

Sept. 3, 1935.

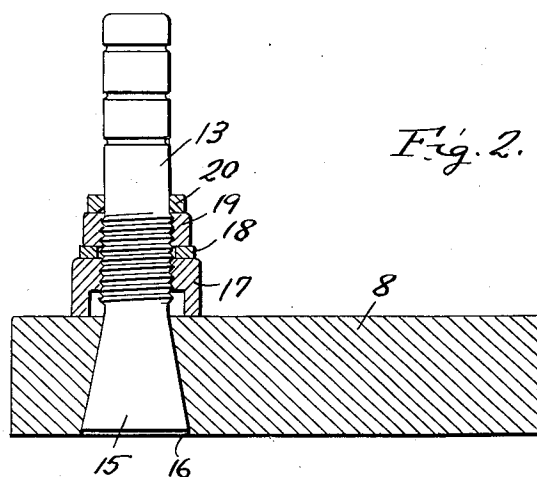
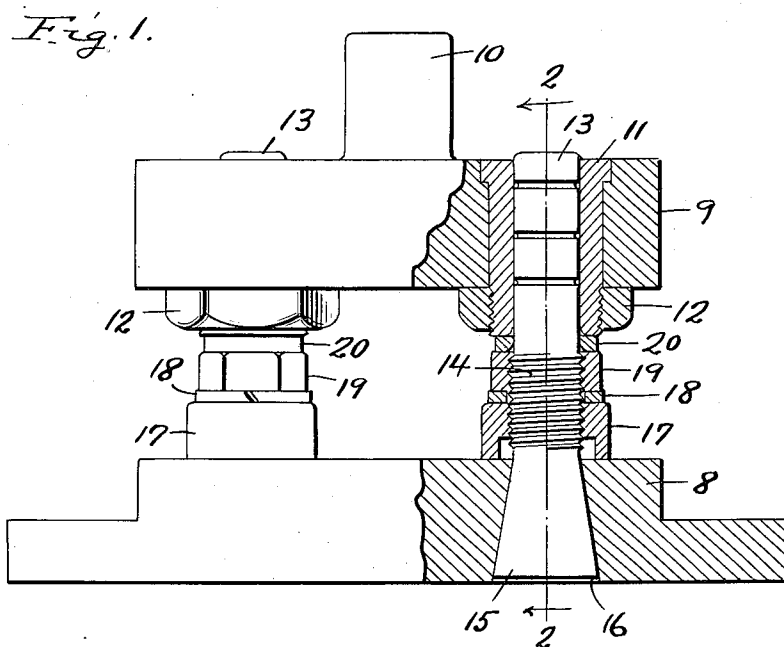
J. D. CARRIER

2,013,488

INTERCHANGEABLE LEADER PIN FOR DIE SETS

Filed Oct. 25, 1933

3 Sheets-Sheet 1



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Fig. 3.

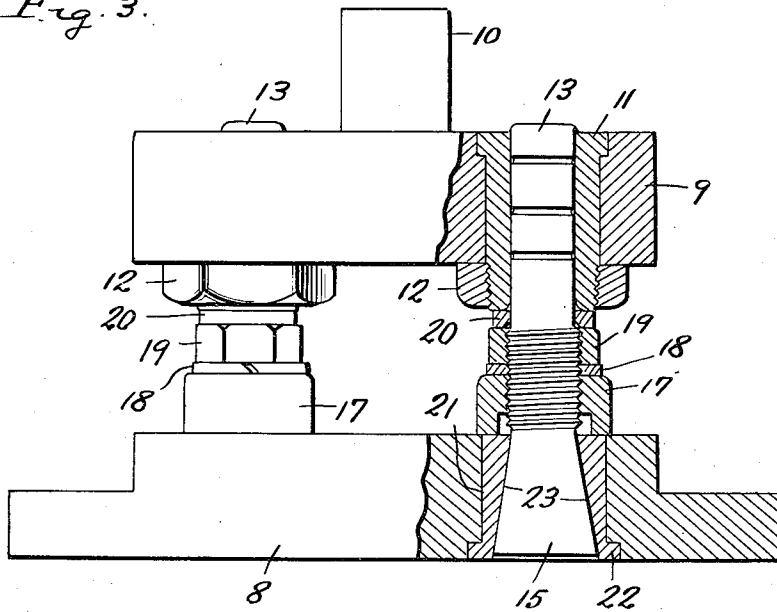


Fig. 4.

