March 22, 1932. H. W. KULP ET AL 1,850,268

POSITIONING TOOL

Filed May 29, 1930

Fig. 1

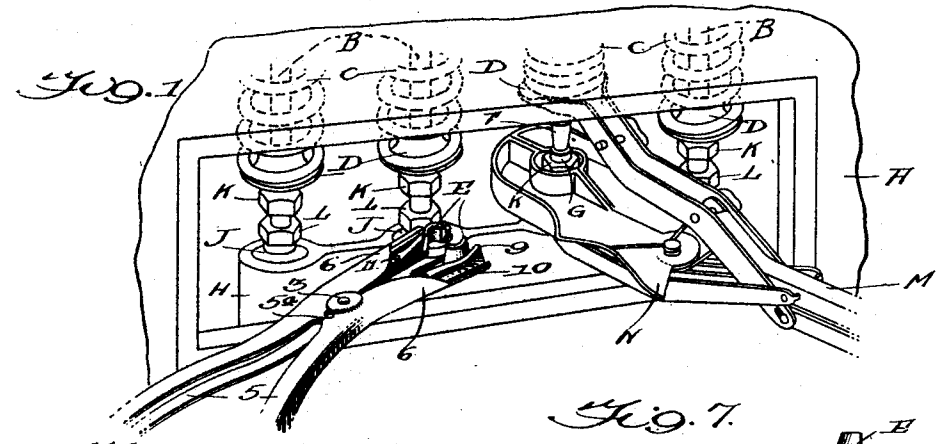

Fig. 7.

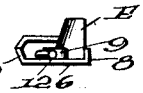

Fig. 6.

Fig. 2.

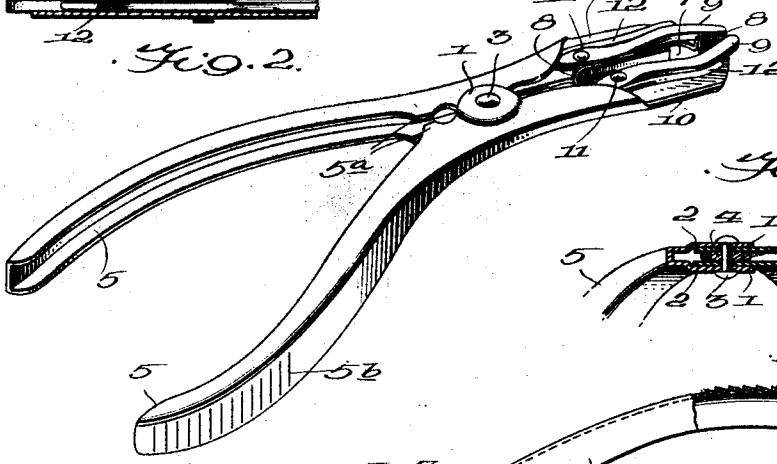

Fig. 5.

