C. S. VAN WAGONER.

SPRING-HINGE.

No. 188,319. Patented March 13, 1877.

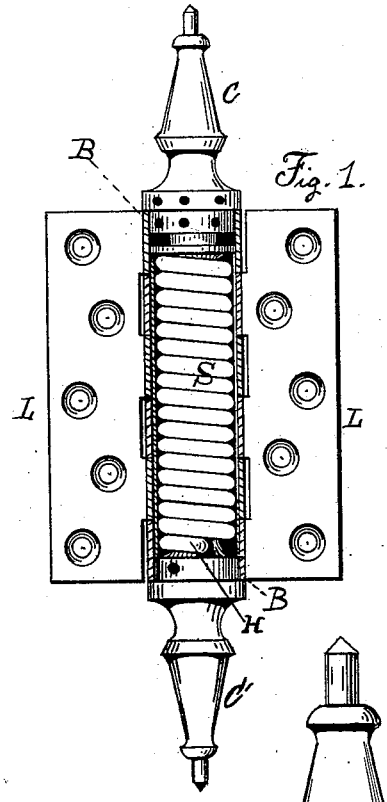

Fig. 1.

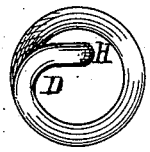

Fig. 2.

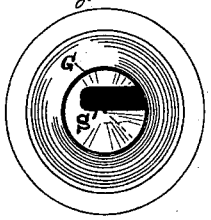

Fig. 3.

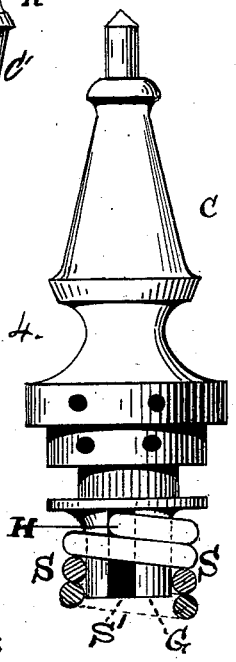

Fig. 4.

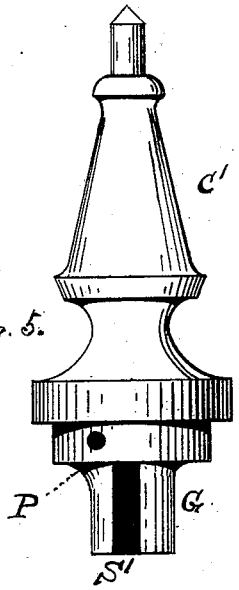

Fig. 5.

Witnesses:

Thos. Houghton.

George Hammell

Inventor:

Cornelius S. Van Wagoner

UNITED STATES PATENT OFFICE.

CORNELIUS S. VAN WAGONER, OF NEW YORK, N. Y.

IMPROVEMENT IN SPRING-HINGES.

Specification forming part of Letters Patent No. **188,319**, dated March 13, 1877; application filed February 5, 1877.

To all whom it may concern:

Be it known that I, CORNELIUS S. VAN WAGONER, of No. 82 Beekman street, in the city, county, and State of New York, have invented a new and useful Improvement in Springs and Caps for Spring-Hinges, which improvement is fully set forth in the following specification and the accompanying drawing, in which—

Figure 1 is in part a perspective, and in part a sectional, view of a spring-hinge, showing my improved spring and cap. Fig. 2 is an end view of the spring S; Fig. 3, an end view of the lug of the cap and the slit therein; and Figs. 4 and 5 are front views of the adjustable cap C and the fixed cap C′.

The object of my invention is to give increased power to each size or number of spring-hinges without increasing the size of the barrel of the hinge, one or more, by inserting therein a coiled steel-wire spring, made of a larger-sized wire than before in that sized hinge, and combining the same with adjustable and fixed caps, provided with lugs for engaging and controlling the same, having the metal thereof so distributed as to give greater strength, notwithstanding the lesser diameter of the lug required for insertion in the smaller annular opening in each end of the spring, caused by the use of the larger wire in its manufacture.

