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2,445,574

DIE SET

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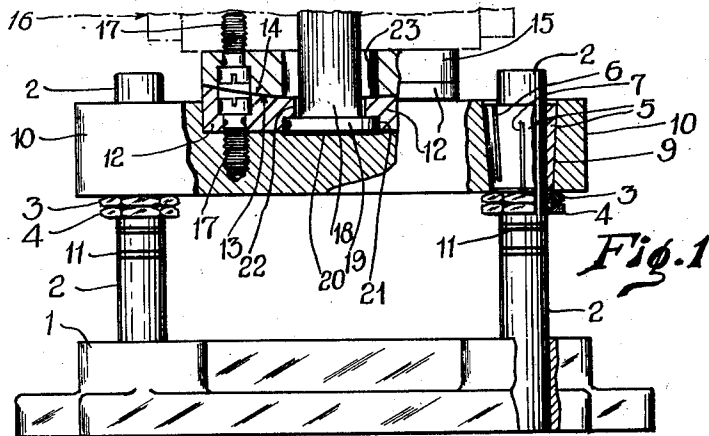


Fig. 1

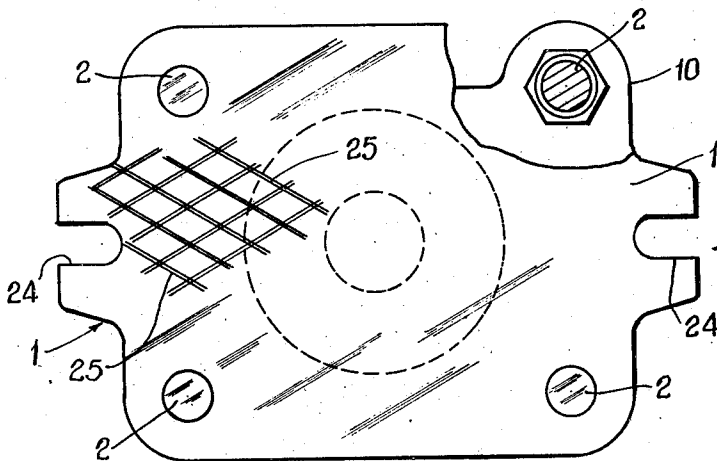


Fig. 2

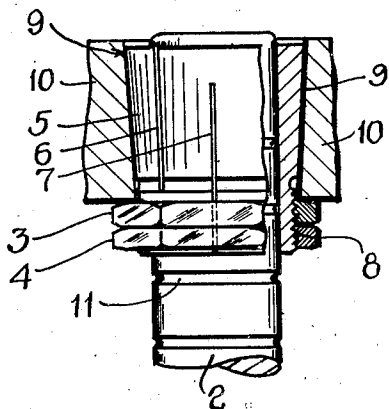


Fig. 3

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DIE SET

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5 Claims. (Cl. 164—118)

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My invention relates to improvements in die sets and more particularly, has reference to means in combination therewith for maintaining parallel relationship between the die shoe and punch holder thereof, providing adjustable post guide bearings for fitting and taking up wear, and means at the base of the die-shoe or holder for removing dirt, grit and foreign matter from beneath the same.

Referring to the accompanying drawings, Fig. 1 illustrates in front elevation, partly in section, a suitable arrangement of die set embodying an application of my invention. Fig. 2 is a plan view, partly broken away, looking upwardly at Fig. 1, and Fig. 3 is an enlarged detail partly in broken section showing an arrangement of tapered adjustable post guide bushing.

1 indicates the die shoe or holder, in which is secured the pillars or posts 2 in the usual manner, and 3, 4 indicate the nuts and jam-nuts respectively, threadably engaging the bushings 5, slotted from top and bottom as shown at 6, 7, said bushings being also threaded as indicated at 8. These bushings 5 are seated in tapered holes 9 in punch holder 10, and guide the movement of the latter on posts 2, annular grooves 11 picking up any grease or foreign matter thereon.

The punch holder 10 is also recessed in the top to receive the lower pressure ring 12 which also is recessed in the top, providing a concave spherical surface 13, engaging a similar convex surface 14, forming the under surface of the upper pressure ring 15, and the upper and lower rings 15 and 12 respectively are secured in the press ram 16 and punch holder 10 respectively by screws 17, 18 indicates the punch holder shank with flanged base or throat 19, secured in the ram 16 as shown, leaving clearances between the punch holder 10, and rings 12 and 15 as indicated at 20, 21, 22, and 23 respectively.

In operation, the holder or shoe 1 is secured upon the press (not shown), in the usual manner through openings 24, and the punch holder 10 with bushings 9 is pushed down on posts 2, over which nuts 3 and 4 have already been dropped. Nuts 3 then engage and are tightened on the lower threaded ends 8 of the bushings, after which the jam or lock nuts 4 are tightened against nuts 3. Ring 12 is secured by screws 17 to the punch holder 10, and ring 15 is similarly secured by similar screws to the press ram 16. The dies are secured to the die holders 1 and 10 in the usual manner. The cross-grooving 25 on the base of the lower die holder or shoe 1 collect any grease

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or foreign matter beneath the same when pushed into place on the bed of the press.

In traveling downward, the punch holder and the upper part of the die secured thereto, together with the ring 12, float into parallel relation to the shoe 1 and the lower part of the die secured thereon, thus insuring a uniform pressure throughout the area and between the meeting surfaces of the die, and between the parts attached thereto. This minimizes any likelihood of a broken die due to unevenness of pressure resulting from any angular relationship between pressed surfaces whether from incorrect mounting, or from foreign matter under the shoe or upon the guide posts 2.

Of course it will be understood that various modifications may be made in the construction and arrangement of parts without departing from the spirit of the invention as claimed.

I claim:

1. In a two part die set, means to reciprocate one part with relation to the other, a ring bearing surrounding an extension on said means, said ring being attached to said means, a second ring bearing loosely surrounding said extension and attached to one part, said second ring attaching said means to said first part, spherical cooperating bearing surfaces on said rings bearings, said spherical surfaces allowing movement such that the first part may automatically maintain parallelism between the two die parts.

2. A die set of the character disclosed having fixed and movable parts, means for driving said movable part, concave and convex concentric bearing rings between said movable part and driving means, one of said rings loosely engaging said movable part and said driving means, to allow automatic paralleling of said parts when in use.

3. A die set of the character disclosed having fixed and movable parts, means for driving said movable part, concave and convex concentric bearing rings between said movable part and driving means, one of said rings loosely engaging said movable part and said driving means, to allow automatic paralleling of said parts when in use, said driving means extending through one of said rings.

4. A die set of the character disclosed having fixed and movable parts, means for driving said movable part, concave and convex concentric bearing rings between said movable part and driving means, one of said rings loosely engaging said movable part and said driving means, to allow automatic paralleling of said parts when in

use, one of said bearings secured to part of said driving means and the other to said movable part.

5. A die set of the character disclosed having fixed and movable parts, means for driving said movable part, concave and convex concentric bearing rings between said movable part and driving means, one of said rings loosely engaging said movable part and said driving means, to allow automatic paralleling of said parts when in use, one of said bearings rigidly secured to part of said driving means and loosely to said movable means.

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