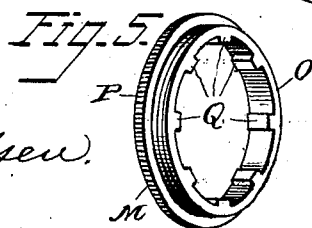
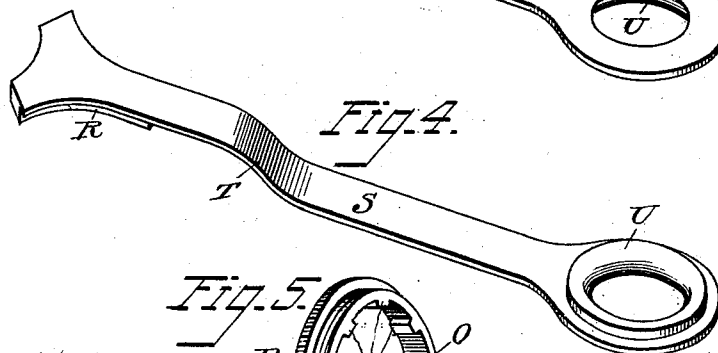
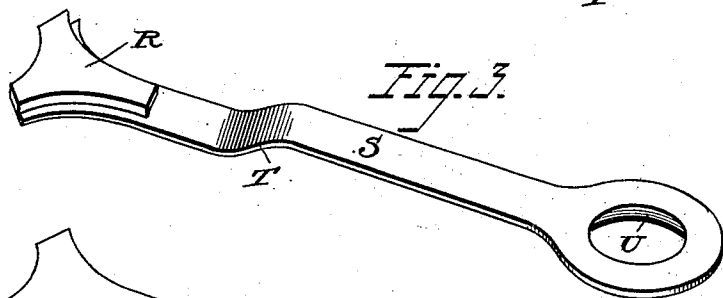
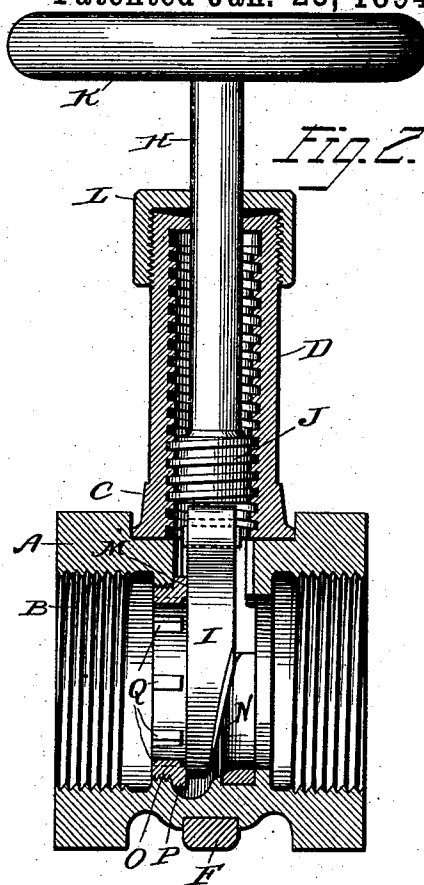
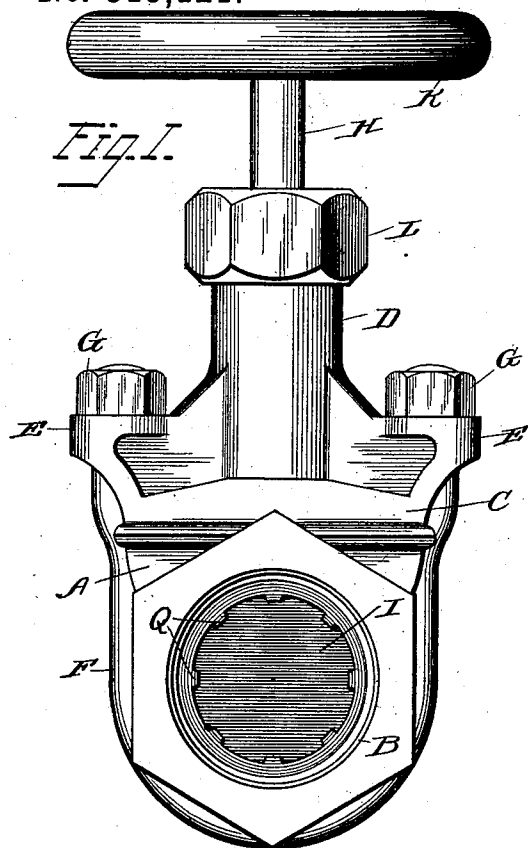


