April 10, 1945. R. C. KUHN 2,373,478

EXPANDER TOOL

Filed Nov. 22, 1943

Fig. 1.

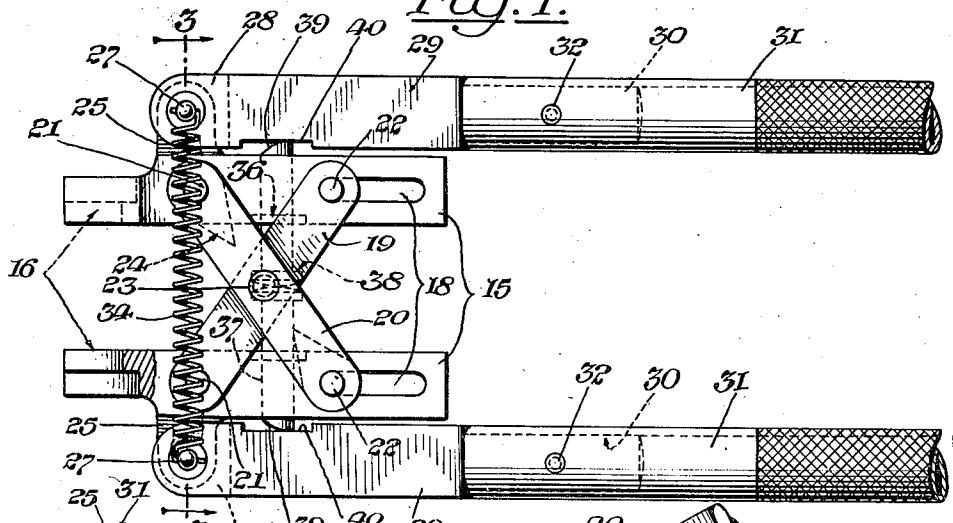

Fig. 3.

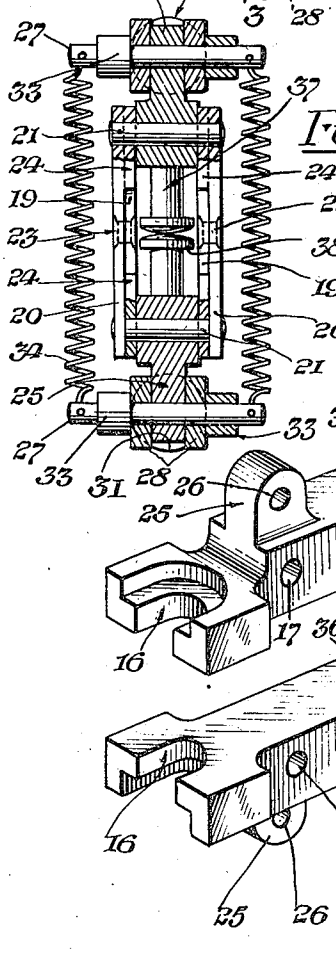

Fig. 2.

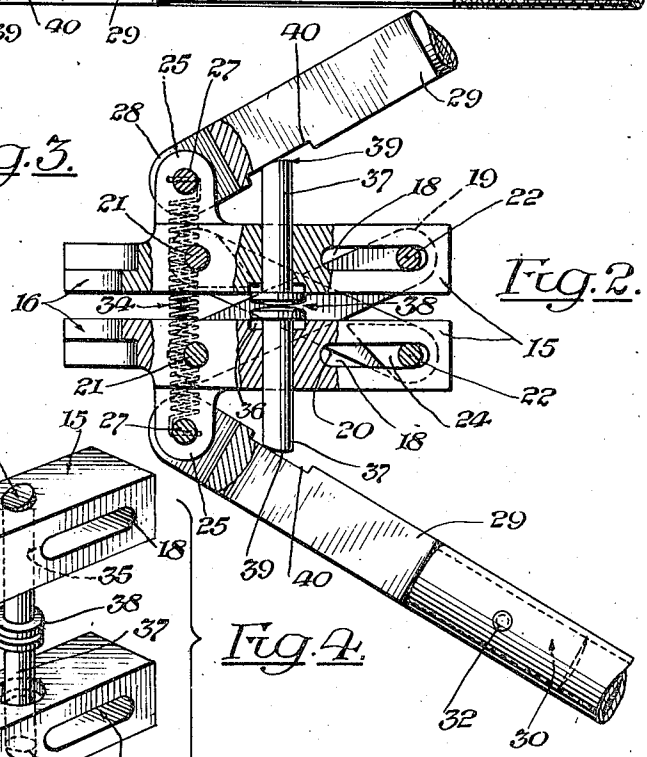

Fig. 4.

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EXPANDER TOOL

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6 Claims. (Cl. 81—48)

This invention relates to hand tools of the pincher type, but more particularly to "pryers" or spreaders, specifically for use in expanding or separating two members.

An object of the invention is to provide a hand operable spreader for general use, the antithesis of pinchers, and particularly adapted to separate the two members of an extruding die.

A further feature is in the provision of a simple, easily operable implement of unusual range of action, strength, power and compactness.

Another purpose is to produce a hand spreader tool particularly effective by reason of its novel design.

These objects are attained by the new and practical construction, combination and arrangement of parts hereinafter described, and illustrated in the accompanying drawing, constituting a graphical component of this disclosure, and in which—

Figure 1 is an abbreviated side elevational view of an embodiment of the invention as fully expanded.

Figure 2 is a similar but fragmentary view of the same, partly in section to show the construction, and in a nearly closed position.

Figure 3 is a transverse sectional view taken on line 3—3 of Figure 1.

