

(No Model.)

J. R. LOCKE.
VEHICLE SPRING.

No. 376,442.

Patented Jan. 17, 1888.

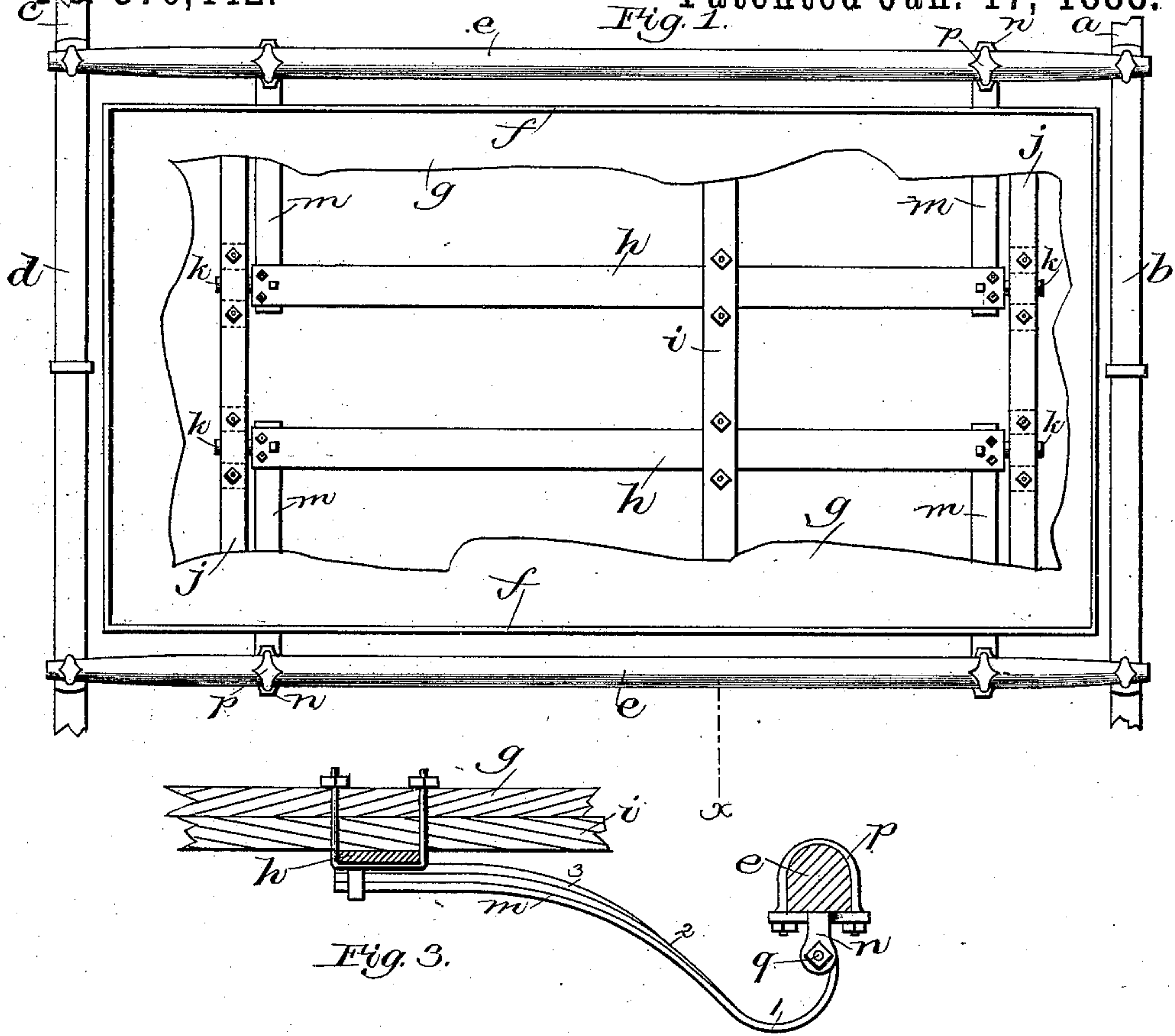
