No. 664,818. Patented Dec. 25, 1900.

S. M. MORDEN.

RUNNING GEAR FOR VEHICLES.

(Application filed Apr. 2, 1900.)

(No Model.)

FIG. 1.

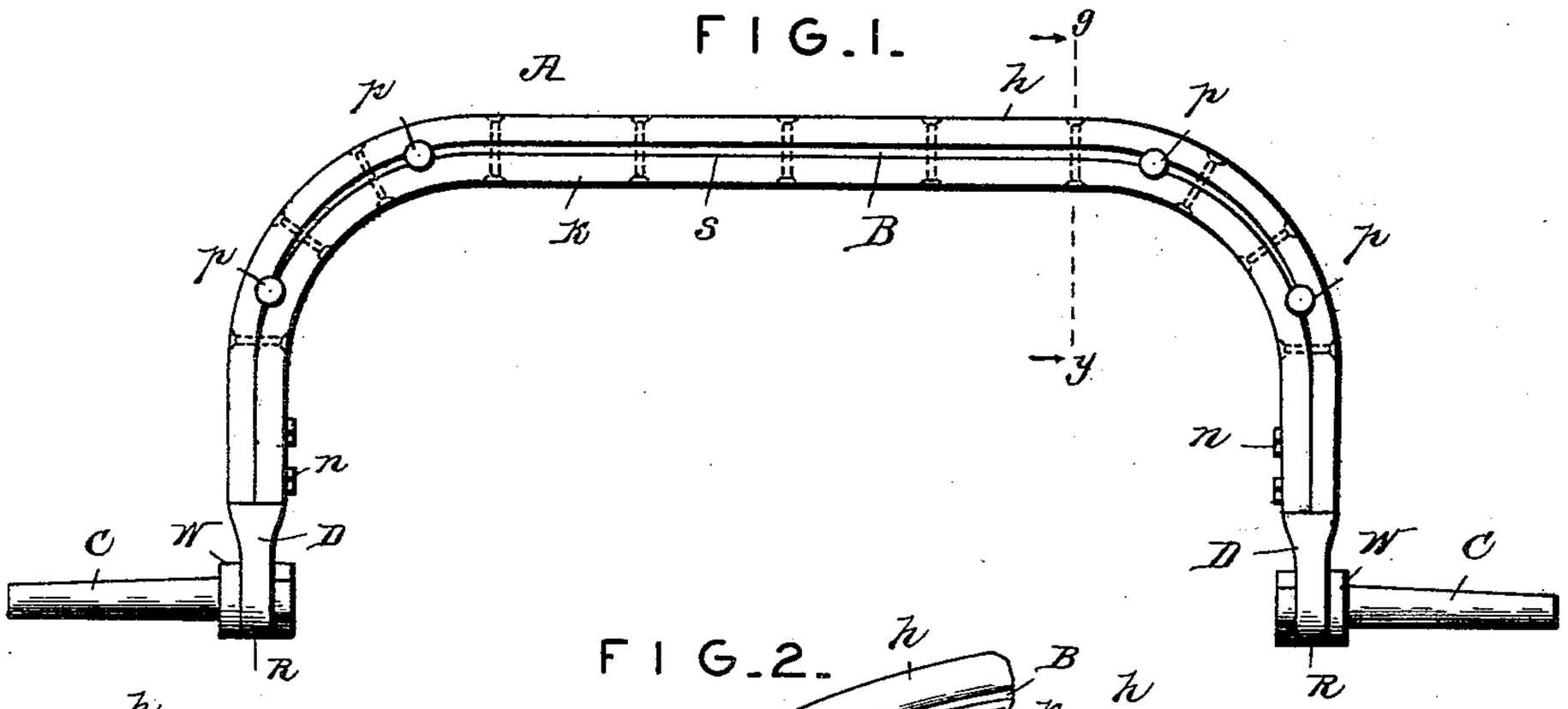


FIG. 2.