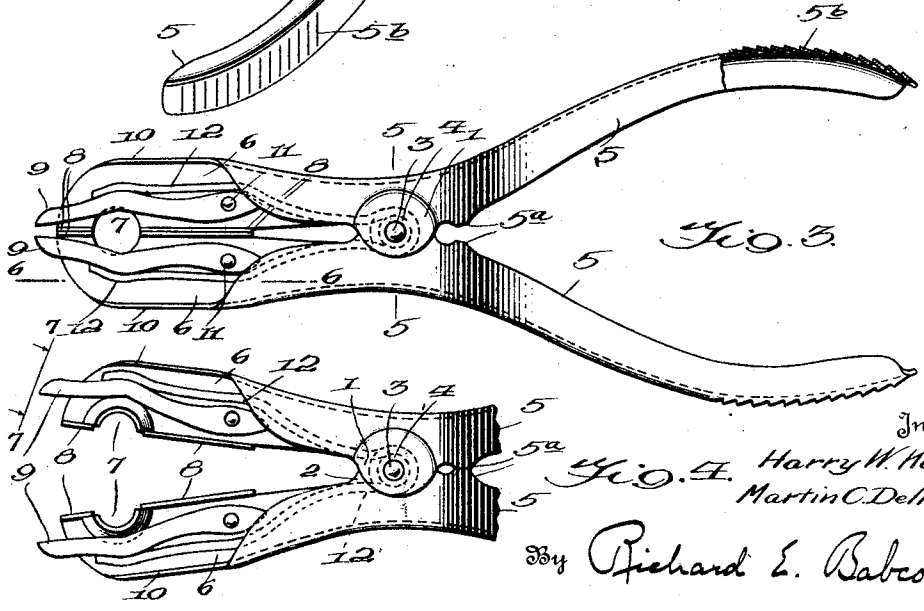

Fig. 3.

Fig. 4.

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Patented Mar. 22, 1932 1,850,268

UNITED STATES PATENT OFFICE

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POSITIONING TOOL

Application filed May 29, 1930. Serial No. 457,029.

This application is for improvements on our invention set forth in our application Ser. No. 409,324, filed November 23, 1930, for positioning tools.

This present invention relates to one-hand plier type tools primarily intended for use in inserting and properly positioning the removable locking means cooperating with the lower end portions respectively of the respective valve-stems to limit the downward movement of the respective spring retainers or cups or washers in connection with the operations necessary to the grinding or replacement of poppet-valves in internal combustion engines, particularly internal combustion engines as mounted in automobiles and as confined and obstructed by the related parts, such as the generator, distributor, carburetor, steering rod, chassis frame and other parts of the automobile.

Of recent years it has been the practice to arrange the valve-stems, and push rods, with their cooperating parts in the interior of the engine block, permitting access thereto through an opening or port normally covered by removable cover plates to keep out dust and dirt. At first this opening was usually quite wide in a vertical direction, allowing relatively easy access, and the top of the crank-case and the adjacent portion of the cylinder block were such as to completely close the top of the crank-case at all points except for the passage of the rods, and the locking means, for limiting the downward movement of the spring retainers or cups on the valve-stems under the thrust of their respective cooperating valve-springs, were cross-pins or other elements requiring to be gripped and positively displaced by the mechanic. However, as time has passed the width of the access opening or port has decreased, while the number of accessories has increased, rendering access to the valve-stems, springs, retainers and locks progressively more difficult.

Quite recently there has been a change whereby the push rods have been mounted in removable spiders, as illustrated in the patent to Horning, No. 1,604,412, granted October 26, 1926, the top of the crank-case on either side of the spider being left open, and it has been usual to continue the upper edge of the opening down in a flange to still further narrow the access opening or port which is normally closed by a cover plate, so that when the springs with their retainer cups are raised they are practically entirely behind the outer wall and the locking means are adjacent the top edge of the opening and to the rear thereof, so that in the usual multiple-cylinder engines access to either remove or replace said locking means is extremely difficult.

In a number of different engines of this type it is now usual to employ split conical locking means normally pressed radially inward toward each other by a cooperating conical face of the retainer to force and keep said locking means in a groove or radially inward of an enlarged lower end of the valve-stem, so that the replacement of these locking devices, "horseshoes" or semicircular cone members is a rather difficult, trying and puzzling task and often a number of attempts are necessary, and often in unsuccessful attempts said locking means or "horseshoes" fall on an inaccessible part of the push-rod spider or securing bolts for the latter, and sometimes fall between the face of said spider and the opposed face of the engine block or crank-case down into the latter.

Where a valve-stem having a cylindrical reduced portion corresponding to portion F with opposed upper and lower annular shoulders extending perpendicularly to the axis of the valve-stem, a well known and at present extensively used construction, is used, the difficulty is even more pronounced, as it is essential to have the two cooperating elements of the locking means so positioned that they will be forced radially into position by the retainer D, and, particularly with this form of valve-stem, if the keepers be slightly inclined to the horizontal, or to a plane perpendicular to the axis of the valve-stem, their upper or lower portions will strike against one or the other of said shoulders and so will not catch, but will be forced out by the retainer and fall as the retainer D engages them, requiring repetition of the effort.

