

(No Model.)

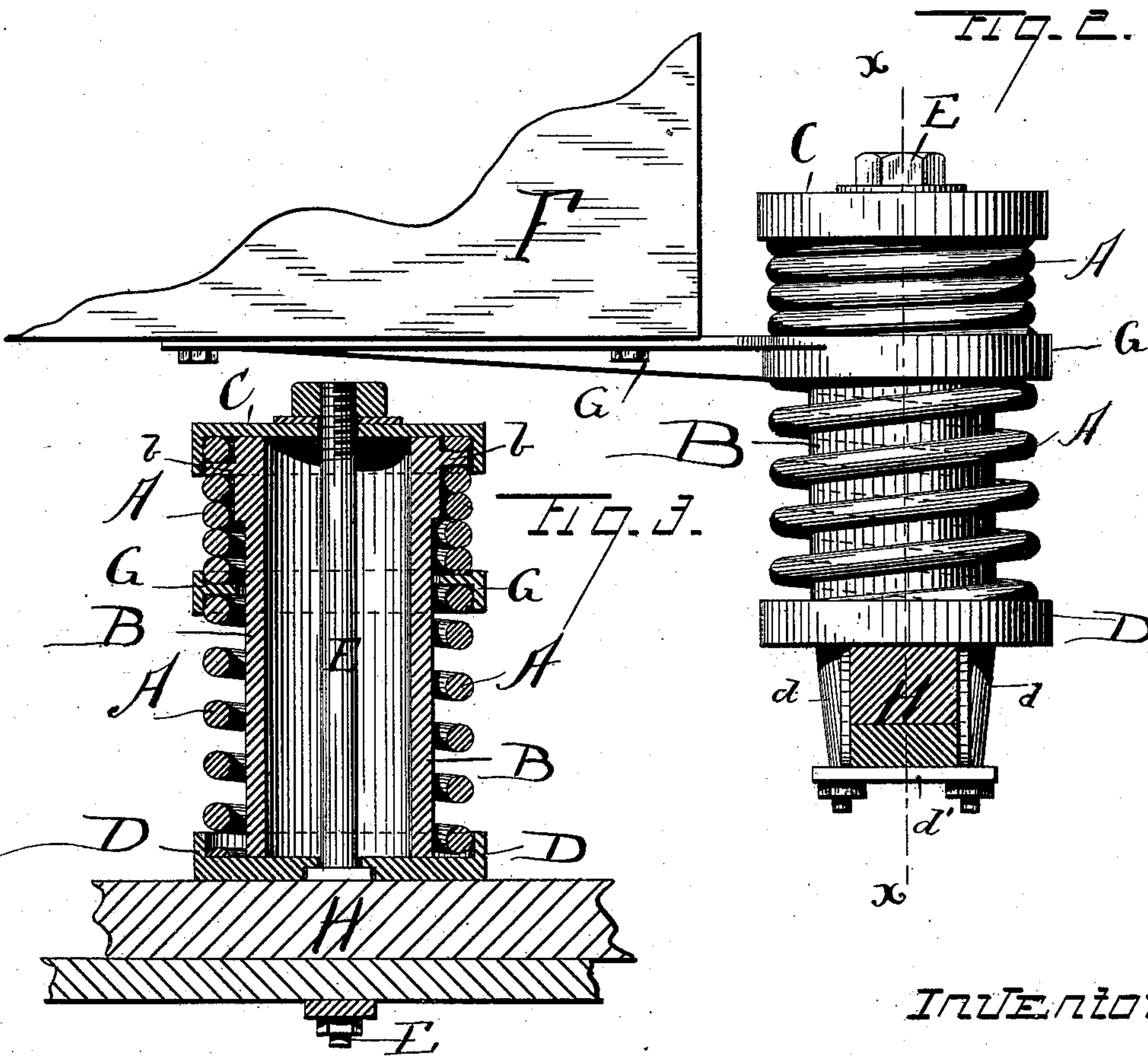
