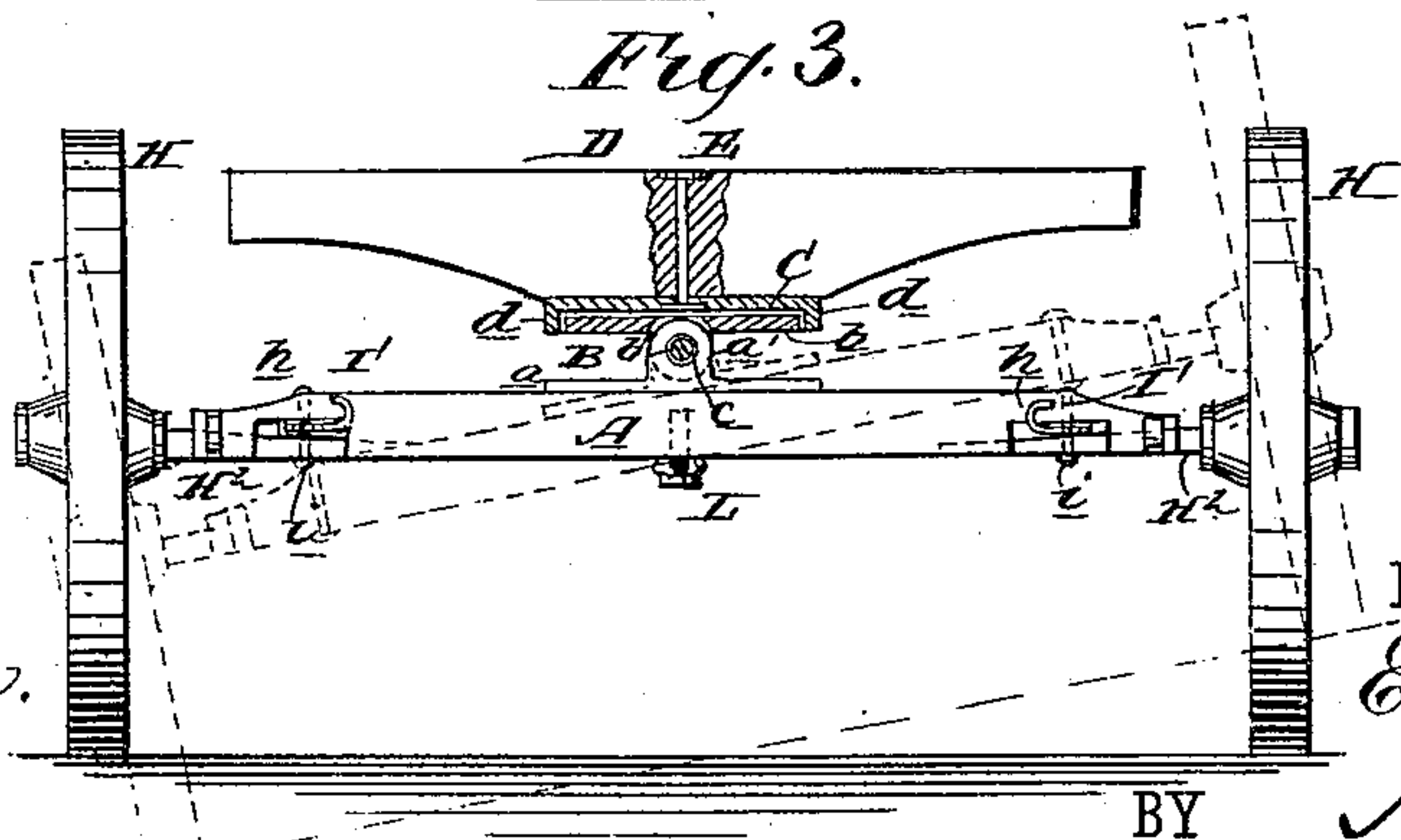
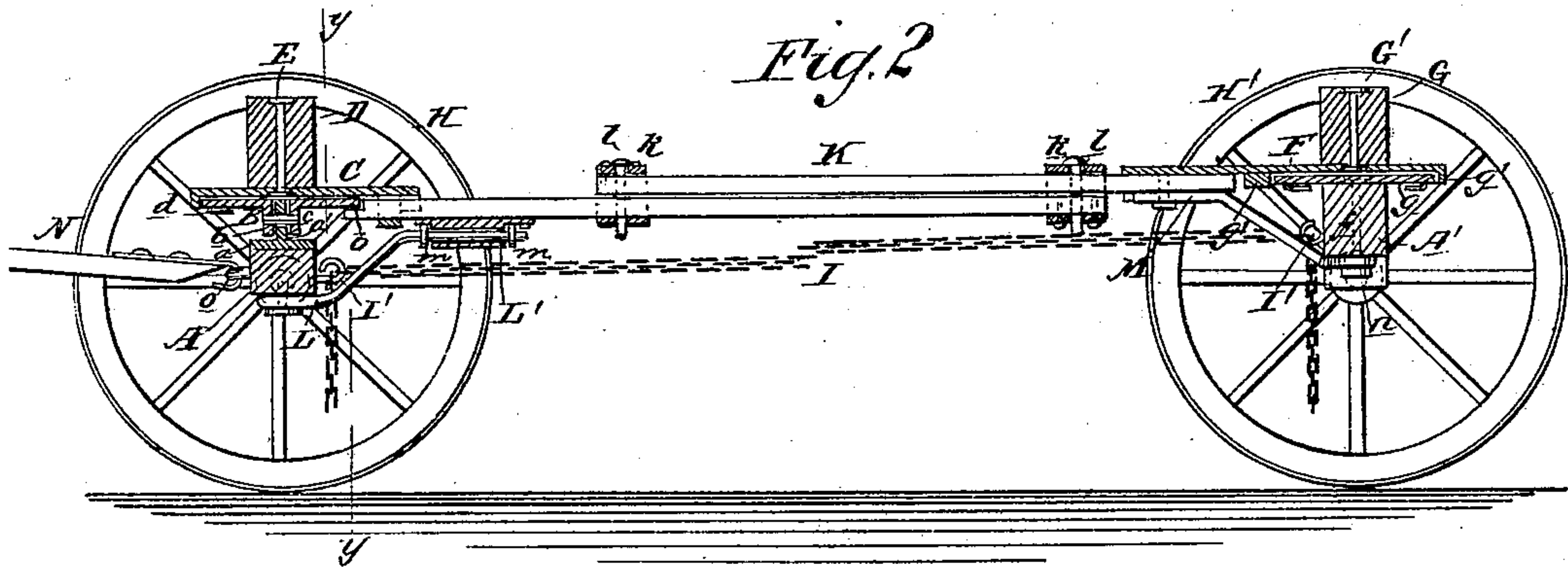
