

A. FRENCH.
COILED SPRINGS FOR CARS.

No. 176,174.

Patented April 18, 1876.

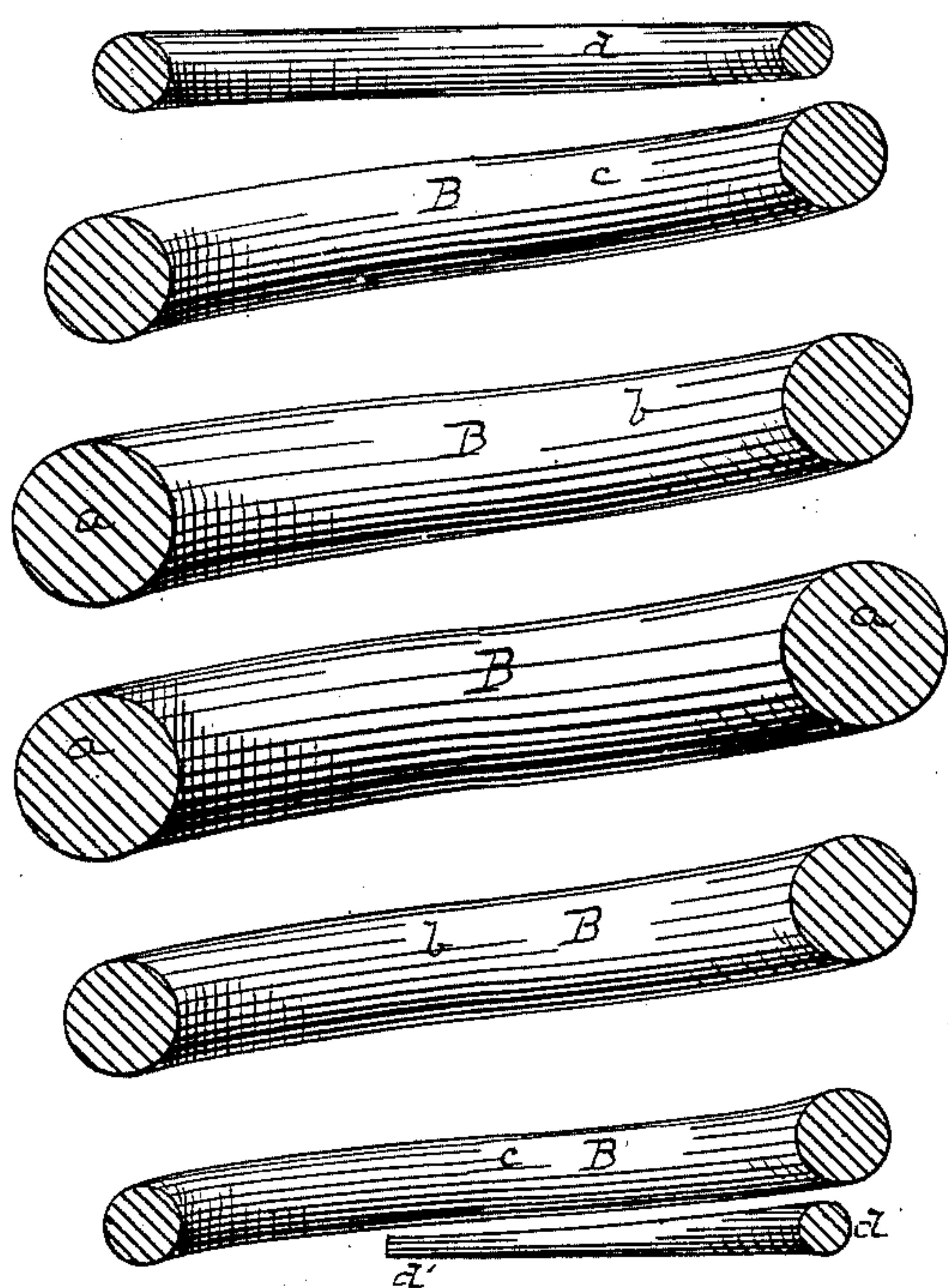


Fig. 1.