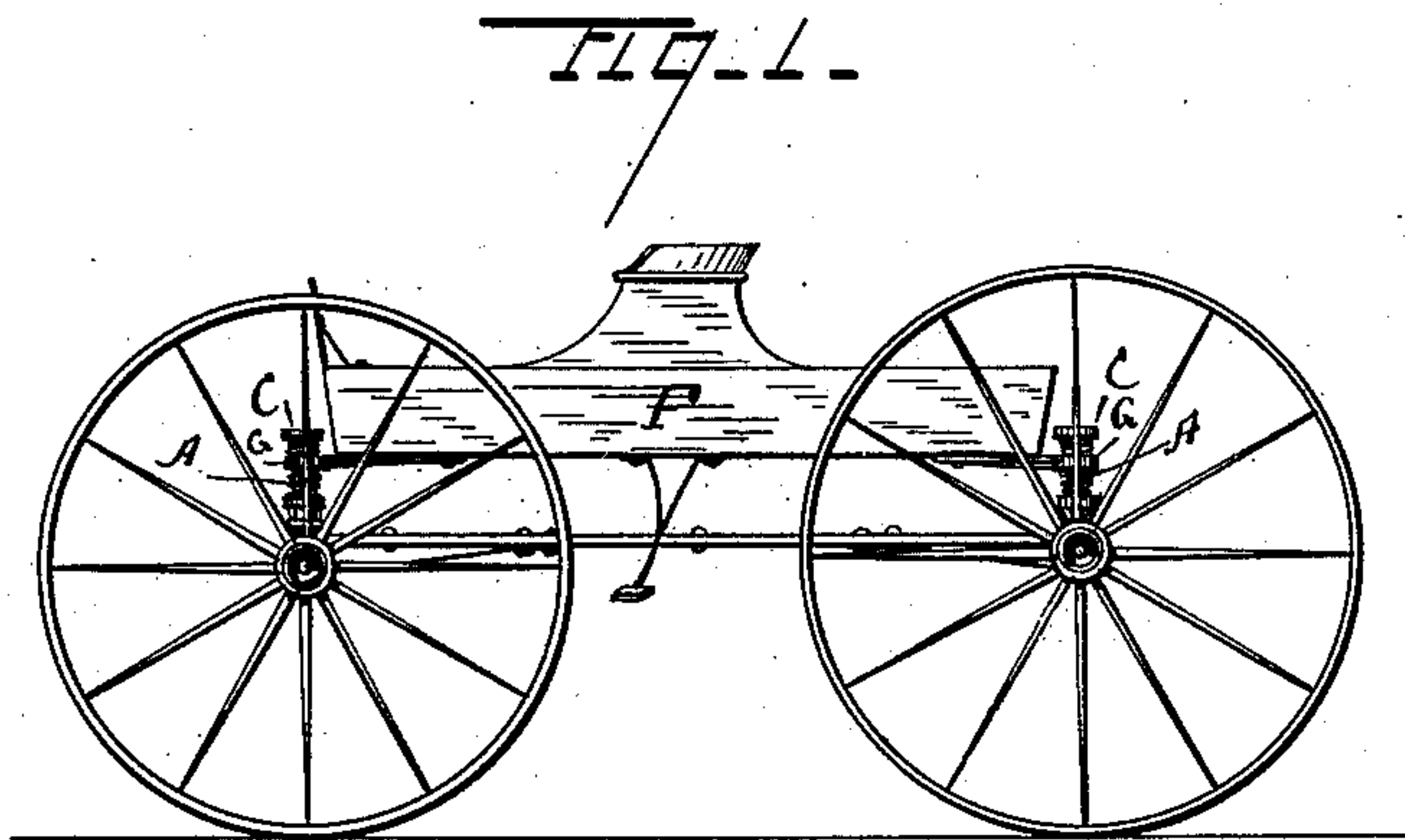
3 Sheets—Sheet 1.