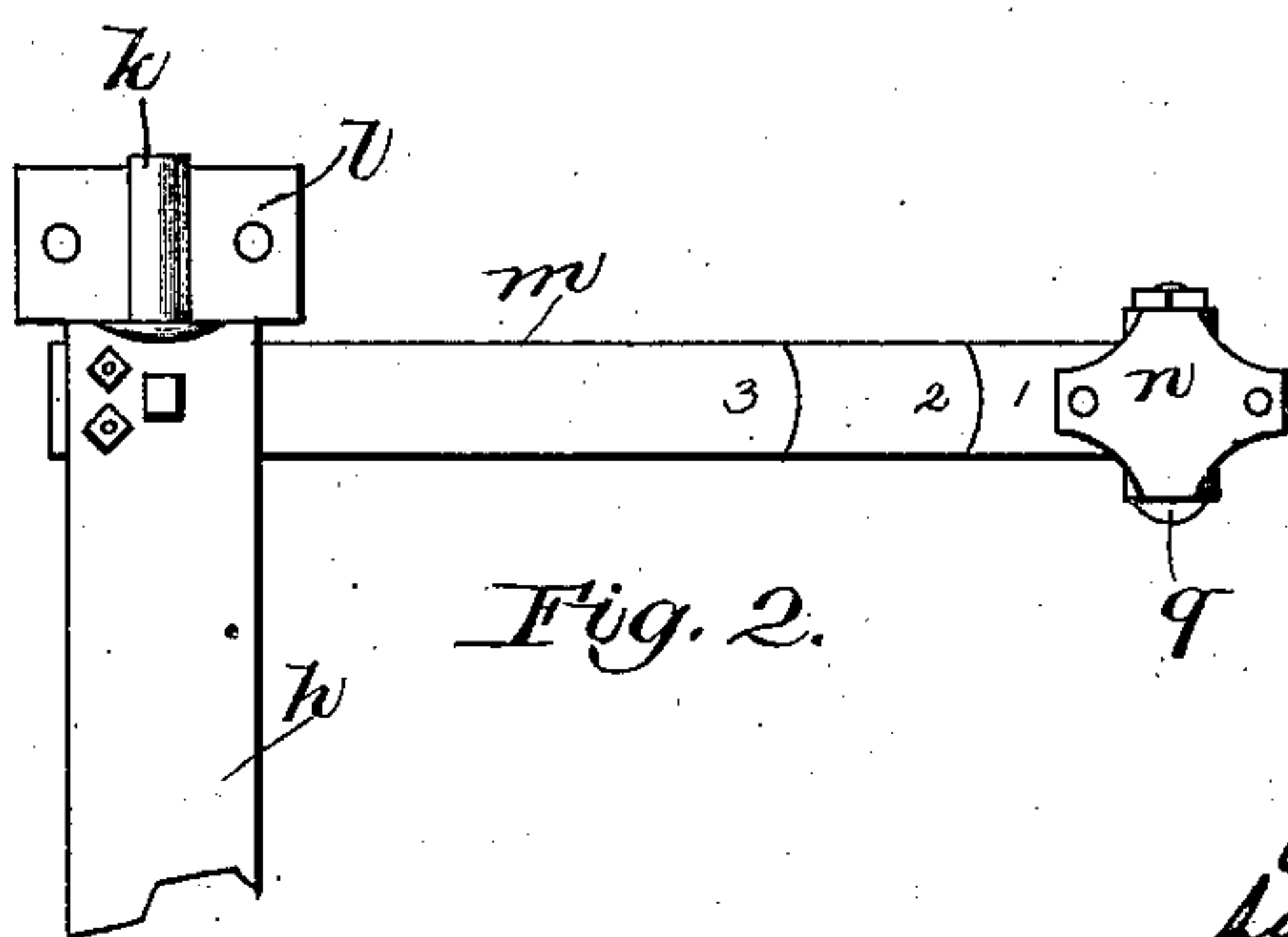
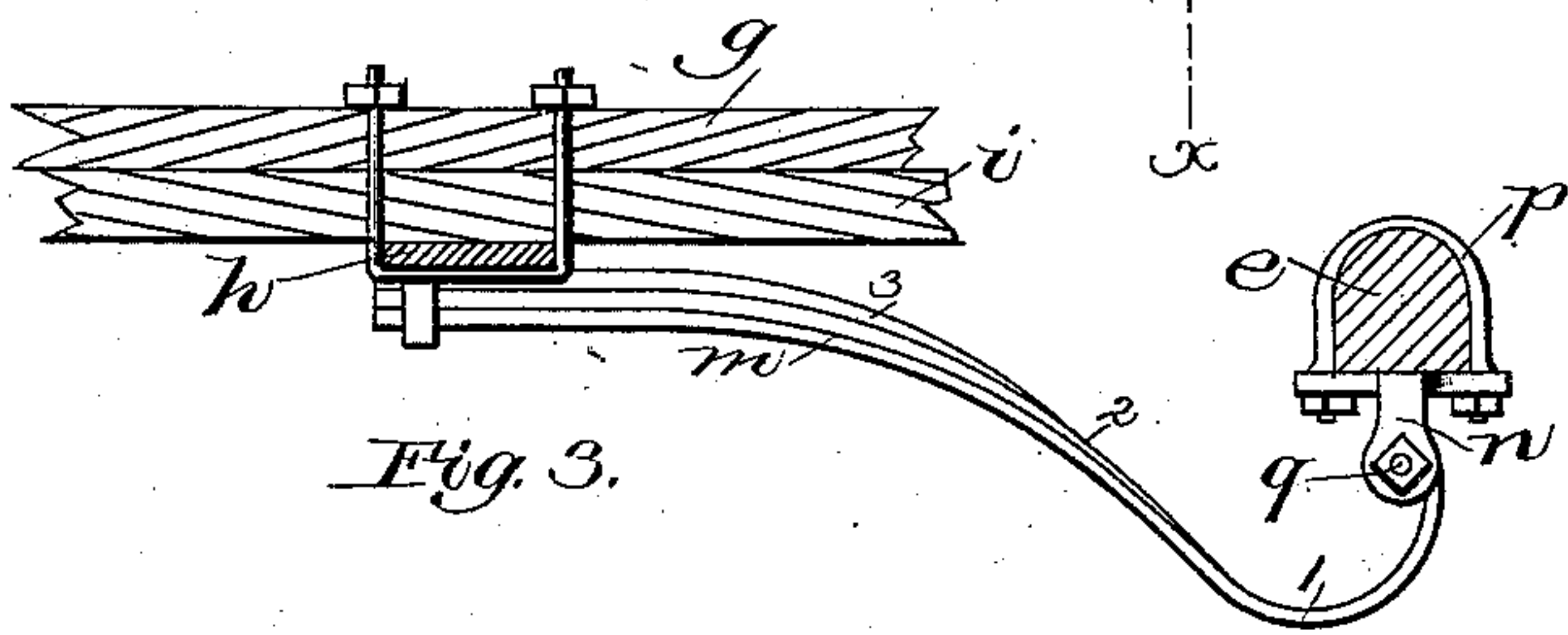