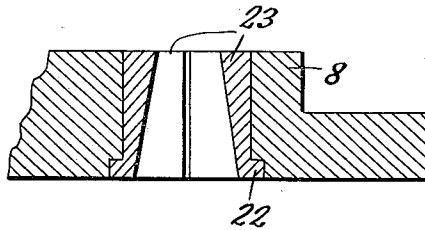
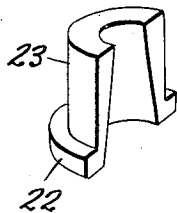


Fig. 5.



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UNITED STATES PATENT OFFICE

2,013,488

INTERCHANGEABLE LEADER PIN FOR
DIE SETS

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Application October 25, 1933, Serial No. 695,210

2 Claims. (Cl. 287—20)

This invention relates to an improved removable and interchangeable guide or leader pin for die sets.

By way of introduction it is to be pointed out that the conventional die set with which the invention is adapted for use comprises the customary complementary parts, that is a relatively stationary base, and a coordinated relatively movable adapter head which is movable toward and from the base and provided with lined receiving holes for the upper end portions of the so called guide and leader pins on the base. As is customary these standardized die sets are generally used in conjunction with punching and forming presses and experience has shown that considerable trouble is encountered with the present day type and styles of guide pins.

I have therefore discovered the need for a structurally improved and refined arrangement wherein the novelty is predicated upon a unique pin and means for detachably securing or anchoring it in or to the base.

The inventive ideas are carried into practice in several different ways and a complete detailed explanation follows to comprehensively explain the fundamental principle of construction and the slight deviations whereby it may be satisfactorily practiced.

In the accompanying drawings wherein like numerals are employed to designate like parts throughout the views:

Figure 1 is a view in section end elevation illustrating a conventional die set whose base is slightly modified to accommodate the improved pins and securing means therefor.

Figure 2 is a vertical sectional end elevational view taken approximately on the plane of the line 2—2 of Figure 1.

Figure 3 is a view like Figure 1 showing a slightly different adaptation or modification of the invention.

Figure 4 is a fragmentary detail sectional view through the sectional tapered anchoring bushing.

Figure 5 is a perspective view of one of the parts or sections of said bushing.

Figure 6 is a view like Figures 1 and 3 showing a still further embodiment of the idea disclosing a unique manner of attaching the pin to the socketed base.

Figure 7 is a perspective view of one of the bushing sections shown in Figure 6.

Attention is first invited to Figures 1 and 2 wherein it will be observed that the base is denoted by the numeral 8, this being of standard form such as used in conventional die sets. The

punch carrier 9 is also standard and includes a connecting stud 10 which is connected to the reciprocatation means (not shown). This punch carrier 9 is formed with the usual holes for the guiding pins and a sleeve or bushing 11 is placed in each hole, each bushing or sleeve being provided with an enlarged upper end for fitting in a countersink of the hole, with its lower end passing below the carrier and exteriorly threaded for receiving the nut 12. Thus the bushing or sleeve is held in place by the enlarged upper end thereof and the nut 12. This avoids the necessity of driving the sleeve into the hole, as is now done, and also eliminates the necessity of having to smooth the bore of the sleeve, after it has been driven into place, as often occurs when a sleeve is driven into the hole, due to upsetting of part of the metal into the bore of the sleeve. Incidentally, and by way of explanation it will be pointed out that the pin construction is the same as shown at the right and left hand end of the arrangement depicted in Figure 1, the description of one arrangement will suffice for both. The guide or leader pin is denoted by the numeral 13 and is of customary grooved lubricating form and has its intermediate portion enlarged in diameter and screw threaded as indicated at 14. The lower end however is of conical or tapered form as indicated at 15 to fit in a correspondingly tapered bore 16 formed in the base 8. The take-up and retaining action is produced through the use of a nut or collar 17 threaded on the threaded portion 14 of the pin, bearing against the top of the base by a flanged part, a washer 18 encircling the threaded part and resting on the sleeve or nut 17 and the nut 19 threaded on the pin and bearing against the washer 18. The numeral 20 represents a shim of which there may be one or more. These shims or washers serve as stops for limiting downward movement of the punch carrier 9.

