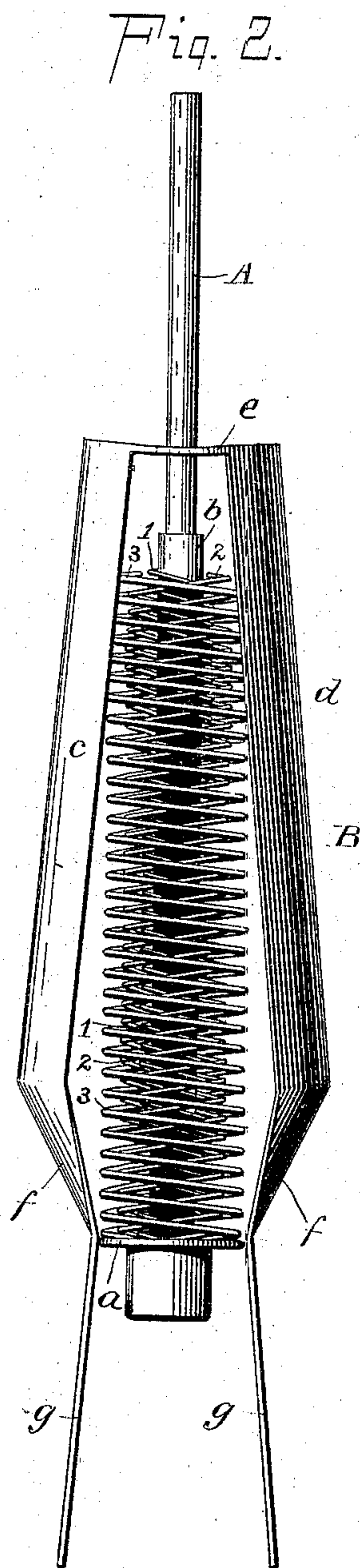
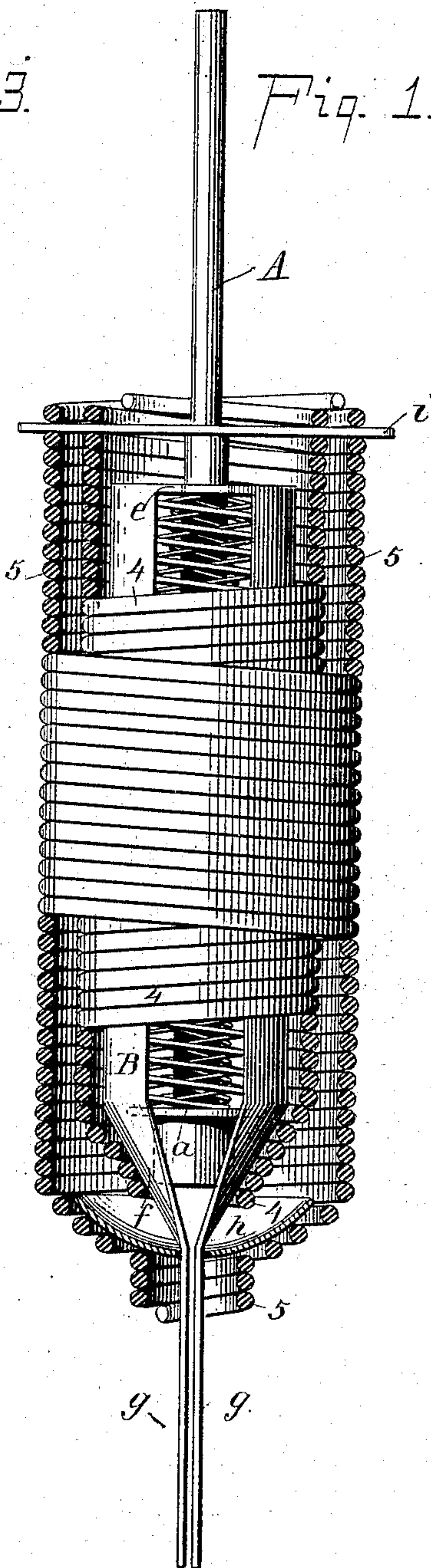
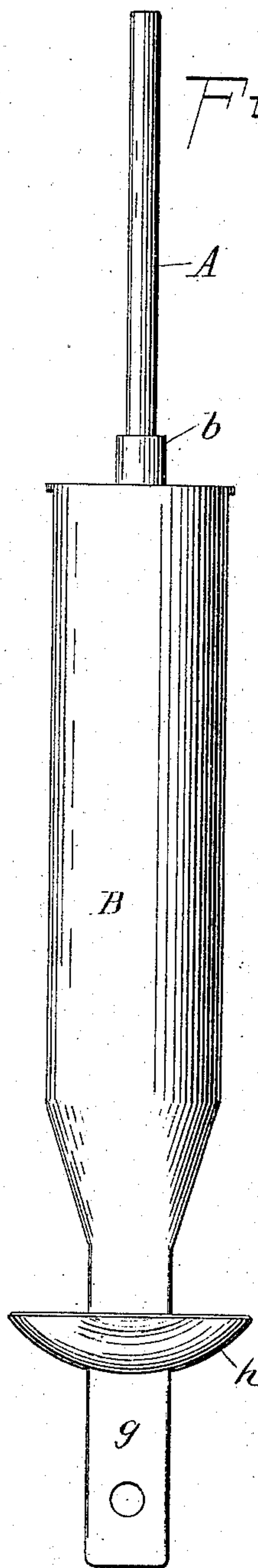


