

(No Model.)

J. T. GURNEY.

4 Sheets—Sheet 1.

RUNNING GEAR FOR VEHICLES.

No. 272,238.

Patented Feb. 13, 1883.

Fig. 1.

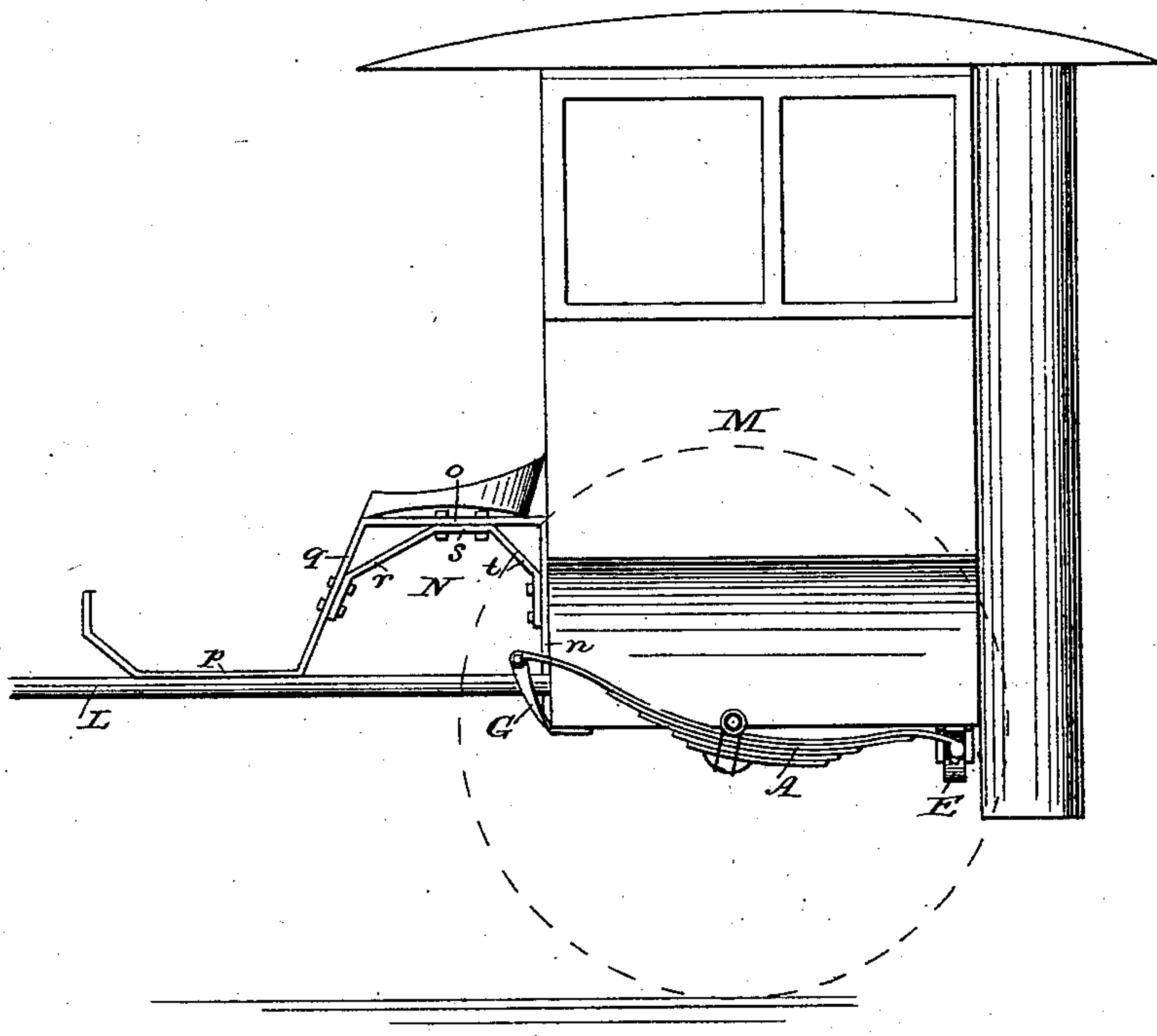
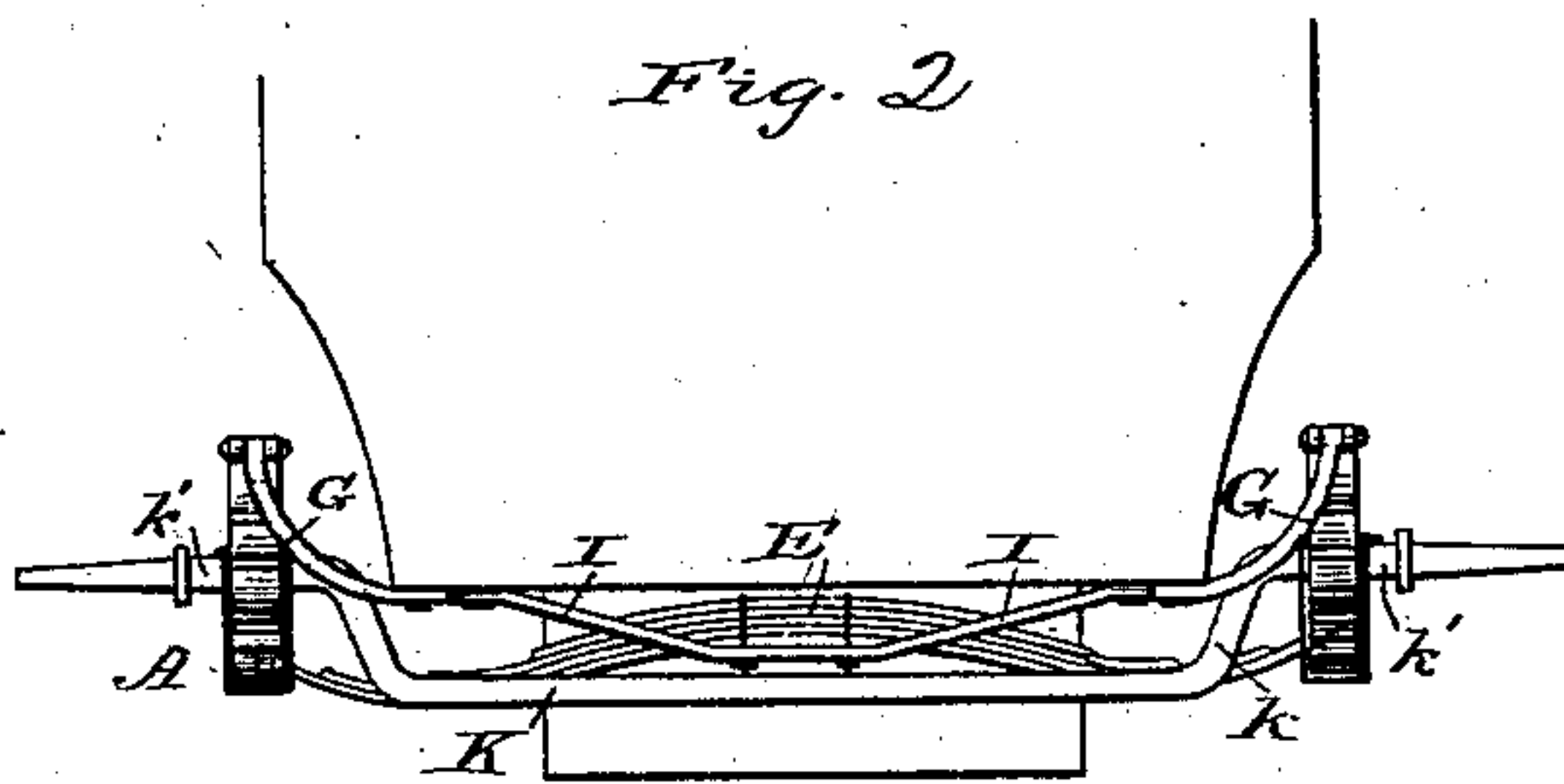


