2 Sheets—Sheet 1.

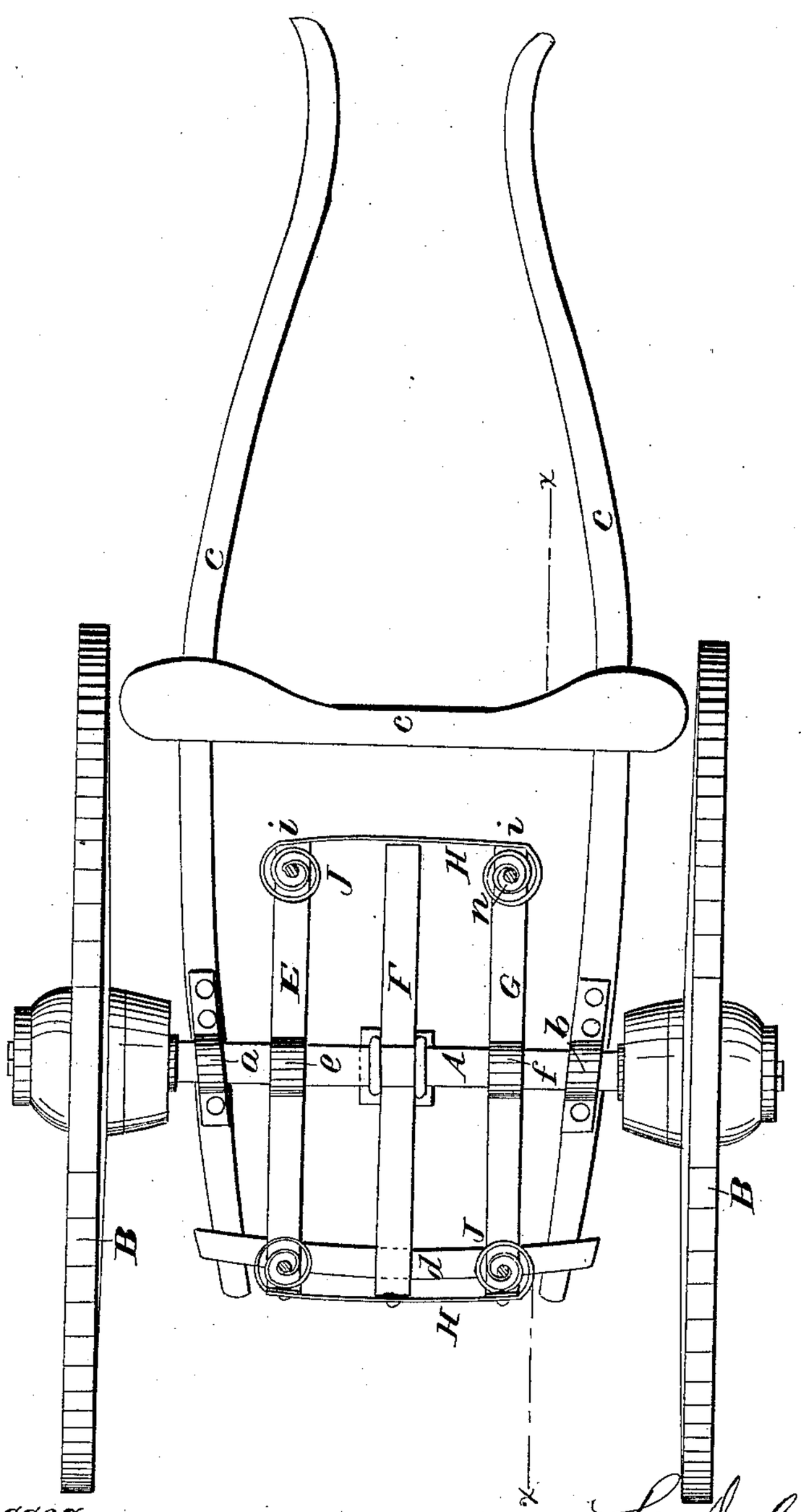
L. D. COWLES

Carriage-Spring.

No. 34,197

Patented Jan. 21, 1862.

Fig: 1.



Witnesses.

J. W. Coombs

G. W. Reed

Inventor.

