

G. ROSEN.
DIE MAKER'S CLEARANCE GAGE.
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1,060,634.

Patented May 6, 1913.

Fig. 1.

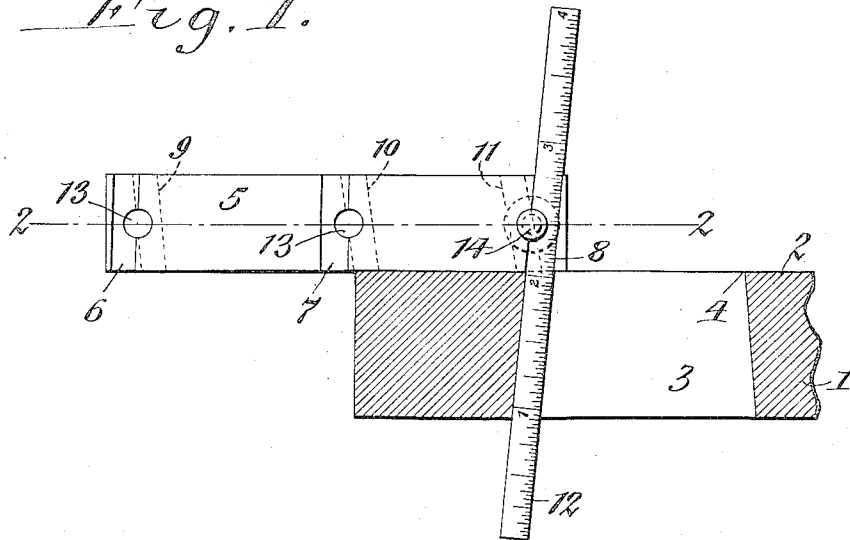
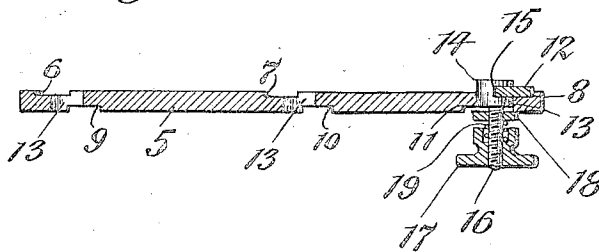


Fig. 2.



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UNITED STATES PATENT OFFICE.

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DIE-MAKER'S CLEARANCE-GAGE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GUSTAF ROSÉN, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Die-Makers' Clearance-Gages, of which the following is a specification:

This invention relates to a die maker's clearance gage or square whereby the angle of the bore or opening of the die may be accurately determined according to the character of the die which is being made and the work which is to be produced by the same.

It has been customary heretofore to employ for this purpose a plurality of gages each of which was provided with a stock and a blade fixed on the stock at a definite angle relatively thereto, the blades of the several gages being arranged at different angles so as to permit a selection of the proper gage for use in making a die with a clearance in its bore corresponding to the particular angle desired. Such means of gaging the clearance of a die are unsatisfactory inasmuch as this necessitates the employment of a plurality of tools which is not only expensive but also necessitates making a selection of the proper tool, to say nothing about the care required to keep the tools together.

It is the object of this invention to provide a single tool of this character having a stock and blade which can be assembled in different fixed relations to each other at the various angles in which such a tool is commonly used for producing the various clearances or bevels in the bore of the die relatively to the face thereof.

In the accompanying drawings: Figure 1 is a fragmentary vertical section of a die showing my improved clearance gage applied thereto for determining the angle of the die opening relatively to the face thereof. Fig. 2 is a horizontal section of the gage, taken in line 2-2, Fig. 1 and looking upwardly.

Similar characters of reference indicate corresponding parts in both views.

1 represents a die having a flat upper face 2 upon which a sheet of metal or other material to be punched is placed and an opening 3 through which that part of the blank which is removed by the punch is discharged downwardly. The corner 4 at the upper

end of the opening and the upper face of the die constitutes the shearing edge of the die with which the punch coöperates for removing a part or piece of the material from the blank or stock which is being operated upon. The opening or bore of the die usually flares or enlarges downwardly from the upper side of the die to the lower side thereof in order to permit the punching or waste which is removed from the blank by the punch to pass freely downward through the die and reduce the frictional contact of the same for avoiding unnecessary wear thereof and also to reduce the amount of power for operating the press. When a comparatively large number of pieces is to be produced from a die the angle of the clearance or downward flare of the die opening is comparatively small inasmuch as in such cases the upper face of the die must be ground down in order to restore the cutting edge of the die when the same becomes worn and it is therefore necessary to have the clearance of the die opening as small as possible in order not to unduly vary the size of the die opening and the product of the same. When, however, only a comparatively small number of pieces is to be produced from the die frequent dressing or facing of the same is not required for keeping the same sharp because the angle of the clearance or downward flare of its opening may be comparatively great inasmuch as the die will produce all the pieces that are necessary without requiring resharpening.