E. H. LUNKEN.

TOOL FOR APPLYING OR REMOVING RENEWABLE SEATS IN
STRAIGHTWAY VALVES.

No. 513,121.

Patented Jan. 23, 1894.



Witnesses
Martin St. Olsen.
R. B. Caffray.

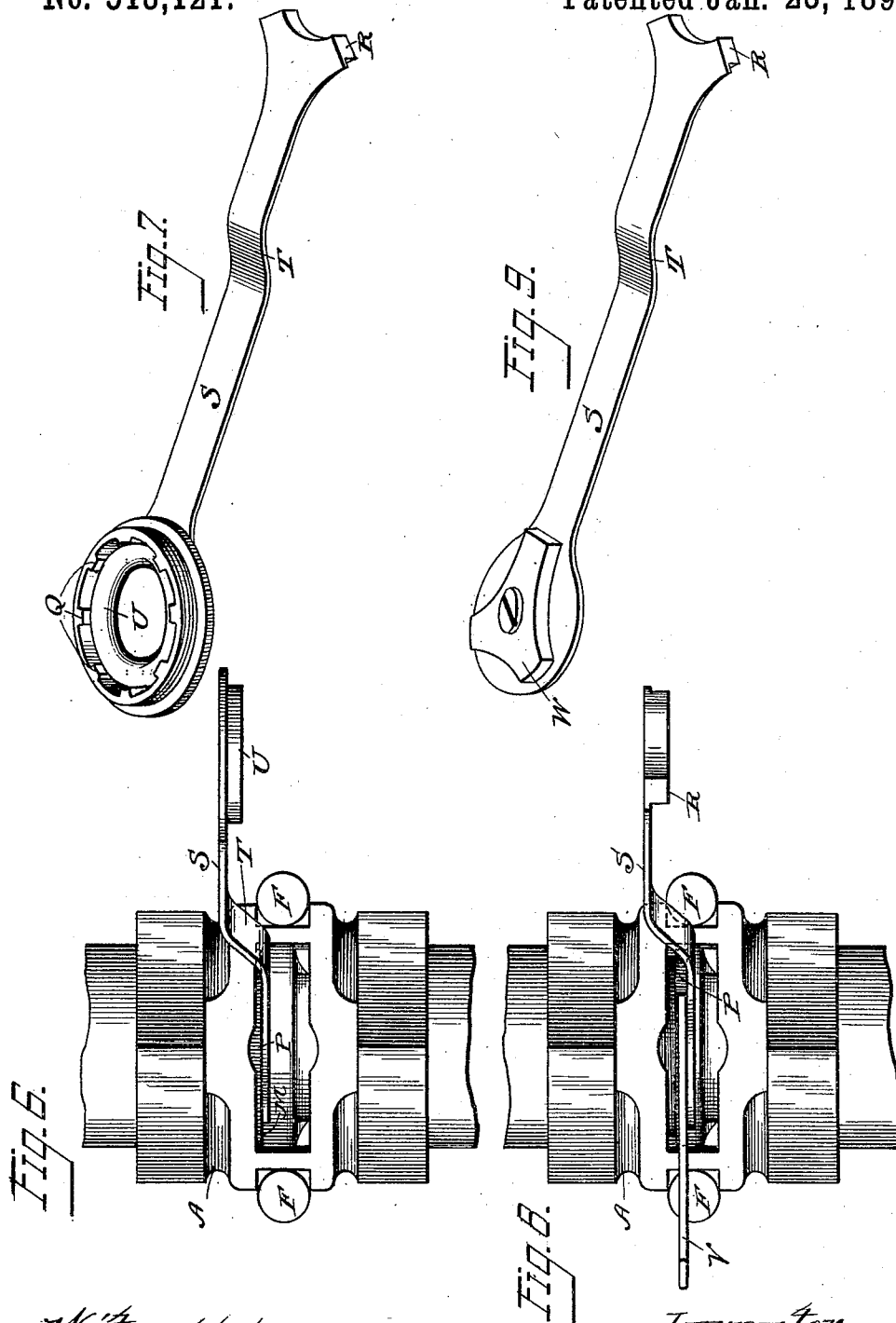
Inventor
Edmund H. Lunken
by Edward Rector
his atty.

