

(No Model.)

E. FIRTH & A. & I. TOMPKINS.

SCREW TAP.

No. 379,213.

Patented Mar. 13, 1888.

Fig. 1.

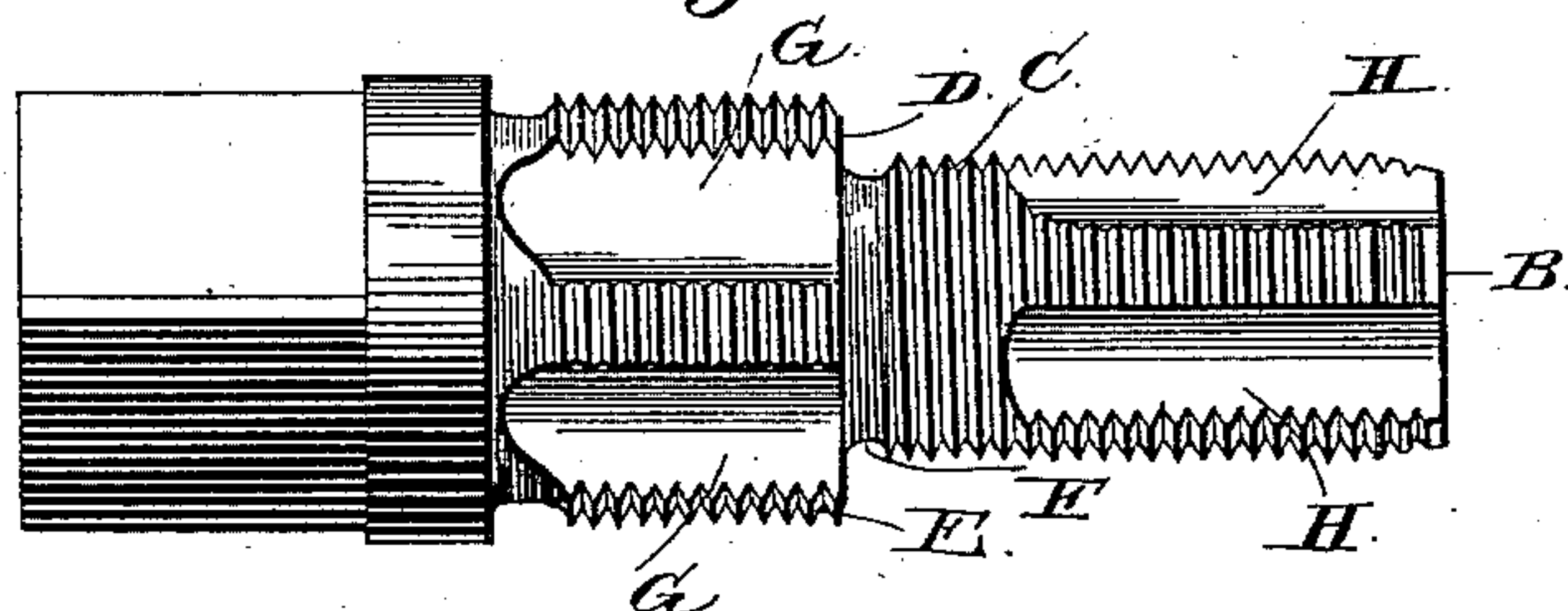


Fig. 2.

