(No Model.) 2 Sheets—Sheet 1.

E. F. MORSE.

TWO WHEELED VEHICLE.

No. 492,224. Patented Feb. 21, 1893.

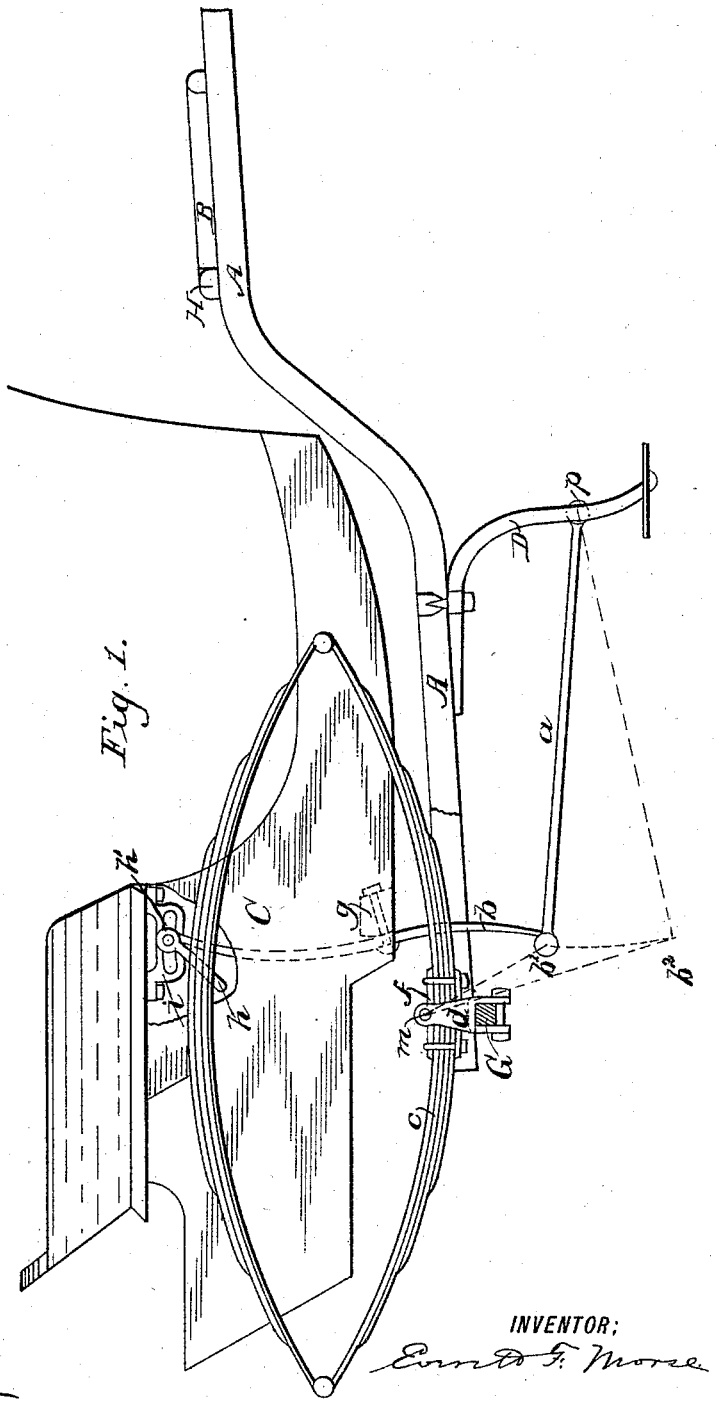

Fig. 1.

WITNESSES:

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Chauncy P. Lyon

INVENTOR;

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(No Model.) 2 Sheets—Sheet 2.