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UNITED STATES PATENT OFFICE.

EDMUND H. LUNKEN, OF CINCINNATI, OHIO, ASSIGNOR TO THE LUNKEN-HEIMER COMPANY, OF SAME PLACE.

TOOL FOR APPLYING OR REMOVING RENEWABLE SEATS IN STRAIGHTWAY-VALVES.

SPECIFICATION forming part of Letters Patent No. 513,121, dated January 23, 1894.

Application filed April 17, 1893. Serial No. 470,654. (No model.)

To all whom it may concern:

Be it known that I, EDMUND H. LUNKEN, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented a certain new and useful Tool for Applying or Removing Renewable Seats in Straightway-Valves, of which the following is a description, reference being had to the accompanying drawings, forming part of this specification.

My novel tool is designed for use in applying and removing renewable seats in straightway valves without disconnecting such valves from the lines of pipe in which they are located. It is intended more particularly for use in connection with straightway valves having renewable seats such as shown and described in Letters Patent No. 494,579, granted to me April 4, 1893, though it may be employed in applying and removing similar renewable seats in other forms of valves.

In the accompanying drawings Figure 1 represents an end elevation of a valve containing a renewable seat similar to that shown in my aforesaid Letters Patent; Fig. 2 a middle vertical section of the same longitudinally of the passage through the valve; Fig. 3 a perspective view of my novel tool in one position; Fig. 4 a similar view of it in another position; Fig. 5 a perspective view of one form of renewable seat for the valve; Fig. 6 a view of the valve located in a line of piping, and having its bonnet or hood and valve-stem and disk removed, and my novel tool inserted in the body of the valve in position to unscrew the renewable seat; Fig. 7 a perspective view of the tool with a loose renewable seat placed thereon ready to be inserted in the valve; Fig. 8 a view of the valve corresponding to that in Fig. 6, with the tool holding the renewable seat in position to be screwed into its seat in the valve, and with a sharp-pointed instrument acting upon the milled edge of the renewable seat to start it in position; and Fig. 9 a perspective view of a modified form of the tool.

The same letters of reference are used to indicate identical parts in all the figures.

Inasmuch as the tool to which my present invention relates is designed particularly for

use in connection with the valves shown in the drawings, I will first briefly describe that valve. Its casing consists of the body portion A having the straight cylindrical passage through it and the opposite integral flanged and interiorly threaded pipe-connections B B. The upper side of the milled portion of the body A is formed into a rectangular seat upon which rests the bonnet or hood C of the casing, the interior of the body communicating with the interior of the bonnet by a long narrow opening through which the valve-disk is lifted into the bonnet when the valve is opened. The top of the bonnet is formed into a vertical neck D, in this instance tubular in form and having the convex surfaces of its opposite sides continued down the opposite faces of the bonnet to the flange at the lower edge of the latter. At the opposite sides of the bonnet are two laterally projecting ears E E through which pass the upper ends of a U-shaped clip F which surrounds the body A of the valve and has nuts G G screwed upon its upper ends and bearing against the ears E E to bind the bonnet and body portion of the valve together. The valve-stem H extends vertically through the neck D of the bonnet to the bottom of the latter and has loosely coupled to its lower end the disk I. Near its lower end it is provided with a threaded portion J which engages threads upon the opposite inner faces of the bonnet and neck D, so that the turning of the valve-stem will cause it and the disk carried by it to be raised and lowered. The valve-stem has a handle K fast upon its upper end, for turning it, and the neck D of the bonnet has a cap-nut L screwed upon its upper end and confining the packing around the valve-stem. The disk I co-operates with a renewable seat M which has a reduced exteriorly-threaded portion by which it is screwed into position in the body of the valve. A wedging piece N fitted in a groove in the body of the valve co-operates with the side of the disk I opposite the seat M and serves to force the disk against its seat when it is lowered by the turning of the valve-stem. As seen more particularly in Fig. 2 the renewable seat M consists of an exteriorly threaded ring O having at one edge a laterally projecting flange

P provided with a roughened or milled edge, and having formed upon its inner surface a series of lugs Q.