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Per Munn & Co

Attorneys

2 Sheets—Sheet 2.

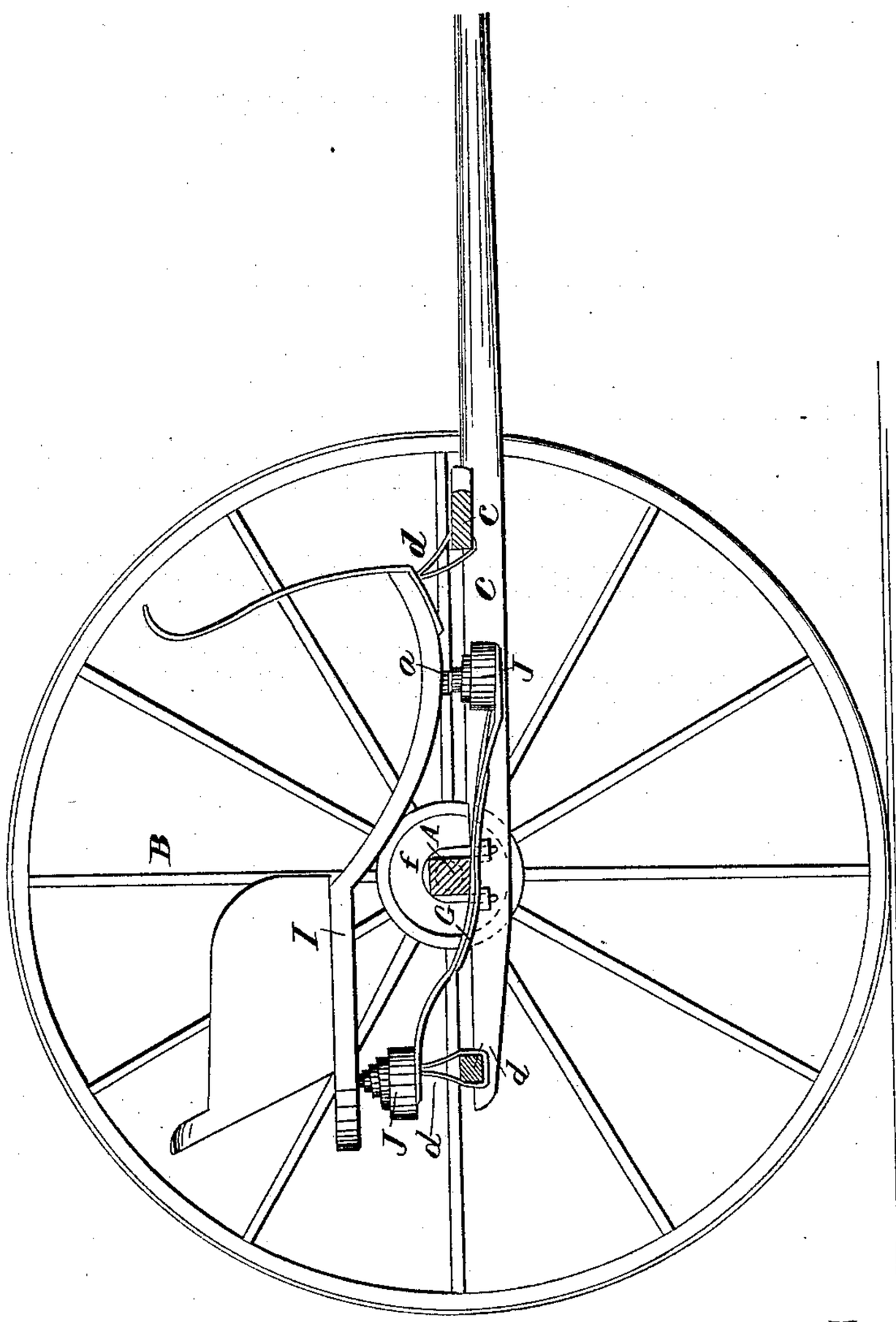
L. D. COWLES.

Carriage-Spring.

No. 34,197

Patented Jan. 21, 1862.

Fig: 2.



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Attorneys.

UNITED STATES PATENT OFFICE.

LORENZO D. COWLES, OF ARMADA, MICHIGAN.

IMPROVEMENT IN CARRIAGES.

Specification forming part of Letters Patent No. **34,197**, dated January 21, 1862.

To all whom it may concern:

Be it known that I, LORENZO D. COWLES, of Armada, in the county of Macomb and State of Michigan, have invented certain new and useful Improvements in Two-Wheeled Carriages; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents my invention by a plan applied to a sulky, the body of the sulky being removed. Fig. 2 is a sectional elevation of the same, the section being taken at the line *x x* of Fig. 1.

Similar letters of reference indicate corresponding parts in the two figures.

This invention consists in a peculiar construction and arrangement of springs of an ordinary two-wheeled carriage, whereby the lateral and nodding motion of the same, produced by one of the wheels striking against an obstruction in the road or dropping into a rut, is neutralized, and a gentle and easy motion given to the carriage, as hereinafter to be fully explained.

To enable others skilled in the art to fully understand and construct my invention, I will proceed to describe it.

A is an ordinary wrought-iron carriage-axle supported on wheels B, and C C are thills, which are attached to the axle in the usual manner by box-straps *a b*. The thills are connected together on opposite sides of the axle by cross-bars *c d*.

E F G are springs formed of two or more leaves of plate-steel and of semi-elliptic or other suitable form, attached in the middle and equidistant apart to the axle A, the two outside springs by U-shaped straps *e f*, which encompass the axle, where cylindrical grooves are cut in it, making a rolling joint. The middle spring F is permanently secured to the axle by a box-strap or by any other suitable device. On the outer end of each of these springs a lip is formed, to which springs H, extending crosswise of the carriage, are firmly secured by rivets or bolts *i*. The ends of these latter springs are bent into spiral or volute form J, the inner turn of the volutes being the width of the spring above the outer, and secured to the body or seat I of the carriage by a projection on the end of the spring or by a bolt *n*, which may be attached to the end of the spring in any suitable manner.

The front and back ends of the body are connected, respectively, to the cross-bars *c d* by check-straps *g*, which prevent too great rolling motion of the body when the animal starts or stops very suddenly.

The middle spring F of the carriage, which is secured permanently to the axle, is designed to break the thill motion of the body and seat and to keep the seat in position, which otherwise would have a tendency to roll round the axle.

The effect of the volute springs, by which the carriage-body is attached to the rolling springs, is to neutralize the nodding as well as the lateral motion of the body produced by either of the wheels dropping into a rut or striking against an obstruction, and to impart to it an easy and very desirable motion.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the springs E G, attached to the axle of a two-wheeled carriage by means of a rolling joint *e f*, with the stationary spring F, when arranged and operating in the manner set forth.

2. The combination of the volute springs H J, with the rolling springs E G, and stationary spring F, when arranged in the manner described.

LORENZO D. COWLES.

Witnesses:

WARREN TIBBITTS,

GEORGE N. WILSON.