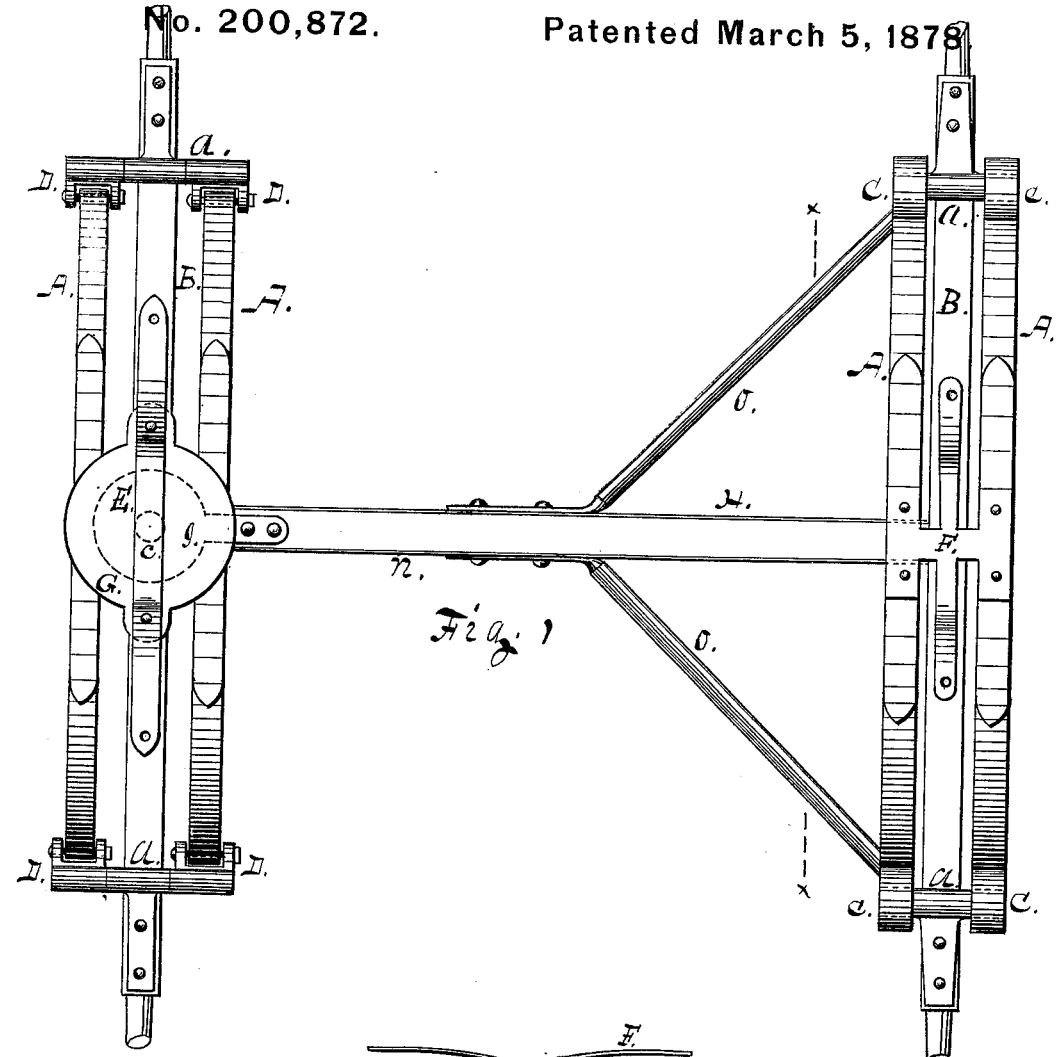
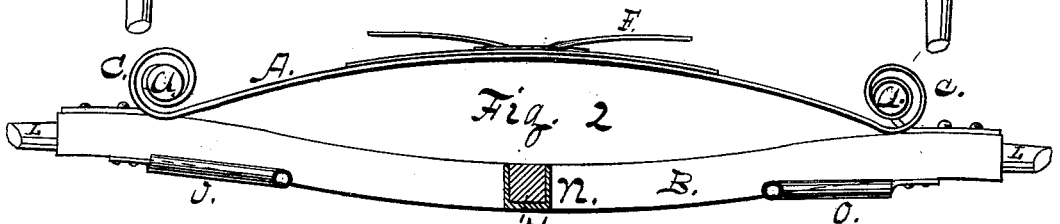
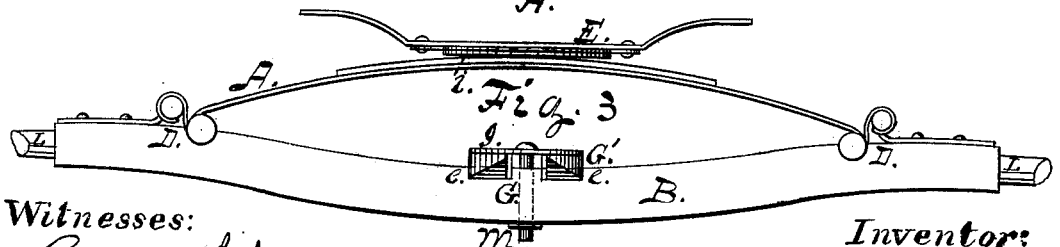
I. H. MULFORD.