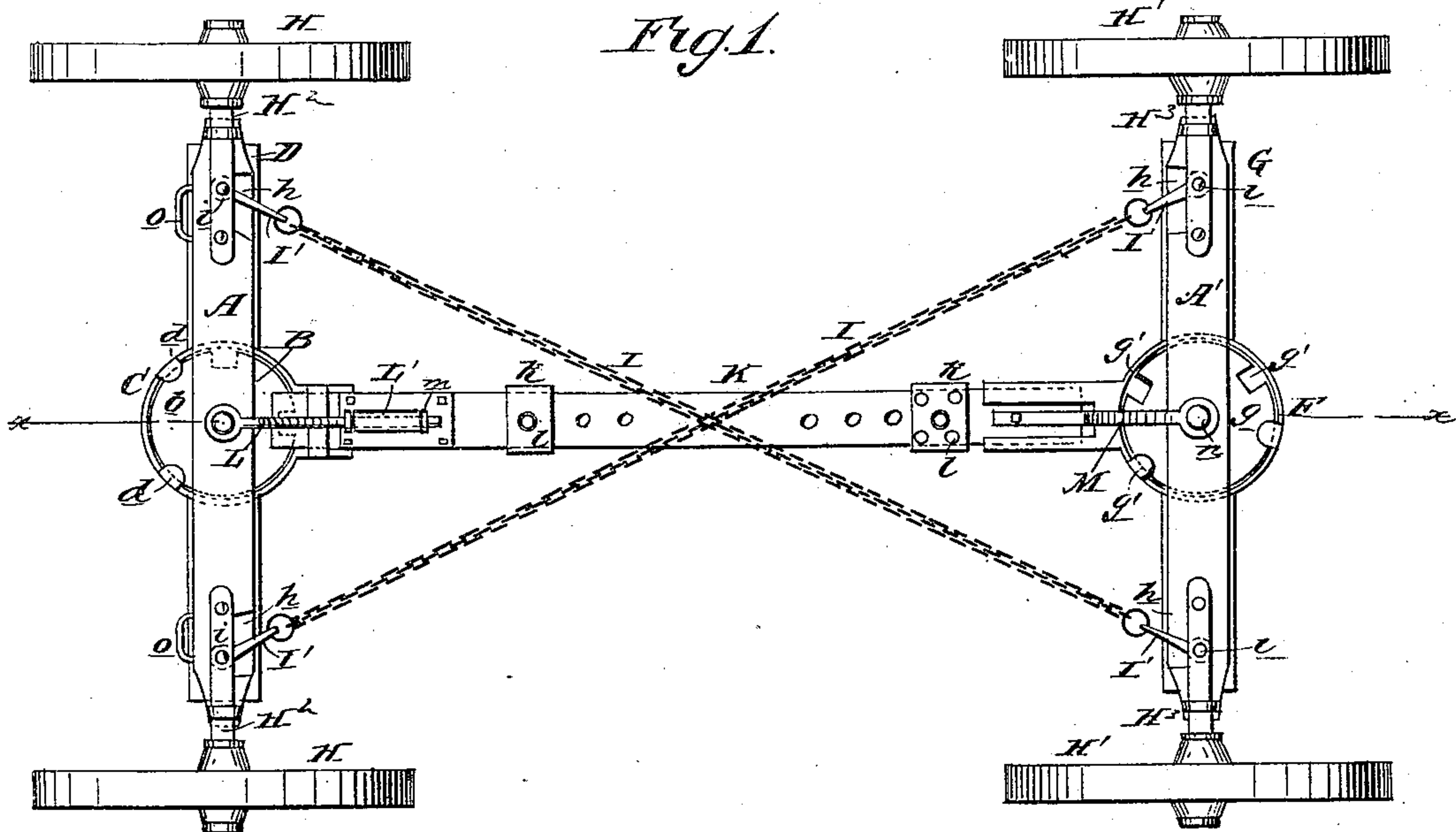