Figure 4 is a perspective detail view showing the jaws and fulcrum pins therebetween.

The implement, as shown, consists of two oppositely disposed bars 15, of generally rectangular cross section, having their front ends integral with jaws 16, shaped and suited to the work parts with which they will become operatively engaged in performing their function.

Rearwardly of the jaws the bars have transversely drilled openings 17, and distanced therebeyond, in the same plane, are elongated transverse slots 18.

Pairs of links 19 and 20, respectively inner and outer, are arranged on each side of the bars and are connected to them by pins 21 and 22, the latter being freely movable in the slots 18; each pair of links are pivotally connected at the center of their lengths by rivets 23, and are further provided with spacers 24 carried by the outer links 20; this arrangement forms, in effect, the well known lazy tong device.

Lugs 25, raised on the outer surfaces of the bars 15, near the jaws, are provided with openings 26 to receive hinge pins 27, by which are connected the forked ends 28 of levers 29, having cylindrical terminals 30, set in tubular handles 31 and secured by rivets 32; the outer portions of the handles are extended to such length as may be desired and knurled, as indicated, to provide an efficient grip.

Fixed on the pins 27, to contact the forks 28, are collars 33, outwardly beyond which the pins are drilled to receive the ends of helical tension springs 34, tending to draw the jaw carrying bars 15 towards each other.

These bars are drilled through from top to bottom, as at 35, and have counterbores 36 in their adjacent surfaces; fitted to the drilled holes are hardened pins 37 having enlarged rounded heads 38 in direct contact between the bars, while their outer ends 39, extending through the bars, are chamferred and rounded in the manner of cams to engage in recesses 40 formed in the under sides of the levers 29 to act as a fulcrum for them.

When the jaws 16 are in a substantially closed position, the fulcrum pin heads 38 may enter the counterbores 36, under the tensional stress of the pair of springs 34, in which event the lever handles 31 will extend outwardly, at an angle, as indicated in Figure 2.

Upon pressing the handles forcibly towards each other, the fulcrum pins 37 act to separate the jaws and cause partial closing of the lazy tong or toggle elements, which operate to maintain the jaws at all times in register, as indicated in Figure 1.

The simplicity and operativeness of the implement, as well as its construction and use, are considered as readily understandable from the foregoing disclosure, but it is apparent that modifications may be made within the scope and spirit of the appended claims.

Having thus described the invention, what is claimed as new and sought to secure by Letters Patent is:

1. An expander, comprising a pair of opposed jaws movable toward and from each other, each of said jaws having a handle pivoted thereto at the side remote from the opposed jaw, fulcrum pins slidably disposed in alined openings in said jaws at a predetermined distance rearwardly of the pivots of said handles whereby the inner ends of said pins abut against each other while their outer ends are engaged by the respective handles, the organization being such that as the handles are moved toward each other they fulcrum on the outer ends of said pins and force the jaws apart, and resilient means operatively associated with said jaws for moving them toward each other when pressure on the handles is released.

2. An expander, comprising a pair of opposed

jaws movable toward and from each other, means to maintain said jaws in permanent parallel relation, each of said jaws having a handle pivoted thereto at the side remote from the opposed jaw, fulcrum pins slidably disposed in alined openings in said jaws at a predetermined distance rearwardly of the pivots of said handles whereby the inner ends of said pins abut against each other while their outer ends are engaged by the respective handles, the organization being such that as the handles are moved toward each other they fulcrum on the outer ends of said pins and force the jaws apart, and a pair of springs connected at their opposite ends to said jaws for moving them toward each other when pressure on the handles is released.

3. An expander comprising a pair of bars having jaws at their forward ends, lazy tongs pivotally connecting said bars for parallel movement toward and from each other, hand levers pivoted to said bars at the sides thereof remote from each other, a fulcrum element, slidably disposed in each of said bars, said fulcrum elements being in alinement with each other and extending beyond the bars at the pivoted sides thereof for contact with said levers whereby as the levers are moved toward each other they fulcrum on said elements and force the bars apart, and tension springs connected to said bars and acting in opposition to said levers thereby normally to draw said bars toward each other.

4. An expander comprising two opposed straight bars, work-engageable jaws integral with the outer ends of said bars, toggle links connecting the bars in parallel relation, fulcrum pins slidable in said bars in alinement with each other, hand levers pivotally connected to said bars at the sides thereof remote from each other and operable to press against the outer ends of said pins thereby to spread the bars apart, and resilient means connecting said bars and operative normally to draw the bars toward each other.

5. An expander comprising a pair of work-engageable jaw-carrying bars having lugs on the sides thereof remote from each other, means to maintain said jaws in alined parallelism, a hand lever pivoted to each of said lugs, a fulcrum pin slidably mounted in each bar adjacently rearward of the lugs, said pins having contacting heads, and curved ends extending beyond the pivoted sides of said bars into position to engage said levers, and resilient means connected to the bars and operative to normally draw said bars towards each other.

6. An expander comprising a pair of opposed bars having raised lugs on the sides thereof remote from each other, work-engageable jaws integral with the outer ends of said bars, pairs of toggle links connecting the bars to maintain them parallel, hinge pins in said lugs, hand levers pivoted on said pins, said levers having recesses in their proximate surfaces, tension springs attached at their opposite ends to the pins in the respective lugs, a fulcrum pin slidable through each bar at a point rearwardly of the pivot of the hand lever, said pins being in alinement with each other and having heads adapted for mutual contact and outer curved ends extending beyond the bars to engage in the recesses of said levers.

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