

Feb. 7, 1939.

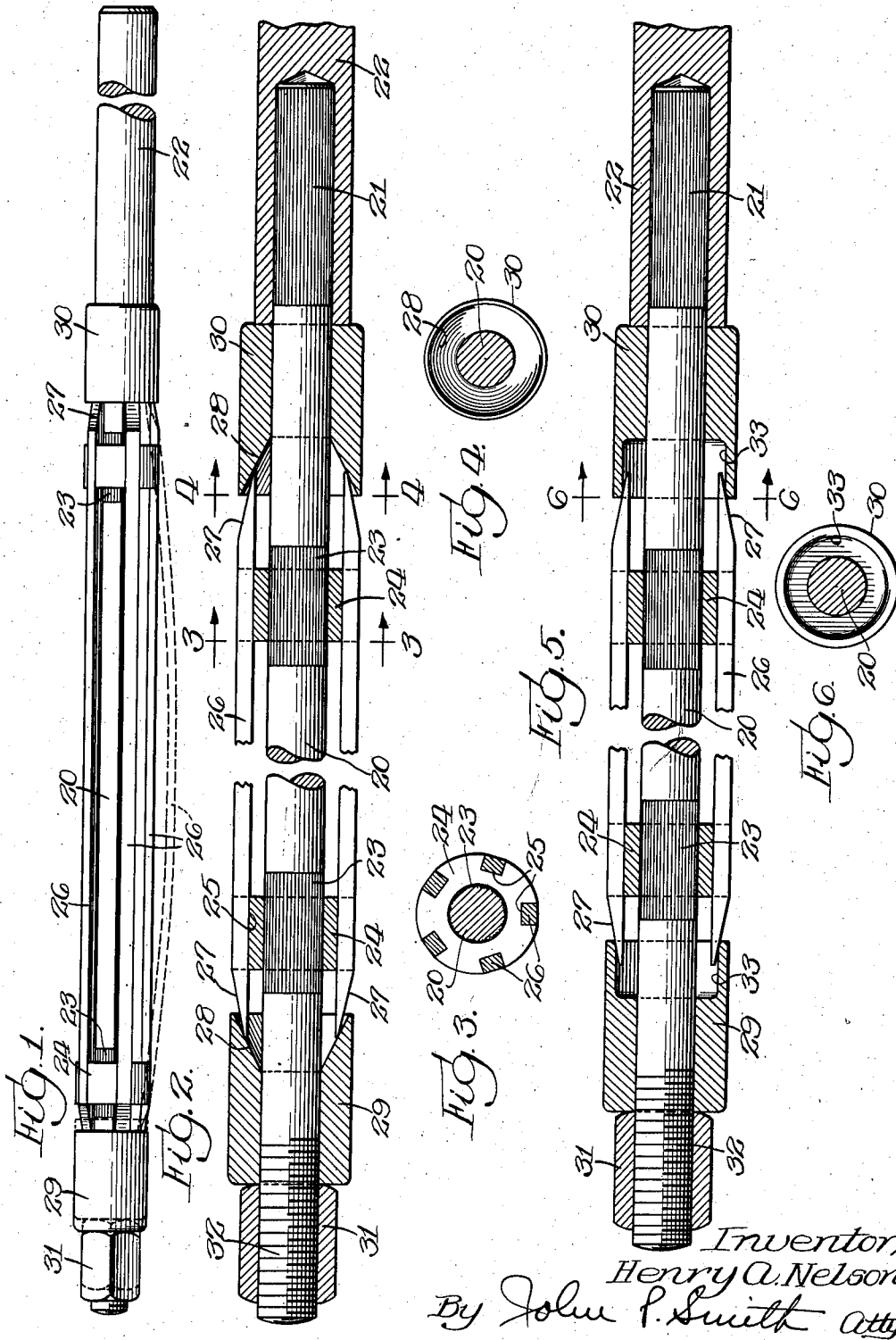
H. A. NELSON

2,146,644

SCRAPER TOOL

Filed May 16, 1935

2 Sheets-Sheet 1



Inventor,
Henry A. Nelson,
By John P. Smith atty.