The present invention has been developed with the above considerations in view, and has primarily for its objects to provide a tool for properly positioning said locking means or "horseshoes"; to provide in a tool suitable to this purpose a pair of cooperating jaws for carrying and positioning respectively the cooperating members of a pair of "horseshoes" or locking elements, said jaws being so related to each other as to have swinging movement toward and from each other so that they may be spread to receive between them the valve-stem and may be closed or moved toward each other to apply the respective locking "horseshoes" or elements to opposite sides of the valve-stem in said groove or reduced portion; to provide special simple means, preferably spring pressed or yielding, for holding the respective locking "horseshoes" or elements in the respective jaws of the tool preparatory to and during application to the valve-stem; said means preferably being movably mounted respectively on said jaws respectively; to provide a spring or other yielding means for forcing said holding means against said locking "horseshoes" or elements as disposed in the respective jaws; to provide a spring or equivalent for forcing said jaws toward each other to, and in, closed position; to provide a very light tool having spreading jaws in combination with means for forcing said jaws toward each other whereby when the locking elements or "horseshoes," as mounted in said jaws, have been positioned about and against the valve-stem, the tool may be released and its resilient means will hold it in the arranged position in opposition to its weight as increased by the leverage of its outer portion, so that if a mechanic is interrupted in his task he may leave the tools as applied without having to do his work all over; to provide a one-hand plier type tool for this purpose, so that the mechanic may employ one hand in operating the valve-spring lifter, while using his other hand to manipulate the tool of the present invention; as, for instance, where he is using a valve-spring lifter not provided with a lock or catch; to provide a tool curved or offset lengthwise so that it may be inserted in the upper portion of the access port or opening of the engine and then rocked, wiggled and/or twisted up and down, as may be necessary, without interference by striking against the upper edge of said opening; to provide a tool of few parts, simple in operation, cheap of manufacture and suitable to production on a large production basis by simple sheet metal stamping and assembling operations.

In this application we show and describe only the preferred embodiment of our invention simply by way of illustration of the practice thereof, as by law required. However, we are well aware that our invention is capable of other and different embodiments, and that the various details thereof may be modified in a number of ways, all without departing from our said invention. Therefore, the drawings and description herein are to be considered as merely illustrative and not as exclusive.

In the accompanying drawings:

Figure 1 represents a perspective view of a tool embodying our invention, with the locking means held therein, as used in applying said locking means to a valve-stem of an engine, the spring and retainer on said stem being shown raised by a valve-spring lifter and with a locking means catching shield positioned between the jaws of the lifter;

Figure 2, a perspective view of the tool by itself;

Figure 3, a top plan view of the tool with the jaws closed;

Figure 4, a fragmentary top plan view, showing the jaws spread or open and with the respective locking means yieldingly held therein;

Figure 5, a sectional view on the line 5—5 of Fig. 3, looking in the direction of the arrows.

Figure 6, a sectional view on the line 6—6 of Fig. 3, looking in the direction of the arrows; and

Figure 7, an end elevation of one of the jaws, looking from line 7—7 of Fig. 4 in the direction of the arrows.

In the drawings, Figs. 3, 4, 5, 6 and 7 are made to full size scale from an actual full size commercial tool; Fig. 2 is made approximately five-sixths actual size, and in Fig. 1 there has been no attempt to stick exactly to actual scale or relative size of tools, engine and parts thereof, but merely to illustrate the use of the tool in a general way.

