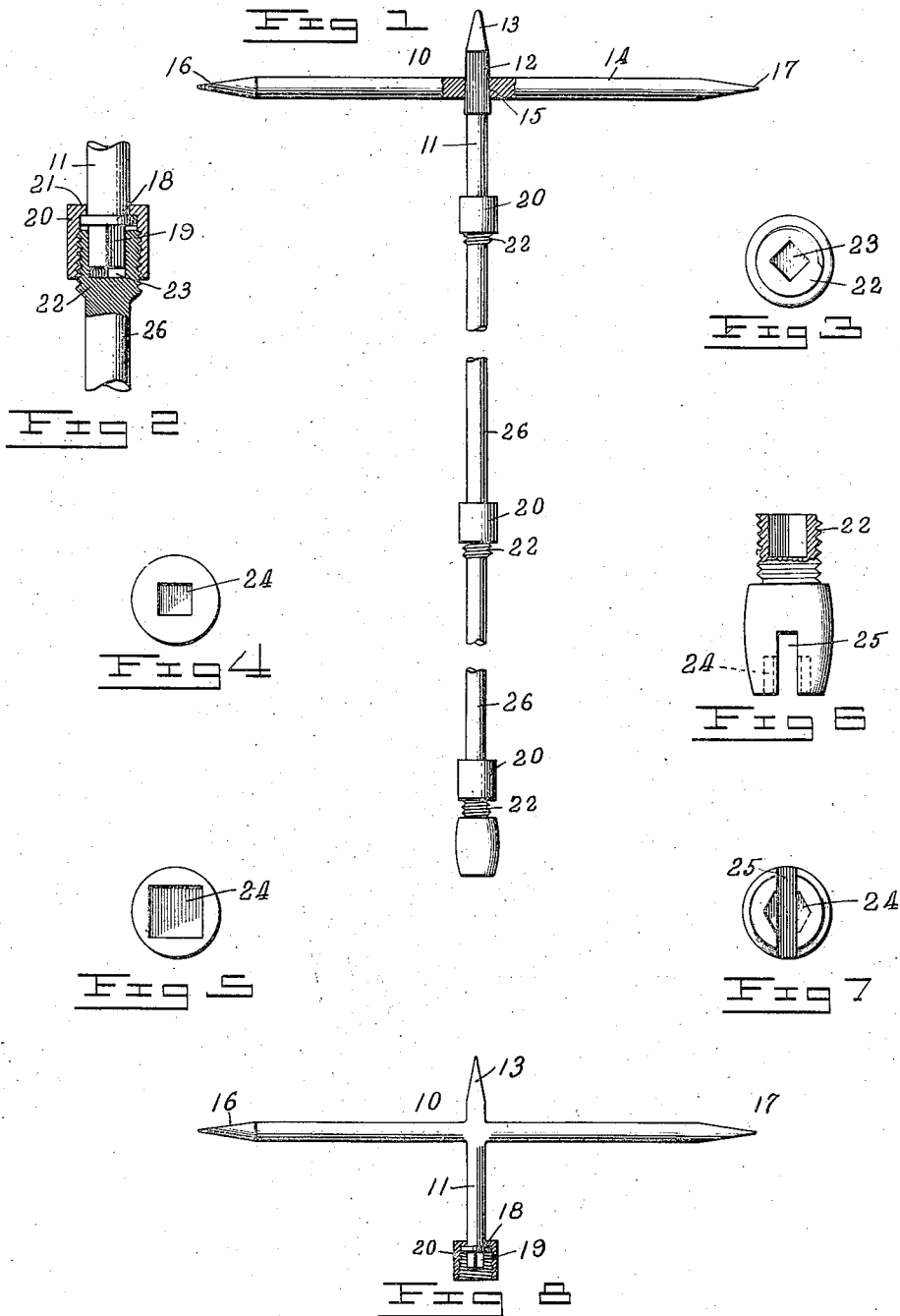


S. T. DOWNS.
SERVICE BOX KEY.
APPLICATION FILED AUG. 1, 1910.

1,018,172.

Patented Feb. 20, 1912.



Inventor
Samuel T. Downs

Witnesses
H. C. Bennett
Horace G. Smith

By Meyers, Cushman & Rea
Attorneys

UNITED STATES PATENT OFFICE.

SAMUEL T. DOWNS, OF IRVINGTON, INDIANA, ASSIGNOR TO H. MUELLER MANUFACTURING COMPANY, OF DECATUR, ILLINOIS, A CORPORATION OF ILLINOIS.

SERVICE-BOX KEY.

1,018,172.

Specification of Letters Patent.

Patented Feb. 20, 1912.

Application filed August 1, 1910. Serial No. 575,039.

To all whom it may concern:

Be it known that I, SAMUEL T. DOWNS, a citizen of the United States, residing at Irvington, in the county of Marion and State of Indiana, have invented new and useful Improvements in Service-Box Keys, of which the following is a specification.