(No Model.)

E. HARDER.  
RUNNING GEAR FOR VEHICLES.

No. 246,501.

Patented Aug. 30, 1881.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

ER HARDER, OF BERKSHIRE, OHIO.

## RUNNING-GEAR FOR VEHICLES.

SPECIFICATION forming part of Letters Patent No. 246,501, dated August 30, 1881.

Application filed June 6, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, ER HARDER, of Berkshire, in the county of Delaware and State of Ohio, have invented a new and Improved Vehicle-Gear, of which the following is a full, clear, and exact description.

The object of this invention is to construct a wagon or bob-sled gear especially adapted for use on rough roads and for making short turns.

Figure 1 represents a reverse plan of the gear as applied to a wagon. Fig. 2 is a longitudinal sectional elevation of the same on line *x x*, Fig. 1. Fig. 3 is a cross-section of the same on line *y y*, Fig. 2, with parts broken away to exhibit other parts.

Similar letters of reference indicate corresponding parts.

In the drawings, A A' respectively represent the front and rear axles, the former of which has secured centrally upon it the sand-board and bolster swivel-coupling B, which consists of a foot bar or plate, *a*, extending lengthwise across and secured on the central portion of said axle A, and having an upward-projecting central lug, *a'*, that is held between the downward-projecting circular lugs *b'* of a horizontal circular plate, *b*, by a pin, *c*, that is passed through said lugs *a' b'* at right angles to the bar *a*, so that the said axle A may move in a vertical plane. This circular plate *b*, which serves, in effect, as a fifth-wheel, is held in the circular end of an upper plate or sand-board, C, by means of clips *d*, that are bent inward over the edges of said circular plate *b* from the depending rim of said sand-board C or by other suitable device, so that the said coupling B is free to move in a horizontal plane. Said sand-board C is held to the under side of the front bolster, D, by the king-bolt E.