Referring now in detail to the drawings, A designates the engine generally; B, the valve-stems of the usual poppet-valves (not shown) thereof; C, the usual valve-springs; D, the valve-spring retainers, cups or washers; E, the split cone or semicircular composite cone-shape locking means normally received in the reduced portion F of the valve-stems B with their cone faces presented upwardly and resting on the lower annular shoulder G of the valve-stem and normally so held by the cooperating inner lower conical face of the retainers, or cups or washers D; H, the push-rod spider; J, the push-rods; K, the adjustable push-rod heads; and L, the lock-nuts for the latter.

The parts specifically immediately above referred to are old and well known and are merely briefly described as above to aid in giving a clearer understanding of the present invention.

M designates generally a valve-spring

lifter with which the present invention is preferably used, and said valve-spring lifter may be constructed as illustrated in accordance with our pending application Serial No. 331,773, filed January 11, 1929, and N designates generally a shield preferably employed during the operation and which may be constructed as illustrated in accordance with our Patent 1,776,159 granted September 16, 1930.

The tool of the present invention is preferably a one-hand plier type of device, and more specifically is of that form of plier type tool wherein the operative arms or jaws move apart or spread as the handles or operating levers are moved toward each other as the mechanic closes his hand and wherein preferably some yielding or resilient means is provided for forcing or urging the operative arm or jaws toward each other to or toward closed position when the leverage or pressure on the handles or operative levers is relaxed. However, viewing our invention in one of its broader aspects, it is not essential that it shall be embodied in a one-hand non-crossing lever form plier type tool, nor that it shall be a plier type tool, nor a one-hand type tool, nor that resilient or other self-acting means tending to force the operative jaws or arms toward each other shall be provided.

In the embodiment illustrated two preferably light thin sheet metal members of general U-shape in cross-section having their inner channel faces presented toward each other are provided with oppositely presented lugs 1 and 2, the lugs 2 of the one member fitting between the lugs 1 of the other member, and a pivot 3 passing through said lapped lugs 1 and 2 and preferably having its ends upset in usual known manner serves to pivotally connect the two members, a perforated supporting spacing disk or washer 4 preferably being interposed between the lugs 2.

Each of the body members so pivotally connected preferably consists of a handle or lever portion 5 extending rearward from the pivot 3 and an operative arm or jaw 6 extending forward from said pivot 3.

Each jaw has its inner edge portion cut out preferably in the form of a semicircle or approximately of that shape, as at 7, adjacent its forward end, the cut-outs or notches 7 of the respective jaws registering, when the jaws are closed, to together define a substantially circular or preferably substantially circular opening to preferably freely accommodate a valve-stem between them when closed, said opening so defined preferably being of a diameter appreciably in excess of the diameter of the lower end portion or lower annular shoulder G of the valve-stem B, so that as the retainer D bears down on the locking elements E, and eventually on the tool as it strips the locking elements E therefrom, said tool will not be caught between the shoulder G and the lower ends of the locking elements or "horseshoes" E, but will be left free to be removed.

The opposed inner edges of the jaws 6 will preferably be formed with preferably continuous flanges 8 from said notches 7 at diametrically opposite points of the opening defined by the jaws 6 when closed, said flanges 8 extending lengthwise of the jaws 6. The opposed inner faces of said flanges will preferably extend parallel to each other and preferably perpendicularly to the lower faces of the respective jaws 6. The upper faces of the jaws 6, at least adjacent the notches 7, will preferably extend in a common plane so as to provide flat supporting surfaces for the corresponding flat straight lower faces of the respective locking elements E. The outer faces of said flanges 8, at least adjacent said notches 7, will preferably extend at an angle of at least ninety degrees with relation to the adjacent portions of the upper faces of their respective jaws 6.

The function of these flanges 8 is simply to act as limiting stops for the locking elements E when inserted in the tool and as acted upon by the spring-pressed arms 9, and for that reason it is not essential that these flanges or stops 8 shall be of the form shown, or of flange form, and it will suffice if any means accomplishing the same function be provided.