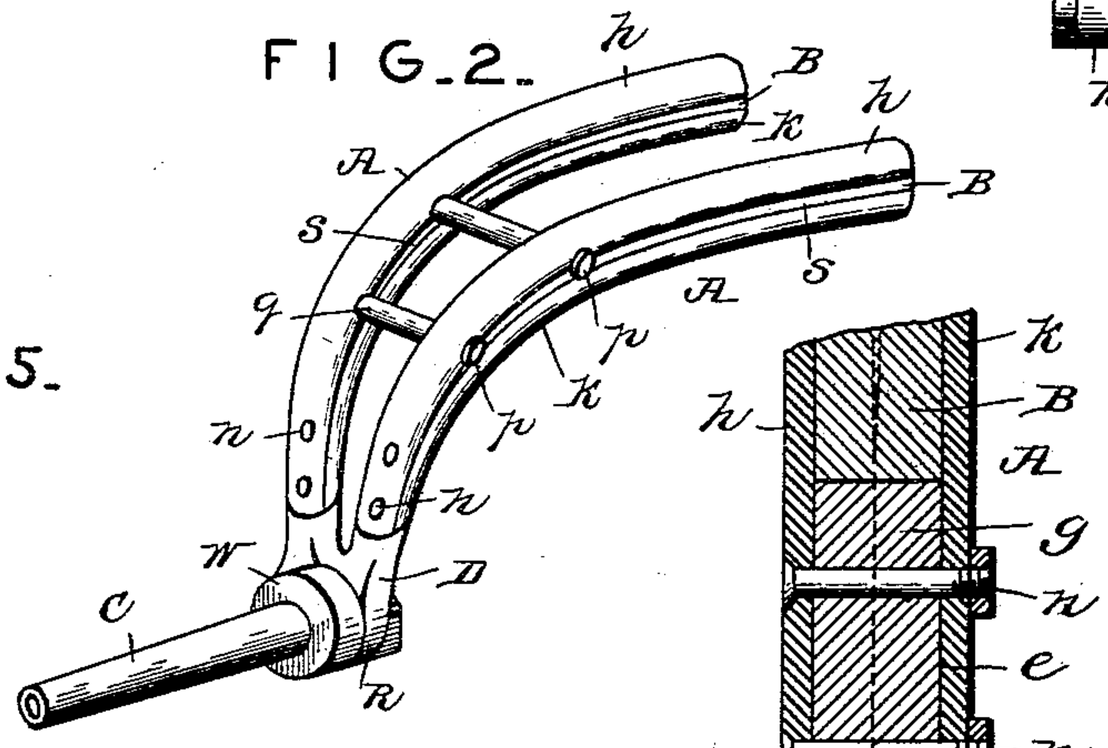


FIG. 5.

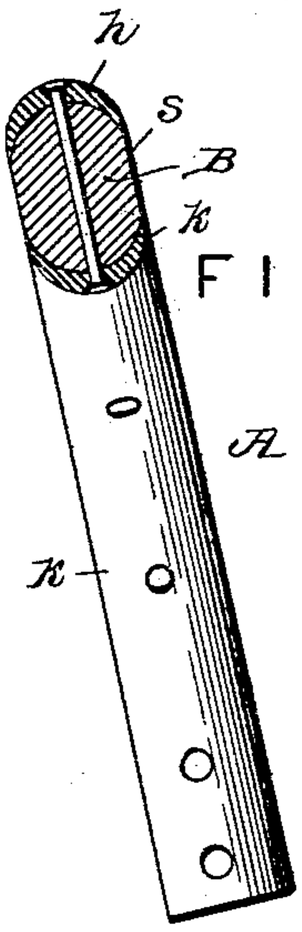


FIG. 4.

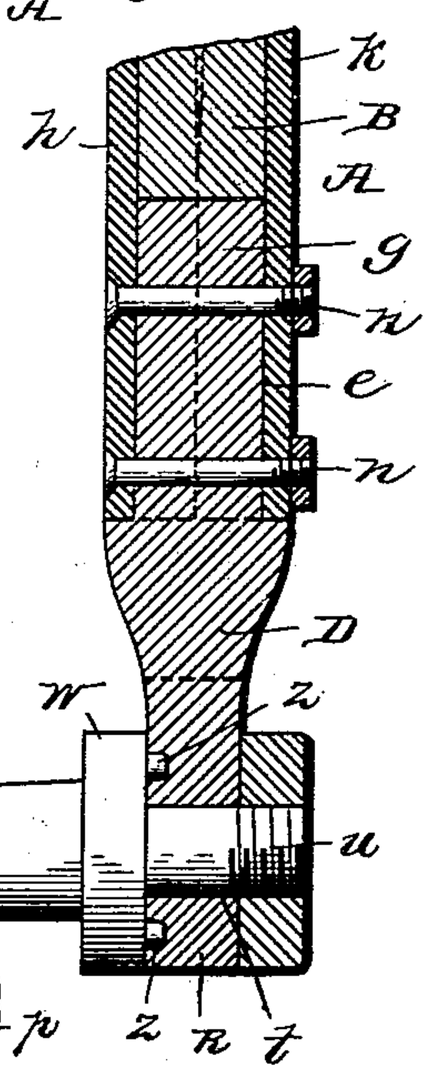


FIG. 6.