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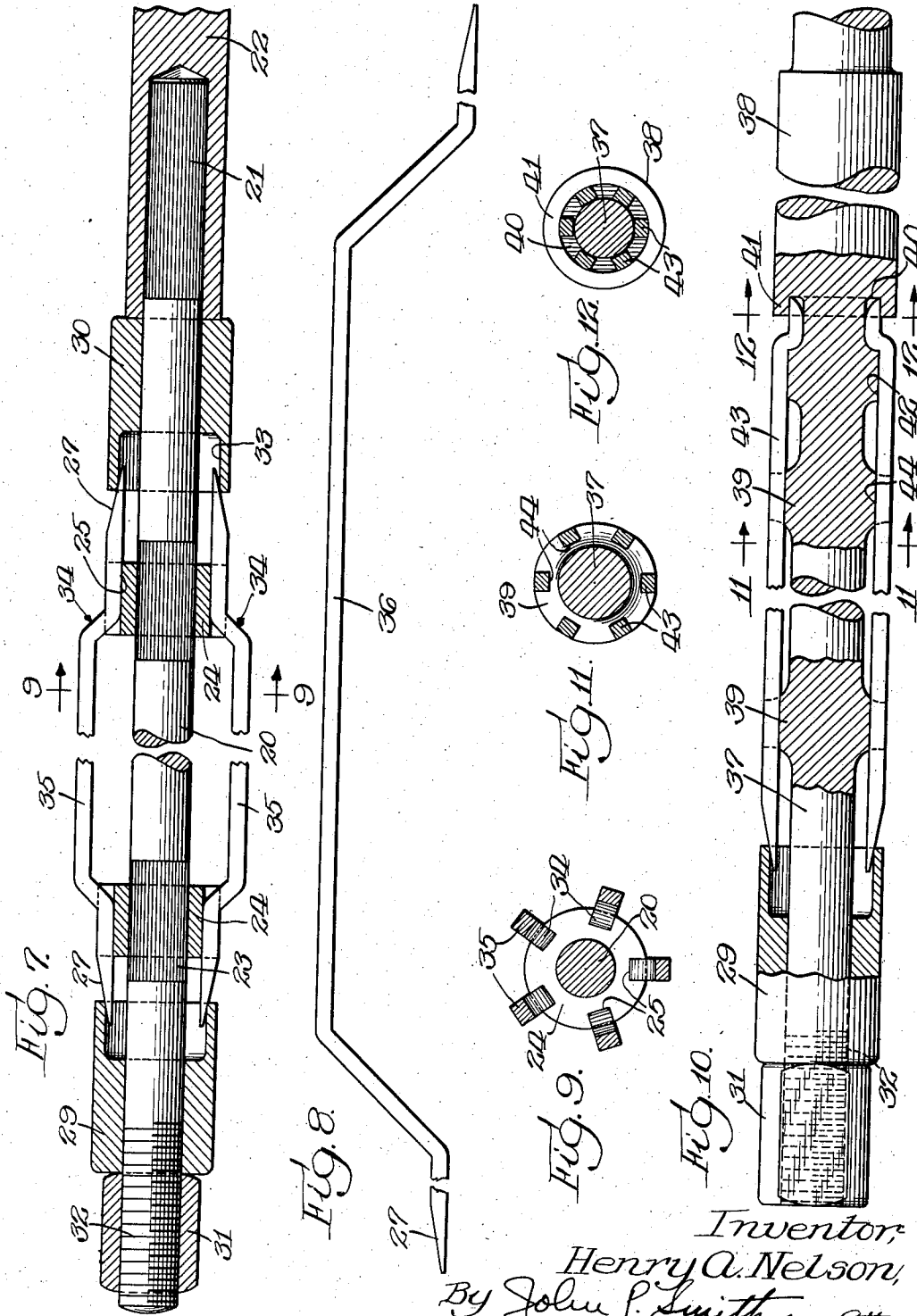
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Inventor:
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UNITED STATES PATENT OFFICE

2,146,644

SCRAPER TOOL

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Application May 16, 1935, Serial No. 21,843

8 Claims. (Cl. 15—104.19)

The present invention relates generally to a scraper tool, but more particularly to an adjustable valve stem guide cleaner tool whereby the effective diameter of the tool may be changed from a relatively small size to a relatively large size for scraping and cleaning bores or openings of various diameters such for example as guide openings for valve stems of internal combustion engines and the like.

