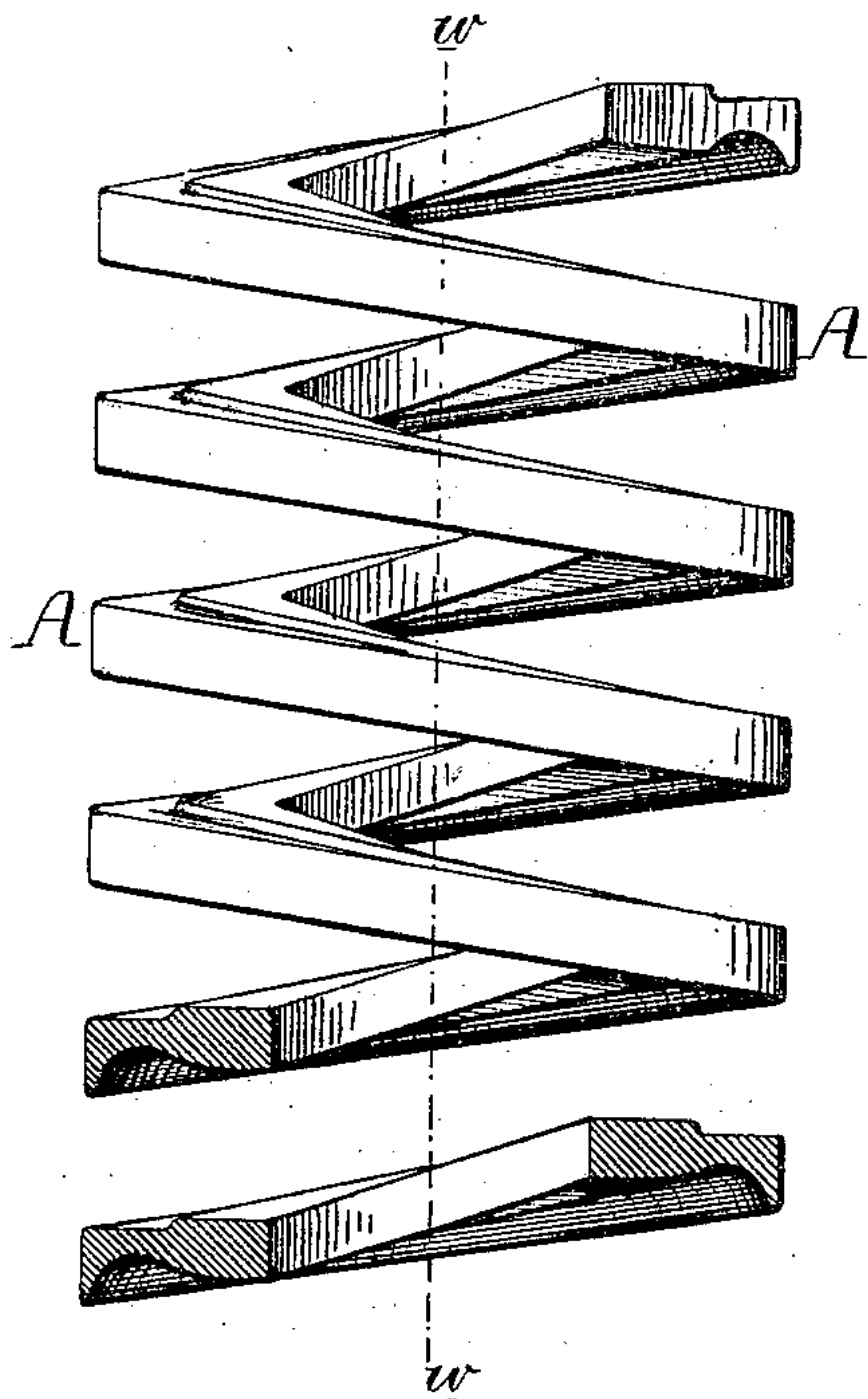


A. MIDDLETON.  
CAR-SPRING.

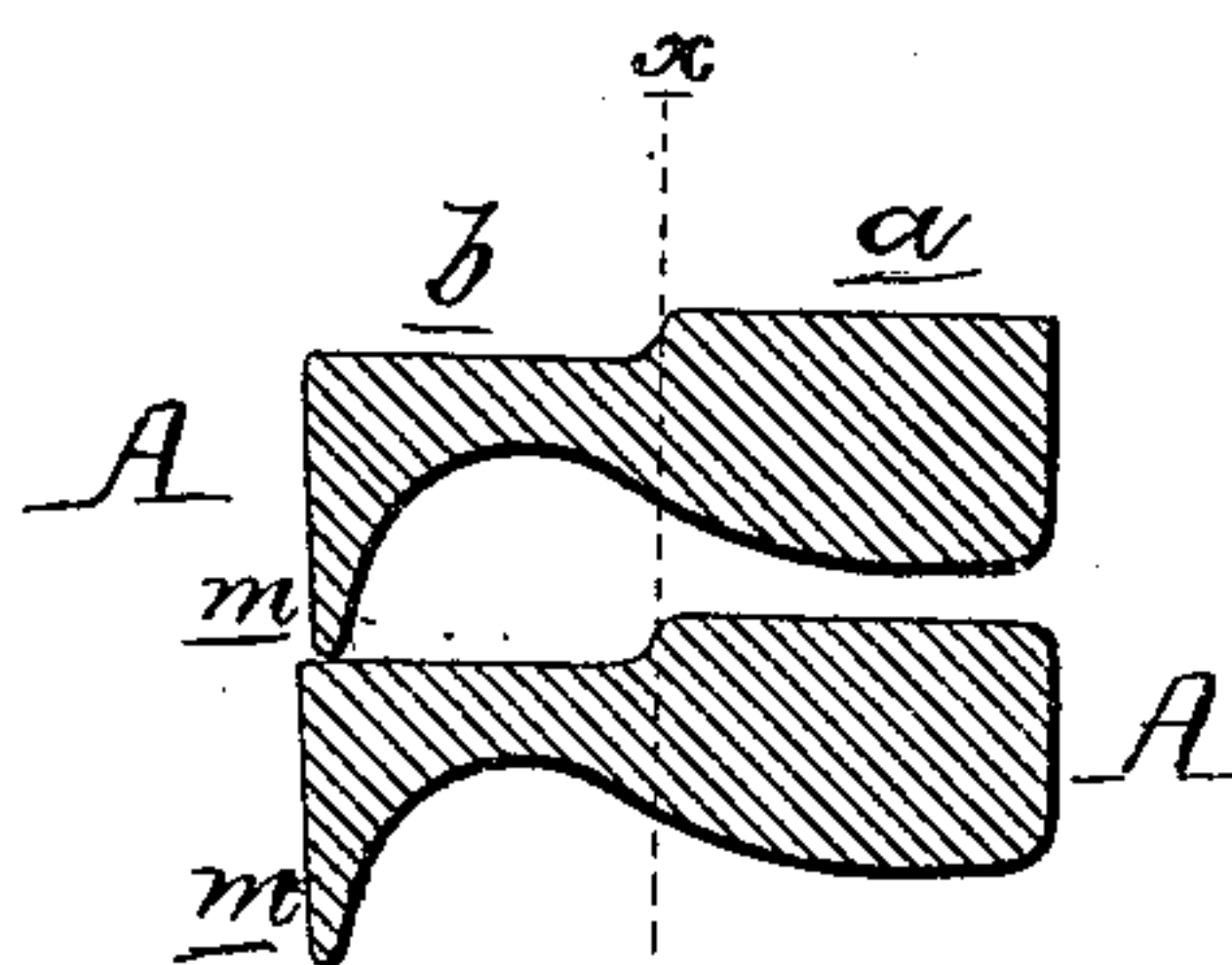
No. 191,361.

Patented May 29, 1877.

*Fig 1*



*Fig 2*



*Fig 3*



Witnesses.

Harry Smith  
John K. Rupertus.

Inventor.  
Allen Middleton  
by his Attorneys  
Howson and Son

# UNITED STATES PATENT OFFICE.

ALLEN MIDDLETON, OF PHILADELPHIA, PENNSYLVANIA.

## IMPROVEMENT IN CAR-SPRINGS.

Specification forming part of Letters Patent No. **191,361**, dated May 29, 1877; application filed February 27, 1877.

*To all whom it may concern:*

Be it known that I, ALLEN MIDDLETON, of Philadelphia, Pennsylvania, have invented a new and useful Improvement in Car-Springs, of which the following is a specification:

My invention relates to improvements in springs composed of steel bars coiled and tempered; and the object of my invention is to increase the strength without any sacrifice of proper resiliency, and to prevent fracture.

In the accompanying drawing, Figure 1 is a side view, partly in section, of my improved spring, and Figs. 2 and 3 sections, drawn to an enlarged scale, of the bar of which the spring is composed.

It will be seen that the coiled bar composing the spring is thickest, but lightest, at its outer edge, while the preponderance of metal is at or near the inner edge—a rule which must be observed for the following reasons in carrying out my invention, although the sectional form of the bar may be varied. A preponderance of metal at and near the inner edge of the coiled bar, (a feature which of itself I do not claim,) insures the strongest spring, but the latter is most liable to break where there is the greatest bulk of metal; hence the main feature of my invention, which consists in making the

outer edge of the bar thicker than the inner edge, by forming on the said outer edge a light flange, *m*, of such a depth that when the coil is compressed, metal to metal, the contact will be at the flange only, (see Fig. 2,) the portions of the coil composed of the heavy portions of the bar being free from contact with each other; in other words, the compression of the inner massive portion of the coil is restricted by the flange at the outer edge of the coil.

I claim as my invention—

A car-spring, composed of a coiled bar shaped substantially as described—that is, thickest but lightest at the outer edge—and having the preponderance of metal at or near the inner edge, so that when the spring is under pressure the contact of the coils with each other at and near the inner edge shall be prevented by the contact of the coils at the outer edge, all substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALLEN MIDDLETON.

Witnesses:

HERMANN MOESSNER,  
HARRY SMITH.