In order to enable the die maker to expeditiously and reliably obtain the proper angle or clearance in the opening of the die in accordance with the work which is required a tool is provided which embodies my invention and which is constructed as follows: 5 represents a stock or body which is preferably constructed in the form of a flat bar of metal, such as steel, and which is provided with a plurality of transverse seats 6, 7, 8, 9, 10, 11 which are arranged at different angles relatively to each other and to the length of the stock. Although the number of these seats may vary, six of them are represented in the drawings, and the same are arranged in two series or groups on opposite flat sides of the stock, three in each series or group. Each of these seats is preferably of rectangular form in cross section so as to present square corners at its oppo-

site longitudinal parallel sides. Although the angles at which these seats are arranged relatively to each other and to the length of the stock may be varied I prefer to construct the central one 7 on one side of the stock at an angle of 90 degrees or at right angles to the length of the stock while the remaining seats are arranged at one-half degree, one degree, one and one-half degrees, two degrees and three degrees relatively to a line perpendicular to the length of the stop.

12 represents a blade which is also preferably constructed of metal and of rectangular form in cross section. This blade is engaged with one or the other of the seats of the stock so as to form a square therewith. When the blade engages one of the seats of the stock it is held against displacement lengthwise of the stock by reason of the square corners of the blade engaging with the square corners of the seat on the stock.

In using the tool the stock is placed with its lower edge upon the face of the die while one end of the blade projects downwardly through the opening thereof in which position of the parts the bore or wall of the opening may be gaged for determining the angle at which the same should be finished in accordance with the character of the work to be produced on the die. By shifting the blade from one seat to another in accordance with the angle of clearance or flare desired in the opening of the die the same tool may be used for the various clearances which are likely to be employed in a variety of dies.

Various means may be employed for detachably connecting the stock and blade in the various positions in which the same may be assembled but those shown in the drawings are suitable and are constructed as follows: 13 represents transverse clamping openings preferably of cylindrical form, associated with the grooved seats, one of such openings being employed for every two seats which are formed on opposite sides of the stock and each opening terminating at its opposite ends in the corresponding seats on opposite sides of the stock. 14 represents a clamping head, preferably of cylindrical form, adapted to be arranged in one of the clamping openings and provided on one side with a jaw or groove 15 which is adapted to receive one edge of the blade. At one end of the clamping head the same is provided with a screw shank 16 upon which is

mounted a thumb screw nut 17. 18 represents a washer arranged on the screw shank and engaging with the flat side of the stock opposite to the side which is engaged by the blade. 19 is a spring interposed between the washer and the thumb screw nut.

When assembling the stock and blade the clamping head is inserted in one of the clamping openings with its groove or jaw registering with the respective seat of the stock which has been selected after which the blade is inserted in said seat of the stock and the jaw of the clamping head and then the thumb screw is tightened, thereby securely drawing the blade and stock together and holding the same reliably in position relatively to each other at a definite angle. While thus assembled the tool may be freely used for gaging the clearance or flare of the die opening without liability of the stock and blade becoming shifted out of place or disarranged. The blade can be as readily shifted from one seat to another on the stock and used with greater facility and accuracy than is possible when a plurality of gages are employed or when the gage is of such a construction that the blade is liable to be displaced relatively to the stock while in use.

The side of the blade is preferably graduated for linear measurement as shown in Fig. 1 so that by placing the same in the central right angle seat 7 of the stock this tool may be also used as a depth gage in making dies as well as a clearance gage by shifting the blade to those seats which are arranged at various angles relatively to the length of the stock and the right angle seat.

I claim as my invention:

A die maker's clearance gage comprising a stock having an opening extending there-through and two groove seats arranged transversely on its opposite sides and intersecting said opening, one of said seats being arranged at one angle relatively to the length of the stock and the other seat being arranged at another angle relatively to the length of the stock; a blade adapted to engage either of said seats, and a clamping device for holding said blade in place on the stock arranged in said opening.

Witness my hand this 31st day of July, 1912.

GUSTAF ROSEN.

Witnesses:

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