From the foregoing description it will be seen that in assembling the parts of the valve the seat M might be inserted through the long narrow opening in the upper side of the valve body and fitted in position and screwed into the body by a tool inserted through one of the pipe-connections; so, too, after the valve has been used if the seat should become worn and it be desired to replace it with a new one the valve could be removed from the line of pipe in which it was located, the seat unscrewed by means of a tool inserted through one of the pipe connections, the bonnet of the valve removed and the seat taken out and a new one inserted and fixed in place; but it is often exceedingly inconvenient to remove a valve from the pipe in which it is located, for the purpose of putting in a new seat, and if the valve be not removed from the pipe the only access which can be had to its interior is through the long narrow opening in the upper side of the valve, as seen in Fig. 6, and it is extremely difficult, if not practically impossible, to remove and apply the renewable seats through this opening without a tool specially designed for the purpose.

My present invention has for its object the production of a tool for this purpose, by which the old seats may be readily removed and replaced by new ones without disconnecting the valve body from the line of pipe in which it is located.

My novel tool consists of two parts, one for removing the seat from the valve, and the other for applying it to the valve. These two parts are formed upon or secured to the same handle, and hence I refer to my invention as a single tool, but they may be upon different handles and in that event constitute two separate tools. The portion of the tool to be employed for removing the seat from the valve may be called a wrench, and consists in this instance of a three-armed plate R located upon one end of the handle S, Fig. 3. This plate is of sufficient thickness or projects above the surface of the handle S far enough to cause it to stand in the plane of the lugs Q upon the inner surface of the ring of the valve-seat M when the latter is placed flanged-end downward upon the handle S and over the plate R. The plate R is also of such shape that the extremities of its three arms will fit between the lugs upon the inner surface of the valve-seat, so that the seat may be turned by turning the handle. The plate R may be of any other suitable shape (in my patent heretofore referred to a straight or two-armed plate is shown), or separate projections upon the handle S may be substituted for the single plate and made to engage the inner surface of the seat M at either more or less than three points.

To remove a seat from a valve in a line of

pipe by means of this wrench portion of the tool, the bonnet of the valve is first removed and the wrench then inserted through the narrow opening in the valve body, as seen in Fig. 6, and its plate R or equivalent projections engaged with the lugs upon the inner surface of the valve-seat. Upon then successively vibrating the handle and disengaging and re-engaging the wrench with the seat the latter may be unscrewed from the body and removed, as will be readily understood. The handle S is bent at T to enable it to clear the ends of the clip F and permit it to be vibrated backward and forward the full length of the opening in the valve body.

The portion of the tool employed for applying the seat to the valve consists of a handle provided upon one end with a bearing upon which the loose seat may freely revolve and by which the seat may be held in position for the threads upon its exterior to engage the threads in the valve body while the seat is turned, to cause such engagement, by means of some pointed instrument inserted through the narrow opening in the valve body and caused to act upon the milled edge of the flange of the seat to turn the latter. This bearing for supporting the seat and permitting it to be turned by such instrument may be either a fixed bearing upon the handle, upon which the seat may be turned, or it may be a rotary bearing carried by the handle and turning with the seat. In my preferred construction it consists simply of a ring U (though it could as well be a solid disk) formed upon the surface of the handle S at the opposite end from the wrench R, and in this instance upon the opposite face of the handle. When the seat is to be applied to the valve it is placed upon the handle around this ring, as seen in Fig. 7, and is then inserted through the narrow opening in the valve body and adjusted to and held in position for the threads upon it to engage the threads in the valve body, and is then turned, to cause such engagement, by means of a pointed instrument, such as V, inserted through the opening in the valve body and engaged with the milled edge of the flange of the seat. After the seat has been turned in this manner sufficiently to engage its threads with those in the valve body, so that the seat will be held in position, the handle is removed from the valve body and its opposite wrench-end then inserted and engaged with the lugs upon the inner surface of the seat and the latter then firmly screwed into position in the same manner that the seat was removed by means of the wrench, as will be readily understood.