The spring-pressed or yielding arms 9 are preferably pivotally mounted on their respective jaws 6 at a point preferably about half way of the length thereof by headed over pivot pins 11 passing through the rear portions of said arms 9 and the adjacent portion of the said jaws 6 respectively.

Said arms have operative faces converging outwardly on a low angle from their forward and rear ends to a point adjacent a line perpendicular to the flanges 8 and intersecting the axis of the circular opening 7 between the two jaws 6 when the arms 9 are in contact at their forward ends with said flanges 8 respectively, and so that when the said jaws 9 have been turned on their pivot pins 11 to hold the locking elements E therein, said point of convergence will lie very close to or will be intersected by said line or lines perpendicular to the respective jaws 6 and intersecting the axis or axes of the locking elements E, whereby the straight faces of said arms 9 diverging at the same degree from said point will engage the said locking elements E at equidistant points to the front and rear of their axes respectively and so center said elements E with relation to the centers of notches 7 respectively and maintain said elements E in such centered position during the operation of application of said locking elements to their valve-stem B, as illustrated in Figs. 1, 4 and 7.

In the embodiment illustrated a relatively

strong long U-shape or hairpin form spring 12 is arranged with its closed end disposed about the spacer or washer 4 and has arms extending forwardly therefrom, said arms being bent abruptly toward each other against said washer 4 so as to extend appreciably more than 180 degrees about said washer, whereby said spring 12 will be securely maintained in place. The arms of said spring 12 extend in the respective jaws 6 lengthwise thereof and bear against the laterally outer faces of arms 9 in advance of pivot pins 11 respectively to force said arms 9 toward some part of the respective flanges 8 thereof, or some definite part rigid with the respective jaws 6 to force said jaws together to closed position.

The particular form of spring, considering our invention in one of its broader aspects, is not essential, nor is it essential that the one spring shall perform the dual functions of pressing the arms 9 toward the flanges 8 of the jaws 6 respectively and of closing the said jaws 6, nor is it essential that self-acting means for closing the jaws be provided.

The upper side or web of the jaws 6 will preferably be cut away at a point adjacent the rear end of the flanges 8 as illustrated for the purpose of giving greater accessibility to the spring-pressed or yielding arms 9 and facilitating the insertion of the locking elements E.

However, the greater portion of the back or bridge will be left at the outer edges in the form of bracing flanges 10.

Closely adjacent to the lugs 1 and 2 the respective handles 5 preferably will be formed with opposed limiting or stop lugs 5^a, the lugs 5^a of the two levers 5 registering in a lateral direction and being adapted to abut, as illustrated in Fig. 4, to prevent unnecessary strain on, or spreading of, the arms or loop of spring 12 and unnecessary wear on, or frictional contact between, the handles 5 at this point.

In use, the locking elements E are inserted in the respective jaws 6 between the spring-pressed arms 9 and the cooperating flanges 8 with their ends engaging the flanges 8 on opposite sides of the notch 7, and supported by the upper faces of the respective jaws 6, all as illustrated in Figs. 1 and 4. With the elements E thus held by the jaws 6 the front end of the tool is inserted through the usual access opening or port and between the jaws of a valve-spring lifter, the jaws 6 being spread to straddle the valve-stem B, when the grip on the handles or levers 5 is released to permit the jaws 6 to close on the reduced portion F of the valve, applying the locking elements E against the opposite sides thereof. At this stage the central vertical line of the elements E will usually be disposed at an angle to the axis of the particular valve-stem B, so the handles 5 will need to be raised until the common central line of the elements E is parallel with the axis of the particular valve-stem B and the bottoms of said elements E are parallel to, extend radially inward of, and rest flatly on the upper face of lower annular shoulder G.

Where opposed upper and lower annular shoulders similar to G are present the task is a little more exacting, as the elements E must fit between said opposed shoulders in order that they may move radially inward to the correct position.

