May 14, 1940. J. LIZAKOWSKI 2,200,453

WRENCH

Filed April 19, 1938 2 Sheets-Sheet 1

Fig. 1.

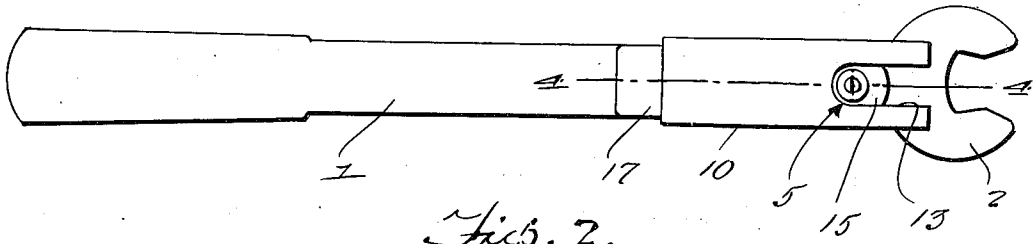



Fig. 2.

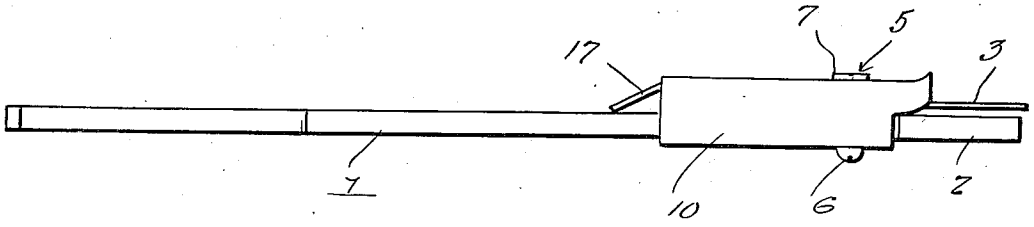



Fig. 3.

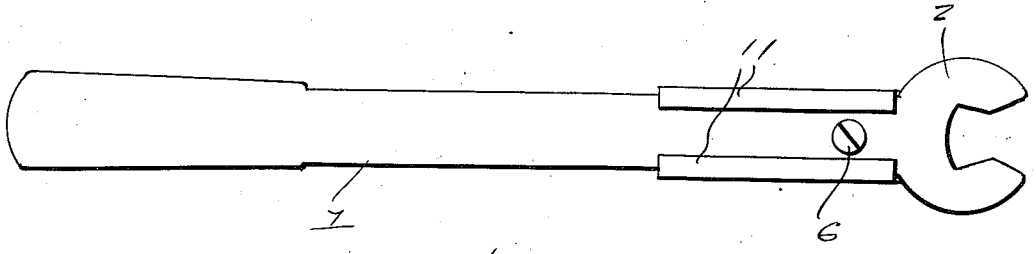
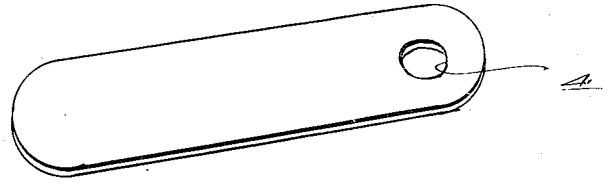



Fig. 6.




Inventor

J. Lizakowski

By Clarence A. O'Brien

Hyman Berman

Attorneys

May 14, 1940. J. LIZAKOWSKI 2,200,453

WRENCH

Filed April 19, 1938 2 Sheets-Sheet 2

Fig. 4.

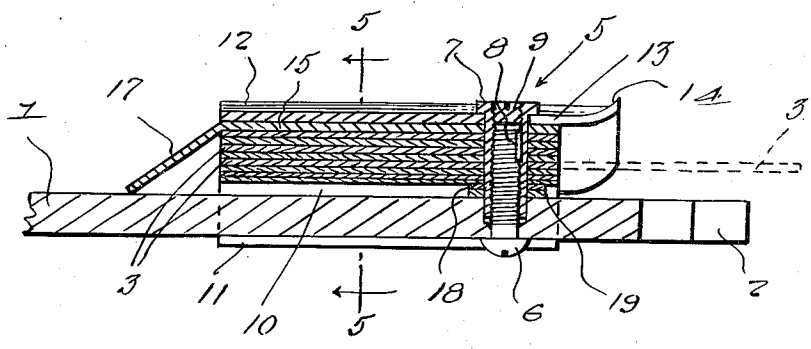



Fig. 5.

