

(No Model.)

F. R. SWALLEY.
VEHICLE AXLE.

No. 427,636.

Patented May 13, 1890.

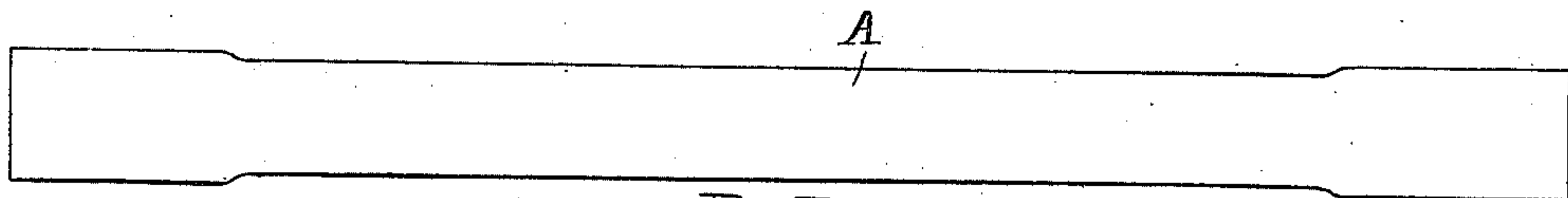


Fig. 1.



Fig. 2.

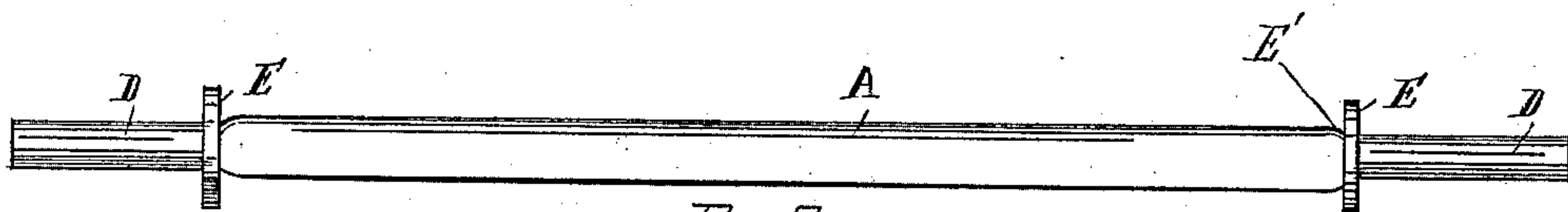


Fig. 3.

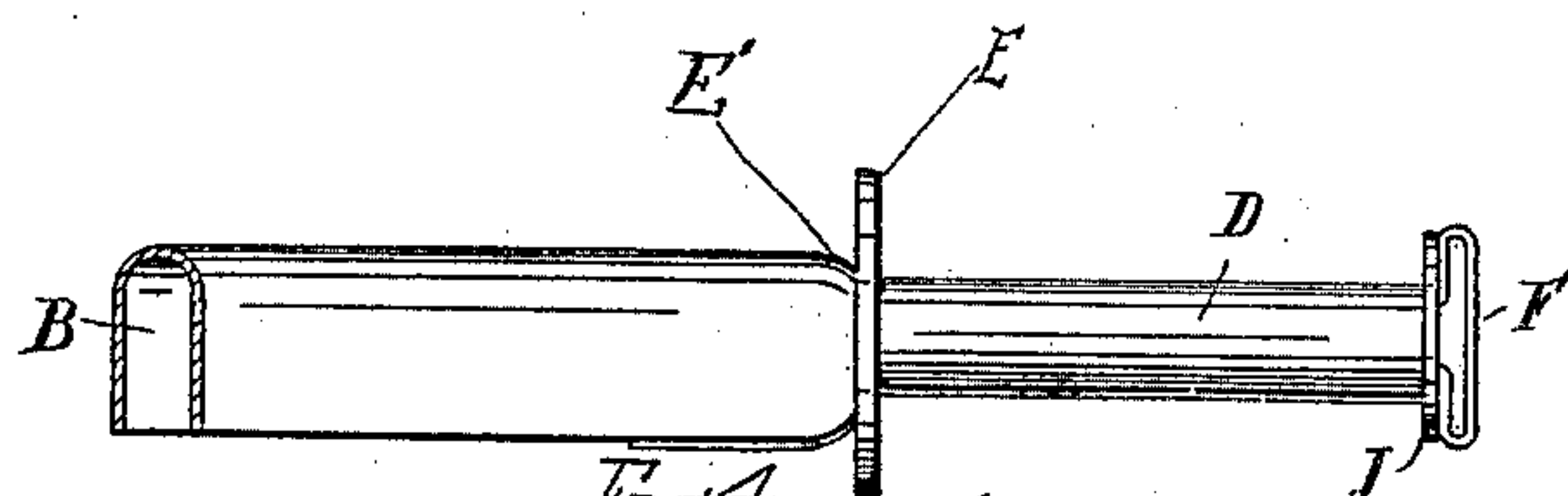


Fig. 4.

