

(No Model.)

J. H. DAVIS.

SPRING.

No. 337,048.

Patented Mar. 2, 1886.

FIG. 1.

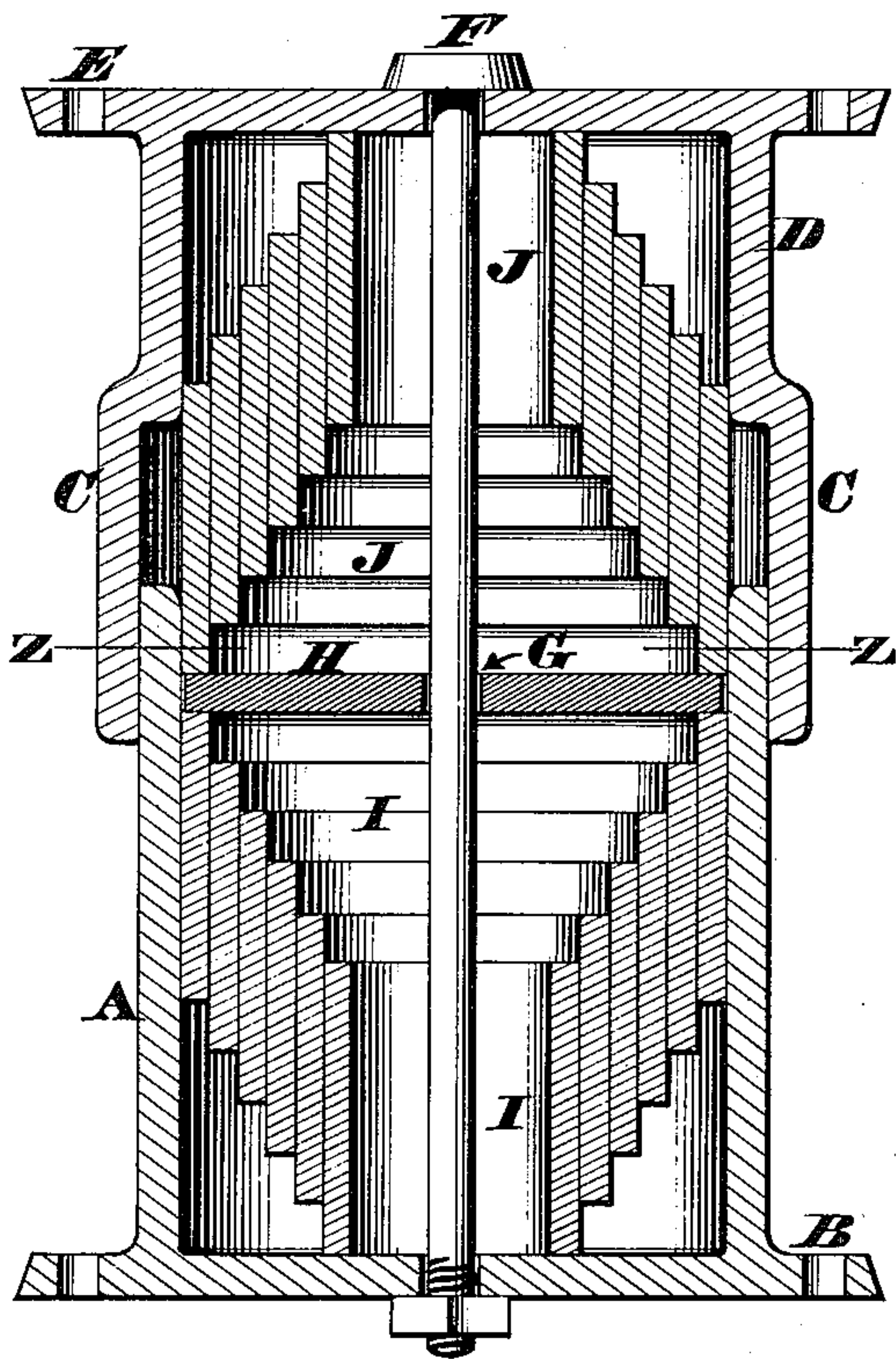


FIG. 4.