(No Model.)

G. H. CHATILLON.
COMPOUND SPRING.

No. 505,092.

Patented Sept. 19, 1893.



WITNESSES:

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UNITED STATES PATENT OFFICE.

GEORGE H. CHATILLON, OF NEW YORK, N. Y.

COMPOUND SPRING.

SPECIFICATION forming part of Letters Patent No. 505,092, dated September 19, 1893.

Application filed May 11, 1893. Serial No. 473,837. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. CHATILLON, a resident of the city, county, and State of New York, have invented an Improvement in Compound Springs, of which the following is a specification, reference being had to the accompanying drawings, forming part hereof, in which—

Figure 1 is a side view, partly in section, of my improved compound spring. Fig. 2 is a like view of the same with the outer springs removed and the internal sleeve sprung out in a position to be removed. Fig. 3 is a side view at right angles to that shown in Fig. 2, showing the fastening disk attached.

My invention relates to compound springs, that is to say, a structure composed of two or more separate springs, and consists mainly in combining one or more spiral springs acting expansively with one or more spiral springs acting contractively and with an appropriate holder, all as described and claimed.

In the drawings A designates the central supporting rod of my new compound spring. This rod has a suitable enlargement *a* on the lower end, for supporting one or a series of concentric spiral springs, 1, 2, 3, three being shown. At the upper portion of the rod A is a shoulder *b* for purposes hereinafter described.

B indicates a sleeve which consists of two sections *c, d*, united at the top by a hinged or flexible connection to a top plate *e* which forms a bearing against which the upper ends of the springs 1, 2, 3, can bear, and which is perforated centrally to fit the rod A below the shoulder *b*. The lower end of each section *c, d*, connects by an inclined arm *f* with a lower stem *g*, the two stems *g g* being, when the parts are in operative position, as in Fig. 1, in contact with one another. In fact the contiguous stems *g* serve as connections with the article to be suspended elastically from the rod A. The contracted portions *f f* also serve as a bearing for a disk *h*, which helps support one or a series of spiral springs 4, 5; or one of said springs (4) may bear against the contracted part *f* of the sleeve, the other (5) against the disk *h* as in Fig. 1. The disk *h* also serves to hold the stems *g g* in contact with one another. The upper ends of the springs 4, 5, are supported by a bar *i* which

is carried by the rod A, resting on the shoulder *b* as shown.

In order to unite the various parts of my compound spring, I first slip the springs 1, 2, 3, on the rod A, either while the sleeve B is opened, as in Fig. 2, or before said sleeve is applied. I then close the sleeve over said springs 1, 2, 3. Then the spring 4 (one or more) is passed over the sleeve B till it bears against the contracted end *f*. Next the perforated disk *h* is slipped on the arms *g* of said sleeve, then the spring 5 is slipped on till it bears on the disk *h*, and finally the bar *i* is turned into the convolutions of the springs 4, 5, so as to form a support therefor (as shown in Fig. 1), when the compound spring is ready for use.