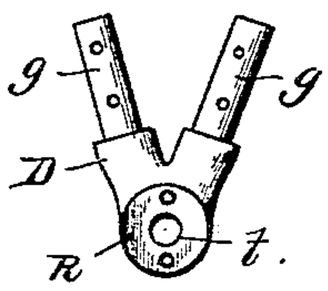
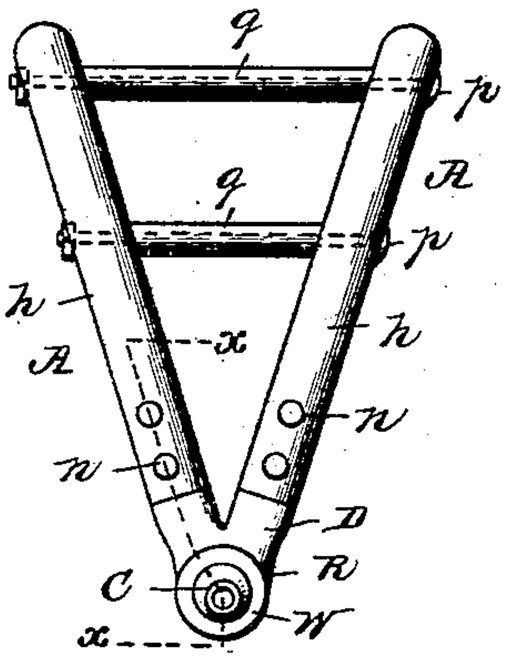


FIG. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

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RUNNING-GEAR FOR VEHICLES.

SPECIFICATION forming part of Letters Patent No. 664,818, dated December 25, 1900.

Application filed April 2, 1900. Serial No. 11,199. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL MELBOURNE MORDEN, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Running-Gear for Vehicles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

In the accompanying drawings, Figure 1 is a front elevation of my invention. Fig. 2 is a perspective view of one end portion of the same. Fig. 3 is an end elevation of the same. Fig. 4 is an enlarged section on the line *x x*, Fig. 3. Fig. 5 is a section on the line *y y*, Fig. 1, showing one branch only of the axle without the connecting-fork. Fig. 6 is a detail side elevation of the connecting-fork.

The invention relates to the running-gear of vehicles, and particularly to the axle; and it consists in the novel construction and combinations of parts, as hereinafter set forth.

In the accompanying drawings, illustrating the invention, the letter A designates a branched bowed axle; B, the wood filling; C, a detachable spindle, and D a fork connection.

The body portion of the axle consists of two diverging branches, each having a straight transverse middle portion which curves downward at its ends in arched form, as indicated, and is formed at its ends with a socket *e* for the reception of a tenon-pin *g* of the fork connection, which is secured in said socket, preferably by means of small bolts. Each branch consists of an outer or top steel bow *h*, having a crescent shape in cross-section, the convexity being outward and upward and forming the top or outer steel shell, and an inner or bottom steel bow *k*, also of crescent form in cross-section, the convexity being outward and downward and forming the bottom or inner steel shell. These shells come together at their end portions to form the socket portion *e*, which engages a standard or tenon-pin *g* of the fork connection, which is secured in place in any suitable manner, but preferably by means of small bolts *n n*, passing through perforations of the pin and shells. From the socket portions the shells diverge a little and cover in the top, bottom, and sides of the wood filling B, with the exception of the narrow opening between the shells along the sides, (indicated at *s*.) The wood filling is usually of elliptical cross-section rounded on the outer and top and inner or bottom surfaces to correspond with the concave surfaces of the steel shells. The ends of the wood filling are arched and tapered or made narrow to fit the arched end portions of the shells down to the socket portions, which are occupied by the tenon-pins of the fork connection. The shells may be welded to the connection; but this method of joining is objectionable, because it is liable to alter the temper of the steel. This arched branched steel-shell axle filled out with hickory forms an exceedingly light and strong support and is especially designed for the lighter form of speeding-vehicles. In each branch of this axle-body it will be observed that the side of the wood filling is very nearly tangent to the concave and convex curves of the shells, this forming a neat smooth lateral surface which can be readily finished to have a very handsome appearance. At intervals the outer and inner shells of each branch are connected by rivets passing through the wood filling and the thickest portions of the shells.