My invention relates to improvements in service box keys, and has particular relation to devices which are take-down in character and in which are combined various tools usable in connection with service box structures and their operation.

The principal object of my invention is to provide a service box key which can be readily taken apart and assembled, and which provides for adjustments in the length of the key to suit various conditions.

A further object of my invention is to provide a structure of this type which, when taken apart, can be carried in the take-down condition within a small space and in the form of a package which can be readily handled.

A further object is to combine, in a device of this type, means whereby the various difficulties arising in manipulating service box structures may be readily overcome, the parts coöperating with one another to produce the required operations.

A further object of the invention is to provide a particular form of connection between parts, by means of which a rotative movement of one part to the other is absolutely prevented without necessitating the provision of a connecting sleeve intricate to operate.

A further object is to provide a structure of this type in which the form of connection is similar in all of the parts, whereby adjustability and interchangeability may be had.

Other and further objects of the invention are to provide a device of this type which is simple and efficient in operation, durable in construction, readily taken down or assembled, and which can be manufactured at a relatively low cost.

To these and other ends, the nature of which will be readily understood as the invention is hereinafter disclosed, said invention consists in the improved construction and combination of parts hereinafter fully described, illustrated in the accompanying

drawings and particularly pointed out in the appended claims.

In the accompanying drawings, in which similar reference characters indicate similar parts in each of the views,—Figure 1 is a view in elevation of a service box key formed in accordance with my invention, the view showing a number of lengthening sections and one form of socket key which may be employed in connection therewith. Fig. 2 is a sectional view taken longitudinally of one of the connecting joints. Fig. 3 is a plan view of one end of a socket key. Figs. 4 and 5 are plan views of the opposite end of socket keys showing various sizes of openings. Fig. 6 is a side elevation, partly in section, of a socket key of different form. Fig. 7 is a bottom plan view of the same. Fig. 8 is a modified form of a cross bar structure.

As is well known service boxes are of varying length, the part to be operated being embedded at various depths according to the particular location of the valve of the service pipe relative to the main pipe. Obviously, to provide a key capable of manipulating boxes of all kinds, it is necessary that the key be of sufficient length to provide for the maximum depth of embedding; where the key is formed of a single piece, it becomes unwieldy both in transportation and in operation where the embedding depth is small.

Another feature in connection with service box operation is the fact that not only is it required to manipulate the actual valve which is located within and protected by the service box, but in addition there is a general requirement that not only must manipulation of the cap of the service box be had, but in addition it is necessary to uncover the latter from dirt, washings or ice, etc.

The present invention is intended to meet these and other conditions, the following construction being used for the purpose.

The service box key forming the subject matter of the present invention comprises a handle portion, a series of socket keys, and one or more lengthening members, these parts having complemental structures for providing a rapid connecting of some or all of the members to form a complete structure of more or less length, the connections

being such that any one part is connectible with any other part, thereby providing both for adjustability as to length and interchangeability to accord with the necessary requirements to meet the varying conditions.

The handle portion, designated as 10, is preferably formed as indicated in Fig. 1, in which 11 designates a rigid portion circular in cross section and having its upper end formed angular in cross section, as at 12, said angular portion terminating in a pointed end 13, and having its several sides preferably inclined toward the pointed end in order that a tightening of the cross bar 14 may be had thereon, said cross bar having an opening 15 of complementary configuration and formed with inclined walls to fit the walls of the angular portion. One end of the cross bar 14 is pointed, as at 16, while the other end is wedge-shaped, as at 17, said ends of the cross bar serving the same functions as the ordinary pick, while the removal of the cross bar permits of the handle, when connected up with the extension or lengthening parts presently described, to act in a manner similar to a crowbar, the pointed end 13 being provided for this purpose, or to serve as a fulcrum in operating in the manner of a pick.

If desired, the handle portion may be formed of one piece, as indicated in Fig. 8, in which case the serviceability as a crowbar would be eliminated, leaving the pointed end 13 useful as a means for removing ice, etc., and serving as a fulcrum point where it is desired to provide a "prying-up" of a part.

The lower end of the handle portion is provided with a collar 18 spaced from the end, the portion between the collar and the end being in the form of a male member 19 angular in cross section, and having its angular points lying wholly within and spaced from the peripheral line of the collar 18. Mounted loosely on the cylindrical portion 11 is a screw-threaded sleeve 20 having an turned upper flange 21 formed with an opening of less diameter than the diameter of the periphery of the collar 18, the sleeve being formed to have a free movement longitudinally of the cylindrical portion but prevented from removal therefrom by the collar 18, said collar serving as a riding face for the flange 21 when the sleeve is turned "home" in connecting one of the parts to be described to the handle. This particular form of the male connecting member is employed in each connection used in completing the key.

