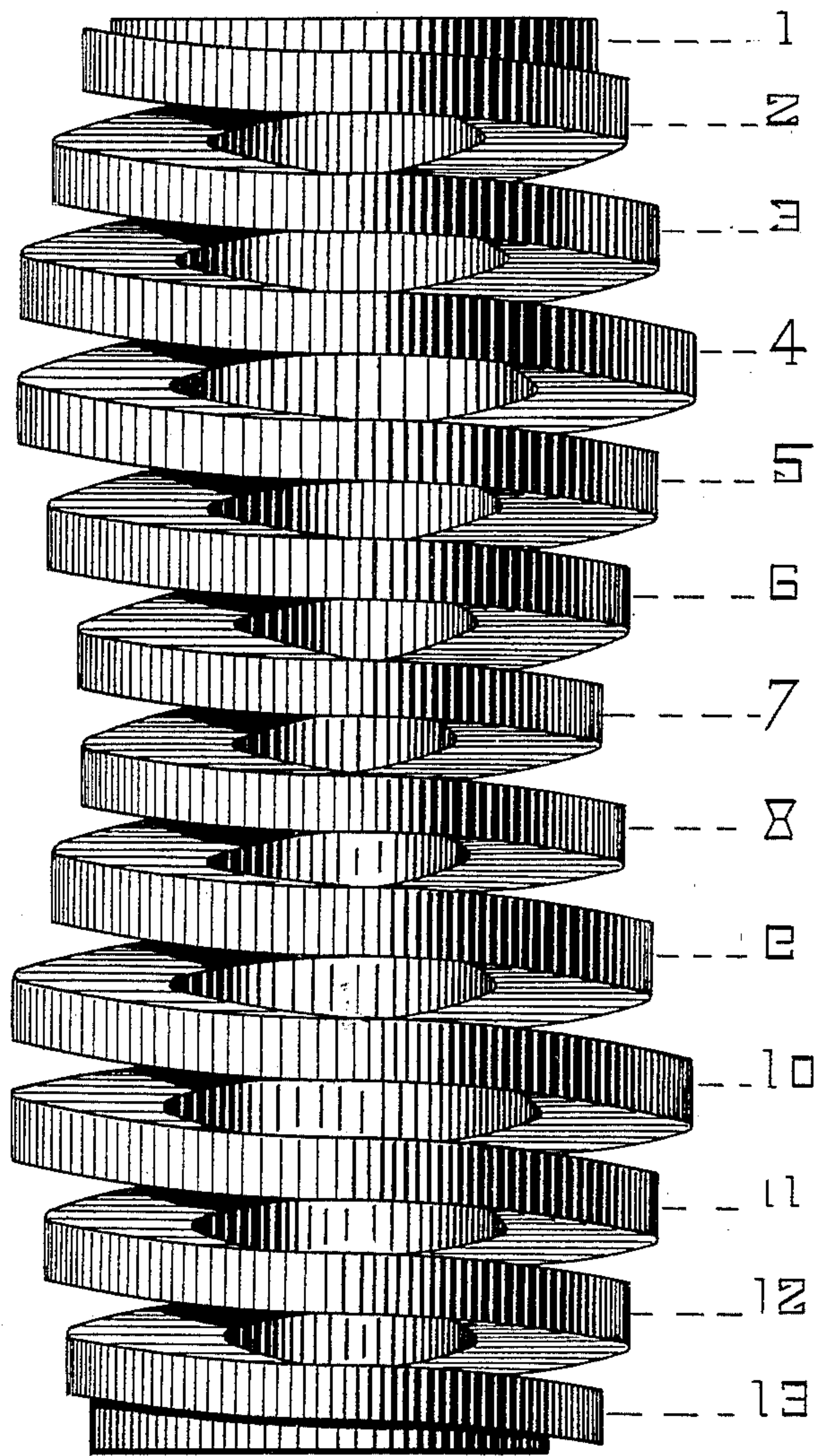


(No Model.)

J. PFEIL.
SPIRAL SPRING.

No. 394,007.

Patented Dec. 4, 1888.



WITNESSES:

Walter Reese
W. G. Wilson

INVENTOR.
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BY
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ATTORNEY.

UNITED STATES PATENT OFFICE.

JOHN PFEIL, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO
V. G. WILSON, OF SAME PLACE.

SPIRAL SPRING.

SPECIFICATION forming part of Letters Patent No. 394,007, dated December 4, 1888.

Application filed August 13, 1888. Serial No. 282,620. (No model.)

To all whom it may concern:

Be it known that I, JOHN PFEIL, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Spiral Springs; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawing, which forms a part of this specification, in which the figure shows an elevation of my improved spiral spring.

My improved spring is made from a steel bar of uniform thickness throughout its length. It is coiled in such manner that the diameters of the coils at its center and ends, respectively, being equal, increase and decrease from both ends, respectively, toward its center, thus producing a spiral spring, both ends and center coils of which, being equal in diameter, are capable of greater resistance than the coils (which are greater in diameter) intermediate such points, respectively, so that whenever said spring is submitted to ordinary pressure the coils intermediate its center and both ends, respectively, yielding more readily than the end and center coils, are compressed. Greater weight being applied, the end coils are compressed, the center coils still affording great elasticity even after the end coils have been considerably compressed.

In the drawing, 1 is a coil at one end of said spring, the diameter of which continues to increase in the coils 2 and 3, respectively, until

the maximum diameter of said spring has been attained in coil 4, after which the coils 5 and 6 respectively decrease in diameter correspondingly as the coils 2 and 3 respectively increase to the center coil, 7, again increasing in diameter in the coils 8 and 9, respectively, to the coil 10, and decreasing correspondingly in the coils 11 and 12 to the other end coil, 13.

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

1. A spiral spring having the coils at both ends and the middle thereof of equal diameter, and with the intermediate coils between such end and middle coils increasing and decreasing at predetermined points, whereby the maximum diameter of the spring lies at points distant from each of its ends about one-fourth of its length, substantially as described.

2. A spiral spring made from a flat rectangular bar having the end and middle coils thereof equal in diameter, and with the coils of maximum diameter distant from each end about one-fourth of the length thereof and decreasing at predetermined points toward both the contracted middle and end coils, substantially as described.

In testimony that I claim the foregoing I hereunto affix my signature this 9th day of August, A. D. 1888.

JOHN PFEIL. [L. s.]

In presence of—

C. C. LEE,

V. G. WILSON.