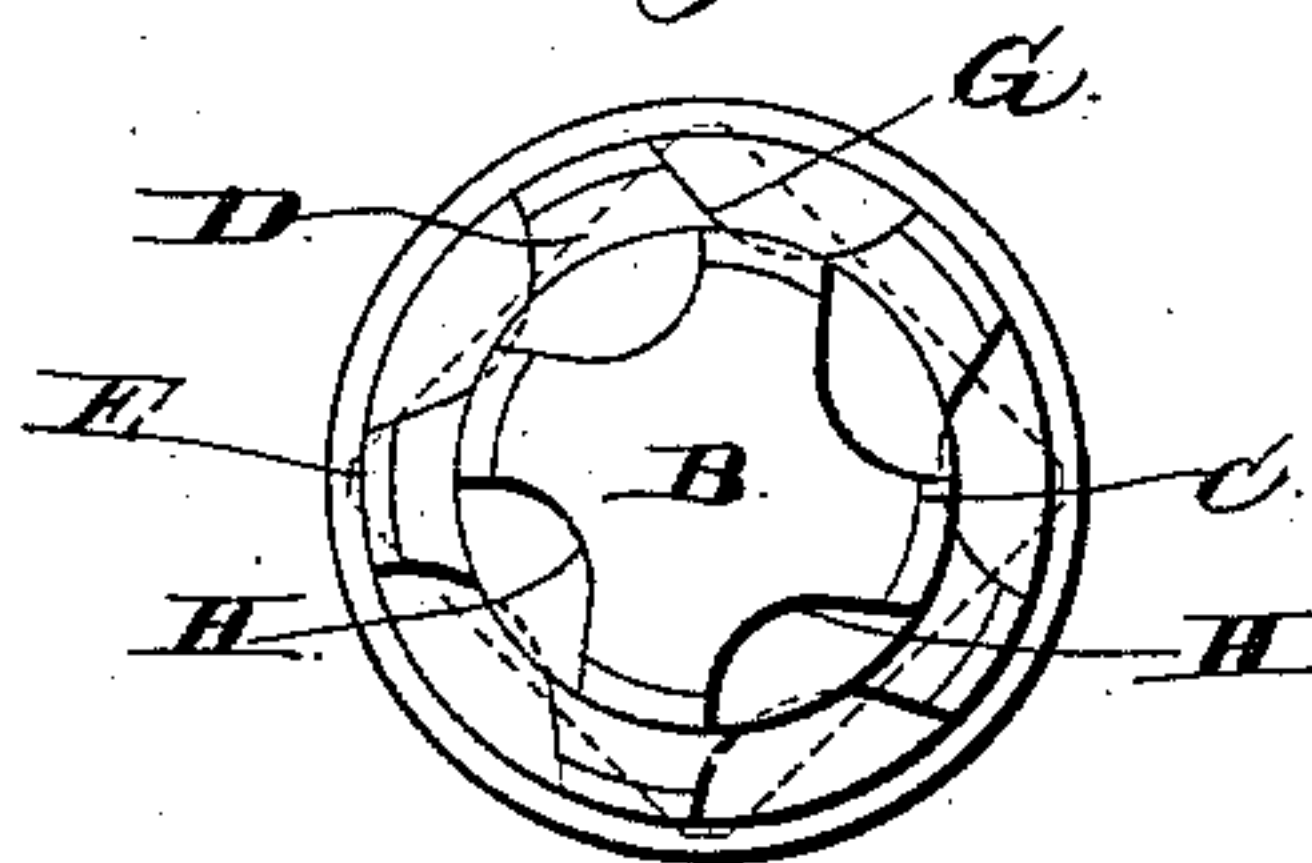
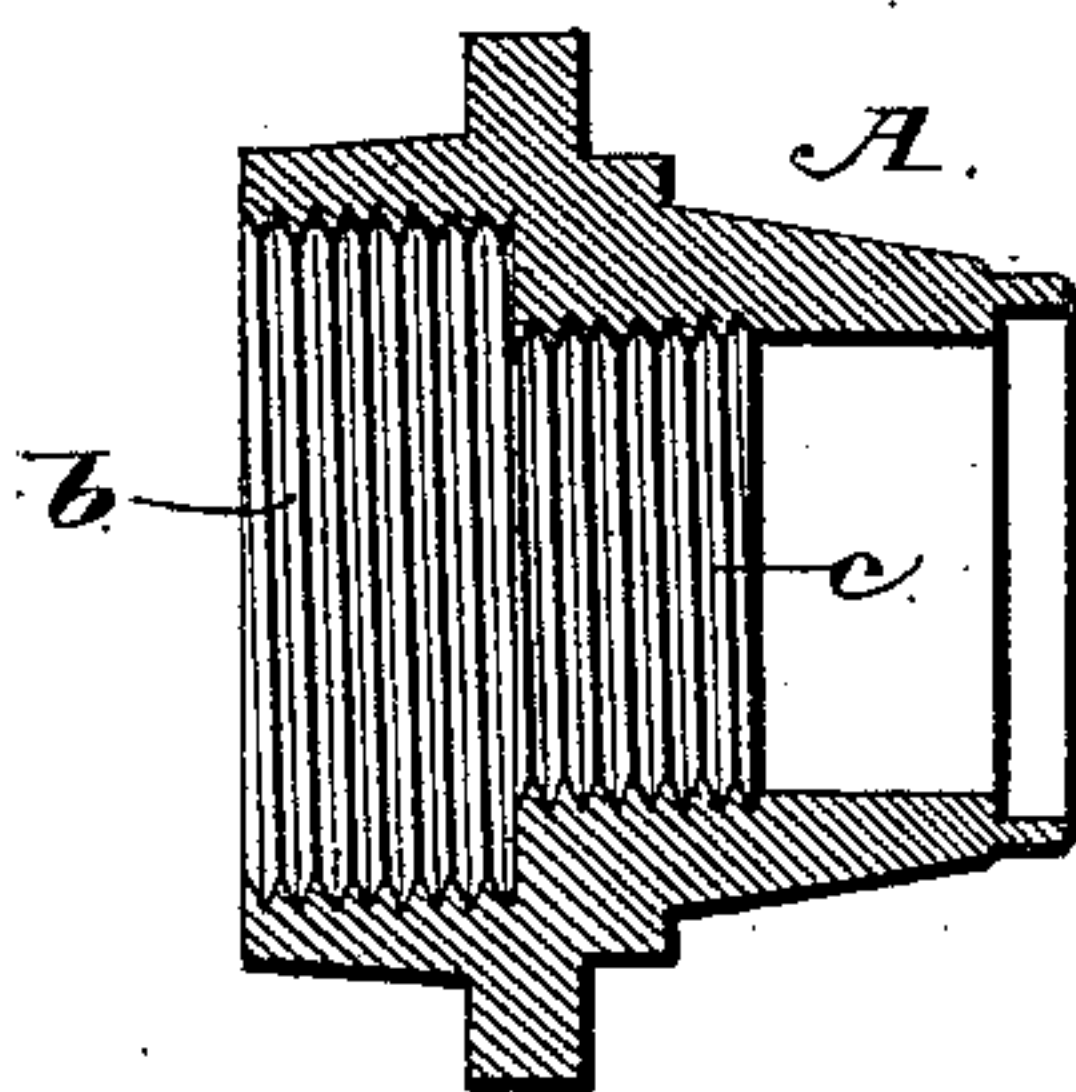