Fig. 2.



Witnesses:

H. N. Low

L. O. Marshall

Inventor:

J. Theodore Gurney.

by Doubleday & Bliss

attys.

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Fig. 4

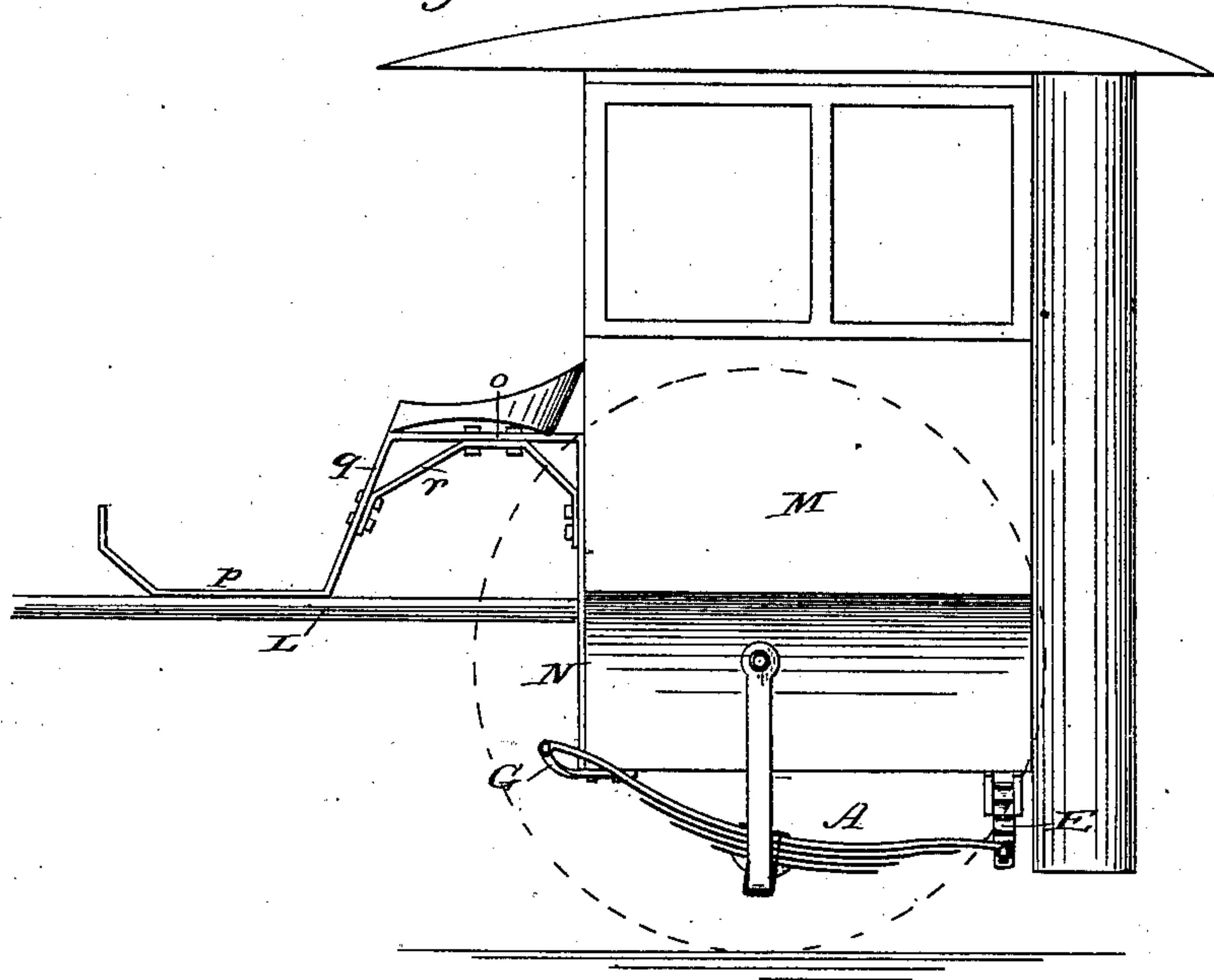


Fig. 5

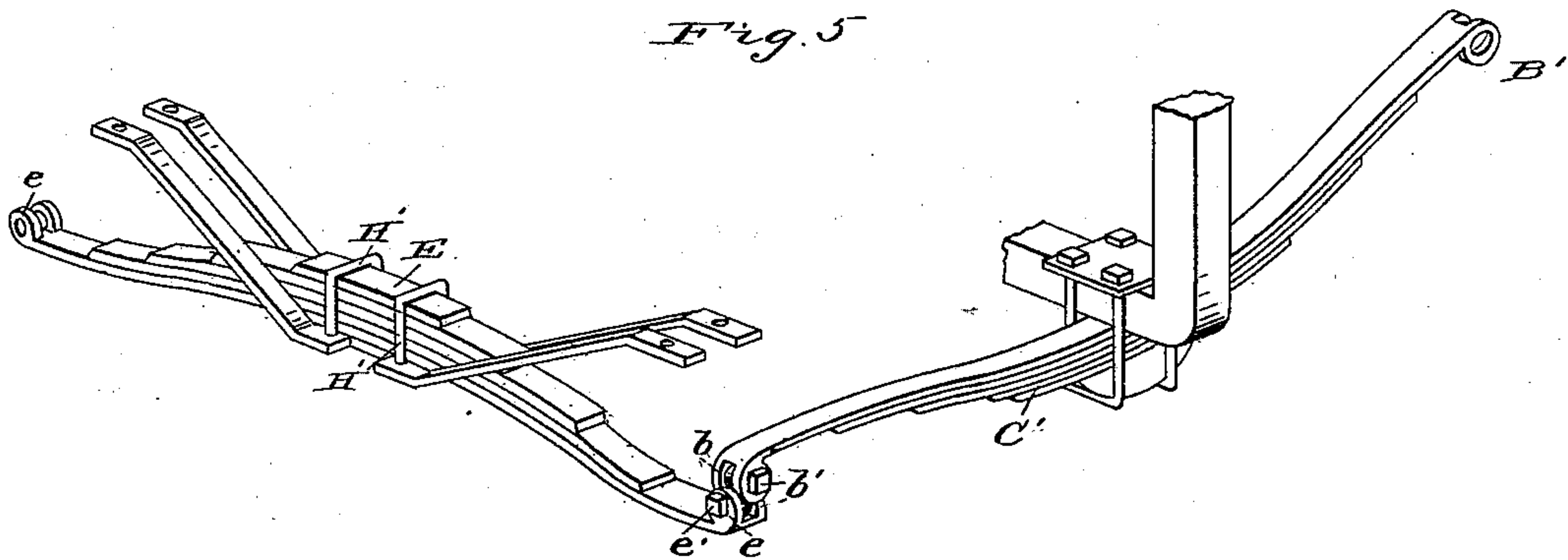


