

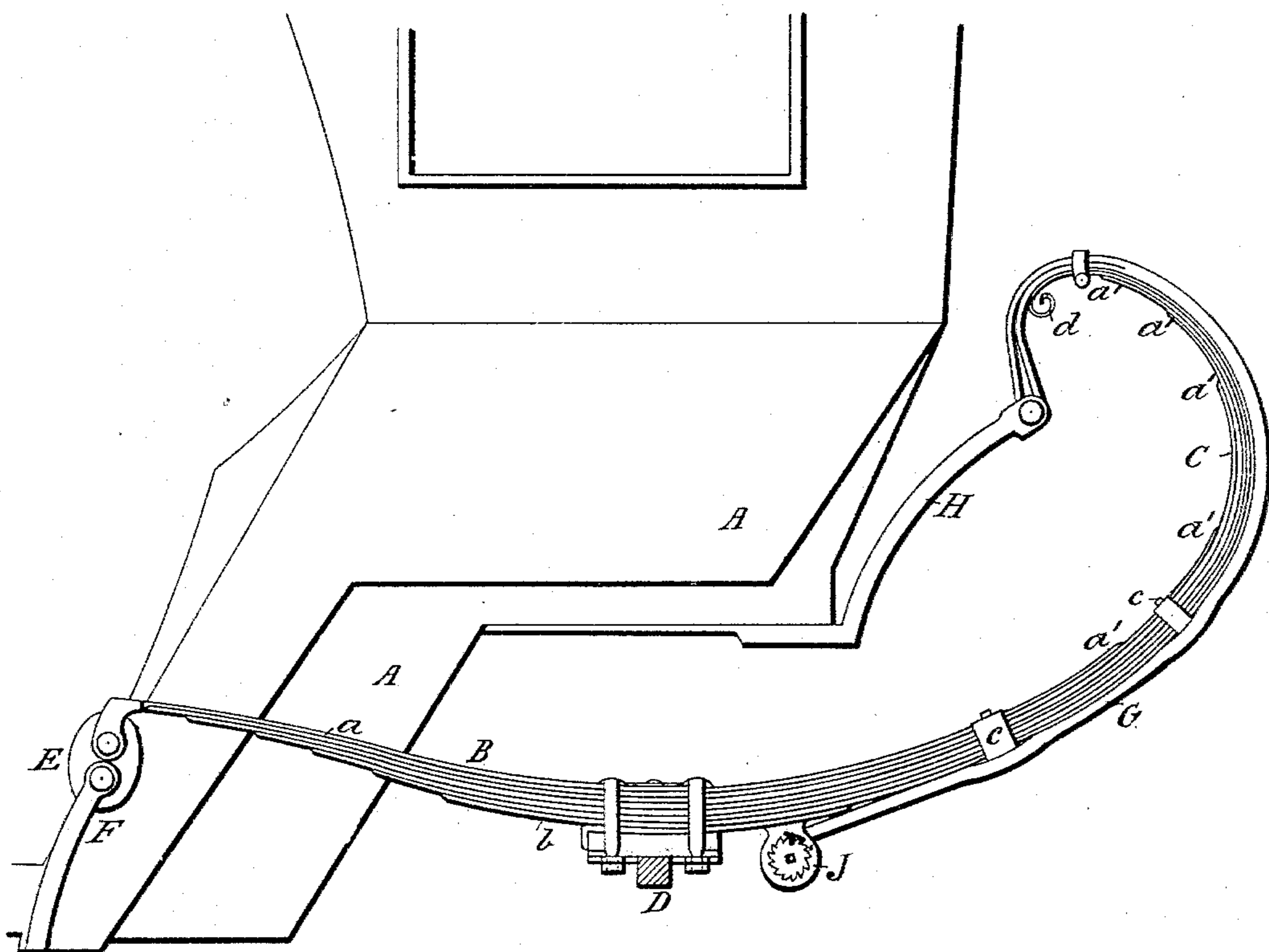
(No Model.)

F. FORDER.

SPRING FOR TWO WHEELED VEHICLES.

No. 315,928.

Patented Apr. 14, 1885.



INVENTOR:

Frederick Forder

WITNESSES:

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UNITED STATES PATENT OFFICE.

FREDERICK FORDER, OF WOLVERHAMPTON, ENGLAND.

SPRING FOR TWO-WHEELED VEHICLES.

SPECIFICATION forming part of Letters Patent No. 315,928, dated April 14, 1885.

Application filed February 9, 1885. (No model.) Patented in England October 21, 1884, No. 14,078.

To all whom it may concern:

Be it known that I, FREDERICK FORDER, of Wolverhampton, England, have invented certain Improvements in Springs and Spring-Mountings for Two-Wheeled Vehicles, especially applicable to "Hansom cabs," (for which I have applied for Letters Patent in Great Britain so far as the invention relates to springs for Hansom cabs, my application being numbered 14,078, and dated the 24th day of October, 1884, but have not yet received the grant of such Letters Patent,) of which the following is a specification.