In Fig. 9 I have shown a rotary bearing for supporting the valve-seat while it is being turned with the pointed instrument, instead of the fixed ring U above described, said rotary bearing consisting of a three-armed plate W, similar in shape to the wrench plate R at the opposite end of the handle, but pivoted

to the handle at its center instead of being rigidly secured thereto. The loose seat may be supported and held in position by this rotary bearing, while it is being turned by the pointed instrument, in the same manner as it was turned by the fixed annular bearing before described.

From the foregoing description it will be seen that by means of my novel tool an old or worn seat in a valve may be readily removed therefrom and a new seat applied and firmly secured in its place, without disconnecting or removing the valve from the line of pipe in which it may be located.

So far as I am aware I am the first in the art to accomplish this desirable result in any manner or by any means whatsoever, and my invention is therefore not restricted to any particular shape or construction of the novel tool which I have invented for this purpose, but contemplates all variations in its form so long as it operates in connection with the removable seat in the manner described.

Having thus fully described my invention, I claim—

1. The herein described tool for removing and applying renewable seats in straight-way valves through the bonnet-openings thereof, consisting of a handle S having formed or secured upon one side at its end the flat multi-armed wrench plate R projecting above the surface of the handle and adapted to be inserted through the bonnet-opening of the valve and engage projections at different points upon the inner periphery of the valve seat, substantially as and for the purpose described.

2. The herein described tool for applying renewable seats to straight-way valves through the bonnet-openings thereof, consisting of a handle provided upon one side at its end with a bearing shaped to receive and be encircled by the valve seat and permit the latter to be freely turned and removed therefrom, said tool being adapted to be inserted with the valve seat through the bonnet-opening and to hold the valve seat in position while it is turned to engage its threads with those in the valve body, substantially as and for the purpose described.

3. The herein described tool for applying renewable seats to straight-way valves through the bonnet-openings thereof, consisting of a handle having formed or secured upon one side at its end a fixed circular bearing to receive and be encircled by the valve seat and

permit the latter to be freely turned and removed therefrom, said tool being adapted to be inserted with the valve seat through the bonnet-opening and to hold the seat in position while it is turned to engage its threads with those in the valve body, substantially as and for the purpose described.

4. The herein described tool for applying renewable valve-seats to straight-way valves, consisting of a handle S provided upon its side near one end with a bearing upon which the valve-seat may be fitted and freely turned, and upon its side near its opposite end with a wrench-portion, said tool being shaped to adapt its end having the bearing to be inserted with the valve-seat through the bonnet-opening and to hold the seat in position while it is turned to engage its threads with those in the valve-body, and to have its opposite end then inserted through the bonnet-opening and its wrench-portion engaged with the projections upon the inner surface of the valve-seat to screw the latter into the valve-body, substantially as and for the purpose described.

5. The herein described tool for applying renewable seats to straight-way valves through the bonnet-openings thereof, consisting of a handle having formed upon its side near one end a fixed circular bearing upon which the valve-seat may be pivoted and freely turned, and having a wrench-portion R formed upon its side near its opposite end, said tool being shaped to adapt its end having the bearing to be inserted with the valve-seat through the bonnet-opening and to hold the seat in position while it is turned to engage its threads with those in the valve-body, and to then have its opposite end inserted through the bonnet-opening and its wrench-portion engaged with projections upon the inner surface of the valve-seat, substantially as and for the purpose described.

6. The herein described tool for removing and applying renewable seats in straight-way valves, consisting of the handle S bent at T and having upon one end the three-armed wrench-plate R and upon its opposite end the fixed circular bearing U, the wrench-plate and bearing being adapted to co-operate with the valve-seat in the manner and for the purpose described.

EDMUND H. LUNKEN.

Witnesses:

EDWARD RECTOR,
ALBERT H. MEADS.