No. 607,379. Patented July 12, 1898.

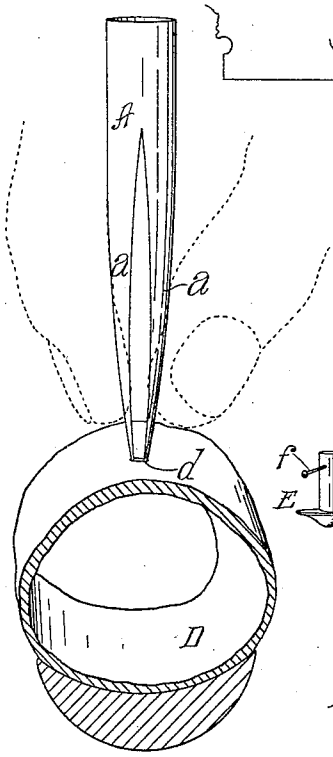
W. M. JONES.

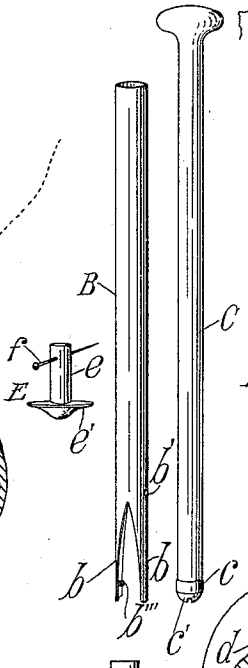
REPAIR KIT FOR SINGLE TUBE BICYCLE TIRES.

(Application filed June 21, 1897.)

(No Model.)

Fig. 1.





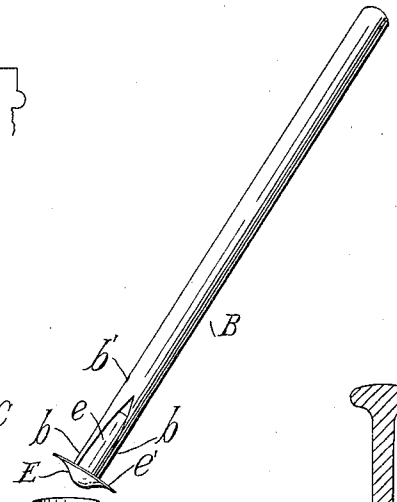
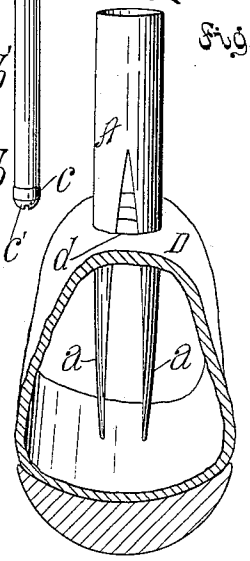


Fig. 2.



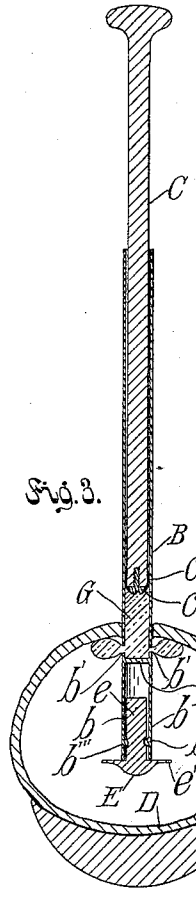
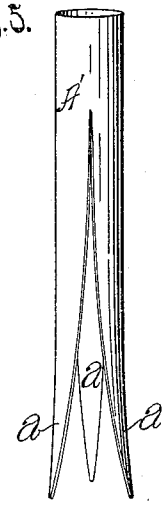


Fig. 3.

Fig. 5.



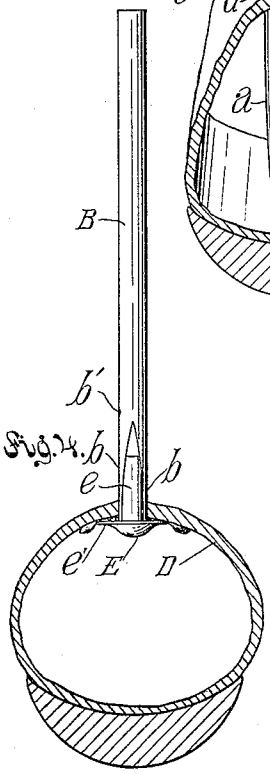


Fig. 4.