When said tool has been manipulated to correctly position the elements E, it may be released, if desired, and the spring 12 pressing the arms 9 toward the flanges 8 respectively will hold the jaws 6 together with sufficient pressure to prevent their relative movement under the opposed weight and leverage of the tool. However, whether said tool be released or a grip thereon retained, the mechanic, after the proper positioning of the elements E, next in order operates the valve-spring lifter M to permit the descent of the spring retainer D under the pressure of the spring C, said retainer D receiving the elements E in its cooperating cone-shape recess or bore concentric with the valve-stem B, and tends to force them radially toward each other, as well as endwise toward and against the lower annular shoulder G, in its descent striking against the spring-pressed or yielding arms 9 and shoving the latter and the jaws 6 downward toward the push rod J below the upper face of annular shoulder G, so stripping the locking elements E from the jaws 6 of the tool and forcing them firmly into their proper position to cooperate with the valve-stem B and retainer D.

The mechanic then presses the handles or levers 5 toward each other to spread the jaws 6 to permit the withdrawal of the jaws 6 from about the valve-stem B.

Of course, it will happen sometimes that the elements E are not properly positioned, or the retainer D will be prematurely lowered, so forcing the elements E out of the jaws 6 without their being held between the retainer D and stem B; and we, therefore, prefer to use the shield N as a precautionary measure to catch the elements E should they be forced from the jaws 6 and drop toward the push-rod spider H.

The handles 5 will preferably have the rear end portions of their lateral portions or bottom of the channel formed with a plurality of serrations 5^b to reinforce said handles so that even though said handles are of quite thin material they will withstand great weight and abuse and also so as to provide a roughened grip portion. The serrations 5^b may be formed by slitting the metal between each two serrations and bending or twisting the material of each serration to lie at an ap-

preciable angle to the longitudinal central line of the tool, all as illustrated in Fig. 3.

We claim:

1. A valve-stem locking-element inserting tool comprising a pair of sheet metal members each comprising a pair of vertically registering laterally presented lugs, a handle portion extending to the rear of said lugs and a jaw portion extending forwardly of said lugs, said jaw portions having their opposed inner edges adjacent their front ends notched out in registry to cooperate in defining between them, in closed position, an opening to receive the valve-stem, stop means carried by said jaw portions respectively to be engaged by the respective locking elements, a pivot-pin extending through said laterally presented lugs to pivotally connect said members, and laterally presented stop lugs carried by said handle portions, the stop lugs of one said handle portion registering in a lateral direction with the stop lugs of the other said handle portion and being adapted to abut therewith to limit the movement of said handle portions, in combination with a pair of arms respectively pivotally mounted on the respective jaw portions for swinging movement toward and from the stop means of said jaw portions respectively, and a spring extending about said pivot-pin and having portions extending lengthwise of said arms and respectively engaging said arms in advance of their points of pivotal mounting respectively to yieldingly press said arms toward their cooperating stop means of the respective jaw portions and acting to press the latter toward closed position, and each said pivoted arm being formed with longitudinally extending faces diverging laterally inwardly from their extreme laterally outer point of intersection adjacent a transverse plane extending at right angles to said jaws and intersecting the axis of the opening defined between said jaws in closed position, said diverging faces of the respective arms being adapted to engage the upwardly inclined outer faces of the respective locking elements to force them lengthwise of the respective jaw portions to proper position and to force them against said stop means, and also at right angles thereto against the top faces of said jaw portions respectively.