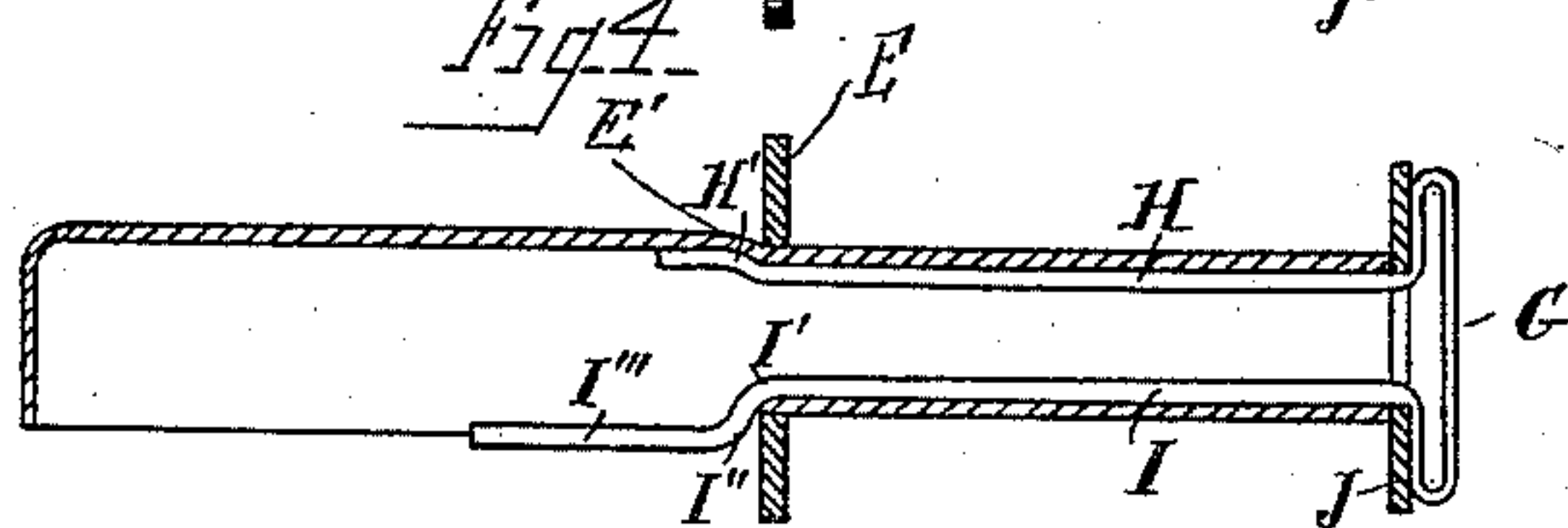


Fig. 5.

WITNESSES

Carroll J. Webster
J. F. Eckhardt.

INVENTOR

Fredrick R. Swalley
By William Webster
Atty

UNITED STATES PATENT OFFICE.

FREDERICK R. SWALLEY, OF TOLEDO, OHIO.

VEHICLE-AXLE.

SPECIFICATION forming part of Letters Patent No. 427,636, dated May 13, 1890.

Application filed June 22, 1889. Serial No. 315,273. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK R. SWALLEY, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Vehicle-Axles; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

My invention relates to vehicle-axles and means for holding the wheel upon the spindle.

The object of the invention is to form a complete axle, comprising the axle-tree and spindles, of a single piece of sheet metal, whereby there shall be a tubular spindle and a central axle-tree formed with a longitudinal opening, thereby combining rigidity with lightness, as well as dispensing with the several parts heretofore assembled in forming a complete axle and spindles.

A further object is to construct spindle and axle-tree relatively to allow a catch to be engaged therewith that shall hold the wheel securely upon the spindle without the aid of the ordinary nut or linchpin.

The invention consists in the parts and combination of parts hereinafter described, and pointed out in the claims.