W. I. BUNKER.

VEHICLE SPRING.

No. 373,267.

Patented Nov. 15, 1887.



WITNESSES,
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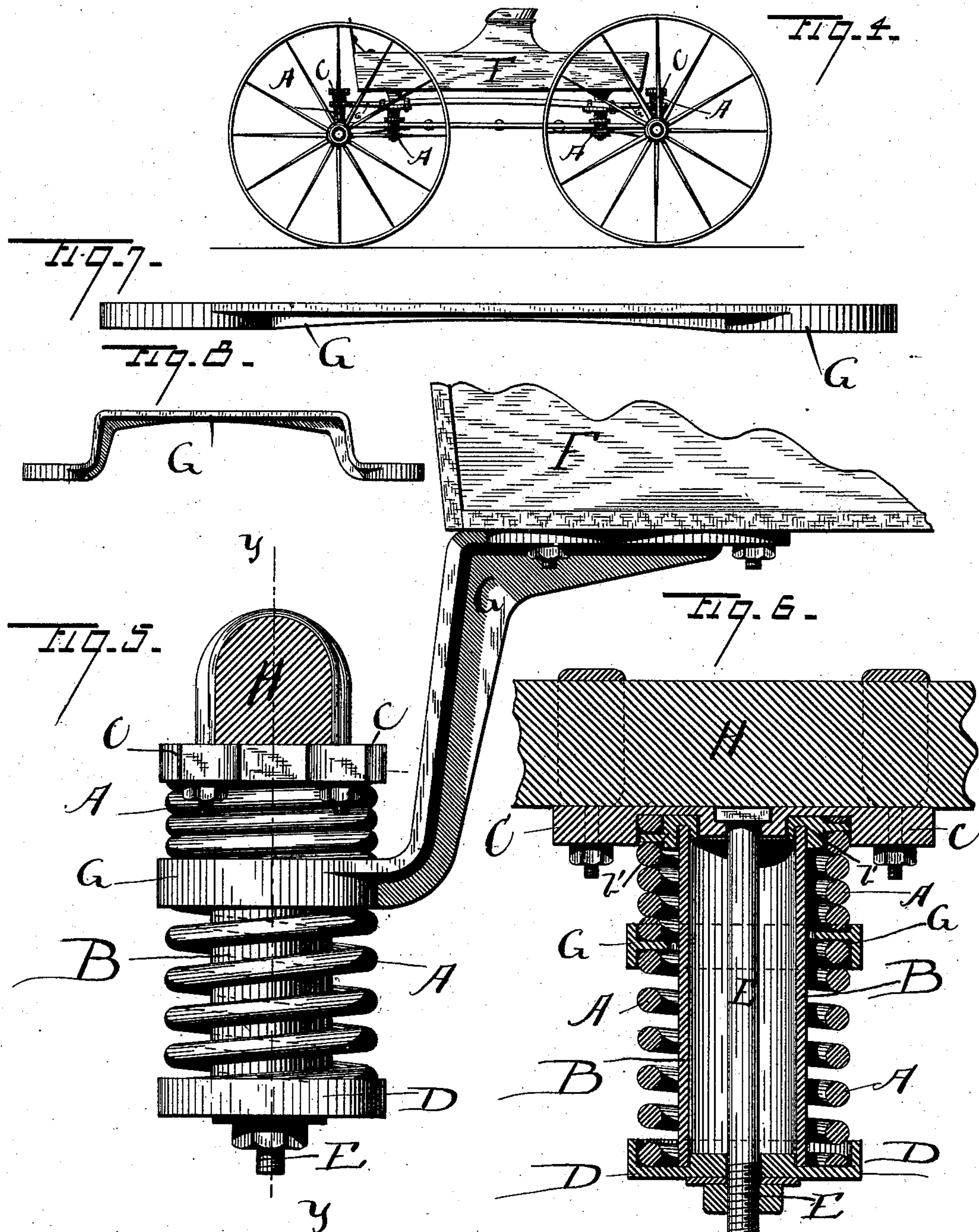
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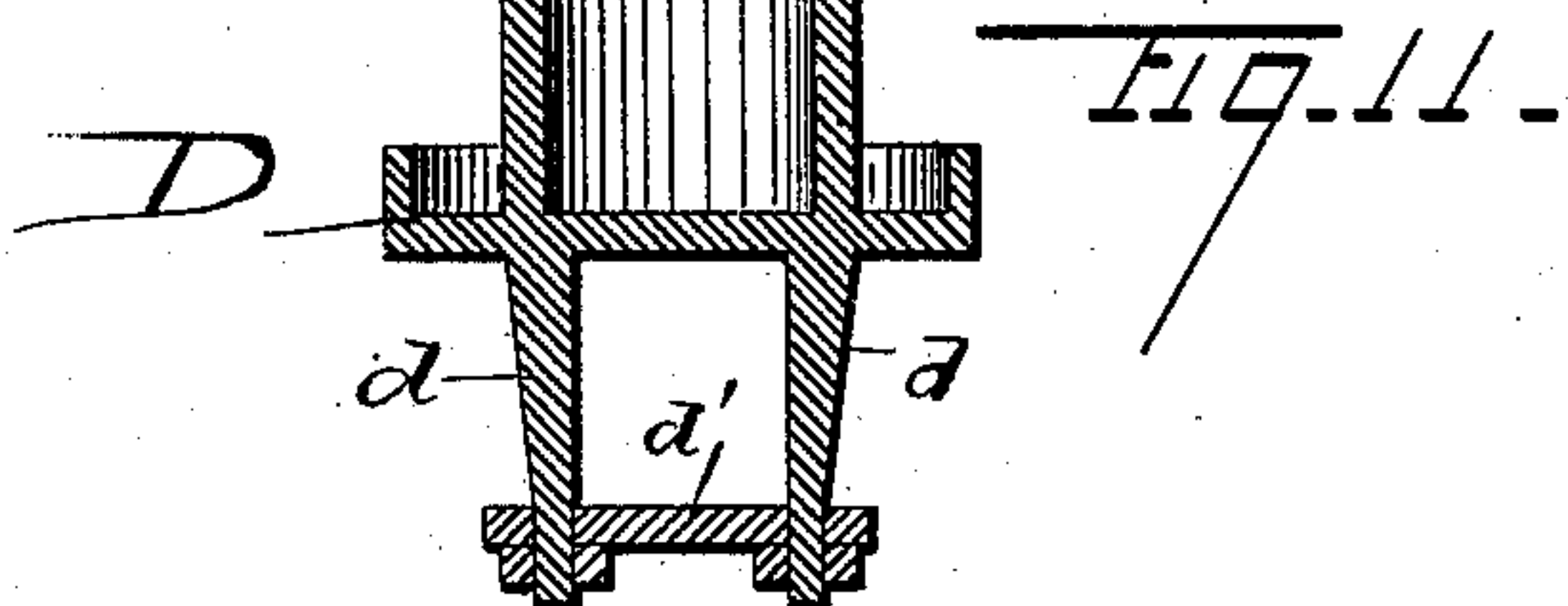