Fig. 3.

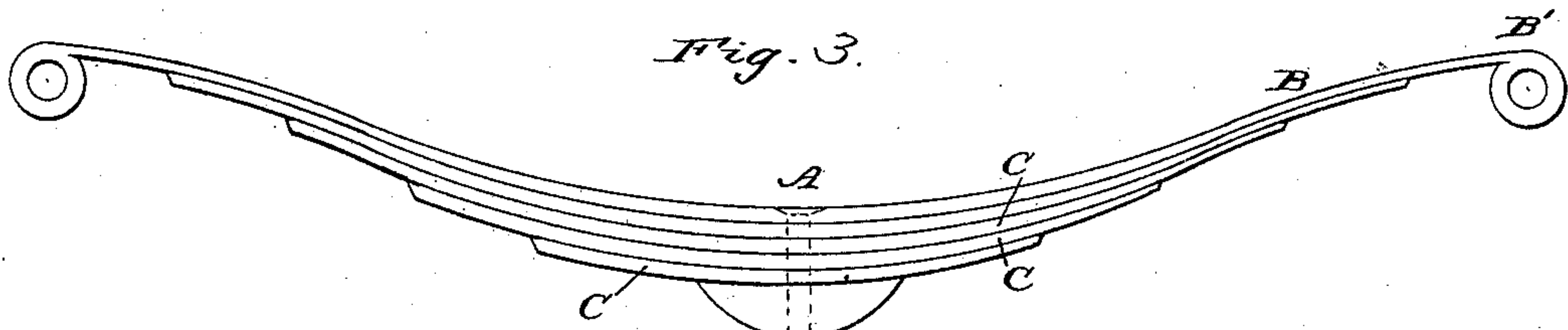
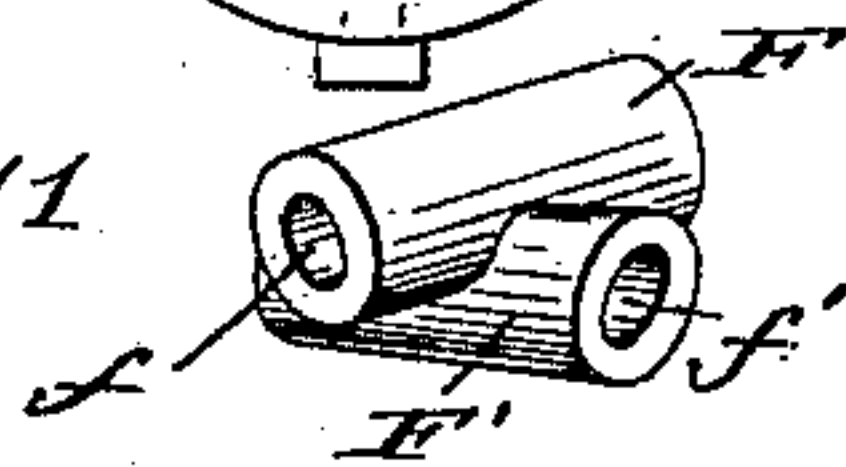


Fig. 11



Witnesses:

N. A. Low  
L. H. Marshall.

Inventor:

J. Theodore Gurney.  
by Doubleday & Bliss  
attys.

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Fig. 7.