In the drawings, Figure 1 is a plan view of a blank of sheet metal of the proper size to form a complete axle-tree and spindles. Fig. 2 is a side view of the blank pressed into form to give the desired shape to the central portion or axle-tree, wherein there is formed a central longitudinal opening, either of U form, as shown in Fig. 4, or it may be of any preferred form in cross-section. Fig. 3 is a side view of a complete axle after the ends of the blank have been formed tubular by pressure, and also with the collar secured thereon, against which the hub of the wheel may abut. Fig. 4 is a side elevation of a portion of a complete axle and spindle, with a fastening device for securing the wheel upon the spindle. Fig. 5 is a longitudinal vertical section of the same, showing the fastening device in place within the spindle and axle-tree.

The object of my invention is to construct an axle with a central longitudinal opening and integral tubular spindles as an article of manufacture, with a spring-catch that shall be particularly adaptable to a thimble and axle of such constructions, whereby the complete axle and fastening may be sold to the trade ready for use.

Heretofore in the branch of the art to which my invention belongs the axle-tree has been formed of a sheet of metal pressed into shape, with an opening throughout the length thereof of a U or V shape in cross-section, and the spindles have been secured within the openings and held by clips. While this construction embraces the advantage of strength, rigidity, and lightness to the axle-tree, it requires considerable additional weight to the arms of the spindles and the expense of clips to secure the same. Tubular axles have also been formed with the spindles integral; but this construction requires great weight of metal and care in welding the axle the entire length thereof, necessitating, also, the expense of turning or grinding the spindle to the proper taper. These difficulties are entirely overcome by my invention, in which the blank A is constructed of the proper form and size, preferably by the use of dies, whereby the blank is cut from a sheet of metal. The blank is then pressed into the desired form for the axle-tree of the axle by bending the same throughout the entire length of the blank, preferably by male and female die, to form a channel B of any desired form in cross-section. The ends C of the blank are now bent or turned to form a spindle D, either straight or with any desired taper, said spindle being tubular in form and its bore communicating with the channel or groove of the axle-tree, and at the juncture of the said axle-tree and spindle is formed a shoulder E', against which the washer E abuts when shrunk upon the spindle, as shown.

F designates a device for securing the wheel upon the spindle, and comprises a catch G, formed of wire doubled upon itself in parallel relation, and with a spring-head formed in T shape, the end of one of the side wires H having a slight bend at H' to conform to the shape of the interior of the axle-tree, and the opposite side wire I bent at nearly a right an-

gle at I', and again at the same angle at I'', to cause the end I''' to lie in parallel relation with the lower side of the axle-tree.

J designates a washer, through which the side wires are passed, causing the washer to rest against the T-shaped head of the spring-catch.

In operation the wheel is placed upon the spindle, the side wires are compressed to the interior diameter of the spindles and urged through the same, the bend of wire H rests in the curved portion of the axle-tree, and the angled portion of wire I passes through the narrow opening between the two sides of the blank just in rear of the point where the two sides join in forming the spindle, and the side wires are held in this frictional engagement of wire H and positive engagement of wire I by reason of the spring of the T-head, and the hub of the wheel is confined between the two washers. To release the catch and allow the removal of the wheel from the spindle, the end I''' of wire I is pressed inwardly to remove the angled portion from engagement with the axle, and the entire catch is pulled out of the spindle. It will be seen that the peculiar formation of the axle-tree and spindle renders the same particularly adaptable to the spring-catch.

It will be apparent that I may modify the formation of the T-head somewhat by having but one side thereof protrude prominently to pass through the opening occupied by the angled portion of wire I, and form the opposite side to rest against the shoulder of the axle-tree at the point occupied by the bent portion H' of wire H, and allow the ends of the wires to protrude through the outer end of the spindle

without departing from the spirit of my invention.

What I claim is—

1. As an improved article of manufacture, an axle formed of a single blank of sheet metal and consisting of an axle-tree essentially U-shaped in cross-section, spindles arranged at each end of the axle-tree, said spindles being tubular in form and formed with an annular shoulder at the juncture of the spindle and axle-tree, against which the collar E abuts, and adapted for engagement with the hub-retaining device, substantially as shown and described.

2. As an article of manufacture, a metal axle formed with a body portion having a longitudinal opening upon the under side and tubular spindles upon each end, and a spring-catch passed through the tubular portion and engaging with the body portion of the axle, with projections upon the outer end to hold the wheel upon the spindle, as and for the purpose set forth.

3. An improved wheel-retaining device G for tubular spindles, consisting of a T-shaped head portion, the parallel side wires H and I, having the bent portion H' and I', respectively, near their inner ends, adapted to engage the inner ends of the tubular spindle and hold the device within the same, substantially as shown and described.

In testimony that I claim the foregoing as my own I hereby affix my signature in presence of two witnesses.

FREDERICK R. SWALLEY.

Witnesses:

T. B. TUCKER,
ALANSON WOOD.