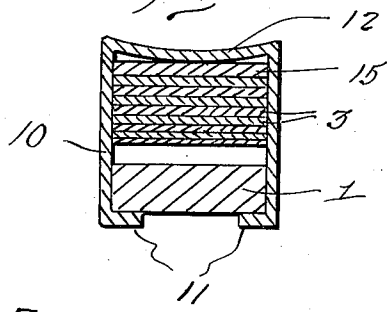



Fig. 7.

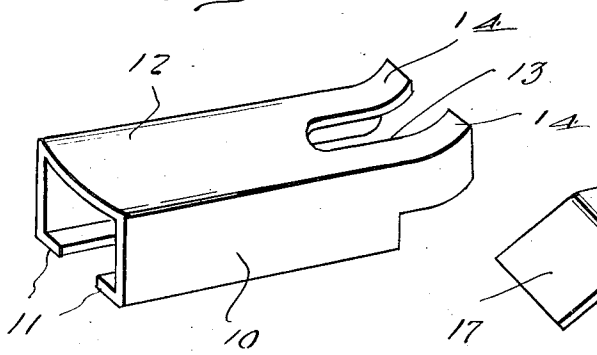
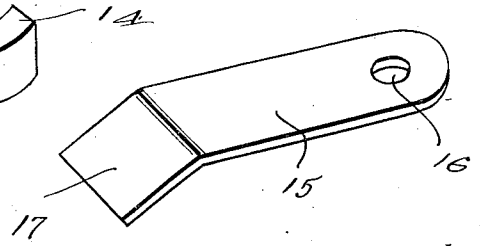



Fig. 8.




Inventor

J. Lizakowski

By Clarence A. O'Brien

Hyman Berman

Attorneys

Patented May 14, 1940 2,200,453

# UNITED STATES PATENT OFFICE

2,200,453

## WRENCH

Julius Lizakowski, Minto, N. Dak., assignor to Frank H. Lizakowski, Minto, N. Dak.

Application April 19, 1938, Serial No. 202,971

4 Claims. (Cl. 7—1)

The present invention relates to new and useful improvements in wrenches particularly for adjusting the valves of internal combustion engines and has for its primary object to provide, in a manner as hereinafter set forth, a tool of this character embodying a novel combination and arrangement of gauges for checking the clearance of the valves.

Another very important object of the invention is to provide a tool of the aforementioned character embodying novel means for securing the feeler gauges in operative or inoperative position.

Other objects of the invention are to provide a valve wrench of the character described which will be comparatively simple in construction, strong, durable, highly efficient and reliable in use, compact, light in weight and which may be manufactured at low cost.

All of the foregoing and still further objects and advantages of the invention will become apparent from a study of the following specification, taken in connection with the accompanying drawings wherein like characters of reference designate corresponding parts throughout the several views, and wherein:

Figure 1 is a top plan view of a tool embodying the present invention.

Figure 2 is a side elevation of the tool with one of the gauge elements extended.

Figure 3 is a bottom plan of the tool view.

Figure 4 is an enlarged view in vertical longitudinal section, taken substantially on the line 4—4 of Fig. 1.

Figure 5 is a cross sectional view on the line 5—5 of Fig. 4.

Figure 6 is a detail view in perspective of one of the feeler gauges.

Figure 7 is a detail view in perspective of the slidable feeler gauge housing.

Figure 8 is a detail view in perspective of the guide for the housing shown in Fig. 7.

Referring now to the drawings in detail, it will be seen that the embodiment of the invention which has been illustrated comprises a handle 1 of suitable metal which is provided, on one end, with an integral rigid jaw 2 of the shape shown to advantage in Figs. 1 and 3 of the drawings. Pivotally mounted for swinging movement on the handle 1 adjacent the jaw 2, is a plurality of feeler gauges 3. The feeler gauges 3 have formed in one end portion thereof an opening 4 which accommodates a pin designated generally by the reference numeral 5 through the medium of which said feeler gauges are mounted for swinging movement on the handle 1.

As illustrated to advantage in Fig. 4 of the drawings, the pin 5 comprises male and female screws 6 and 7, respectively, having headed outer ends. The female screw 7 passes downwardly through the openings 4 in the gauges 3 and has its lower end portion engaged in a counter-bored opening which is provided in the handle 1 and which accommodates the male screw 6. A key 8 disposed in a thread intersecting keyway secures the elements 6 and 7 in adjusted position relative to each other. A plug 9 is threaded into the upper portion of the element 7 for retaining the key 8.