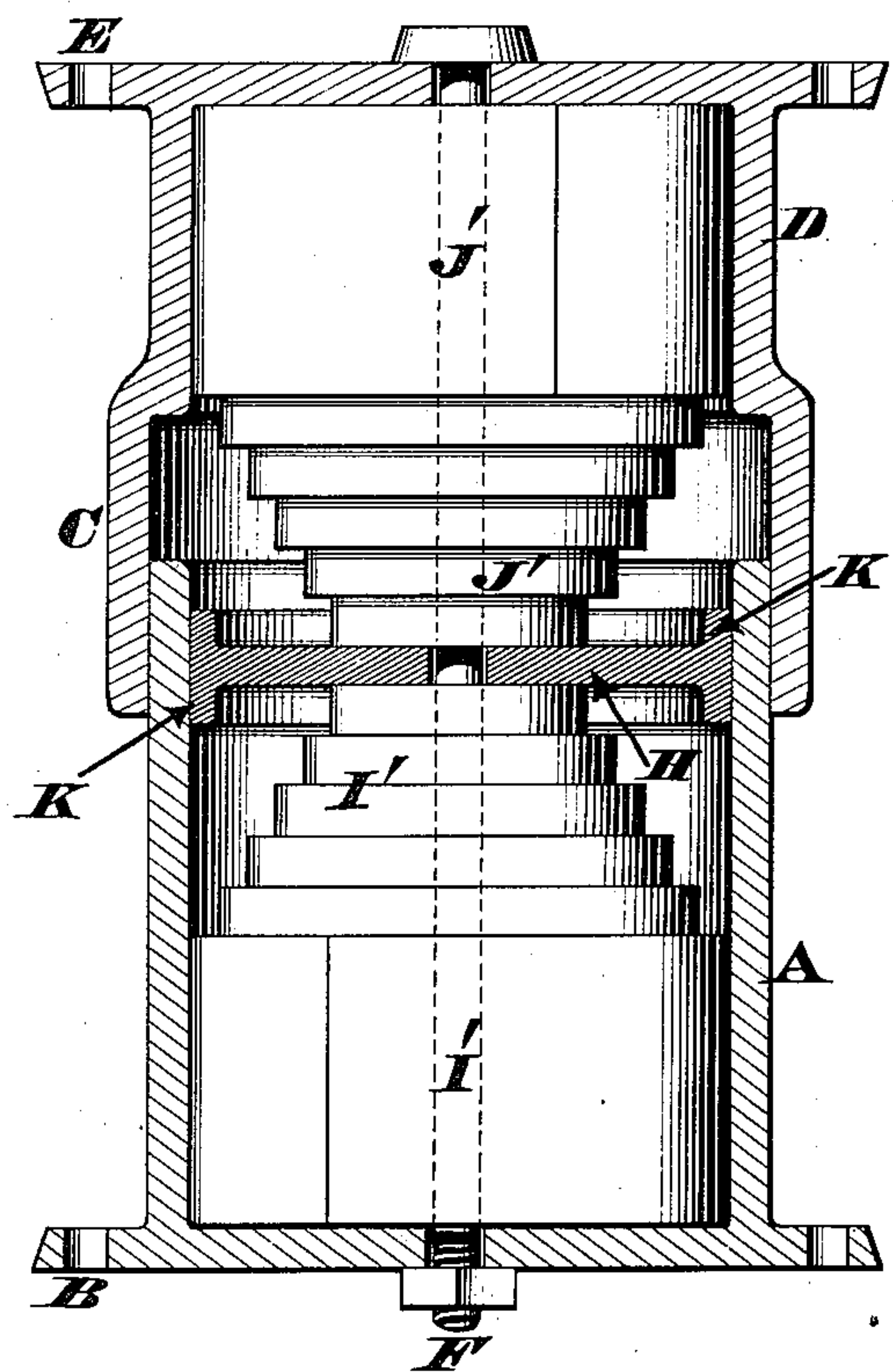


FIG. 2.