Fig. 3.



Witnesses

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by *C. Snow*
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UNITED STATES PATENT OFFICE.

EDWIN FIRTH, ALBERT TOMPKINS, AND IRA TOMPKINS, OF TROY, NEW YORK.

SCREW-TAP.

SPECIFICATION forming part of Letters Patent No. 379,213, dated March 13, 1888.

Application filed December 1, 1887. Serial No. 256,686. (No model.)

To all whom it may concern:

Be it known that we, EDWIN FIRTH, ALBERT TOMPKINS, and IRA TOMPKINS, citizens of the United States, residing at Troy, in the county of Rensselaer and State of New York, have invented a new and useful Improvement in Taps for Cutting Screw-Threads in Axle-Nuts, of which the following is a specification.

Our invention relates to an improvement in taps for cutting screw-threads in axle-nuts; and it consists in the peculiar construction and arrangement of devices that will be fully set forth hereinafter, and particularly pointed out in the claims.

The object of our invention is to provide a tap which is adapted to cut screw-threads in openings of different diameters without straining or injuring either of the threads, our improved tap being adapted especially for cutting the threads in axle-nuts such as are employed in connection with a vehicle-axle for which Letters Patent of the United States No. 365,376 were granted to Edwin Firth June 28, 1887.

In the accompanying drawings, Figure 1 is an elevation of a tap embodying our improvements. Fig. 2 is an end elevation of the same. Fig. 3 is a vertical longitudinal sectional view of an axle-nut in which the tap is designed to cut screw-threads.

