

E. TOLLES.  
Carriage-Wheel.

No. 1,440

Patented Dec 27, 1839.

Fig. 1.

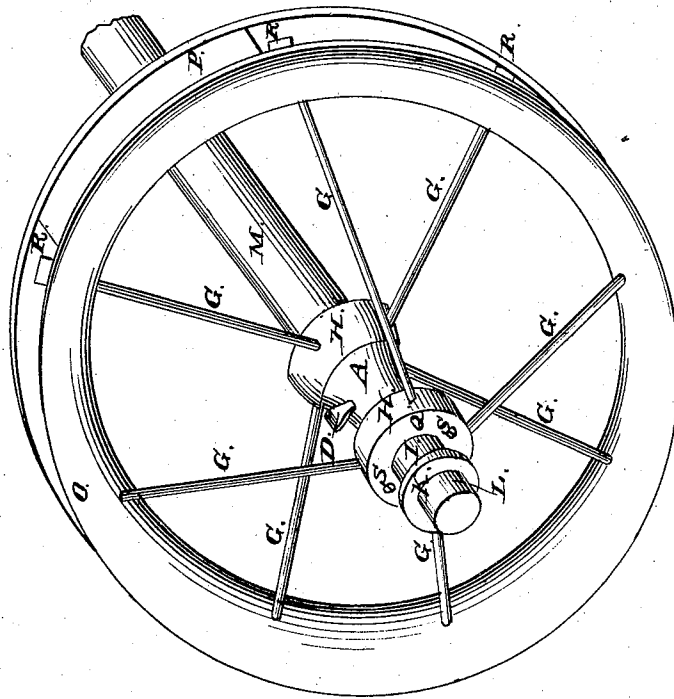


Fig. 4.

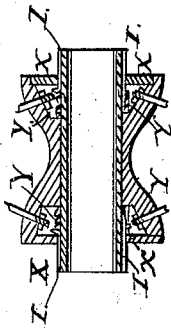


Fig. 2.

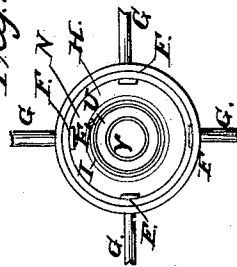
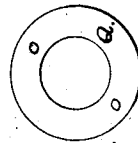


Fig. 3.



# UNITED STATES PATENT OFFICE.

ELISHA TOLLES, OF HARTFORD, CONNECTICUT.

## CONSTRUCTION OF WHEELS FOR CARRIAGES.

Specification of Letters Patent No. 1,440, dated December 27, 1839.

*To all whom it may concern:*

Be it known that I, ELISHA TOLLES, of the city and county of Hartford and State of Connecticut, have invented a new and useful Improvement in Wheels for Carriages of Every Description, Called an "Improved Metallic Suspension-Wheel for Carriages," of which the following is a full and exact description, reference being had to the drawings hereunto annexed.

The hub is to be made of malleable or common, cast iron, or brass, or of any other suitable metal. The body of the hub (Figure 1, A) is a metallic cylinder, the length not varying greatly from the length of the ordinary hub; the thickness and diameter to be proportioned to the size of the axle and wheel, and to the weight proposed to be applied. The perforation of the hub is so much larger than the axle, as to admit of the insertion of a metallic box, or of boxing of other materials, between the hub and the axle. On the outside of the hub, and at a short distance from each end, arise flanges or shoulders made solid with the hub, indicated in Figs. 1 and 2 by letters H, H. On the outer circumference of these flanges, rims are cast, projecting beyond the flanges at each end of the hub; like the metallic bands or rims sometimes used on wooden hubs, leaving an open circular space or chamber between the rim and that portion of the hub which is outside of the flanges. These rims are perforated, at proper distances, to receive the spokes, when metallic spokes are used; and these spokes are fastened to the rims by nuts, screwed on their ends, in the inner side of the rims. These nuts are shown by letters F F F F, in Fig. 2; and the spokes by letters G, G, G, G, in Figs. 1 and 2. To that portion of the hub which extends beyond the outside of the flanges, is fitted a tight movable case or broad ring of metal, which I call the "sand valve." On one end of the hub, in Fig. 1, it is shown by letter I; and in Figs. 2 and 4, the edge of it is shown by the same letter. This case or broad ring is fitted so as to slide easily upon the projecting end of the hub. On the end of this ring or sand valve which is toward the middle of the hub, there is a projecting flange (Fig. 4, X X X X) between which and the flange on the hub, are placed springs (Fig. 4, Y Y Y Y) which press the ring or sand valve toward the end of the hub, and make the sand valve on the inner end of the

hub bear lightly against the washer or shoulder of the axle, and the sand valve on the outer end of the hub (Fig. 1, I) bear in like manner against the nut (Fig. 1, K) or other fastening which is put on the end of the axle to keep on the wheel. The object of this ring or sand valve is to exclude sand or dirt from the inside of the hub, and to keep the oil upon the axle from working out.