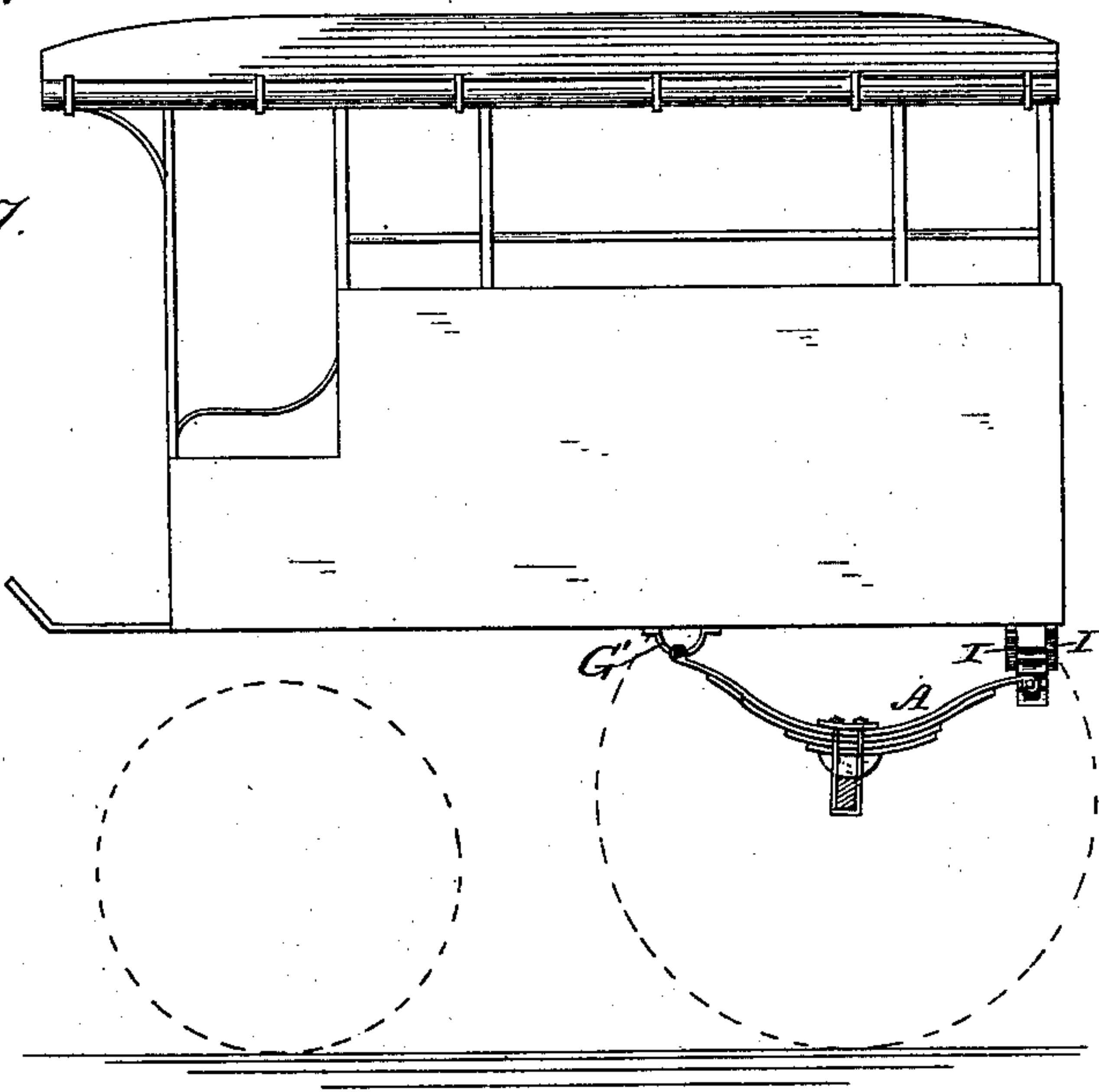


Fig. 8.

