central supporting portion terminating at its outer end in a recess engaging die portion having extensions beyond opposite sides of the central portion to provide recesses at opposite sides of the latter, a drainboard forming die member adapted to be supported at one side of said central portion and having an integral part fitting into one of the recesses, a flange supporting die member adapted to be supported at the opposite side of said central portion in spaced relation thereto, and a die block insert cooperable with said last-named die member to fit into the other recess, said block insert being separate from said last-named die member and said flange supporting die member and drainboard forming die member having their working surfaces in different horizontal planes, said flange supporting die member and block insert as a unit being interchangeable with said drainboard forming die member at opposite sides of the recess engaging die member.

5. A die block assembly for performing a stamping operation on sheet metal sink blanks each having in its completed form a basin and a drainboard portion located alternately on the right hand or left hand side of said basin, comprising upper and lower die blocks having cooperating basin engaging die members, the lower die block comprising a central basin engaging die member fitting the bottom and side wall contour of the basin recess, a pair of die members adapted to be positioned at opposite sides of the basin engaging die member and one having its working surface located nearer the plane of the bottom of the sink basin than the other and also being contoured differently than the other at the locality of the outer edge of the basin side wall, one die member of said pair having a cooperating member fitting into a side wall recess in the central die member and also fitting into the basin recess and the other die member of the pair having a cooperating member of different formation than said last-named cooperating member fitting into a corresponding recess in the opposite side wall of the central die member, said recesses being identical and each die member of the pair together with its cooperating member being interchangeable with the other die member of the pair together with its cooperating member.

VINCENT J. GRAF.