HUNTER & MERRILL.

Carriage-Wheel and Axle.

No. 6,147. Patented Feb. 27, 1849.

Fig. 5.

Fig. 4.

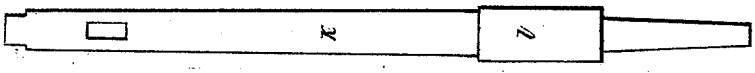


Fig. 3. Sec: on X X of fig. 1.

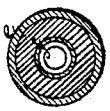


Fig. 6.

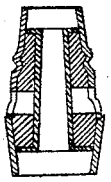


Fig. 2.

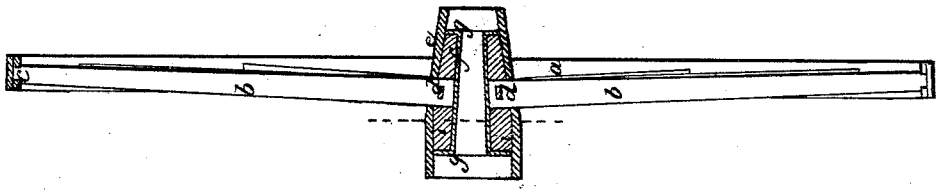
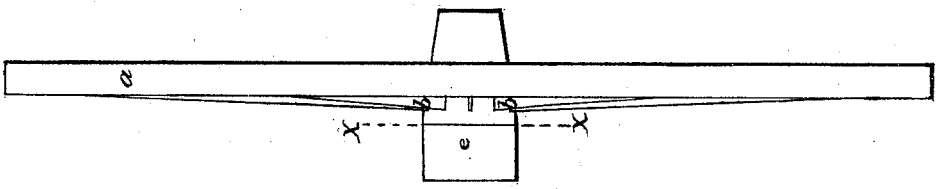


Fig. 1.



UNITED STATES PATENT OFFICE.

S. R. HUNTER AND M. MERRILL, OF CORTLANDVILLE, NEW YORK.

MANUFACTURE OF HUBS AND AXLES.

Specification of Letters Patent No. 6,147, dated February 27, 1849.

To all whom it may concern:

Be it known that we, STEPHEN R. HUNTER and MEAD MERRILL, of Cortlandville, in the county of Cortland and State of New York, have invented new and useful Improvements in Wheels and Axles of Carriages, and that the following is a full, clear, and exact description of the principle or character which distinguishes them from all other things before known and of the manner of making, constructing, and using the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is an elevation of the face of the wheel; Fig. 2, a vertical section thereof; and Fig. 3 a section taken at the line (X X) of Fig. 1; Fig. 4, a representation of the axle; and Fig. 5, a longitudinal section thereof.

The same letters indicate like parts in all the figures.

The first part of our invention relates to the construction of carriage wheels of wrought iron and steel and cast iron, and consists in making the inside and outside of the hub of sheet iron or steel with a sheet metal washer at each end, and the spokes which are made of thin steel or other metal, riveted or otherwise secured to the rim of the wheel, and let into the outer case of the hub and formed with a mortise or indentation, when this is combined with the method of firmly securing the whole by running cast iron into and filling up the space within the hub. And the second part of our invention relates to the construction of the axles of carriages, and consists in making the arm of the axle of sheet iron bent to the required form and secured into a steel or wrought iron axle by running cast iron into the space between.

In the accompanying drawings, (*a*) represents the rim of a carriage wheel made of iron bent into the required form, in which the spokes (*b*), made of thin plates of steel with a tenon (*c*) on the outer end, are inserted and secured by riveting. The inner end of the spokes are pierced with a hole (*d*) and inserted into the hub by passing them through holes in the outer case (*e*) which is made of sheet iron bent to the required form, the holes (*d*) of the spokes extending within this case. The inner tubing or box (*f*) of the hub is also made of sheet iron bent to the required form, and this is secured centrally within the outer case with a sheet iron washer (*g*) at each end driven onto the ends of the inner tube and to the required distance within the outer case. When thus put together, a hole is made in one of the washers leading into the space (*i*) within and after the inner surfaces of the sheet iron and the inner ends of the spokes have been properly prepared in accordance with any of the known modes of effecting the union of molten iron with wrought iron and steel, cast iron is run in to fill this space (*i*) and pass into the holes in the ends of the spoke and thus connect and bind together the whole. In this way we are enabled to produce a strong and light wheel at very little cost and possessing a high degree of elasticity. When it is desired to give such an ornamental form to the exterior of the hub, as cannot be produced by rolling or hammering sheet iron we make the outer case of two or more parts let into, or otherwise fitted to one another, as shown in the separate Fig. 6, which represents an outer case made in two parts.

The axle (*k*) is formed of a bar of steel of any desired form and size the outer end of which is inserted in a case (*l*) made of sheet iron of the required form to fit the box of the hub of the wheel, and to extend back of this in a square form sufficiently far to admit of fastening to it the supports of a semi-elliptic spring in the usual way of forming such connections and after the outer end of the space (*o*) between the axle and the outer case (*l*) has been properly closed, and the outer surface of the axle and the inner surface of the outer case have been properly prepared, molten iron is run into this space to fill it up and unite the whole. In this way the required form can be given to the arms of an axle without the necessity of working it out of the solid metal, while at the same time the smooth surface of the sheet iron is preserved for that part which is to run in the box of the hub.

We wish it to be distinctly understood that we do not wish to confine ourselves to the use of any particular kind of sheet iron for the hub and arm of the axle although we prefer to use what is known as russia iron. Nor do we wish to confine ourselves to the use of steel for the axle or the spokes although we have essayed this material for this purpose, and deem it the best, but wrought iron or other metal or compounds of metals may be substituted. In forming the hub the washers to unite at first the outer case and the box

of the hub may be dispensed with by properly securing these in proper relative positions in a mold, but the use of the washers we have found in practice to be advantageous.

What we claim as our invention and desire to secure by Letters Patent is—

1. The method substantially as herein described, of making the hubs of carriage wheels by forming the inner box and outer case or surface of sheet metal and uniting them by filling the inner space with cast iron by running the molten iron in between them, as described; and in combination with this method of forming the hub we also claim the method of securing the spokes by inserting their inner ends in the outer case of the hub that the cast iron within the hub may run around and secure them in place, substantially as described.

2. And we also claim the method of forming the axles of carriages by making the outer form of the arm of the axle of sheet iron when this is united to the steel or wrought iron axle within by means of iron cast in the space between the two, substantially as described.

STEPHEN R. HUNTER.
MEAD MERRILL.

Witnesses:
JULIAN COLLINS,
ERASTUS CUMINGS.