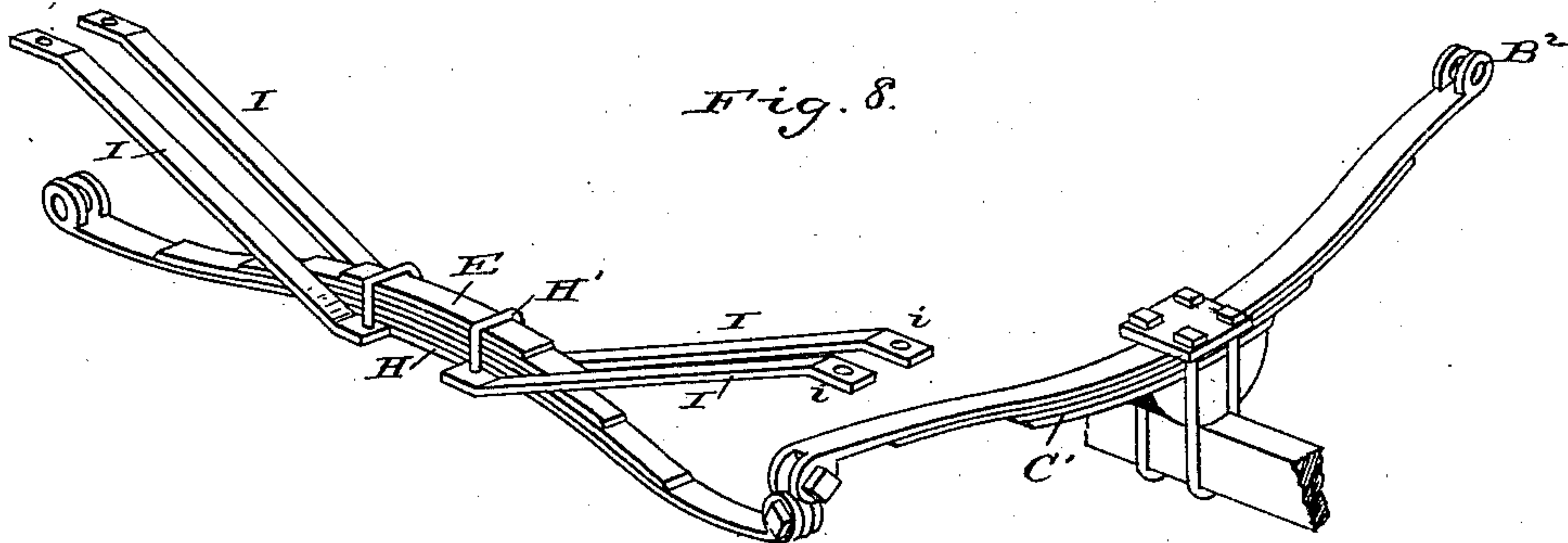
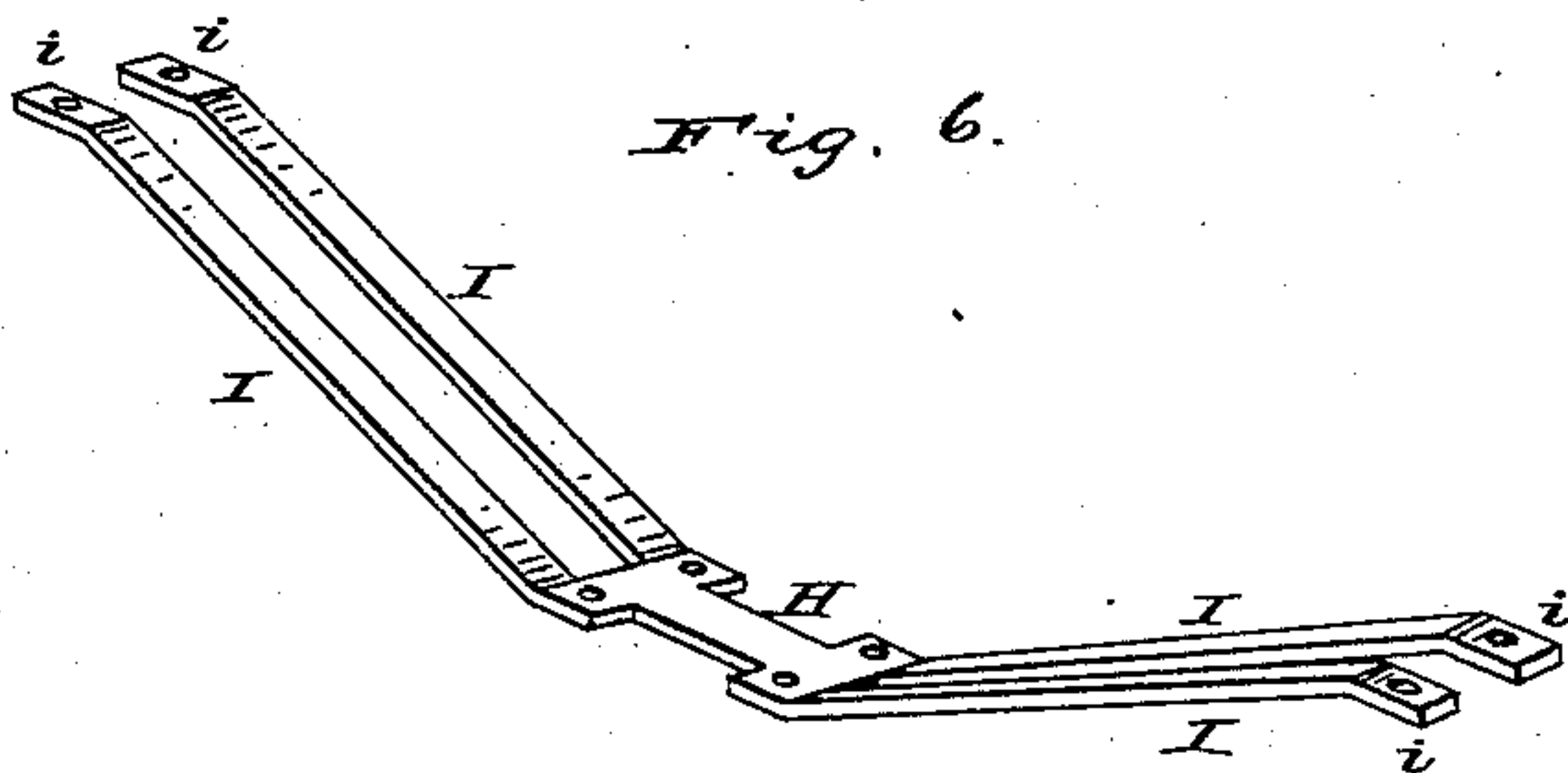