Witnesses
Berry Ingman.
E. C. Chapman

Inventor
Walter Malcolm Jones
by Townsend Bros
his attys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WALTER MALCOLM JONES, OF SANTA MONICA, CALIFORNIA.

REPAIR-KIT FOR SINGLE-TUBE BICYCLE-TIRES.

SPECIFICATION forming part of Letters Patent No. 607,379, dated July 12, 1898.

Application filed June 21, 1897. Serial No. 641,724. (No model.)

To all whom it may concern:

Be it known that I, WALTER MALCOLM JONES, a citizen of the United States, residing at Santa Monica, in the county of Los Angeles and State of California, have invented a new and useful Repair Outfit for Single-Tube Bicycle-Tires, of which the following is a specification.

My invention relates particularly to repair outfits for repairing single-tube bicycle-tires by means of a plug. Heretofore difficulty has been experienced in applying such plugs, in that the head of the plug offers great resistance to the proper introduction of the plug into the tire, and also to the further fact that it is very difficult to insure the proper application of cement to the plug and to the walls of the puncture.

It has heretofore been proposed to insert the plug through a hollow expander having a number of resilient fingers springing normally inward to form a point, the fingers being afterward expanded by the introduction therethrough of a tube containing the plug, the head of the plug being chambered in the end of the tube. Thus the tube must not only expand the walls of the puncture, but must also overcome the resistance of the spring-fingers, thus making the force required to introduce the tube so great as to necessitate that the head of the plug be entirely chambered within the tube. It is difficult to compress the head of the plug to seat it in the chamber. It has also been proposed to apply the plug by placing it within a hollow tube having a beveled end, inserting the tube into the puncture, and then pushing the plug downward out of the tube, cement being introduced into the tube and discharged through orifices in the walls of the tube above the end thereof. This means is inconvenient and unsatisfactory in practice, since the plug is depended upon to stop the lower end of the tube, so that the cement may be forced out through the orifices, and in order to allow the head of the plug to be chambered in the tube the tube must be much larger than the stem of the plug, so that as soon as the head of the plug is forced from the tube the plug is liable to drop from the tube into the tire.

It is an object of my invention to produce a repair outfit for single-tube tires in which the plug may be introduced into the tire without contracting the head of the plug materially beyond its normal size and whereby cement may be properly introduced without any liability whatever of failure.

My invention comprises a plug-guide having a plurality of spring-fingers at one end, such fingers being arranged to normally spring apart when the guide is forced into the puncture to expand the walls of the puncture, and a tubular cement-nozzle having plug-holding fingers at one end, lateral outlets from the inside of the tube near the base of such fingers, a closure for the tube arranged below the outlets, and a piston to work within the cement-tube and to force cement from the tube through the outlets.

The accompanying drawings illustrate my invention.

Figure 1 shows the apparatus with parts separate and the guide-plug just started into a hole in the tire, a fragment of which is shown. Fig. 2 shows the guide fully inserted in the hole in the tire and the cement-nozzle and plug-holder with plug in place ready for insertion. Fig. 3 is a longitudinal mid-section showing the plug fully inserted into the tire and the piston partially pressed down and the cement partially pressed out to form the cement bed into which the flange of the plug will be drawn. Fig. 4 is a section showing the plug-holder drawn out sufficiently to fully seat the plug. A further outward movement of the plug-holder will withdraw it from the plug, thus leaving the plug firmly seated and the hole perfectly closed. Fig. 5 is a perspective view of a plug-guide having three plug-guiding fingers.

My invention embraces the single-tube-bicycle-tire-repair outfit, comprising a plug-guide A, having a plurality of spring-fingers *a* at one end to form the plugway, a tubular cement-nozzle B, with plug-holding fingers *b* at one end and lateral outlets *b'* from the inside of the tube near the base of such fingers, and a piston C for the cement-tube.

My invention also includes the plug-guide, having two, three, or any suitable number of pointed spring-fingers, which can be pressed together to bring the several points close to each other to virtually form a single point to be inserted into the puncture in the tube.

The resiliency of the fingers is sufficient to open the puncture to the diameter necessary to easily receive the plug when the same is pushed in by the plug-holder. The guide shown is formed of a section of brass tube, with V-shaped cuts in one end extending far enough along the tube to form between them fingers which are flexible enough to allow the ends to be pressed together to enter a small puncture.