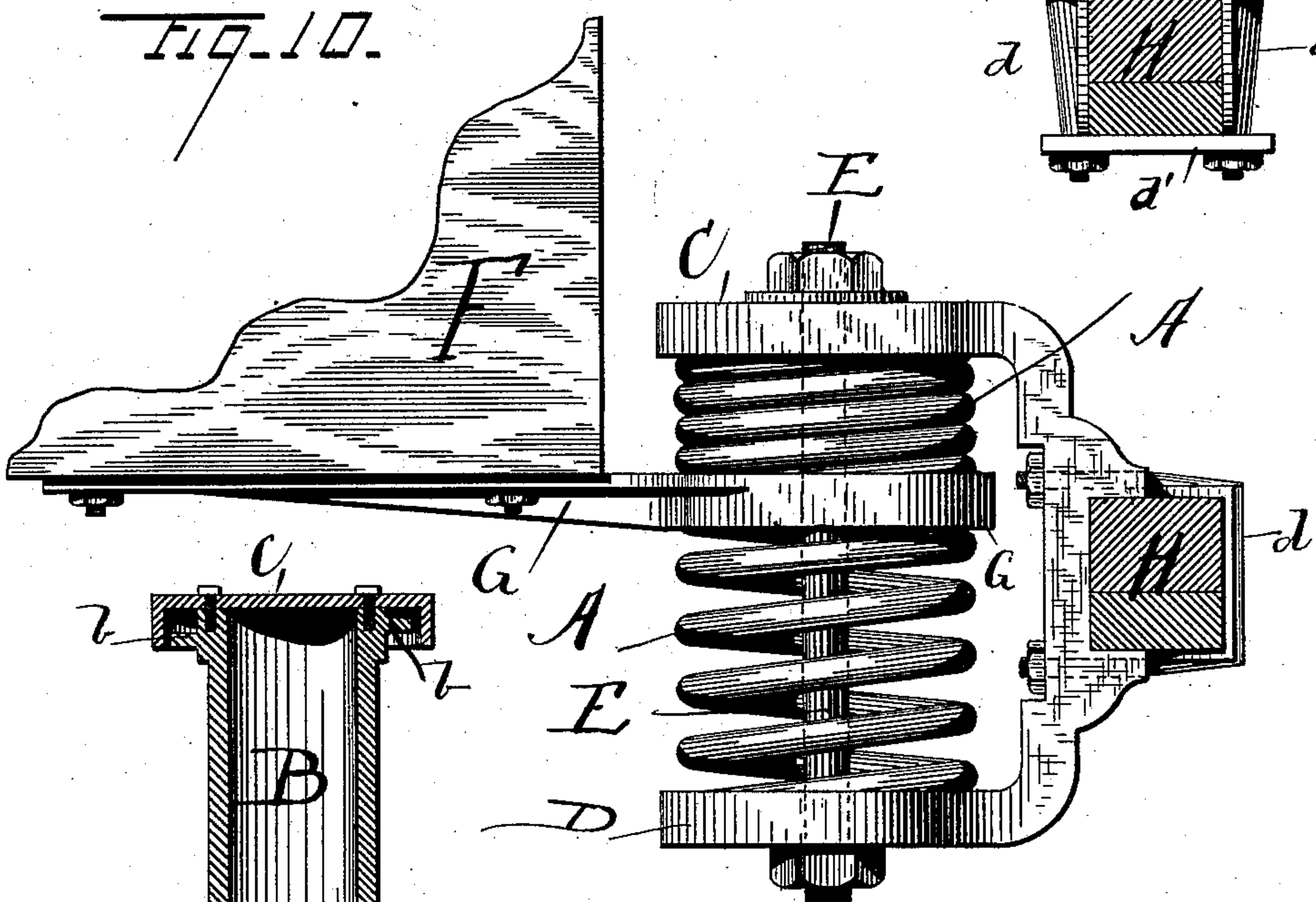
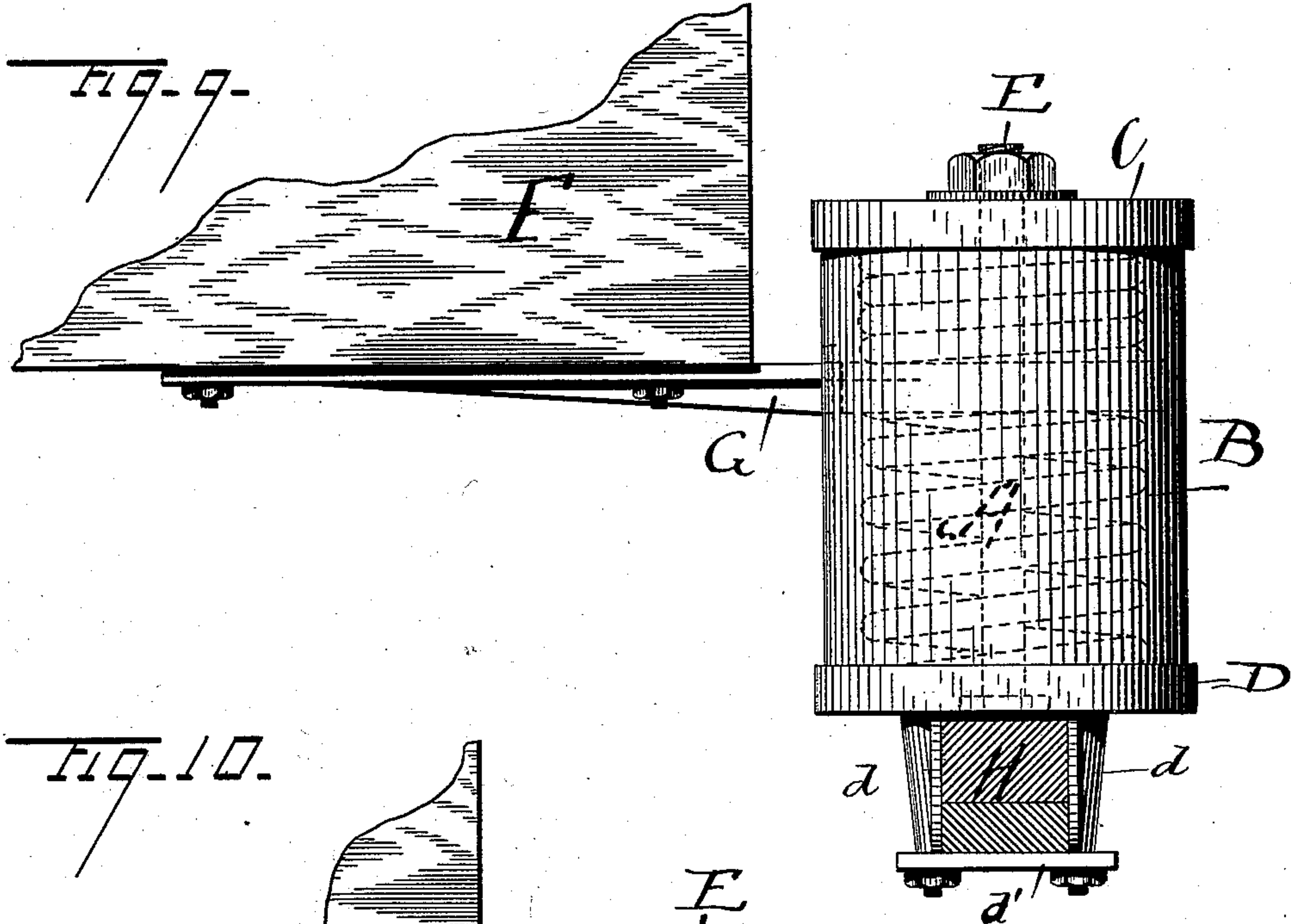
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WITNESSES