Fig. 6.



Witnesses

N. A. Low  
L. H. Marshall

Inventor:

J. Theodore Gurney.  
by Doubleday & Bliss  
attys.

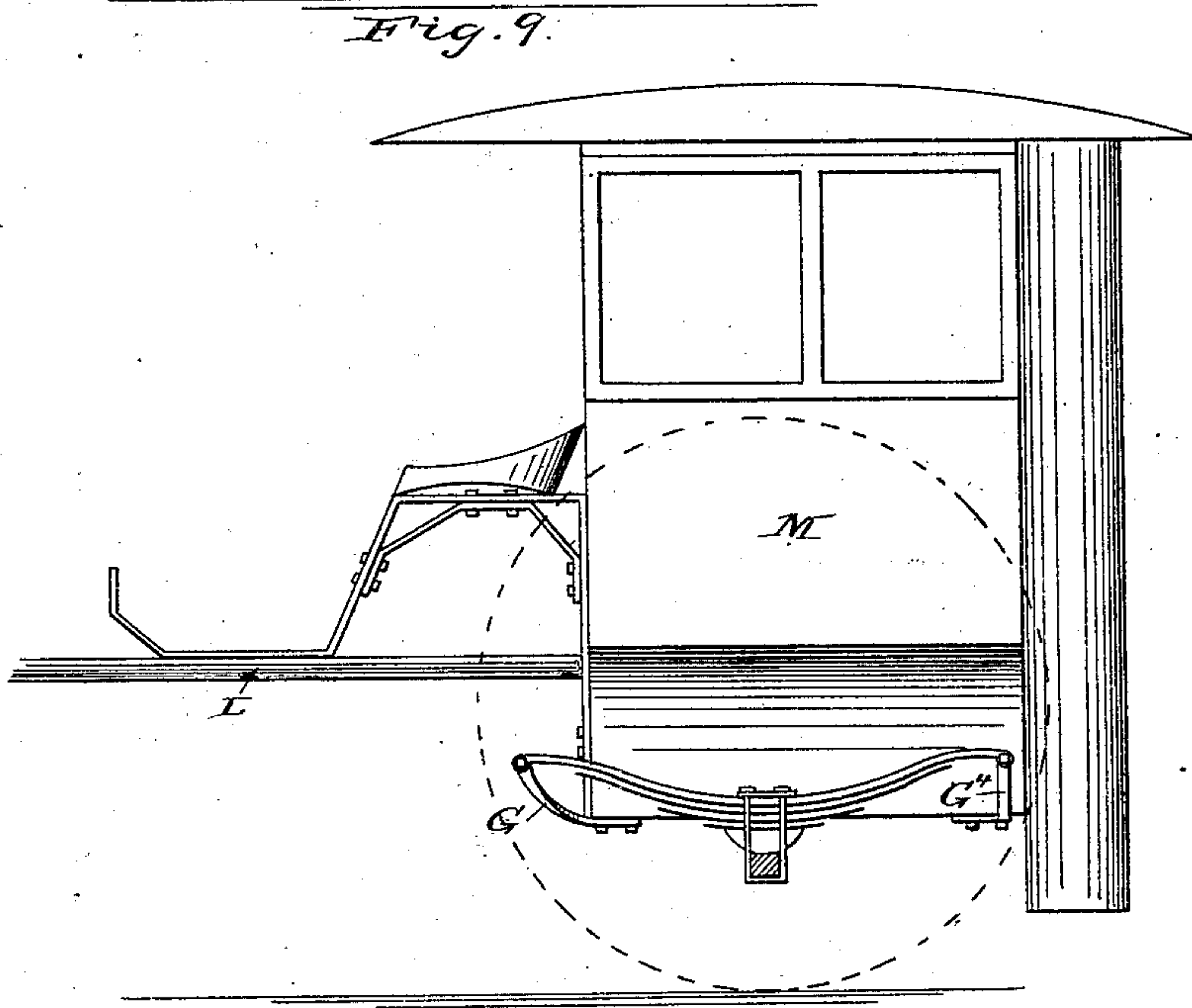
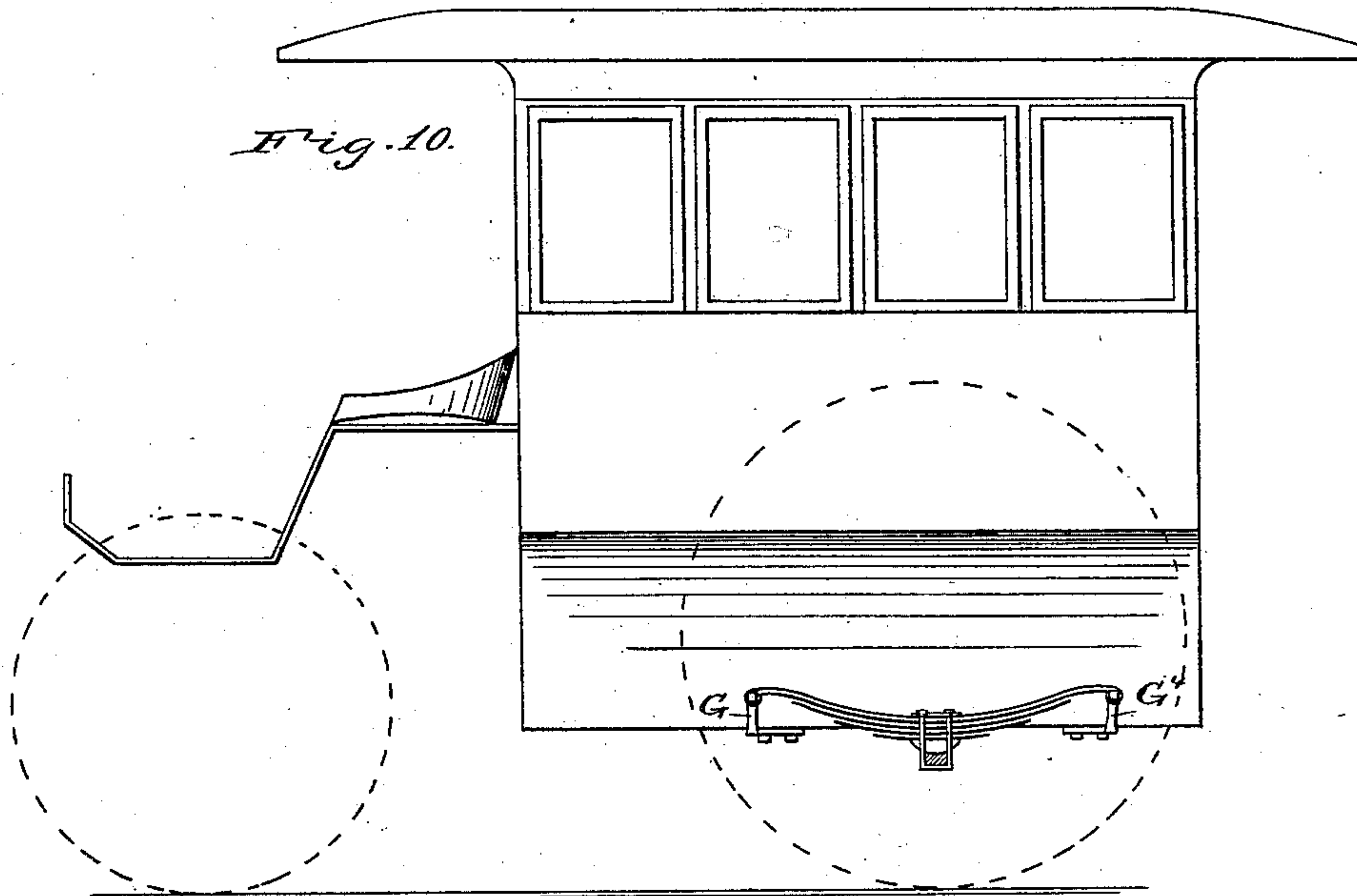
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Witnesses:

*H. N. Low*  
*L. H. Marshall.*

Inventor:

*J. Theodore Gurney.*  
*by Doubleday & Bliss*  
*Atty.*



# UNITED STATES PATENT OFFICE.

J. THEODORE GURNEY, OF BOSTON, MASSACHUSETTS.

## RUNNING-GEAR FOR VEHICLES.

SPECIFICATION forming part of Letters Patent No. 272,238, dated February 13, 1883.

Application filed April 1, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, J. THEODORE GURNEY, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Running-Gear for Vehicles, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to an improved construction of running-gear for vehicles, and improvements in devices for uniting the same to the draft devices.

Heretofore it has been customary to make 15 the springs used in constructing vehicles in such a manner that they shall be of equal strength on both sides of the center. It is often necessary to so attach these springs that they shall exert a greater resistance at one end than at the other. Therefore it has been cus- 20 tomary when using these springs thus to suspend them at points away from their centers longitudinally, in order to give one end a greater leverage than the other, the end farthest from 25 the point of support being more flexible than the other, and yielding with less resistance. Suspending the springs at points away from their centers produces many disadvantages which it is my purpose to obviate.