By arranging the fingers to spring normally outward when they are inserted into the puncture, as shown in Fig. 2, they spring out of the way and allow the introduction of the plug through the guideway without requiring that the plug-head be compressed by being forced through or chambered within a tube, as has heretofore been proposed.

My invention also includes the tubular cement-nozzle, with plug-holding fingers at one end below the cement-outlets.

b'' indicates a plug or partition to close the lower end of the cement-tube between the cement-outlets b' and the plug-holding fingers b. I have shown two cement-outlets, but three or more may be provided, if desired.

b''' indicates plug-holding points on the inside of the plug-holding fingers, so that when the stem of the plug is inserted into the space between the plug-holding fingers the points will retain the plug with sufficient force to resist a considerable pressure when the plug is drawn up to press the flange tightly into the bed of cement. This is of very great importance, since thereby I am enabled to slip the plug-stem in between the fingers, the projections gripping the stem so tightly that there is no possibility of losing the plug or of not causing it to become properly seated in the puncture. It is obvious that these plug-holding points cannot be employed in a tube, since the plug-stem must be forced in from the side or the fingers spread apart to allow the stem to be slipped in from below. The piston C is shown with a packing c, held in place by a screw c'; but in ordinary practice it will be sufficient to provide a plunger the end of which tightly fits the tube B without any additional packing.

In practice the operator will press the points of the plug-guide fingers together, as indicated in Fig. 1, and these points will be inserted into and pushed through the puncture d in the tire D. When fully inserted, as shown in Fig. 2, the margin of the puncture will have stretched so as to allow the plug to be easily inserted. Then the stem e of the plug E is inserted between the fingers b of the plug-holder, as indicated in Fig. 2, and then the plug is pushed down through the plug-guide A until it is fully within the tube, as indicated in Fig. 3.

A very easy way to insert the stem of the plug into the plug-holder is to run a pin f through the plug, and this pin can be passed between the fingers b. Then by pulling on the pin the plug can be easily drawn into place between the fingers. When the plug is in place in the holder, the pin f will be withdrawn, thus allowing the plug and holder to be inserted in the plug-guide.

After the plug is fully inserted into the plug-guide in the tire the tube of the cement-nozzle B is supplied with a sufficient charge G of liquid rubber cement. A simple way to charge the cement-nozzle is to insert into the mouth of the cement-nozzle the end of an ordinary cement-tube in which the cement is sold in the market. Then squeeze the tube until a sufficient quantity of the cement has been forced into the cement-nozzle. Then the piston C is inserted into and pushed down the tube of the cement-nozzle, thus squeezing the cement out through the lateral outlets b' and forming a cement bed ready to receive the flange e' of the plug. When the cement is thus discharged, the plug-holder is withdrawn. The points b''' hold the plug with sufficient force to cause the flange e' to be well seated in the cement before the holder withdraws from the plug, and a further outward movement of the plug-holder will withdraw the plug-holder from the stem of the plug, thus leaving the flange of the plug firmly seated in the cement. Then the stem of the plug may be pulled upon to more firmly seat the plug, if desired, after which the projecting portion of the stem of the plug is cut off even with the outside of the tube and the repair is completed.

Now, having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A tire-repair outfit comprising a plug-guide having a plurality of spring-fingers at one end to form the plugway; a tubular cement-nozzle with plug-holding fingers at one end and lateral outlets from the tube near the base of such fingers; a partition or closure arranged in the tube below the outlets; and a piston for the cement-tube.

2. The combination of the tubular cement-nozzle with plug-holding fingers at one end and lateral outlets from the tube near the base of such fingers; a partition or closure arranged below the outlets; and a piston for the cement-tube.

3. A tire-repairing outfit comprising a plug-guide having a plurality of spring-fingers at one end arranged to normally spring apart to form the plugway; a tubular cement-nozzle with plug-holding fingers at one end and lateral outlets and plug-holding points arranged upon the inside of the fingers; a partition or closure arranged in the tube below the outlets; and a piston for the cement-tube.

4. The tubular cement-nozzle with plug-holding fingers at one end below the cement-outlets, and plug-holding points on the inside of said fingers.

WALTER MALCOLM JONES.

Witnesses:
EUGENE DAY,
E. J. CLARK.