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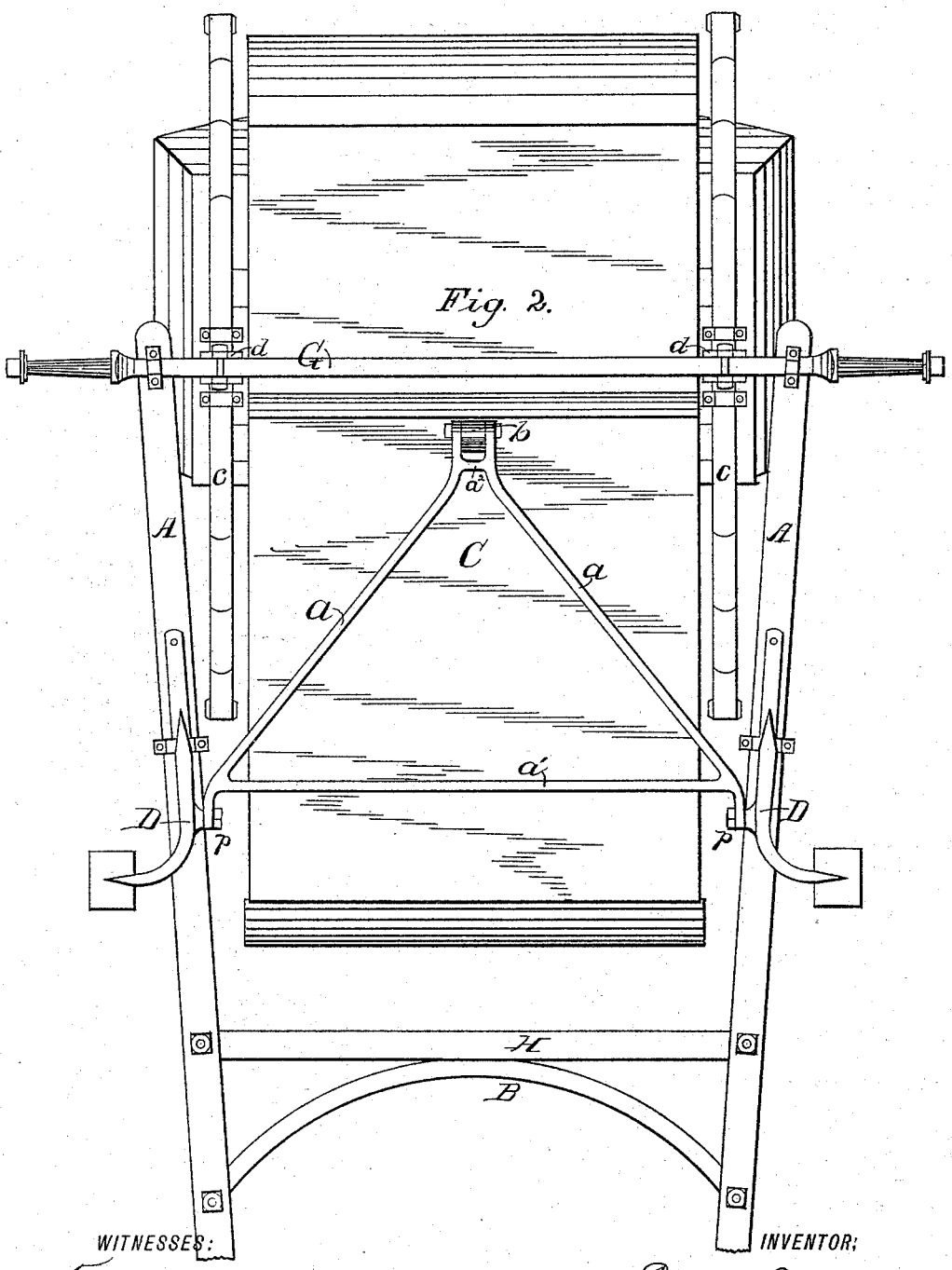
Fig. 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

EVERETT F. MORSE, OF TRUMANSBURG, NEW YORK.

TWO-WHEELED VEHICLE.

SPECIFICATION forming part of Letters Patent No. 492,224, dated February 21, 1893.

Application filed August 3, 1891. Renewed November 26, 1892. Serial No. 453,212. (No model.)

To all whom it may concern:

Be it known that I, EVERETT F. MORSE, a citizen of the United States, residing at Trumansburg, in the county of Tompkins and State of New York, have invented certain new and useful Improvements in Two-Wheeled Vehicles, of which the following is a specification.

The objects of my invention are to provide an elastic connection between the body and gear which will permit the free ends of the thills to vibrate up and down independently of the body and also form a yielding resistance to this vibratory movement that will increase in intensity as the load in the vehicle is increased and the body depressed, and to provide convenient means for adjusting the body to horses of different heights, also to provide means for increasing the resistance to sidewise tipping of the body independent of the resistance to vertical depression. I attain these objects by the mechanism illustrated in the accompanying drawings in which,—

Figure 1, is a side elevation of a part of a vehicle embodying my improvements and having parts of one thill and the body broken away to more fully show the details of construction. Fig. 2, is a bottom view of the same.

Similar letters refer to similar parts throughout both the views.

Referring to the drawings, G is the axle.

A A, are the thills securely attached to the axle.

H and B are cross bars connecting the thills.