as Paré

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UNITED STATES PATENT OFFICE.

WILLIAM I. BUNKER, OF CHICAGO, ILLINOIS.

VEHICLE-SPRING.

SPECIFICATION forming part of Letters Patent No. 373,267, dated November 15, 1887.

Application filed August 23, 1886. Serial No. 211,676. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM I. BUNKER, a citizen of the United States, residing at Chicago, in the State of Illinois, have invented certain new and useful Improvements in Vehicle-Springs, of which the following is a specification.

My present invention is an improvement on the one described in my patent of June 9, 1885, No. 319,555; and it consists, particularly, in the manner of applying and fastening the springs, hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a side elevation of an ordinary buggy with my improved springs applied at the ends of its bed; Fig. 2, a side elevation of the spring and a part of the buggy-bed, the spring encircling a tube or core; Fig. 3, a vertical section taken in line *xx* of Fig. 2; Fig. 4, a side elevation of the buggy with the springs at both the ends and sides of the bed; Fig. 5, an end view of part of the buggy-bed, showing the spring connected to the side bar; Fig. 6, a vertical section taken in line *yy* of Fig. 5; Figs. 7 and 8, side elevations of the attaching-bracket; Fig. 9, the same as Fig. 2, except that the tube is outside of the spring; Fig. 10, a side elevation of the spring and part of the buggy, but showing a modification of the devices connecting it to the side bar or axle, and Fig. 11 a vertical section of the tube or core formed in one piece.

A is the spring; B, the tube, and *b* its screw-thread; C, the upper end cap or cover; D, the lower end cap; E, the connecting-rod; F, the buggy-bed; G, the bracket attaching and securing the spring to the bed; H, the side bar, cross-bar, or axle; *d*, the projecting portions or clips of the lower end cap, forming a retaining-clip, and *d'* the clip-bar under the axle.

My present form of spring is preferably intended to operate as a compression and extension spring, as described in my patent above referred to; but in practice I have found it desirable to have the spring encircle a tube or large core, preferably of metal, through which, when a tube is used, the rod connecting the ends or end caps of the spring is inserted. This tube or core should be somewhat smaller in outside diameter than the inside diameter

of the spring, so as to be capable of being inserted therein. Instead of forming a screw-thread on the tube or core, a separate piece or casting, *b'*, Fig. 6, containing such screw-thread may be used. This piece or casting has an annular recess, into which the end of the tube fits and is held by the rod connecting the end or end caps of the spring.

A suitable screw-thread, *b*, may be formed on the outside of the tube or core at or near one end—say the upper end—adapted to be screwed into the coils, particularly between the last coil and the one next to it, and thus operate to rigidly secure the same to the spring. The cap or cover C is put on top of the tube and spring; and this cap has an annular rim that encircles the screw-thread of the tube and coils of the spring for a short distance—say half an inch—and is also provided with a central hole for the passage of the rod intended to connect the ends or end caps of the spring.