In the inner side of the rim of each flange, as above described, is a shoulder or offset, of such depth, that the nuts on the ends of the spokes, when turned to their proper places, will all be flush and even with the outer edge of the shoulder; as shown at letters F F F F in Fig. 2; and the flat ring or cup (Q, Figs. 1 and 2) fits into the inner side of the rim, and rests upon the shoulder and upon the edges of the nuts; and being secured in its place by bolts or screws (S, S, Fig. 1), passing through the flanges, it secures the nuts on the ends of the spokes, so that they cannot turn or work loose.

The perforation of the hub, as above stated, is sufficiently large to admit of a metallic box or of boxing of leather or other materials, between its inner surface and the axle: One box is used for each hub. The box or boxing is secured in its place by means of thumb screws, passing through the body of the hub (A, Fig. 1) at opposite points, one of which is shown at D, Fig. 1. The screws are of proper length to pass through the hub and the box; the thread of the screw being only extended through the hub. These thumb screws can be readily withdrawn for the purpose of introducing oil. When leather or raw hide or other suitable substance is used for boxing, instead of metallic boxes, the material is placed in a thin metallic case or cover fitting the inner side of the hub, the case having a slight rim, in the interior, at its ends, or elsewhere, to keep the boxing material from slipping, and the whole secured by thumb screws, as above described.

The holes for the spokes are made in the rims of each flange on the hub, alternately; so that the spokes at one end of the hub are opposite to the spaces at the other end, as shown in Fig. 1.

The felly or rim of the wheel is of wrought or cast iron, or of steel, or other metal, my improvement consisting in its peculiar shape. It may be made from a flat bar of metal, of a degree of thickness and width

proportioned to the strength required, by bending the bar into a circle of the proper size, and welding the ends; the edges of the bar are then to be turned outward from the center, so as to make a deep hollow groove, furrow, or channel around the periphery of the wheel on the outside, the edges or sides of which channel are, for a short distance, parallel to each other, and perpendicular to the axis of the wheel, and the bottom of the channel or the bend in the metal, is semi-circular, or a segment of a circle. The surface next the hub, on a section parallel to the axis, is, in like manner, convex, and approaching a semicircle, until it meets the parallel sides. This shape is shown in Fig. 1, O, O. The shape and form of the felly are my invention, and not the material or any particular method of producing that shape or form. This shape or form gives to the felly greater strength to resist pressure than any other form of equal weight of metal, especially when further strengthened by the tire.

The felly or rim is pierced with holes, at proper distances, to insert the spokes; which are secured in their places at this end, by nuts, screwing upon the ends of the spokes, and closely fitting into the channel on the outer periphery of the felly; as is shown by the letters R, R, in Fig. 1. This cavity or channel is then filled with wood, as shown at letter P in Fig. 1; having mortises or holes in its inner surface, to fit the nut of each spoke and keep it in its place; and tire is put on, as in case of ordinary wheels. The ends of the spokes in the felly or rim, are all in the same plane, but are carried so as to meet the holes in the rims of the flanges, at each end of the hub, alter-

nately; as shown in Fig. 1, by which they are made to brace, laterally more or less, according to the length of the hub, and thus strengthened against any lateral strain in ordinary use.

These wheels sustain a weight resting on the axle, on what is called the suspension principle, the weight being suspended or hung by the nuts in the hub, and those in the cavity of the rim or felly, as before described, on the spokes which are in the upper half of the wheel, at any time, instead or resting upon those which are in the lower half, as in the common wheel.

In the above described wheel I do not claim the suspension principle, or the making any part of it of metal, or anything in the shape of the spokes or the securing them at each end by nuts, but

I do claim as my invention and improvement, and desire to secure by Letters Patent:

1. The rim of the wheel, of the form and shape hereinbefore described.

2. I claim the furnishing a metallic hub with a box or boxing, which can be replaced when worn, and secured in its place, as above described.

3. I also claim the sand valves in the manner and for the purpose hereinbefore described.

In testimony whereof I, the said ELISHA TOLLES, hereto subscribe my name in the presence of the witnesses whose names are hereto subscribed, on the 11th day of November, A. D. 1839.

ELISHA TOLLES.

Witnesses:

ISAAC P. MARTIN,  
WM. M. HOLLAND.