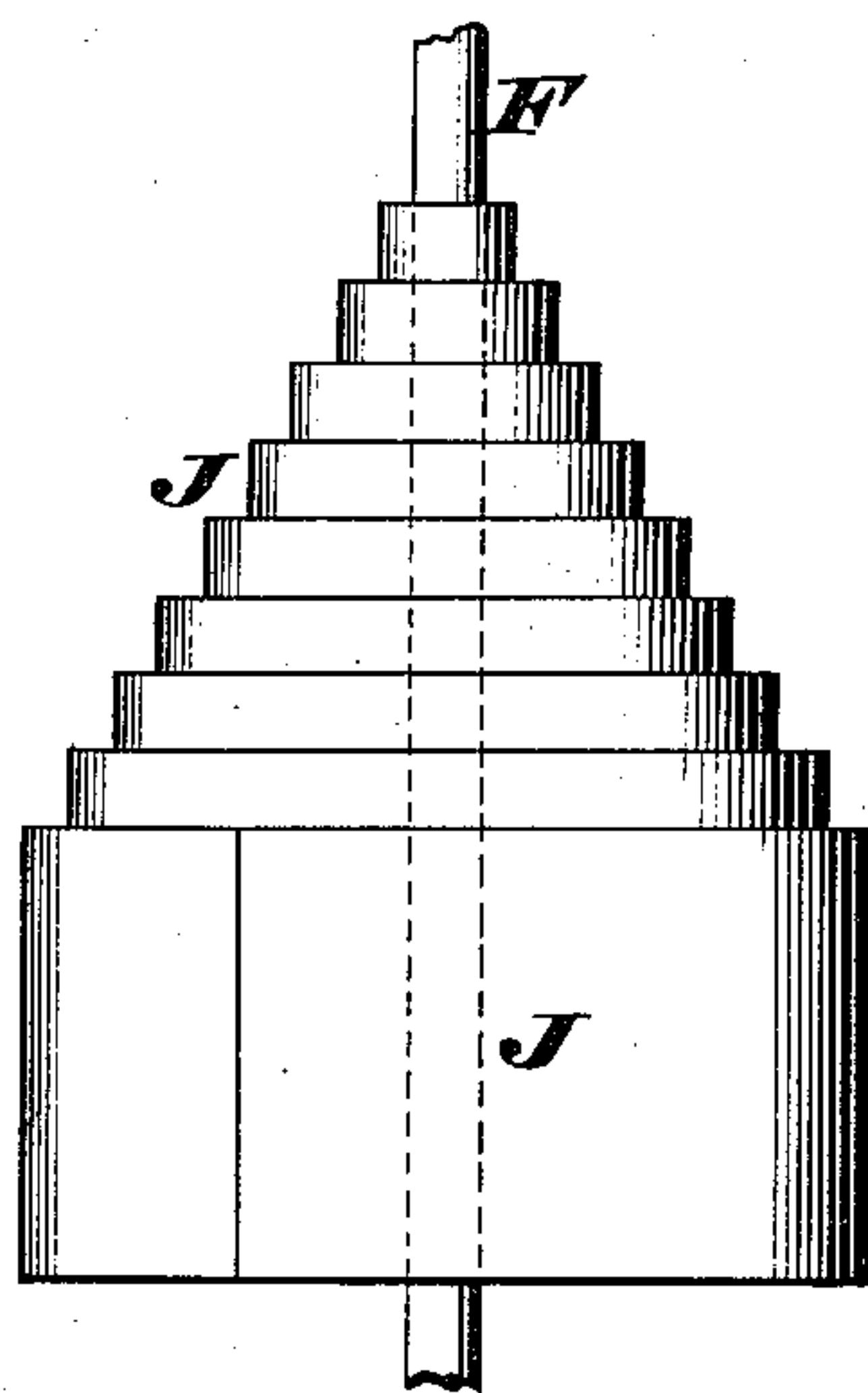