C is the body mounted on elliptic springs *c c*, arranged lengthwise of the gear and on either side of the body. These springs have their lower halves hinged to the gear and their upper halves rigidly attached to the body, thus permitting the body to tip endwise freely except as restrained by arm *b*, which extends in a nearly vertical direction to a point directly or obliquely below the axis *m*, about which the body rocks endwise. Bar *g*, extends crosswise of the body and has its ends securely bolted to the framework of the same. To this, arm *b*, is securely attached. Eyes may be turned on both the upper and lower ends of arm *b*, for the purpose of connecting it to bracket *i*, and brace *a*, respectively. Step arms D, have their upper ends securely bolted to the thills and are provided with lug bolts *p p*, projecting from them crosswise of the cart. The triangular brace *a a'*, has its forward ends provided with eyes adapted to receive the lug bolts *p p*, to which it is secured. The rear end of the brace is also provided with eyes through which and the lower end of arm *b*, a bolt passes. Thus arranged, the lower end of arm *b*, is permitted to move up and down with the body by the angular motion of brace *a*, about the lug bolts *p p*, at the same time it is restrained to follow the path b' b^2, in this movement. The triangular form of the brace *a a'*, restrains the end *b'*, of arm *b*, from moving laterally and thereby provides an additional restraint to the sidewise tipping of the body. Bracket *i*, which is securely bolted to the bottom of the seat, is provided with a curved slot which follows the path of the upper end of arm *b*, as it is turned in a vertical longitudinal plane about its attachment to bar *g*. Bolt *h'* adapted to extend through the slot and the upper eye of arm *b*, is provided with a head on one end and a nut *h*, with handle on the other. By screwing up the nut *h*, the arm *b*, is firmly clamped to the bracket *i*, and by loosening this bolt, arm *b*, can move along the slot in bracket *i*, and the body can be tipped endwise so as to be level, with the thills attached to a horse of any height, and when adjusted to the desired position, is securely held by tightening the bolt *h'*.

In operation, the yielding of the supporting springs *c*, as the load is increased, permits the body to be depressed carrying the arm *b*, down with it. If the body is tipped endwise, the lower end of arm *b*, tends to follow a path circular about the axis *m*, of tipping but it is restrained from following this path by the brace *a*, so that the body can tip endwise only through the flexion of arm *b*. When the body is in its normal position, the arm *b*, acts with the lever arm *m b'* to resist the tipping of the body, but when the body is depressed so that the lower end occupies the position b^2, the arm *b*, then acts with the much longer lever arm *m* b^2, to resist the tipping of the body. Thus by this arrangement the resistance to the endwise tipping of the body

increases with the depression of the body and consequently with the load causing such depression.

While I have shown my invention used in connection with elliptic springs extending lengthwise of the body, it is evident that it is applicable to half elliptic springs extending crosswise of the cart and also to other forms of springs.

The arm *b*, is shown arranged in the middle of the body but it is evident that two such arms could be arranged on either side of the body and accomplish substantially the same objects.

Instead of hinge *d*, a flexion connection with the gear can be used or a rigid connection which would utilize the resistance of the springs to permit the endwise rocking of the body, as it is only necessary that the axis about which the body rocks should be above the end *b'*, of arm *b*, so that it shall move away from this axis as the body is depressed. It is also apparent that the thills may be flexibly connected to the axle or hinged to the same instead of making the joint directly between the spring and axle.

While arm *b*, is shown to be connected to the body in a manner permitting the body to be adjusted to horses of different heights, it is evident that this arm may be attached to the body in any secure manner and perform its principal function, also, that the arm *b*, may be rigid and the necessary flexibility provided in the arm D, or link *a*.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a two wheeled vehicle, the combination with the axle thills, attached thereto, and a body adapted to rock endwise about an axis near the axle, of an arm attached to said body and extending downward to a point directly or obliquely below said axis about which the body rocks, a brace connecting said downwardly extending arm with the gear, substantially as described.

2. In a two wheeled vehicle, a spring hinged to the gear and supporting the body in combination with an arm attached to the body and extending to a point directly or obliquely below said hinged connection of the spring and a brace connecting said arm with the gear, substantially as described.

3. In a vehicle, the combination with the body and gear of an arm securely attached to the body and extending downward therefrom, two arms securely attached to the gear and extending downward therefrom, a horizontal trussed brace connecting said arms extending from the body and gear, substantially as described.

4. In a vehicle, the combination of an arm securely attached to the body and extending from a point near the seat to a point below the body, the lower end of said arm being connected to the gear by a brace and the upper end adjustably connected to a bracket securely attached to the body, substantially as described.

EVERETT F. MORSE.

In presence of—
CHANCEY P. GREGG,
FRANK L. MORSE.