Fig. 3.



Witnesses
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UNITED STATES PATENT OFFICE.

JOSEPH R. LOCKE, OF AMESBURY, MASSACHUSETTS.

VEHICLE-SPRING.

SPECIFICATION forming part of Letters Patent No. 376,442, dated January 17, 1888.

Application filed September 14, 1885. Serial No. 177,018. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH R. LOCKE, of Amesbury, in the county of Essex and State of Massachusetts, have invented a new and useful Improvement in Vehicle-Springs, which will, in connection with the accompanying drawings, be hereinafter fully described, and specifically defined in the appended claims.

Figure 1 is a top plan view of the body and part of the under work of a buggy with my invention thereto applied, a portion of the floor of the body being broken away to show the parts below it. Fig. 2 is a detached top plan view of a portion of one of my springs. Fig. 3 is a sectional elevation, the section being vertical and taken on line X, Fig. 1, through the near spring, and the elevation showing that position of the spring to the right of said line.

My invention relates to combined torsion and arm springs; and it consists in features of novelty hereinafter fully described, and pointed out in the claims.

Referring to the drawings, *a* represents the rear axle, and *b* a semi-elliptic spring secured at its lineal center to the axle.

c is the front axle, and *d* a spring like *b*, and which at its center is secured to the usual head-block that is secured to and rests upon the axle. A pair of side bars, *e e*, are shown with their ends secured to the ends of springs *b d*.

The walls of the body are shown at *f* and its floor at *g*, and partially broken away, as stated. Two flat longitudinal bars, *h h*, of tempered steel, are secured to the under side of the body by being clamped to bar *i* (secured to the under side of the body) at a point distant from their rear end about two-fifths of their length, and also by the pivots *k* upon their respective ends, which are journaled in boxes *l*, which are secured to bars *j*, also secured to the under side of the body. To the respective ends of bars *h* are bolted and clamped the arm-springs *m*, shown as formed with leaves 1 2 3 of spring-steel, the outer end of the main or lower leaf, 1, being formed with an eye, which receives pivot-bolt *q* of shackle *n*, which is secured to bars *e* by clip *p*, as shown.

As weight is placed in the body and it is thereby depressed, the arm-springs *m*, in addition to their elastic yielding action, will by their twisting action upon bars *h h* economize

the elasticity thereof, the respective arms of said bars (the portions respectively forward and behind bar *i*) turning upon their pivot *k* at their end, while clamped rigidly to said bar *i*. Instead of supporting side bars *e* upon the cross-springs *b d*, said bars may be attached directly to the hind axle and a long head-block, or racked, in a manner equally well known to that shown in the drawings.

I am well aware that bars square in cross-section have been arranged and secured as are my flat bars *h*, and that rigid unyielding arms were secured to said square bars and shackled to side bars *e*; but, besides the rigidity of the lateral arms and the stiff, jerky, and uncomfortable motion derived from the square torsion-bars, the two constituted a rigid arch when the body was unoccupied and the lateral arms and bars in normal position, and when the body was depressed and said arch thereby reduced the side bars *e* were forced apart laterally at their middle portion, while their ends were confined at a fixed distance apart, and this added to the unpleasant action of the body.

With the torsion-bars square in cross-section, they were usually nine-sixteenths of an inch in diameter, while with them flattened, as shown, they require (with the same load) a bar of best spring-steel that is two inches by nine thirty-seconds in cross-section, or more than seventy-five per cent. more metal than in the former case, thus showing that the elasticity of the bar is much more perfectly utilized when flattened than when square. In addition to this, the arm-springs *m*, by reason of their elasticity and their compound curve, will, when (by the roughness of the way or other causes) greater force is applied to them, be shortened by the increased curve of the thin outer end more than they will be lengthened by the straightening of the curve at the thicker end thereof, and hence the lateral thrust which accrued when rigid arms were employed is obviated, and the body moves up and down, carrying the torsion-bars past the line of the side bars without thrusting the latter apart, as occurred with the rigid arms.

By arranging the clamping-bar, as *i*, at a point in rear of the lineal center of torsion-bars *h*, the portion of said torsion-bars thus in rear of the clamp is less yielding than is the

portion in front of the clamp, thereby causing the body to maintain a level position both when empty and when loaded, as the center of gravity of the weight of the occupants is, as in all light vehicles, considerably in rear of the lineal center of the body, and hence the advantage of having the rear arms of bars *h* less yielding than their front arms.

I claim as my invention—

10 1. In a side-bar vehicle, the combination of two elastic metallic bars of flattened cross-section arranged lengthwise of the body, and at both their respective ends pivotally connected therewith, and at a point between their ends
15 rigidly secured to the body, and an arm at each end of said bars rigidly secured thereto and pivotally connected with the side bars, substantially as specified.

2. In a side-bar vehicle, the combination of

the flat bars *h*, pivotally supported at their ends and rigidly secured to the body at a point between their ends, and arms *m*, rigidly secured to said bars *h* near their respective ends, and pivotally connected with side bars, *e*, substantially as specified.

25 3. In a side-bar vehicle, the longitudinal torsion-bars *h*, pivoted at their respective ends, and having at each end an arm rigidly connected to them and pivotally connected with the side bars, said torsion-bars being rigidly secured to the body at a point in rear of their lineal center, substantially as for the purpose specified.

JOSEPH R. LOCKE.

Witnesses:

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