30 Springs of the character to which I allude are made, as is well known, of several plates or leaves, curved into a semi-elliptic form; and heretofore these plates or leaves have been made so as to be of the same shape and thick- 35 ness on both sides of the center, or so that the thickness gradually decreased from the center on both sides alike. I construct the springs so that on one side of the center there shall be more of the spring metal than upon the 40 other. One method which I follow to attain this end is to construct the spring plates or leaves so that they shall be thinner on one side of the center, the difference in thickness being effected in the process of hammering 45 them out. Another method is to apply one or more short plates or leaves, extending only from the center toward the end which is to be the stiffer. A spring constructed in either of these ways can be attached at its center to 50 the vehicle, and when thus centrally connected it permits the other parts to be arranged relatively to the spring and to each other more

advantageously than they can be when the springs are attached at a point nearer one end than the other. Springs made according to 55 my method can be used in many ways in constructing vehicles, and they are specially adapted to those vehicles in which use is made of one semi-elliptic spring on each side, a cross-spring at or near the rear end of the vehicle, 60 and a cross-bar to which the front ends are attached, or in which the front ends of the side springs are secured directly to the bottom or side of the vehicle.

Another object of the invention is to pro- 65 vide a means of connecting the side springs and the rear cross-spring together, so that there shall be none of the jarring or rattling incident to the attaching devices in ordinary use. For this purpose I employ a connecting 70 piece or shackle, of substantially the ordinary character, having two tubes or pipes at right angles to each other, and bolt this directly to the eye-pieces of the springs, and produce a novel and advantageous connection for the 75 ends of the springs.

The invention relates, further, to improvements in the devices for connecting the running-gear of a two-wheeled vehicle with the draft 80 devices. In this matter it consists in the combination, with the body mounted upon two wheels and the draft-frame extended back and connected rigidly with the body, of a peculiarly-shaped bracket-frame, by the use of which I avoid the cumbersome and expensive devices 85 that have been heretofore used for this purpose and provide a much stronger connection.

The invention relates, further, to a novel means of support for the rear cross-spring employed in vehicles of this character. Instead 90 of the bulky wooden blocks or supporting devices heretofore used, I employ a suspended iron plate supported by means of inclined straps or hangers, whereby the body is allowed to be dropped lower and the spring can 95 be more compactly arranged and more firmly supported.

The invention relates, also, to a novel form of axle and method for connecting together the body, the axle, and the intermediate springs. 100 Heretofore in vehicles of the class to which my invention pertains it has been customary to bend the axles so that they shall have two upwardly-extending arms situated sharply at



right angles substantially to the central part of the axle, and it has been further customary to support the side springs upon the top of the central portion of the axle. I provide a  
 5 more compact and durable union of the parts supported upon the axle by shaping it so that it shall lie in curved lines and supporting the side spring upon the under side of the axle, whereby I am enabled to bring the body low  
 10 without the cumbersome axle and joining parts hitherto employed.

The invention relates, further, to matters of detail in the construction of vehicles of this sort, which will be fully hereinafter set forth.

15 Figure 1 is a side elevation of a two-wheeled vehicle embodying my improvements. Fig. 2 is a front end view of sufficient thereof to illustrate the relations of the body to the running-gear. Fig. 3 is a side elevation of a side spring  
 20 constructed according to my improved plan. Fig. 4 is a side elevation of a vehicle having the now common crank-axle and my improved form of gear and connection of draft devices combined therewith. Fig. 5 shows in perspec-  
 25 tive the rear cross-spring, a side spring, and a portion of the axle shown in Fig. 4. Fig. 6 is a perspective of the rear spring support. Fig. 7 is a side elevation of a business-wagon having my improved side spring and rear spring support. Fig. 8 is a perspective of a portion  
 30 of the running-gear in Fig. 7 detached. Fig. 9 shows a two-wheeled cab without the rear cross-spring. Fig. 10 is a side view of a four-wheeled vehicle similarly mounted. Fig. 11  
 35 is a perspective of the coupling between the side and rear springs.

In the drawings, A represents generally the side spring of the vehicle. It is constructed of a back or top plate or leaf, B, shown to be  
 40 curved toward the ends and provided at the rear end with downwardly-turned eyes *b*. At the rear end it is connected to the cross-spring E, in a manner to be hereinafter described, when such spring is employed. At  
 45 the front end it is connected to a bracket or hanger, which in the passenger-vehicles shown in Figs. 1, 4, 9, and 10 extends upwardly from the bottom of the body, and in the business delivery-wagon shown in Fig. 7 extends down-  
 50 wardly.

C C, Fig. 3, represent the shorter plates or leaves of the spring. They are placed beneath the central part of the back leaf or plate, B. These are so constructed and arranged as to  
 55 provide a greater amount of the spring metal on the rear side of the center of the spring than on the front side. The plates or leaves C C are shown in Fig. 3, which, when being formed, are hammered at the front end thinner than at the other. The degree of thickness  
 60 is a matter which depends upon the circumstances of each case.

In the constructions shown in Figs. 1, 4, 5, 7, and 8 the side springs are made heavier  
 65 upon the rear side of the center by means of one or more supplemental plates, C', extending from the center backward sufficiently far.

It will be seen that as the said springs are connected rigidly to the vehicle-body at their front ends, and are connected flexibly thereto  
 70 by means of the intermediate rear cross-spring, E, at their rear ends, much less flexibility of the springs is required at their rear ends than at their front ends—that is, if they are attached to the vehicle at their centers longitudinally.  
 75 Now, it is desirable both to have the springs thus attached at their centers and also to have them as flexible at their front ends, where they are rigidly connected to the vehicle-body, as at their rear end. By providing a greater amount  
 80 of spring metal upon the rear side of the center than in front of it, the spring will exert much less resistance at the front end than if there were the same amount of spring metal upon that side that there is on the rear side.  
 85 This enables me to attach the springs at their centers and to use much longer and stronger springs than can possibly be used when they are secured to the body at points considerably in rear of their centers, as has been the custom  
 90 heretofore. When short supplemental leaves or plates C' are used, extending from the center toward the rear end, they operate to increase the resistance of the spring upon that side of the center, and necessitate a greater  
 95 leverage upon that end of the spring to produce the same amount of bending than will be possible at the front end.

The side springs, A, and the cross-spring E are connected together in such a way as to  
 100 avoid rattling and jarring entirely, and also avoid the looseness between the parts which has been incident to the connecting devices heretofore employed. As shown, the cross-spring E is situated in a manner the reverse  
 105 of the side springs—that is to say, the heavier back or base piece of the spring is below the shorter plates or leaves and the eyes *e* project upward in a plane at right angles to that of the eyes *b*. The joining of the springs is ef-  
 110 fected by means of a pipe coupling or shackle, F F', having two apertures, *f f'*, at right angles to each other. The shackle or coupling is so placed that the part F lies between the eyes *b* and the part F' between the eyes *e*. By  
 115 means of bolts *b'* and *e'* these parts are fastened together.