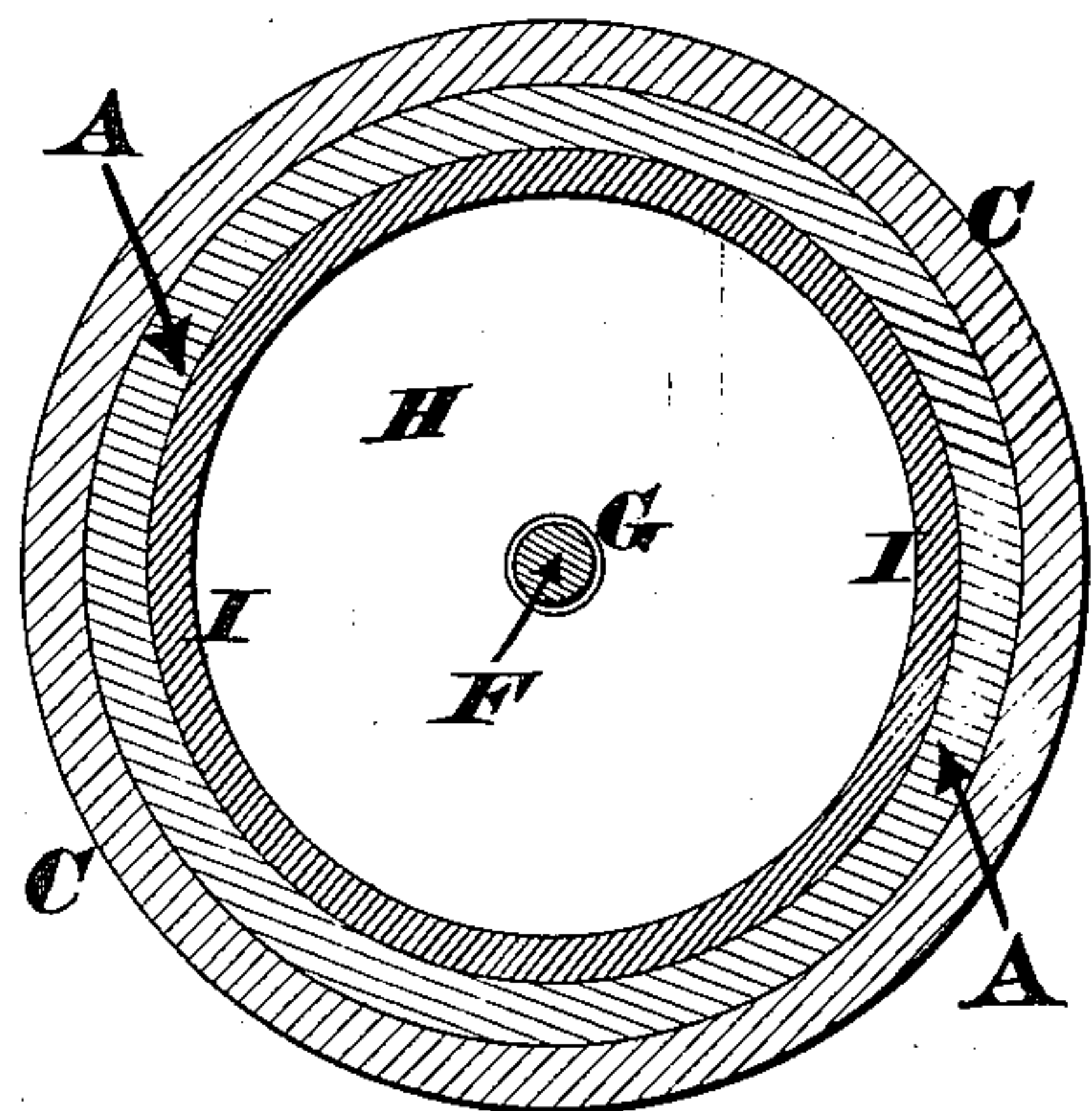