When I refer herein to the upward or downward movement of a part or the top or bottom of certain parts, &c., I do so merely for the purpose of explaining the drawings, and desire it understood that my improved spring is applicable to any devices wherein coiled springs are used and in any relation therein.

The springs 1, 2, 3, meaning those which directly surround the rod A and which rest on the head or enlargement *a* thereof, are open coiled, so that they permit of compression longitudinally whenever by drawing on the stems *g* the upper plate *e* of the sleeve is drawn downward. This upper plate *e* when drawn downward comes into contact with the upper ends of these open coiled springs 1, 2, 3, and pushes them together. These springs, therefore, tend after that to re-elevate the sleeve B and whatever load is suspended therefrom, and in this sense they act as cushions for the said sleeve and anything suspended therefrom. The outer series of springs, 4, 5, are closed coiled as shown, so that they cannot be compacted beyond the normal position in which they are applied. When therefore tension is applied to the stems *g g* these outer series of springs follow the sleeve B in its downward movement, because they are connected to said sleeve either at the inclined portions *f* or by the disk *h*, or both, and thus these springs 4, 5, under strain are expanded. Hence, I term the inner series of springs 1, 2, 3, contractible, and the outer series of springs expansible, because the ones contract and the others expand under strain. I find

that this combination of contractible and expansible coiled springs around the same stem works desirable results, and that in cases of overstrain it acts as a safety cushion. Sup-
 5 posing my structure to be employed for sus-
 pending a platform from a bridge or viaduct,
 and that under strain some of the expansive
 springs should break; the contractive springs,
 however, will under all circumstances still
 10 constitute a cushion. The strain is divided,
 and being divided between oppositely tend-
 ing forces, is less liable to work any injury
 than when all the forces work in the same
 manner under tension. A special advantage
 15 connected with my construction is also to be
 found in the simple arrangement for putting
 the parts together and taking them asunder.
 To take the structure apart it is only neces-
 sary to turn the rod *i* out of the convolutions
 20 of the springs 4, 5; thereupon to slip the spring
 5 down off the sleeve and rod; then take off
 the disk *h*. This releases the spring 4, and
 after that is off, leaving the parts in the po-
 sition shown in Fig. 2, the sleeve can be eas-
 25 ily opened and moved upward, so that the in-
 terior springs may also be gotten at. It is
 important that the sleeve should be jointed
 in such a way that its two wings or portions
c d can be opened out in the manner shown
 30 in Fig. 2, because if said parts *c d* were so
 narrow as to expose the whole diameter of
 the inner springs between them, there would
 be danger of the lower end of the rod A slip-
 ping out laterally from between the arms *c d*
 35 of the sleeve under strain; but inasmuch as

the arms *c d* of my sleeve B, as is clearly
 shown in Fig. 1, approach one another suffi-
 ciently far to prevent the head *a* passing out
 between them, the danger above mentioned
 is entirely overcome. 40

Having now described my invention, what
 I claim, and desire to secure by Letters Pat-
 ent, is—

1. The combination of a central rod or stem
 with one or more open coiled springs 1, 2, 3, 45
 cushioning contractively, and with one or
 more closely coiled springs, cushioning expan-
 sively, and with means substantially as de-
 scribed for supporting both sets of springs on
 said rod, all as specified. 50

2. The combination of the rod A having
 head or enlargement *a* and shoulder *b*, with
 the sleeve B carried by said rod and adapted
 to be opened and shut, with one or more open
 coiled spiral springs 1, 2, 3 supported on the 55
 head *a*, and with one or more closed coiled
 springs 4, 5 bearing against the sleeve B, and
 with a holder *i* resting on the shoulder *b* and
 connecting with the outer spring or springs,
 all as and for the purpose specified. 60

3. The combination of the central rod A
 having head *a* and shoulder *b* with the open
 coiled spring or springs 1, 2, 3, sleeve B form-
 ing stems *g g*, disk *h*, closed coiled spring or
 springs 4, 5, and rod *i* resting on shoulder *b*, 65
 all arranged as and for the purpose specified.

GEORGE H. CHATILLON.

Witnesses:

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