Mounted for longitudinal sliding movement on the handle 1 is a metallic housing or keeper 10 for the feeler gauges 3. The housing 10 comprises inturned flanges 11 on its lower portion (see Fig. 5) engaged beneath the handle 1. The top of the housing 10 is curved downwardly, as at 12 (see Fig. 5) so as to provide better frictional or retention contact with the guide member 15. The forward end portion of the housing 10 is provided with a longitudinal slot 13 which receives the upper portion of the pin 5. Further, the forward end portion of the housing 10 is curved upwardly, as at 14.

Mounted on the uppermost feeler gauge 3 is a metallic guide 15 for the housing 10. The pin 5 passes through an opening 16 in the forward end portion of the guide 15 for securing said guide in position. The guide 15 extends rearwardly beyond the feeler gauges 3 and terminates in an inclined end portion 17 which rests on the handle 1 and cooperates with the housing parts 14 to properly guide the housing when it is moved forwardly upon or over the gauges.

It is thought that the manner of using the tool will be readily apparent from a consideration of the foregoing. The jaw 2 of the wrench is, of course, used in the usual manner when adjusting the valves. When it is desired to check the clearance, the housing 10 is moved rearwardly on the handle 1 for uncovering the feeler gauges 3. The desired gauge may then be selected and swung around on the pin 5 to a position over the jaw 2, as seen in Fig. 2 of the drawings. The housing 10 may then be moved forwardly over the gauges and when this is done the gauge which is being used is secured in extended or operative position over the jaw 2 and against swinging movement on the pivot pin 5 while the remaining gauges are also locked against objectionable swinging but in their idle or inoperative positions. When moving forwardly and rearwardly the housing 10 slides on the

guide 15. A spring washer 18 and a spacing washer 19 are provided on the pin 5 between the handle 1 and the lowermost feeler gauge 3.

It is believed that the many advantages of a tool constructed in accordance with the present invention will be readily understood and although a preferred embodiment of the device is as illustrated and described, it is to be understood that changes in the details of construction and in the combination and arrangement of parts may be resorted to which will fall within the scope of the invention as claimed.

What is claimed is:

1. In a tool of the character described, wherein there is provided an elongated handle shank and wherein an outer open end wrench jaw is carried by one end of the handle shank, a plurality of feeler gauge strips pivotally secured directly on the shank and overlying the shank, the operative ends of the feeler gauge strips extending beyond the pivotal mounting a distance whereby gauge strips when selected and swung away from normal idle position may be positioned to overlie the jaw opening, and a box-like keeper slidably mounted on the handle shank and having a cross-sectional dimension to snugly embrace the shank and gauge strips whereby it may be moved into inclosing relation to the gauge strips for releasably securing all of the gauge strips in parallelism on the handle shank and restraining a selected operative gauge strip from pivotal movement.

2. In a tool of the character described, wherein there is provided an elongated handle shank and wherein an outer open end wrench jaw is carried by one end of the shank, a plurality of feeler gauge strips pivotally secured directly on the handle shank and normally overlying the handle shank, the operative ends of the feeler gauge strips extending beyond the pivotal mounting a distance whereby gauge strips when selected and swung away from normal idle position may be positioned to overlie the jaw opening, and a keeper having a top wall and side angular flanges mounted on the handle shank in slidable interfitting engagement therewith and inclosing said strips for releasably securing all of the gauge strips in parallelism on the handle shank, the top wall of the keeper being transversely concaved and resilient for frictionally engaging the gauge strips.

3. In a tool of the character described, wherein there is provided an elongated handle shank and wherein an outer open end wrench jaw is carried by one end of the shank, a set of feeler gauge strips pivotally secured on the shank and adapted to be selectively swung to overlying positions with respect to the wrench jaw, a guide member disposed over the strips and having one end extending beyond the strips and angled toward the handle shank, and a keeper having a top wall and side angular flanges mounted on the handle shank in slidable interfitting engagement therewith for inclosing said feeler gauge strips and guide member and to restrain them from turning, the end of the top wall of said keeper adjacent the wrench jaw moving over said angled end of the guide member to be guided thereby when the keeper is moved into inclosing relationship with said feeler gauge strips.

4. In a tool of the character described, wherein there is provided an elongated handle shank and wherein an outer open end wrench jaw is carried by one end of the shank, a set of feeler gauge strips pivotally secured on the handle shank and adapted to be selectively swung to overlying positions with respect to the wrench jaw, a guide member disposed over the strips and having one end extending beyond the strips and angled toward the handle shank, and a keeper having a top wall and side angular flanges mounted on the handle shank in slidable interfitting engagement therewith and inclosing said feeler gauge strips and guide member, the end of the top wall of said keeper adjacent the wrench jaw being upwardly flared to cooperate with said angled inner end of said guide member for guiding the keeper into inclosing engagement with said guide member and feeler gauge strips.

JULIUS LIZAKOWSKI.