Vehicle Running-Gear.

No. 200,872. Patented March 5, 1878.







Witnesses:

George D. Dean.

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Inventor:

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UNITED STATES PATENT OFFICE.

ICHABOD H. MULFORD, OF EAST ORANGE, NEW JERSEY.

IMPROVEMENT IN VEHICLE RUNNING-GEAR.

Specification forming part of Letters Patent No. **200,872**, dated March 5, 1878; application filed June 20, 1877.

To all whom it may concern:

Be it known that I, ICHABOD H. MULFORD, of East Orange, in Essex county, and State of New Jersey, have invented Improvements in Running-Gear for Carriages, of which the following is a specification:

The object of this invention is to simplify the construction of the running-gear of vehicles, reduce the weight, and hang the body lower than has hitherto been accomplished; and it consists in a novel arrangement of the springs, in combination with an upper and lower turn-plate, or fifth-wheels, at the front axle, whereby the usual bolster is dispensed with and the elevation of the body reduced, as will be hereinafter more fully described by reference to the accompanying drawing, in which—

Figure 1 represents a top view of my improved running-gear. Fig. 2 is a sectional elevation on the line *x x* of Fig. 1, showing the rear axle and springs; and Fig. 3 is a front elevation of the fore axle, springs, and turn-plates or fifth-wheels.

The same letters appearing on the several figures indicate like parts.

A A represent the springs, which are arranged in pairs, one on each side of both front and rear axles B. These springs are of semi-elliptic form, and are supported by swinging shackles D on the bolts or bars *a*, which are rigidly attached to the axles, crosswise thereto, and as near as convenient to the arms L; or these shackles D may be dispensed with, and the ends of the springs curled to form scrolls C around the bolts *a*, which scrolls admit, in like manner, of the extension of the spring when under pressure. The springs on each side of the rear axle are connected at their midlength by an iron saddle-plate or bar, F, which, furthermore, has two lateral extensions for connection with the body of the vehicle. The saddle *i*, which connects the two springs at the front axle, is of circular form, and constitutes the bed of the turn-plate or fifth-wheel, while the plate E, also of circular form, is attached by its lateral extension to the body of the vehicle, and, by a central bolt, *c*, to the plate *i*, forms the upper portion of said fifth-wheel. The perch H is rigidly connected with the rear axle, and, by a circular plate, I, above and plate *m* below, with the front axle, which is fitted with segmental blocks *e e*, and, having a king-bolt, G, passing vertically through the plates I and *m* and axle B, constitutes a secondary fifth-wheel, vertically under the fifth-wheel before described.

By this arrangement of springs and turn-plates the bolsters ordinarily used are dispensed with, and the body of the vehicle can be hung much lower, while the superincumbent weight is thrown more directly on the wheels, instead of on the center of the axles and bolsters, as in the use of elliptic springs.

In order to further reduce the weight of the running-gear, I sheath the perch H with a U-shaped casing of sheet metal, *n*, covering its two sides and bottom, to protect it from fracture, even if the grain of the wood should run slightly crosswise, whereby said perch may be reduced much below the ordinary size and weight. The stays O, for bracing the perch in its connection with the rear axle, are, preferably, made of iron tubes, being both stiffer and lighter than bar-iron.

I am aware that semi-elliptic springs have been used on each side of the ordinary bolsters, also one above the other; but these rather increase than decrease the elevation of the body of the vehicle. These, therefore, I do not claim; but

What is here claimed as new, and desired to be secured by Letters Patent, is—

1. The combination of the springs A A and their bearings *a* with the axle B and turn-plates E and I, the former connecting the two springs together and in an oscillating manner with the body, and the latter arranged beneath, connecting the perch with the axle, as shown and described.

2. The U-shaped sheet-metal sheathing *n*, in combination with the perch H, as shown and described, for the purpose set forth.

ICHABOD H. MULFORD.

Witnesses:
HORACE HARRIS,
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