In connection with Figures 1 and 2 it is to be pointed out that the bore 16 in the conventional base 8 is truly cylindrical and of the same diameter from end to end. In the improved arrangement just described it is necessary to ream out the bore to provide the tapered formation to accommodate the conical anchoring head 15.

In Figures 3 and 4 only a slight change in the standard arrangement is necessary. It is also to be pointed out here that the same numerals used to designate corresponding parts in Figures 1 and 2 are also used here to designate the same or like parts. In this arrangement the cylindrical bore 21 is simply counterbored at the bottom to

provide an annular seat to accommodate the retaining flanges 22 on the sections 23 of the anchoring bushing which is fitted into the bore. In other words the sections 23 are made to fit the counterbored base. It is obvious however that sections 23 are tapered to accommodate the conical or tapered head 15 of the leader or guide pin 13. Otherwise the construction here is virtually the same as illustrated in Figures 1 and 2.

The only difference shown in Figure 6 is found in the means and method of attaching the tapered head 15 of the pin to the base block 8. In this arrangement the base block is bored to form a cylindrical socket 24 and this socket is adapted to accommodate a sectional anchoring expander bushing. The sections are denoted by the numerals 25 and of semi-circular design and cylindrical on their exterior sides to fit into the cylindrical bore 24. Said sections 25 have their faces 26 fashioned to provide a tapered passage to accommodate the head 15 and when the head is drawn up by tightening the nut the sections 25 are expanded into firm gripping contact with the wall of the socket 24. This therefore anchors the bushing in the socket and securely fastens the conical or tapered head 15 of the pin to the base.

Generically stated I have produced a leader or guide pin whose upper portion is of conventional form, whose intermediate portion is screw threaded and whose lower end portion is formed with a conical head 15. The head 15 is anchored and attachable to the base 8 in the three various ways disclosed in the drawings.

It is to be observed that this improved pin construction provides for self alignment and interchangeability. The pin can be removed to work on the die without interference and replaced to the original position. As shown in Figure 6 it can be anchored in a blind hole or socket thus saving the cost of boring entirely through the base or weakening the die shoe. The pin can be reground and replaced in case of wear or accident. It can be shifted with shims to equalize breaking clearance between the punch and die. These shims are placed between the walls of the conical seat in the base and the conical head of the pin so as to shift the pin in the desired direction to center the punch relative to the die.

The invention is simple and economical, durable and otherwise aptly fitted to fulfill the purposes for which it is intended. It is an unusual and effective adaptation to standard or conven-

tional die sets. Owing to its specific construction and arrangement it fulfills a long felt need in this particular line of endeavor.

A careful consideration of the foregoing description in conjunction with the illustrative drawings will enable the reader to obtain a clear understanding of the purpose, features and advantages, the explicit construction, and the invention as hereinafter claimed.

It is to be understood that minor changes in shape, size, relative proportions, and materials may be resorted to in practice without departing from the spirit of the invention or the scope of the invention as now claimed.

Having thus described my invention, what I claim as new is:

1. In a die set, a base having a conical seat therein, a guide pin having a conical lower end engaging the seat, a portion of the pin being threaded above the conical end, said threaded portion being of greater diameter than the small end of the conical part and of greater diameter than the rest of the pin above the threaded part, a collar threaded on the threaded part of the pin and having a depending flange resting against the base, said flange extending below the threaded part of the pin, a nut threaded on the pin, a washer located between the nut and the collar, the upper face of the nut being flat and a shim resting on said face of the nut above the threaded part of the pin and acting as a stop for the downward limit of movement of the carrier of the die set.

2. In a die set, a base having a cylindrical opening therein, a sectional bushing fitting in said opening, the inner faces of said sections being tapered to provide a conical seat, a pin having a conical lower end engaging the seat with an intermediate part of the pin threaded, said threaded part being of a greater diameter than the small end of the conical part of the pin and of the rest of the pin above the threaded portion, a collar threaded to the pin and having a depending flange, the lower end of which rests on said base, the internal diameter of the flange being smaller than the diameter of the opening extending below the threaded part and, whereby a portion of the lower end of the flange will engage the bushing, and a nut threaded on the pin above the collar.

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