2. A valve-stem locking-element inserting tool comprising a pair of sheet metal members each comprising a laterally presented lug, a handle portion extending to the rear of said lugs and a jaw portion extending forwardly of said lug, said jaw portions having their opposed inner edges adjacent their front ends notched out in registry to cooperate in defining between them, in closed position, an opening to receive the valve-stem, stop means carried by said jaw portions respectively to be engaged by the respective locking elements, and a pivot-pin extending through said laterally presented lugs to pivotally connect said members, in combination with a pair of arms respectively movably mounted on the respective jaw portions for movement toward and from the stop means of said jaw portions respectively, and a spring extending about said pivot-pin and having portions extending lengthwise of said arms and respectively engaging said arms to yieldingly press said arms toward their cooperating stop means of the respective jaw portions and acting to press the latter toward closed position, and each said pivoted arm being formed with longitudinally extending faces diverging laterally inwardly from their extreme laterally outer point of intersection adjacent a transverse plane extending at right angles to said jaws and intersecting the axis of the opening defined between said jaws in closed position, said diverging faces of the respective arms being adapted to engage the upwardly inclined outer faces of the respective locking elements to force them lengthwise of the respective jaw portions to proper position and to force them against said stop means, and also at right angles thereto against the top faces of said jaw portions respectively.

3. A valve-stem locking-element inserting tool comprising a pair of sheet metal members each comprising a laterally presented lug, a handle portion extending to the rear of said lug and a jaw extending forwardly of said lug, said jaw portions having their opposed inner edges adjacent their front ends notched out in registry to cooperate in defining between them, in closed position, an opening to receive the valve-stem, stop means carried by said jaw portions respectively to be engaged by the respective locking elements, and a pivot-pin extending through said laterally presented lugs to pivotally connect said members, in combination with a pair of arms respectively mounted for movement toward and from the stop means of said jaw portions respectively, and a spring extending about said pivot-pin and having portions extending lengthwise of said arms and respectively engaging said arms to yieldingly press said arms toward their cooperating stop means of the respective jaw portions and acting to press the latter toward closed position, and each said arm being adapted to engage the upwardly inclined outer faces of the respective locking elements to force them lengthwise of the respective jaw portions to proper position and to force them against said stop means, and also at right angles thereto against the top faces of said jaw portions respectively.

4. A valve-stem locking-element inserting tool comprising a pair of sheet metal members each comprising a laterally presented lug, a handle portion extending to the rear of

said lugs and a jaw portion extending forwardly of said lug, said jaw portions having their opposed inner edges adjacent their front ends notched out in registry to cooperate in defining between them, in closed position, an opening to receive the valve-stem, stop means carried by said jaw portions respectively to be engaged by the respective locking elements, and a pivot-pin extending through said laterally presented lugs to pivotally connect said members, in combination with a pair of arms mounted for movement toward and from the stop means of said jaw portions respectively, and a spring extending about said pivot-pin and having portions extending lengthwise of said arms and respectively engaging said arms to yieldingly press said arms toward their cooperating stop means of the respective jaw portions and acting to press the latter toward closed position, and each of said arms being adapted to engage the outer faces of the respective locking elements to force them against said stop means.

5. A valve-stem locking-element inserting tool comprising a pair of sheet metal members each comprising a laterally presented lug, a handle portion extending to the rear of said lug and a jaw portion extending forwardly of said lug, said jaw portions having their opposed inner edges adjacent their front ends notched out in registry to cooperate in defining between them, in closed position, an opening to receive the valve-stem, stop means carried by said jaw portions respectively to be engaged by the respective locking elements, and a pivot-pin extending through said laterally presented lug to pivotally connect said members, in combination with a pair of arms respectively mounted for movement toward and from the stop means of said jaw portions respectively, and means respectively engaging said arms to press said arms toward their cooperating stop means of the respective jaw portions, said arms being adapted to engage the outer faces of the respective locking elements to force them against said stop means.

6. A valve-stem locking-element inserting tool comprising a pair of sheet metal members each comprising a laterally presented lug, a handle portion extending to the rear of said lug and a jaw portion extending forwardly of said lug, said jaw portions having their opposed inner edges adjacent their front ends notched out in registry to cooperate in defining between them, in closed position, an opening to receive the valve-stem, stop means carried by said jaw portions respectively to be engaged by the respective locking elements, and a pivot-pin extending through said laterally presented lugs to pivotally connect said members, and laterally presented stop lugs carried by said handle portions, the stop lugs of one said handle portion registering in a lateral direction with the stop lugs of the other said handle portion and being adapted to abut therewith to limit the movement of said handle portions, in combination with a pair of arms respectively mounted for movement toward and from the stop means of said jaw portions respectively, and means respectively engaging said arms to press said arms toward their cooperating stop means of the respective jaw portions.

