J. SPRUCE.

SPRING-HINGE.

No. 192,091. Patented June 19, 1877.

Fig. 1.

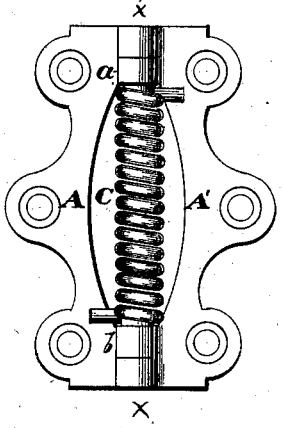
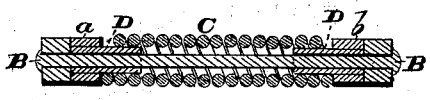


Fig. 2.



WITNESSES

Edw. S. Nottingham

A. M. Bright.

INVENTOR

James Spruce.

By H. A. Seymour.

ATTORNEY

UNITED STATES PATENT OFFICE.

JAMES SPRUCE, OF WATERBURY, CONNECTICUT.

IMPROVEMENT IN SPRING-HINGES.

Specification forming part of Letters Patent No. **192,091**, dated June 19, 1877; application filed May 8, 1877.

To all whom it may concern:

Be it known that I, JAMES SPRUCE, of Waterbury, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Spring-Hinges; 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 it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in spring-hinges.

The object of this invention is to provide sheet-metal spring-hinges of such a construction that a spiral spring of the minimum diameter and maximum strength may be disposed upon the pintle of the hinge in such a manner as not to abrade either the spring or pintle, or that portion of the knuckle of the hinge which supports the ends of the spring, and also to afford an increased bearing for the opposite ends of the spring, and thus avoid the breakage incident to spring-hinges where the power of the spring is sustained by the extreme ends of the same resting on the leaves of the hinge; and to that end my invention consists in the combination, with the spiral spring and pintle of a sheet-metal spring-hinge, of short tubes made of separate pieces, and rigidly secured to the inner knuckles of the hinge by welding, brazing, swaging, or any equivalent method, for the purpose of insulating the spring from the pintle, and also to afford an extended bearing for the extreme coils of the spring, and thereby prevent any abrasion between the spring, pintle, and knuckle, and obviate the danger of breaking the ends of the spring.

In the accompanying drawings, Figure 1 represents a plan view of my improvement, and Fig. 2 is a section taken through line *x x* of Fig. 1.

A A′ are the leaves of a sheet-metal hinge, and may be made of any desired form or size. Leaves A A′ are each provided with knuckles *a b*, through which extends the pintle B, to serve as a bearing for the leaves of the hinge. C is a spiral spring, and, while it is necessary that it should possess the requisite strength for the work required, it is desirable that it shall be of the smallest possible diameter consistent with due regard to strength, so that the spring may not project below the plane of the inner face of the leaves A A′, and also that the surface of the spring may project but slightly from the knuckles of the hinge. Again, in order to provide a durable article, it is requisite that the spring shall not come in contact with the pintle, and thus cause an abrading action between the spring and pintle, which would result in soon destroying the efficiency of the hinge.

Also, another prerequisite to a practical and durable article of this character is that the ends of the spring shall have a bearing other than on their free ends, as the power of the spring continually exerted on its ends operates to soon fracture and destroy the same, and hence a broad extended bearing is necessary for the extreme ends of the spring.

To accomplish the desired results, as above set forth, short collars or tubes D are rigidly secured, by brazing, swaging, or in any desired manner, to the inner knuckles *a b*, the tubes being held within the knuckles, and projecting therefrom a sufficient distance to afford a bearing for one or more coils of the spiral spring. It will be observed that the tubes serve to insulate the spring from the pintle of the hinge, and prevent any wear or abrasion of either, and also afford sufficient intervening space for the contraction of the spring, the diameter of the same being necessarily reduced as the hinge is opened.

Again, the tubes serve as a bearing for the end coils of the spring, and hence the latter is supported at its ends by the free ends resting on the leaves of the hinge, and by the end coils bearing on the tubes D, and, as the latter move in unison with the ends of the spring, there can be no abrasive action between such parts.

In my patent for spring-hinges dated December 26, 1876, the spring is insulated from the pintle by means of tubes loosely secured around the pintle. Again, spring-hinges have been made wherein the spring is inclosed within enlarged knuckles and the ends of the spring secured to end pieces, which latter are removably secured within the outer ends of the knuckles for the purpose of regu-

lating the tension of the spring, and hence I make no claim to spring-hinges of the construction above set forth; but,

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

The inner knuckles of a sheet-metal spring-hinge, having short tubes made of separate pieces, secured thereto by brazing, welding, swaging, or in any equivalent manner, in combination with a spiral spring, the end coils of which have bearing on said tubes, while the extreme ends of the spring rest upon the leaves of the hinge, substantially as and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 5th day of May, 1877.

JAMES SPRUCE.

In presence of—
M. L. SPERRY,
T. R. HYDE, Jr.