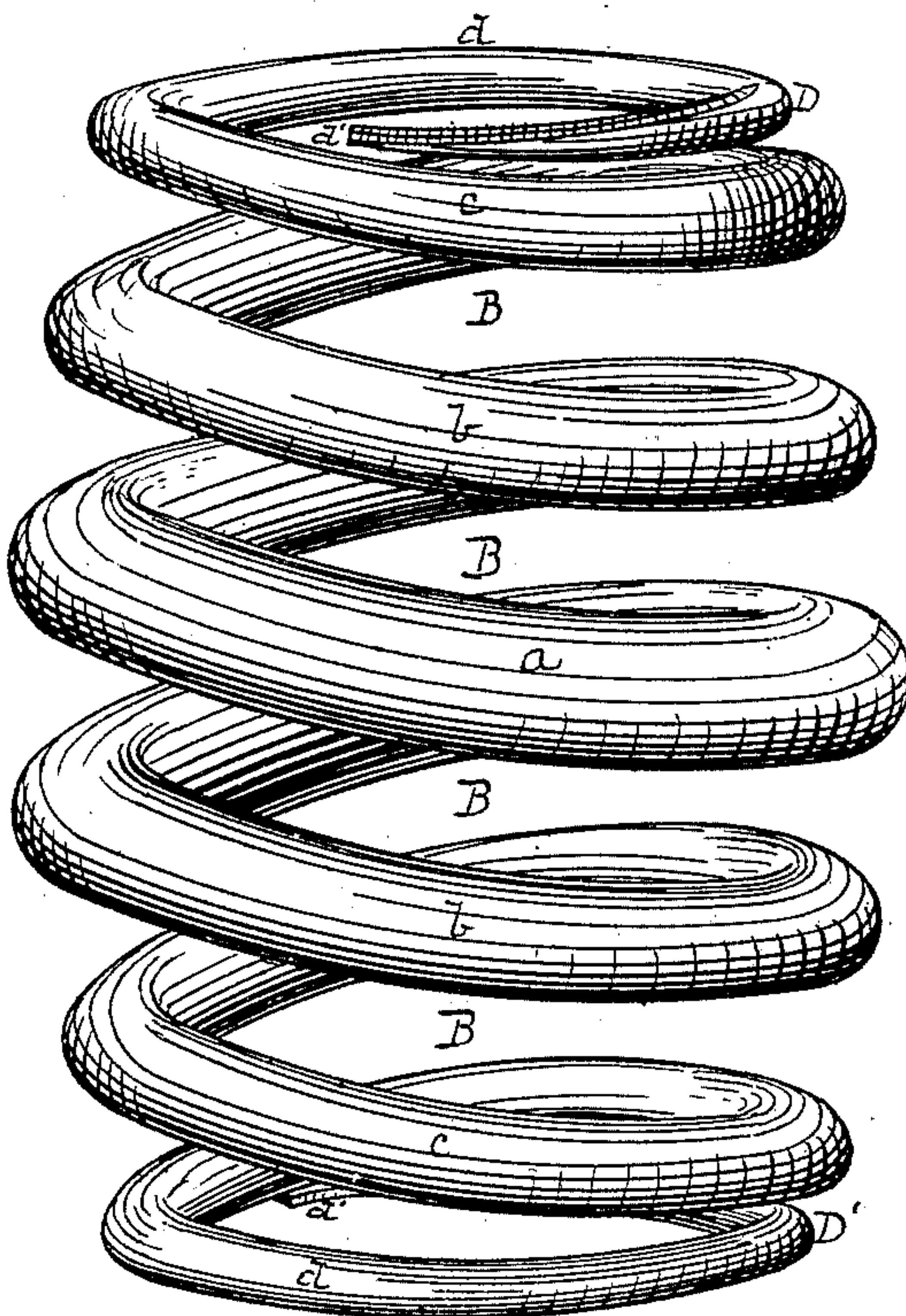


Fig. 2.

Witnesses
Clandrus & Parker
J. E. Boggs.

Inventor
Aaron French,
by George H. Christy
his Att'y.

UNITED STATES PATENT OFFICE.

AARON FRENCH, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO A. FRENCH & CO., OF SAME PLACE.

IMPROVEMENT IN COILED SPRINGS FOR CARS.

Specification forming part of Letters Patent No. **176,174**, dated April 18, 1876; application filed February 26, 1876.

To all whom it may concern:

Be it known that I, AARON FRENCH, of Pittsburg, county of Allegheny, State of Pennsylvania, have invented or discovered a new and useful Improvement in Coiled Springs; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawing, making a part of this specification, in which, like letters indicating like parts—

Figure 1 is a longitudinal sectional view of one of my improved springs, and Fig. 2 is a perspective view thereof.

My improvement relates to the manufacture of coiled steel springs, wherein the spring, made of steel rods or bars, has its maximum size at or near the middle coil, and tapers therefrom each way to the bearing ends.

In the drawing, B represents one, and probably the best, form of my improved steel spring. It is made to shape from a round bar or rod, by rolling or in other of the ways known to the art, and coiled by suitable machinery, so that the coil *a*, at or near the middle, shall be of the maximum size desired in the spring. From the maximum coil the successive exterior coils *b c d*, &c., taper in regular succession, and such taper is preferably made uniform along the length of the material constituting the coils, to the outer bearing ends D D'. The outermost or end coils are made with flat bearing-surfaces *d'*, such flattened parts being made in the operation of shaping the rod or blank before coiling.

This product gives a spring the ends of which are comparatively light, so that they will yield readily to the desired extent under a light blow or light weight, but so that the amount of compression under a heavy blow or weight, being distributed or divided between the two ends, will not be liable to result in the breakage of either end. At the same time, the ends being first compressed, the heavy middle part will afford the necessary or desired elastic or yielding resistance to the heaviest weight or blow. In this manner, also, with the same weight of material, I am enabled to make a stronger spring.

A coiled spring made of a seven-eighth-inch diameter round, will have a certain strength, and give a certain maximum resistance. By my improvement I can take a steel rod of one inch diameter round, taper it from the middle each way, and get a spring of the same or a less amount of material, but stronger, and capable of resisting a greater compressing force, or which, in other words, will act with an elastic operation under a greater load, as well as yield to the desired extent under a less load; and such springs I employ as buffer and draw-bar springs on railway-cars, and also as carrying-springs under car-bodies, and for other analogous uses.

The taper described is preferably made uniform from the middle of the spring each way, and may be varied at pleasure in amount. I propose to make it in any of the known ways of making taper rounds, and do not limit myself in this respect.

For the purpose of making the taper, eccentric rolls having each a half-round taper groove will be preferable. The rolling in such case is done from the middle or near the middle of the blank toward each end.

The same arrangement of taper may be applied in the making of coiled springs from rods or bars oval, elliptic, or rectangular in cross-section, the taper, however, being such that both the major and minor axes or transverse dimensions shall be reduced from the maximum at or near the middle to the outer ends. Such springs are, in practical use, arranged in nests, one inside the other, in the manner ordinarily practiced in the art.

I claim herein as my invention—

A coiled spring made of steel rods or bars, tapered through the successive coils from the middle to each bearing end, substantially as set forth.

In testimony whereof I have hereunto set my hand.

AARON FRENCH.

Witnesses:

HARRY J. SCHLUTZ,
GEORGE H. CHRISTY.