Heretofore it has been customary to turn the eyes *b b* of the side springs upward and the eyes *e e* of the cross-spring downward and  
 120 connecting them by a common double stirrup-shackle; but these connecting devices I have found very disadvantageous for many reasons, there being much jarring, rattling, looseness, and liability to breakage incident to their use.  
 125

I do not claim, broadly, the pipe coupling or shackle which I have shown, as this, broadly considered, is very old; but by shaping the spring-plates and their heads or eyes in the  
 130 manner described herein, and by connecting them in the way I have set forth, I avoid the disadvantages mentioned above incident to the previously-used devices.

In vehicles of the class shown in Figs. 2, 4,



9, and 10 it is desirable to have the body of the vehicle as low as possible relatively to the running-gear. To permit the dropping of the body low, I employ brackets G, with upwardly-  
 5 extending arms, which are provided with an eye, whereby the forward end of each side spring may be attached, the spring having two corresponding eyes, B', pivotally connected to the eye of the bracket or hanger by a bolt.  
 10 When the spring is combined with a wagon of the character shown in Fig. 7, a loop or stirrup hanger, G', is employed having a central downwardly-turned eye adapted to be pivoted to the upwardly-turned eyes B<sup>2</sup> of the side  
 15 springs, specially adapted for wagons of this character, and shown in Fig. 8. The device for supporting the rear cross-spring, E, is shown detached in Fig. 6, and its relations to the springs in Figs. 5 and 8. It is formed with  
 20 a central plate, H, which can be firmly secured to the central portion of the spring E by means of stirrup-bolts H'. I are arms or straps extending laterally from the central plate, H, two at each end, and one upon each side of  
 25 the spring at the end. These arms I are at i bolted to the bottom of the vehicle. This enables me to bring the central part of the spring closer to the body and provide a much stronger and more durable support than are  
 30 those heretofore employed. The supporting device may be formed by welding the arms I I to the plate H, though they may be all made in one piece, if preferred.

I am aware that the patents to Davis, No. 210,925, December 17, 1878, and Shea, Reissue No. 3,982, May 17, 1870, show hangers for supporting cross-springs, and I do not claim, broadly, all hangers as my invention.

Heretofore a cumbersome and comparatively  
 40 complicated running-gear has been employed in two-wheeled passenger-vehicles. A long crank-axle has been employed, bent at right angles to provide long upwardly-extending arms, upon the top of which the side springs  
 45 have been supported. I have succeeded in devising a much simpler and lighter form of axle and connecting mechanism. It is shown more especially in Figs. 1 and 2. The axle K is provided with a comparatively short downward  
 50 bend at k, to permit all the vertical swinging of the body that is required. To bring the body low enough the side springs are mounted upon the under side of the horizontal arms k' of the axle and connected directly thereto. A  
 55 rear cross-spring, side springs, and front upwardly-turned brackets, G, of the character above described, are combined with this axle.

Another matter of great advantage in a two-wheeled vehicle of the kind shown in Fig. 1 consists in the method of joining together the  
 60 body, the draft-frame, and the seat-frame. I avoid the heavy and cumbersome connecting devices heretofore used, and provide a simple but strong frame, constructed as follows: L represents the draft-frame, to which the thills  
 65 are attached. It extends back and is rigidly connected to the body M. N represents a

strong bracket, formed of a vertical part, n, adapted to be bolted to the front end of the body at or near the bottom, and having also  
 70 a horizontal portion, o, to support the seat, a front bottom part, p, at the foot-board, and an inclined connecting part, q. There is a bracket upon each side of the draft-frame and seat-frame of this character. The part p is securely  
 75 fastened to the draft-frame, the part o is connected to the seat, and the part n to the body, as described. A supplemental bracket, r s, is employed, having the part s bolted to the part o of the main bracket, the portions r and t ar-  
 80 ranged as braces, respectively, between the parts o and q and the parts o and n. I have in a previous patent shown the advantages in a four-wheeled vehicle of a bracket-frame of this character for joining the body with the  
 85 front gear frame; but I am not aware that use has ever been made of a draft-frame rigidly connected to a body mounted upon two wheels and braced securely to said body and the seat-frame by means of a metallic bracing of the  
 90 character described. When arranged as shown, the three main parts of the vehicle are rigidly connected by devices having no superfluous weight and exceedingly simple in construction. I do not, however, herein claim the pe-  
 95 culiarly-constructed bracket which I have last described for supporting the seat; nor do I claim, broadly, the combination of the bracket, the seat, and the body; nor, broadly, the combination of the bracket, the seat, the body,  
 100 and the thills or draft devices.

By means of the upwardly-turned brackets G G<sup>4</sup>, the body can be mounted much lower relatively to the other parts than it can when hangers or brackets of the ordinary character  
 105 are employed. This method of supporting a body is shown in Figs. 9 and 10, where a rear hanger or bracket, G<sup>4</sup>, is arranged to extend upwardly from the bottom of the bed, so as to throw the rear ends of the side springs to a  
 110 point higher than the bottom.

I do not in this application claim herein anything but what is specifically set forth in the following claims, reserving to myself the right  
 115 to claim the other patentable features in another application which I am about to file as a division hereof.

What I claim is—

1. In a two-wheeled cab or vehicle, the combination, with the body M and the bracket-  
 120 frame N, having the front lower part, p, the upper part, o, for supporting the seat, and the rear part, n, secured to the body M, of the thill-frame situated beneath and joined to the bracket-frame, and extending to and rigidly  
 125 secured to the body, substantially as set forth.

2. A vehicle-spring composed of leaves or plates secured together at the center of the spring and at the centers of the leaves, respectively, each leaf having a greater amount of  
 130 spring metal upon one side of its center than upon the other side, substantially as set forth.

3. The combination of the vehicle-body, the semi-elliptical cross-spring E, the side springs,



C C', respectively attached to the ends of the cross-spring, the supporting-plate H, situated on the under side of the center of the spring, and the arms I I, attached to said plate, extending up on both sides of the semi-elliptical spring, and having their upper ends secured to the under side of the body directly, whereby said spring can have its upper face brought

into close proximity to the under side of the body, substantially as set forth. 1c

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

J. THEODORE GURNEY.

Witnesses:

JAMES T. McLAUGHLIN,  
HENRY H. PAGE.