While the arched portion of the outer shell presents its transverse convex surface toward the convexity of the arch, the arched portion of the inner shell presents its transverse concave surface toward this arch convexity, so that the wood filling is almost entirely covered in above and below.

The diverging arched portion of the branches of the axle-body are tied together with a bolt or bolts, (indicated at *p*,) said bolts passing through the wood filling and through the tubular braces *q*. This strengthens the body in the arched portions against racking or torsional action.

The connecting-fork D is provided with the standards or tenon-pins *g g*, formed with a shoulder bearing on a spindle heel piece or plate R, from which the spindle C projects. This spindle is preferably made detachable from the spindle-piece R in order to avoid injury to the temper of the part by welding. For this purpose the spindle-heel of the fork

connection is provided with an aperture or eye *t*, which receives the tenon projection *u* of the spindle, said tenon passing through the eye and being secured in position by means of a nut or other fastening on its end bearing against the plate R. The spindle is also formed with a collar *w*, which bears against the outer surface of the piece R and braces the parts in position. The piece R and the spindle shoulder or collar are provided with stud-and-recess connection (indicated at *z*) in order that the spindle shall not turn, but remain always in position for proper bearing in the wheel-hub. This check device or lock against turning also serves to prevent in great measure the unscrewing and loosening of the fastening-nut of the spindle. When the spindle is worn or injured, it may very readily be taken off and replaced.

The invention is designed to provide a very light and serviceable wood-filled steel axle which is very strong and durable. The wood is protected from moisture to a very large extent, so that it is not liable to swell, and should there be any slight swelling it will only cause a closer relation between the shells and the filling; yet the shell is divided along the sides of the axle or longitudinally split or separated, so that the wood filling is not positively confined.

It will be noted that the upper and lower substantially semicylindrical shells of steel or the like separated laterally by a narrow slot or interval form a tube. The strain being greatest at the top and bottom, these shells are beveled at their edges to make them of crescent form in cross-section, with the advantage of decreased weight without decrease in strength. For the same reason the shells may be separated laterally. In order to connect these shells rigidly together, a filling of wood or the like and the rivets are provided.

Having described this invention, what I claim, and desire to secure by Letters Patent, is—

1. An axle of tubular form, composed of upper and lower substantially semicylindrical sections of steel or the like of crescent form in cross-section, and separated from each other laterally by a narrow slot or interval, a filling of wood or the like, and means for connecting said sections and filling rigidly together, substantially as specified.

2. An axle, having upper and lower substantially semicylindrical steel shells, crescent form in cross-section, a wooden filling, and means for connecting said shells and filling rigidly together, substantially as specified.

3. A longitudinally-arched diverging two-part axle, each said part having upper and lower steel shells crescent form in cross-section, and approaching each other at their end portions to form a socket, a wooden filling for such shells, and spindles having diverging tenon-pins engaging said sockets, substantially as specified.

4. A longitudinally-arched diverging two-part axle, each said part having upper and lower steel shells crescent form in cross-section and separated from each other laterally by a narrow interval, a wooden filling, and tie-bolts for said axle parts passing through said intervals, substantially as specified.

5. A longitudinally-arched diverging two-part axle, each said part having upper and lower steel shells crescent form in cross-section, a wooden filling terminating short of the extremities of said shells to leave sockets, and spindles having diverging tenon-pins engaging such sockets, substantially as specified.

6. In an axle, the diverging arched two-part steel-shell axle-bodies, having wood fillings, and the tie-bolts and braces connecting the arched portions, substantially as specified.

7. In an axle, the diverging arched two-part steel-shell axle-bodies, having wood fillings, and braces, and tie-bolts passing through the wood filling and connecting the arched portions of the bodies, substantially as specified.

8. An axle, consisting of diverging arched two-part wood-filled steel shells, having end sockets, spindle-pieces having diverging tenon-pins engaging said sockets, and tie-and-brace connections at the arched portions, substantially as specified.

9. An axle, consisting of arched two-part steel-shell axle-bodies, spindle-pieces connected to said shell-bodies, and connecting the same at their ends, and detachable spindles connected to eyes of said spindle-pieces, and devices for locking said spindles against turning, substantially as specified.

10. The combination with diverging two-part arched steel-shell axle-bodies, having sockets at their ends and wood fillings between the sockets, of a detachable spindle and a spindle-piece having diverging tenon-pins engaging said sockets, and an eye engaging said spindle, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

SAMUEL M. MORDEN.

Witnesses:

GEORGE M. ANDERSON,

HARRY L. AMER.