One of the primary objects of the present invention is to provide a simple, efficient as well as adjustable scraper tool which is adapted to adjustably and rigidly secure therein scraper blades so that the effective diameter thereof may be adjusted to accommodate bores of different diameters.

A still further object of the invention is to provide a novel and improved scraper tool in which a novel arrangement of offset blades is provided which may be substituted for the regular scraper blades to effectively increase the range or diameter of the tool to a considerable greater extent than has been accomplished by similar tools heretofore constructed for scraping holes of relatively larger diameters.

A still further object of the invention is to provide a novel and improved scraper tool in which blade supporting members secured to the stem of the tool also perform the function of fulcrums at points adjacent each end of the stem for effectively expanding the intermediate portions of the blades to vary the diameter of the tool.

These and other objects of the invention are accomplished by providing a construction and an arrangement of the various parts in the manner hereinafter described and particularly pointed out in the appended claims.

Referring to the drawings:

Fig. 1 is a side elevational view of my improved scraper tool;

Fig. 2 is an enlarged longitudinal cross sectional view of the tool shown in Fig. 1;

Fig. 3 is a cross sectional view of the tool taken on the line 3—3 in Fig. 2;

Fig. 4 is a cross sectional view taken on the line 4—4 in Fig. 2;

Fig. 5 is a longitudinal cross sectional view of a slightly modified form of my improved tool;

Fig. 6 is a cross sectional view taken on the line 6—6 in Fig. 5;

Fig. 7 is an enlarged longitudinal cross sectional view of the tool of Figs. 5 and 6 showing my improved offset blade mounted therein;

Fig. 8 is a side elevational view of a blade hav-

ing a relatively larger offset than the one shown in Fig. 7;

Fig. 9 is a cross sectional view taken on the line 9—9 in Fig. 7;

Fig. 10 is an enlarged side elevational view partly in cross section of another modified form of my improved tool;

Fig. 11 is a cross sectional view taken on the line 11—11 in Fig. 10; and

Fig. 12 is a cross sectional view taken on the line 12—12 in Fig. 10.

In illustrating the preferred form of my invention I have shown the same as comprising an elongated stem or rod 20 which has its upper end provided with longitudinal grooves and ribs, as shown at 21, for rigidly securing and telescopically engaging a bore in the lower end of a shank 22. At short distances from each of the ends of the stem 20 are similar longitudinal grooved and ribbed portions 23 on which are driven and frictionally secured blade supporting fulcrum members 24. These blade supporting members 24 are provided with equally spaced apart peripheral recesses or slots 25 in which are seated the opposite end portions of the scraper blades 26. The opposite ends of each of these blades 26 are beveled as shown at 27 and are adapted to engage the beveled or conically shaped portions 28 of the opposing loosely mounted sleeves 29 and 30 respectively. The sleeve 30 is loosely mounted on the stem 20 and has its upper end abutting against the lower end of the shank 22 as clearly shown in Figs. 1 and 2 of the drawings. The sleeve 29 is slidably and loosely mounted on the stem and is adjustable longitudinally thereof by a nut 31 mounted in threaded engagement with the threaded portion 32 of the lower end of the stem 20. Obviously upon the adjustment of the nut 31 inwardly of the rod from the full line position to the dotted line position shown in Fig. 1, the beveled portions 28 of each of the sleeves 29 and 30 will compress the opposite ends of each of the blades 26 to effectively expand the intermediate portion of the blade to the dotted line position shown in Fig. 1. In this operation of expanding the intermediate portions of the blades, it will be noted that the portions near the ends of the blades are fulcrumed about the blade supports 24 to effectively expand and thereby adjust the effective diameter of the scraping tool.