In the lugs of caps for spring-hinges previously used, it has been found difficult to so attach the spring to the lug as to give proper control of the spring by the lug, to prevent the spring from collapsing for want of the internal support of the lug, the steel wire of the coiled spring from breaking, in use, at the bend, where compression and extension, caused by so flexing the end of the wire as to form the requisite hook, occurs, and the lug from giving way because of the severe strain to which it is subjected. Since the spring increases and diminishes in length in use, the lug, as made hitherto, allows the spring free play in its connection with itself, and necessarily sustains the full force of the spring on one-half of the lug, or less.

The best arrangement known to me previous to my invention is that shown in the Letters Patent No. 40,879, granted to Lorenzo Bommer, and dated December 8, 1863, wherein the lug is split in half, so as to allow the hook or end of the coiled spring-wire, which is turned across the center of the coil at each end, to slide up and down therein, as the existing tension may require, and prevent its straightening out or disengaging from the lug, while the rounded outside of the lug supports the two or three coils of wire adjoining each end on all sides, and so resists the constant tendency thereof to collapse. The size of wire which can be used with this form of lug is limited, and must be accommodated substantially to the resisting power of one-half the lug, or less, which is capable of insertion within the coil.

I am able to obviate the tendency to breakage of the lug, and increase the strength of my spring at the same time, besides obtaining other advantages, by carrying the bend or hook at each end of the coiled spring, not diametrically across its center or axis, as formerly done, but across the end beyond the axis of the spring, as a chord, and so as to leave more of the tubular space or area within it on one side of the hook than on the other; and the lug I make of corresponding shape, so as to permit insertion.

In the drawing, B is the barrel of the hinge, (shown in section;) L L, the leaves; S, the coiled spring; C, the adjustable cap, and C′ the fixed cap, each with its lug G G. H is the hook, which, being bent across one side instead of across the center of the end of the spring, describes a larger curve at the bend D than it could do if it were bent across the center. The end of the hook H is also shortened, so as not to reach across the coil or end of the spring. The lug G likewise has its slit S′ on one side of a center line across its end, so as to correspond with the spring in formation, and leave more metal on one side than on the other, but does not cut entirely through the lug, as formerly. The large and small sides of the lug continue into and support each other.

The strain of the spring, when in tension, is necessarily imparted to the lug from the inside of its hook H, and therefore I give that part of the lug which is within the hook more metal to support the strain, having provided

an entrance therefor. The smaller side of the lug is in contact with the outer end of the hook H, and has, therefore, the best hold thereof, to prevent the hook from straightening out. I also support the small side of the lug by increasing the metal at its base as fast as the turn of the bottom or end coil of the spring permits, as seen at P, and the main outward strain of the end of the hook H is supported at that point.

By this means I am able to use a spring in a six-inch American spring-hinge made of wire as large as could previously be employed in an eight-inch hinge, with less tendency to breakage either of the spring or of the lug than before, since with the formation described there is more strength in the lug and the hook-bend (which are the weakest parts of the mechanism) than formerly, with the construction previously known, it was possible to have in the lug and spring of a ten-inch hinge.

I claim as my invention—

1. The coiled spring S of a spring-hinge, provided with the hook H, bent across the end of the coil beyond its axis, and so as to leave the larger part of the annular space thereof within the hook, as shown and described.

2. The lug G of the cap of a spring-hinge, provided with a slit, to receive the hook end H of a coiled spring, cut on one side of the vertical axis of the cap, and part way through the same, as shown and described.

3. The coiled spring S, provided with the hook H, bent across the end of the coil beyond its axis, and so as to leave the larger part of the annular area thereof within the hook, in combination with the lug G of the adjusting-cap, provided with the slit S′, located beyond the axis of the lug, and cut only part way through the same, substantially as shown and described.

In witness whereof I have hereunto set my name this 23d day of January, 1877.

CORNELIUS S. VAN WAGONER.

Witnesses:

WM. H. BUTTERWORTH,

GEORGE HAMMEL.