My invention relates to the construction of a side spring for two-wheeled vehicles—such as Hansom cabs—and to the manner of mounting the same; and my object is to combine all the advantages of an ordinary rolled eye or open-ended side spring with the well-known advantages of the ordinary C-spring.

The improvement in the spring consists in the peculiar arrangement of the plates or laminae of the spring, whereby both ends of the spring are better adapted to receive the strain put upon them than in springs of the usual construction; and the improvements in the mounting of the spring and the attachment of the body of the vehicle thereto consist in the manner of attaching the two ends of the spring to the stays on the body, all as will be more particularly hereinafter set forth.

In the drawing which serves to illustrate my invention I have shown my improvements as applied to a Hansom cab.

The drawing shows as much of the cab in side elevation as is necessary to fully illustrate my invention.

A is the body of the vehicle, and B C is the spring. The forward part, B, of the spring is constructed in the same manner as the forward part of an ordinary open-ended side spring, and the hinder part, C, is shaped to form a C-spring. D is the axle, which is shown in transverse section.

The construction of my spring is peculiar. The top plate or lamina, *a*, of the forward part of the spring extends a less distance back of the axle than the plate next below it, and each succeeding lamina, while it projects a less distance forward, as shown, extends a greater distance backward than the plate next

above it, and the hinder ends of the plates extend out beyond and behind one another around the inside of the curve forming the C-shaped end of the spring, as shown at *a' a'*, &c., some of the lower plates of the forward end of the spring thus becoming upper plates around the hinder part of the spring as the curve there sweeps over. Thus the shortest bottom plate, *b*, of B becomes the longest top plate of C, and forms the extreme or inward point of the C-shaped part. It will readily be seen by those skilled in the art that this arrangement of the plates will enable them all to take part in supporting the weight, as the pressure of the body on both ends of the spring will tend to press the plates of the spring together. In former constructions this was not the case. The forward end of the spring is attached to the front stay, F, by means of a link or robbin, E, and the body of the cab is hung to the hinder end of the spring by means of a leather brace, G, which extends from the ordinary pawl-and-ratchet connection, J, under the spring and around its curved end, and the looped end of said brace takes around the back stay, H. No crossing is required. When the loops of the braces are hung vertically or slanting forward, in the usual way, the stopping or sudden retardation of the vehicle will cause the wheels and axle, with the springs thereon, to run forward, as both the robbins (or the links or shackles in the case of rolled-eye-ended springs,) in front and the brace-loops behind would allow of themselves sufficient forward movement for this to take place. To obviate this difficulty, therefore, I slant the loops backward and downward from the point of the spring to the point of their attachment to the back stays, and thus prevent the wheels and axle from running forward under the conditions above described. It is by the adoption of this form of attachment of the body to the springs at the back that I am enabled to employ the robbins, links, or shackles as connections between the springs and front stays, F, and thus to secure the advantage which such a connection gives in allowing a certain degree or amount of extension and contraction, and the consequent free action of the spring in lieu of the rigidity or stiffness due to the ordinary mode

or that formerly employed, which was made necessary by the suspension of the body from the brace-loops hung otherwise than in a backward direction to their connection with the back stays.

c c are clips which embrace the plates of the back part, C, of the spring.

The attachment J is constructed the same as that ordinarily employed with this class of springs, and will need no further description.

In lieu of the brace G attached at J, with its free end constructed to form the loop for attaching the spring to the back stay, H, the loop may be suspended from a hook, *d*, formed on or secured to the end of the spring, and the brace be omitted. In this case the loop would incline backward in the same manner as that described for the loop on the brace. This change of construction simply omits the brace and may be made by any intelligent workman.

I do not claim, broadly, a spring for two-wheeled vehicles having a front portion, B, and a rear portion, C, as this is not new with me; but

What I claim is—

1. A side spring, B C, for a two-wheeled ve-

hicle, composed of plates or laminae arranged substantially as described—that is to say, having the upper and longest lamina, *a*, of the forward part, B, arranged to form the shortest lamina of the hinder part, C, and the shortest and lower lamina, *b*, of the part B arranged to form the longest lamina of the part C, for the purpose set forth.

2. The combination, with a body, a front stay, a back stay, and an axle of a two-wheeled vehicle, of springs of substantially the form shown, connected to the front stay by a robbin or shackle and to the back stay by a loop that is set or arranged to extend backward and downward from its point of attachment to the spring to its point of attachment to the back stay, and the said loop and robbin or shackle, all constructed and adapted to operate substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

FREDERICK FORDER.

Witnesses:

STEPHEN WATKINS,
ROBERT M. LISTER.