FIG. 3.



Attest.  
Sizic Layman.  
S. S. Carpenter

Inventor.  
John H. Davis.  
By James H. Layman.  
Atty.



# UNITED STATES PATENT OFFICE.

JOHN H. DAVIS, OF COVINGTON, KENTUCKY.

## SPRING.

SPECIFICATION forming part of Letters Patent No. 337,048, dated March 2, 1886.

Application filed November 23, 1885. Serial No. 153,635. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN H. DAVIS, a citizen of the United States, residing at Covington, in the county of Kenton, State of Kentucky, have invented certain new and useful Improvements in Springs, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention comprises a compound spring that can be readily applied either to vehicles, cars, mechanical purposes generally, or any other use for which such devices are adapted.

Said compound device consists of a pair of conical coiled springs placed in line with each other, and with a movable disk, washer, or head interposed between their inner ends, the springs and washer being fitted within a cylindrical cage or housing composed of two sections, one member of which is adapted to slide or "telescope" within the other or chambered section, so as to allow the proper play or motion. A tie-bolt occupies an axial position within the device, which bolt serves the twofold purpose of a central guide for the disk and springs, and also prevents the cylindrical housings becoming separated from each other by any unusual expansion or opening of the said tie-rod being passed through a central opening of said disk, as hereinafter more fully described.

In the annexed drawings, Figure 1 is an axial section of the preferred arrangement of my springs. Fig. 2 is a side elevation of one of said springs detached from the case or housing. Fig. 3 is a horizontal section of the housing, taken at the line  $z z$  of Fig. 1. Fig. 4 is an axial section of a modification of the invention.

A represents a cylindrical cage, case, or housing open at one end, but closed at the other, and having a perforated flange, collar, or base, B, wherewith said cylinder is secured to a suitable support. The open end of this housing is adapted to fit within an enlargement, chamber, or counterbore, C, of another cylinder, D, the latter being provided with a perforated flange, E, for attachment to any bearing. Occupying an axial position within these cylinders is a tie-bolt, F, that passes through a central orifice, G, of a movable

disk, washer, or head, H, which washer is adapted to play freely within the lower housing, A. Furthermore, this disk serves to separate a pair of conical volute-springs, I J, composed of any desired number of coils. Of these springs the lower one, I, is inverted—that is to say, its apex rests on the closed end of cylinder A, while its base or greatest diameter supports the disk H, just referred to; but the base of the upper spring, J, rests on this disk, and its apex supports the cylinder D.

From the above description it is apparent that any load placed upon the upper cylinder or housing, D, will be supported by the united action of the two springs I and J, and any compression of said springs will cause said housing to descend accordingly, this descent being limited by the upper end of counterbore C coming in contact with cylinder A; but when the load is removed the bolt F acts as a tie that prevents separation of the two sections A and D of the housing. In Fig. 1 some considerable clearance is shown between the smaller coils of the springs and the axial rod or bolt, but in Fig. 2 the smaller coil of spring J is represented as being quite near said rod, thereby indicating that the springs may be arranged to suit any special requirement.

In Fig. 4, the apices of the springs I' J' are shown in contact with the disk H, while the bases of said springs bear against the opposite ends of the cylinders A D. Furthermore, this illustration shows the disk H, provided with an annular flange, K, that serves as a guide to confine said disk to a proper path as it plays within the housing every time the springs expand or contract.

I am aware of the peculiar arrangement of conical volute-springs seen in the patent issued to R. Vose, October 28, 1862, No. 36,813; also, I am aware of the arrangement of such springs as seen in English Patents No. 12,122 of 1848 and No. 4,310 of 1875. Therefore, my claim is not to be construed as an attempt to cover the arrangement of springs seen in either of these patents, but is limited to the peculiar construction herein shown and described.

I claim as my invention—

The combination of a pair of conical volute-springs, I J, placed in line with each other and having a movable disk, H, interposed between their inner ends, the outer ends of said springs being in contact with the opposite heads of the cylindrical housings A D, one of which is chambered at C, and a tie-rod, F, being employed to unite said housings, which tie-rod passes through a central

opening, G, of said disk and occupies an axial position within said springs, as herein described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN H. DAVIS.

Witnesses:

JAMES H. LAYMAN,  
SAML. S. CARPENTER.