7. A positioning tool comprising a pivot-pin, and a pair of levers pivoted together by said pin and including handles on one side of the pivot-pin and jaws on the opposite side of said pivot-pin arranged to move away from each other as the handles are moved together, said jaws being formed to define an opening between them when in closed position, in combination with stop means carried by said jaws, arms pivotally mounted on the respective jaws for swinging movement toward and from said stop means of said jaws respectively and adapted to press against said stop means the elements to be positioned, and yielding means extending about said pivot-pin and bearing on the laterally outer portions of said arms to yieldingly press the latter toward their cooperating stop means and to hold the respective elements to be positioned between the respective arms and their cooperating stop means and to press said jaws toward each other to closed position.

8. A positioning tool comprising a pivot-pin, and a pair of levers pivoted together by said pin and including handles on one side of the pivot-pin and jaws on the opposite side of said pivot-pin arranged to move away from each other as the handles are moved together, said jaws being formed to define an opening between them when in closed position, in combination with stop means carried by said jaws, arms mounted for swinging movement toward and from said stop means of said jaws respectively and adapted to press against said stop means the elements to be positioned, and yielding means extending about said pivot-pin and bearing on the laterally outer portions of said arms to yieldingly press the latter toward their cooperating stop means and to hold the respective elements to be positioned between the respective arms and their cooperating stop means and to press said jaws toward each other to closed position.

9. A positioning tool comprising a pivot-pin, and a pair of levers pivoted together by said pin and including handles on one side of the pivot-pin and jaws on the opposite side of said pivot-pin arranged to move away from each other as the handles are moved together, said jaws being formed to define an opening between them when in closed position, in combination with stop means on the inner edge portions of said jaws and facing outward, arms mounted for movement toward and from said stop means of said jaws respectively and adapted to

press against said stop means the elements to be positioned, and yielding means respectively bearing on the laterally outer portions of said arms to yieldingly press the latter toward their cooperating stop means and to hold the respective elements to be positioned between the respective arms and their cooperating stop means.

10. A positioning tool comprising a pivot-pin, and a pair of levers pivoted together by said pin and including handles on one side of the pivot-pin and jaws on the opposite side of said pivot-pin arranged to move away from each other as the handles are moved together, said jaws being formed to define an opening between them when in closed position, in combination with stop means on the inner edge portions of said jaws and facing outward, arms pivotally mounted on the respective jaws for swinging movement toward and from said stop means of said jaws respectively and adapted to press against said stop means the elements to be positioned, and resilient means respectively engaging said arms to yieldingly press the latter toward their cooperating stop means and to hold the respective elements to be positoned between the respective arms and their cooperating stop means.

11. A positioning tool comprising a pivot-pin, and a pair of levers pivoted together by said pin and including handles on one side of the pivot-pin and jaws on the opposite side of said pivot-pin arranged to move away from each other as the handles are moved together, said jaws being formed to define an opening between them when in closed position, in combination with stop means on the inner edge portions of said jaws and facing outward, arms mounted for movement toward and from said stop means of said jaws respectively and adapted to press against said stop means the elements to be positioned, and means extending about said pivot-pin and respectively engaging said arms to yieldingly press the latter toward their cooperating stop means and to hold the respective elements to be positioned between the respective arms and their cooperating stop means.

In testimony whereof, we have signed our names to this specification at Lancaster, Pennsylvania, this 24th day of May, 1930.

HARRY W. KULP.
MARTIN C. DELLINGER.