The rear axle, A', has secured centrally upon it by pin *f* a circular plate, *g*, which is movably held in the circular end of the sand-board F by clips *g'*, that are bent inward from the depending rim of said sand-board F, so that said axle A' can move in a horizontal plane, and the rear bolster, G, is secured to said sand-board F by a king-bolt, G'.

H H' represent, respectively, the front and hind wheels of the wagon, secured to the axles

A A', respectively, by spindles H<sup>2</sup> H<sup>3</sup>, that are bolted thereto.

Beneath the inward extension of each axle-spindle H<sup>2</sup> H<sup>3</sup> sockets *h h* are formed in each axle A A' to permit free horizontal play to the hooks I' I', that are pivoted on bolts *i i*, which assist in securing said axle-spindles H<sup>2</sup> H<sup>3</sup> to their respective axles A A'; and held by these hooks I' I' are the chains I I, that are stretched diagonally across each other, as shown in Fig. 1, so that when either end—the right-hand end, for instance—of the front axle, A, moves in advance of its right-angled position relatively to the reach K the chain I thereto attached will draw the left-hand end of the rear axle, A', correspondingly forward out of line, whereby the rear wheels, H', on each side of the wagon will be forced to run in the tracks of the front wheels, H; hence, when the front wheels, H, are carefully guided to avoid stumps, rocks, and holes in a rough road the chains I assure the clearance of these obstacles by the hind wheels, H'.

The reach K is made in two sections that slide on each other, and are held together by clips *k*, through which and the reach-sections are passed bolts *l*, so that said reach K may be lengthened or shortened, as may be desired, the chains I I being capable of corresponding extension or shortening. The ends of the said reach K are secured in the rearward and forward extensions, respectively, of the sand-boards C F, as shown, and the front axle, A, is directly connected with the forward section of the reach K by a rod or brace, L, one end of which is secured centrally in the under side of the said axle A, while the other end is journaled in a box, L', secured on the under side of said reach K, so that said rod or brace L is free to turn in said box L'. Collars *m* on said brace L hold it in position in said box L'.

The rear axle, A', is directly connected with the reach K by a rod or brace, M, one end of which is pivoted by bolt *n* on the center of said axle A', while the other end is rigidly secured on the rear section of the said reach K.

The wagon-pole N is attached at the staples *o* on the front axle, A.

In a gear constructed in this manner the front axle and wheels may incline in a vertical

plane, as shown in dotted lines, Fig. 3, without inclining the wagon-body from the horizontal position, so that the danger of upsetting in rough roads is greatly diminished and a wagon-load is carried more easily and safely.

It will readily be seen that this gear is applicable also, with slight modifications, to bobsleds.

I am aware that the reach has been pivoted to the king-bolt, so as to allow the axle to swing in a vertical plane; also, that the front and rear axles have been connected by an adjustable reach and each been provided with a segmental sheave, said sheaves being connected by cross chains and rods; but

What I claim is—

1. The combination, with the plate *a*, secured to the axle *A* and provided with upwardly-projecting lugs *a'*, of the plate *b*, provided with

the downwardly-projecting lugs *b'*, the pin *c*, and the flanged sand-band *C*, secured to the bolster *D*, and provided with clips *d*, substantially as and for the purpose set forth.

2. In combination with the axles *A A'*, provided with sockets *h h*, the axle-spindles *H<sup>2</sup> H<sup>3</sup>*, and the chains *I*, of the hooks *I'*, pivoted in the said sockets by bolts *i*, substantially as and for the purpose set forth.

3. The combination, with the plates *b g*, secured, respectively, to the front and rear axles, *A A'*, of the flanged sand-bands *C F*, secured to the bolsters *D G*, and provided with clips *d g'*, substantially as and for the purpose set forth.

ER HARDER.

Witnesses:

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