A represents the axle-nut, having the threads *b* in an enlarged opening at the inner end of the nut, and threads *c* in a smaller opening in the nut communicating with the large opening therein. Great difficulty has heretofore been experienced in cutting these screw-threads in the nuts, as the taps such as are commonly employed for cutting threads in openings of different sizes at one continuous operation were found unsuited for this work, being defective in that the threads in the smaller opening in the nut were invariably strained and injured as soon as the tap commenced to cut the threads in the larger opening.

It is essential in manufacturing axle-nuts such as here shown that the screw-threads in the openings therein be cut by the same tap and in one continuous operation, in order that the nuts may be manufactured at so slight a cost as will enable them to be readily disposed of in the market.

The tap hereinafter described is adapted to do this work with perfect satisfaction and in a very expeditious manner, and the construction of the same is as follows: At the outer end of the tap is formed a spindle, B, which is equal in diameter to the smaller opening in the nut and is provided with a screw-thread, C, throughout nearly its entire length. At the inner end of the spindle B is a shoulder, D, the diameter of which is equal to that of the opening in the inner end of the nut, and the said shoulder is provided with screw-threads E, of the same pitch as the thread C. At the inner end of the spindle B, between the thread C and the shoulder D, is an annular groove, F. In the sides of the shoulder D, and parallel with the axis thereof, are grooves G, which intersect the threads E, and thereby provide the same with cutting-edges, and the said grooves G extend entirely across the said threads E. In the sides of the spindle B are cut grooves H, which extend across the threads C and provide the same with cutting-edges; but the said grooves H extend from the outer end of the said spindle only through about two-thirds the length thereof, and thereby leave the threads C beyond the inner ends of the said grooves intact, as shown in Fig. 1.

In the double taps heretofore constructed these grooves H extend the entire length of the spindle, and therefore intersect all of the threads C, so as to leave none of them intact. The result is that while the threads C are cutting the threads in the smaller opening in the nut the threads E, when they commence cutting the threads in the larger opening in the nut, cause the frictional resistance to become so greatly increased as to momentarily retard the forward motion of the tap through the nut, and thereby cause the threads C of the spindle B to exert so great a side pressure upon the threads in the smaller opening of the nut as to injure the said latter threads and weaken them very materially, and also make them irregular and render the nut difficult to be screwed onto or removed from the axle-box. These objections we overcome by extending the grooves H only partially throughout the length of the stem B, so as to leave the threads at the inner ends of the said grooves intact. By this arrangement the in-

tact portions of the threads C are in engagement with the threads in the smaller opening in the nut at the instant that the threads E of the enlarged shoulder begin cutting the threads
5 in the larger opening in the nut, and the said intact portions of the threads C, being in no sense cutting-threads, but acting merely as a leading-screw on a screw-cutting lathe, or a screw or bolt in the small threaded opening in
10 the nut, engage all of the threads in the smaller opening in the nut and distribute the strain upon them when the cutting-threads E begin to work, thereby preventing the forward-motion of the tap from being momentarily retarded and preserving the threads in the
15 smaller opening of the nut from injury.

We have practically tested our improved double tap, and now have the same in successful operation at our factory in Troy, New
20 York, and find that the same possesses very material advantages over the double plug taps heretofore constructed.

Having thus described our invention, we claim—

1. The double tap for cutting screw-threads, 25 having the enlarged shoulder provided with the cutting-threads E, and the grooves G, extending across the said threads, and the projection or spindle B, extending from the front side of the shoulder and having the threads 30 C, and the grooves H, extending longitudinally on the spindle, but only partially across the threads C, whereby the threads C beyond the inner ends of the grooves H are left intact, substantially as described. 35

2. A tap for cutting screw-threads, having grooves extending only partially across its threads, so as to leave a portion of the threads intact, substantially as described.

In testimony that we claim the foregoing as 40 our own we have hereto affixed our signatures in presence of two witnesses.

EDWIN FIRTH.
ALBERT TOMPKINS.
IRA TOMPKINS.

Witnesses:

WILLIAM KEMP,
F. N. MANN, Sr.