In the modified form shown in Fig. 5 of the drawings, the same reference numerals are used for corresponding parts as those used in Figs. 1 and 2 of the drawings as the function and opera-

tion of these parts are substantially identical. The only difference in structure is that the respective sleeves 29 and 30 are provided with cylindrical recesses 33 instead of the conical recesses shown in the corresponding sleeves shown in Figs. 1 and 2 of the drawings. However, the function and operation of the tool shown in Fig. 5 is substantially identical as that shown in Figs. 1 and 2 of the drawings.

Another essential feature of my invention is the provision of a novel offset scraper blade which may be used for the conventional one shown in Figs. 1, 2 and 5, so that the same tool with the substituted offset blades may be used to clean or scrape bores of relatively larger diameter without the necessity of supplying additional tools as heretofore required. In order to secure this wide range of adjustment, I have provided offset blades generally indicated by the reference character 34 which have their opposite ends of the same general configuration as the blades shown in Figs. 1 to 6 inclusive except that the intermediate portion of each of these blades is offset as shown at 35 and extend from a point adjacent each of the blade supporting members 24 as clearly shown in Fig. 7 of the drawings. Obviously with this construction, by adjusting the threaded nut 31 on the shank 20 the effective diameter of the offset blades 35 may be increased from that shown in Fig. 7 to secure a cleaning or scraping of bores having relatively larger diameters. In this connection it will also be noted that blades of even greater offsets as shown at 35 in Fig. 8 of the drawings may be substituted for those in Fig. 7 if so desired to secure even greater diameters. This wide range of adjustment is secured in a single tool by merely making a substitution of the blades.

In the last modification of my improved scraping tool shown in Figs. 10 to 12 inclusive, I have provided a stem 37 which has a shank 38 formed integrally therewith and in which the supporting or guiding members as shown at 39 are also formed integrally therewith. The lower guiding member 39 serves the function of a fulcrum in the adjustment of the blades. Positioned adjacent the lower end of the shank portion is an annular recess as shown at 40 which extends longitudinally thereof so as to form in effect an overhanging flange 41. Positioned adjacent this recess is a circular rim 42. Conforming substantially to the configuration of this circular rim 42 and undercut recess 40 each of the upper ends of blades 43 are formed to be seated therein as clearly shown in Fig. 10 of the drawings. Each of these blades extends longitudinally and is seated in aligned recesses 44 of each of the blade supporting members somewhat similar to the manner in which the blades in the other recesses are supported, so that upon a manipulation of the nut 31 to move the sleeve 29 upwardly thereon, the blades 43 will fulcrum about the lower supporting member 39 and be expanded to change the effective diameter of the tool. The important feature of the construction disclosed is this last modification is the manner in which the upper ends of the scraper blades are anchored so as to prevent their longitudinal displacement or disengagement from the tool.

From the above specification it will be readily seen that I have provided not only a simple, compact and efficient scraper tool, but one which by the interchange of blades thereof, permits a wide range of effective diameters to which the tool proper may be adjusted which heretofore

required several tools to accomplish this same function.

While in the above specification I have described one preferred embodiment and modifications of my invention which it may assume in practice, it will of course be understood that certain other modifications may be made without departing from the spirit and scope of the invention as expressed in the following claims.

What I claim is my invention and desire to secure by Letters Patent is:

1. A scraper tool comprising a rotary stem, a plurality of elongated resilient scraper blades carried by and extending longitudinally of said stem, said blades being peripherally spaced about said stem, spaced apart blade fulcrum members fixed to said stem, said blades being fulcrumed on said members, longitudinally adjustable means mounted on said stem, and means mounted on one end of said stem abutting and receiving the adjacent ends of said blades, said first named means adapted to compress the other ends of said blades inwardly towards the stem for fulcruming said blades about said members whereby the effective diameter of said tool may be adjusted.