The bracket G is adapted to be secured to the bed of the buggy, and has a screw-thread adapted to be coiled into the spring at the lower end of its close coils. This bracket is put on by screwing in from the lower end of the coils to the point here suggested—that is, to a point where it encircles or has a bearing on one of the close coils—and in this way is rigidly and firmly fastened to the spring. Its other end may of course be secured to the buggy-bed by screws, bolts, or in any other convenient way. The end cap or cover, D, which is of course large enough to have its annular rim encircle the coils of the spring, is then put on, and the connecting-rod, passing through the central hole therein, secured by a nut or in any other convenient way. The screwing of the nut will of course bring the end caps against the ends of the tube or core, and in this way firmly and rigidly connect the whole together. The threaded ends of the connecting-rod, onto which the nut is screwed, may be at either the upper or lower end of the spring, as desired.

In order to secure the spring and its attachments to the side bar, cross-bar, or axle the lower end cap may be provided with downwardly-projecting clips or parts *d*, adapted to straddle the same, so as to have one pass down at each side thereof. These clips are prefer-

ably extended a slight distance below the axle, to receive a clip-bar, d' , and the whole is then rigidly and firmly secured by screws, nuts, or otherwise. In this way I form from the tube, 5 end caps, connecting-rod, &c., a single bracket, as it were, which operates to secure both ends of the spring to the axle, side bar, cross-bar, or other suitable part of the running-gear, while the other bracket, G, serves to secure 10 the spring from its body or central part to the buggy-bed. Of course the manner of attachment may be reversed when found desirable, so as to have each spring secured to the bed from its ends and to the axles or bars from its 15 body or central part.

I prefer to secure at least four of these springs to the buggy-bed and axles or bars; but of course more may be used, if desired, or possibly less in some cases. These springs 20 being thus secured rigidly to the bed and side bars or axles, preferably in such a way as to permit one part of each to be compressed as another is extended, serve to support the buggy-bed and its occupants and also provide 25 for an easy and delightful up-and-down motion, as required by the jolting of the buggy, which motion is of course largely affected or regulated by the compressing and extending of the spring just described.

30 In Fig. 9 I have shown the tube encircling the spring instead of inside of it. In Fig. 10 I have shown a modified form of supporting-bracket, or bracket used to connect the spring to the axle or side bars, and in Fig. 11 I have 35 shown the screw-threads, lower cap, and clip projections all cast integral with the tube or core; but in all these modifications the idea of having my spring secured and operated in the general way above described is intended 40 to be preserved.

I claim—

1. In combination with a buggy or other vehicle, a compound compression and extension

spiral spring having alternating series of coils, the coils of one series being adapted to be 45 opened or extended as the coils of the other series are closed or compressed, such spring being rigidly secured to the running-gear of the vehicle from its ends and to the bed from its body or central part, or vice versa, sub- 50 stantially as described.

2. As a new article of manufacture, a spring attachment for vehicles, comprising a tube or core, a compound compression and extension spiral spring having alternating series of coils, 55 the coils of one series being adapted to be opened or extended as the coils of the other series are closed or compressed, and means for securing the same to the bed and running-gear of the vehicle, substantially as described. 60

3. As a new article of manufacture, a spring attachment for vehicles, comprising a spiral spring, a tube or core connected thereto and having downwardly-projecting clips integral therewith to secure it to the running-gear, and 65 a bracket to secure the whole to the bed of the vehicle, substantially as described.

4. As a new article of manufacture, a spring attachment for vehicles, comprising a spiral spring having close coils in one part and open 70 coils in another, a tube or core having a screw-thread at one end to secure it to the coils of the spring and clips at the other to secure it to the running-gear, and means for securing the whole to the bed of the vehicle, substan- 75 tially as described.

5. An attachment for vehicle-springs, comprising a bracket or connecting mechanism having one part adapted to be secured to the bed or running-gear of a vehicle and another 80 part adapted to be secured to both ends of a spiral spring, substantially as described.

WILLIAM I. BUNKER.

Witnesses:

EPHRAIM BANNING,
M. B. BANNING.