The female member of the connection is in the form of a head 22 exteriorly screw-threaded to fit the threads of the sleeve 20, said head being formed with an angular recess 23 adapted to receive the male portion 19, the two parts being of complementary

angularity. To form the connection, the sleeve 20 is moved on its supporting portion (the cylindrical part 11) until the lower face of the collar 18 is exposed. The female member, 22 is then placed in position with its upper face in contact with the lower face of the collar 18, the male member 19 passing into the recess 23. This places the screw-threaded portion of the member 22 in position where a rotary movement of the sleeve 20 will cause the screw threads to engage, the sleeve 20 being simply run down on the member 22 until contact is had of the collar 18 and the flange 21 at which time the parts connected by this connection are held against longitudinal movement by reason of the screw-threaded connection and the contact of flange and collar, and against relative rotative movement by reason of the angularity of the complementary male and female portions.

In the drawings I have shown the male and female portions as of angular configuration, being square in cross section; obviously, the contour of the angular portion may be varied by a greater or less number of faces which may be of unequal length if desired. Or the configuration of these complementary members may extend on curved lines regular or irregular, such, for instance, as an oval or other non-circular configuration, an equivalent thereto being the use of one or more pins and corresponding recesses, located to provide the equivalent of an "off-center" position, all of these forms being included within the scope of the invention in this respect, the purpose being to provide complementary portions located entirely within and spaced from the plane of the screw-threaded connection of the sleeve, for preventing relative movement without placing any rotative pressure or strain on the screw-threads when the connected parts are rotated as a unit. In other words, the complementary male and female portions are formed non-rotative with respect to each other when the sleeve is in position, the structure providing against a placing of strains on the screw threaded connection while the tool is being rotated, thereby retaining the serviceability of an entirely integral structure with the advantage of it being formed take-down structurally. There is an additional advantage resulting from this structure in use, in that the sleeve forms an annular strengthening member for the walls of the female member of the connection against the strains thereon provided by the rotative movements of the key, this strengthening member being removed by the disconnection of the parts.

The remaining members of the key herein disclosed are socket keys each having the portion 22 hereinbefore described at their upper ends and having their lower ends

formed with recesses 24, the walls of which are angular with respect to each other, the recesses being adapted to fit valve keys of the general type used, the drawings showing various forms and sizes employed, one of said socket keys also having a groove 25 extending diametrically of the end and intersecting the recess 24 of the key.

The remaining member or members of the structure is the extension bar 26, one end of which is formed with the male portion of the connection, the opposite end having the female portion. This member may be made of standard length and in use any required number may be connected together to provide the necessary length to the service box key.

Inasmuch as each of the remaining parts of the structure are formed with female connecting members, it will be obvious that any of said parts may be connected directly to the handle portion, thereby permitting of a direct connection of a socket key member with the handle member; where a great length is desired one or more of the lengthening members 26 may be employed between the handle member and the socket key member, and inasmuch as the socket key members all have the same form of coupling, it will be obvious that either one of the forms shown may be connected up in this manner.

There are several particular advantages resulting from the use of the connection disclosed herein, some of which have been heretofore pointed out. In addition thereto, it may be noted that, while the sleeve 20 acts to some extent in the same manner as the ordinary union or coupling member, the presence of the male and female portions, provides for a support for the member to be coupled while the threads are being engaged, thereby eliminating the necessity for the user attempting to manually position the members relative to each other during the movement of the sleeve.

As will be readily understood, the parts can be taken down and placed within a package of relatively small compass, the portion 14 being removable and lying alongside of the extension members 26, the socket key members being connected up to the several extension members to prevent their loss. When it is desired to place the key in operation, the service box cap is opened,

the handle portion serving for this purpose, and the necessary length of key built up by connecting one or more extensions to the handle and securing the socket key member in position at the lower end thereof.

While I have herein disclosed a preferred type of my invention, it will be readily understood that variations in structure thereof may be had to meet varying conditions which may arise, and I reserve the right to make such modifications and changes therein as may be found necessary and which may fall within the spirit of the appended claims.

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

1. In a service box key, a round handle portion having an angular tapering upper end and having a collar at its lower end with a reduced angular extension projecting longitudinally below the collar, an internally threaded sleeve loose on the handle portion and having an inturned flange engaging the collar to retain the sleeve from displacement, a cross bar carried on the upper end of the handle portion and having a central opening of complemental configuration to bind the bar on the handle, and an extension member having an angular socket snugly receiving the angular extension of the handle portion and having exterior threads about the socket for the reception of said sleeve.

2. In a service box key, a round handle member having a fixed collar on its lower end, and an angular extension projecting longitudinally below the collar, the member being provided with an upwardly tapering angularly formed portion at its upper end, a sleeve loose on the round handle and having an inturned flange adapted to engage the collar to retain the sleeve on the member, and a cross bar carried on the upper end of the handle member and having an opening therethrough midway of its ends, the opening being of complemental configuration whereby the cross bar is adapted to bind on the handle member.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

SAMUEL T. DOWNS.

Witnesses:

ERNEST A. MORRIS,
Mrs. T. W. PEARSON.