2. A scraper tool comprising a rotary stem, a plurality of elongated peripherally spaced apart resilient scraper blades carried by and extending longitudinally of said stem, spaced apart blades supporting members carried by said stem having longitudinally extending aligned peripheral recesses therein for the reception of said blades, said blades being fulcrumed on said members, means mounted adjacent one end of said stem and having a recess engageable with the adjacent ends of said blades, and longitudinal adjustable means mounted adjacent the other end of said stem and having recesses engageable with the adjacent ends of said blades for compressing both ends of said blades inwardly towards said stem and fulcruming said blades about said supports to flex the intermediate portions of said blades outwardly whereby the effective diameter of said tool may be adjusted.

3. A scraper tool comprising a rotary stem, a plurality of elongated peripherally spaced apart resilient flat scraper blades carried by and extending longitudinally of and in spaced relation from said stem, blade supporting members fixed to and adjacent the opposite ends of said stem and having longitudinally extending aligned outwardly opening recesses therein for the reception of said blades, said blades having their opposite ends beveled inwardly towards said stem, a sleeve mounted on said stem, having a recess therein for engaging one of the beveled ends of each of said blades, and a longitudinal adjustable sleeve having a longitudinal recess therein and engageable with the other beveled ends of each of said blades for fulcruming said blades about said supporting members whereby the effective diameter of said tool may be adjusted.

4. A scraper tool comprising a rotary stem, a plurality of elongated resilient flat blades carried by and extending longitudinally of and in spaced relation around said stem, means carried adjacent the opposite ends of said stem and engaging said blades for holding said blades in spaced relation with respect to each other, said blades having their opposite ends bevelled inwardly toward said stem, and means longitudinally adjustable on said stem having undercut recesses engageable with the bevelled ends of each of said blades for fulcruming the end por-

tions of said blades inwardly about said first named means whereby the intermediate portions of said blades may be expanded.

5 5. A scraper tool comprising a rotary stem, two spaced apart members secured to said stem and having longitudinally extending aligned recesses formed on their peripheries, a plurality of elongated resilient scraper blades having portions adjacent their opposite ends mounted in the recesses
10 formed in said members and extending longitudinally of and in spaced relation with respect to said stem, the opposite ends of said blades being bevelled inwardly toward said stem, and sleeves slidably mounted on the opposite ends of
15 said stem having recesses engageable with the opposite bevelled ends of said blades for fulcruming the end portions of said blades inwardly about said first named members, whereby the intermediate portions of said blades may be expanded.

20 6. A scraper tool comprising a rotary stem, two spaced apart members secured to said stem and having longitudinally extending aligned recesses formed in the peripheries thereof, a plurality of substantially elongated and outwardly offset resilient scraper blades mounted in said recesses,
25 and longitudinally adjustable means mounted on the opposite ends of said stem and engageable with the opposite ends of said blades for fulcruming the end portions of said blades inwardly about said first named members.

30 7. A scraper tool comprising a rotary stem, a plurality of elongated peripheral spaced apart

resilient scraper blades carried by and extending longitudinally of said stem, longitudinal spaced apart fulcrum members mounted on said stem and located intermediate the ends of said blades,
5 and separate means mounted on the opposite ends of said stem and engageable with the opposite ends of said blades for fulcruming said blades about said members whereby the intermediate portions of said blades may be expanded outwardly.

10 8. A scraper tool comprising a rotary stem, two spaced apart blade supporting portions formed integrally with said stem and having longitudinally extending grooves therein, longitudinally extending resilient scraper blades mounted in said
15 grooves and having their intermediate portions adapted to expand outwardly with respect to said stem, there being an inwardly facing undercut annular recess formed in and on an enlarged portion adjacent one end of said stem, each of said
20 blades having an inwardly offset portion formed on one end thereof for interlocking each blade in said annular recess, and a longitudinally adjustable sleeve mounted on the other end of said stem having an undercut portion engageable with
25 one of the ends of each of said blades for fulcruming the end portions of said blades inwardly about said blade supporting portions, whereby the intermediate portions of said blades may be expanded.

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