(No Model.)

C. OSBORNE.

HINGE.

No. 481,732. Patented Aug. 30, 1892.

Fig. 1.

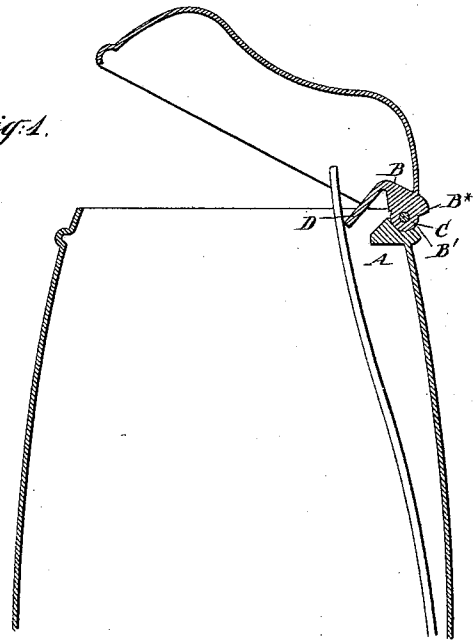


Fig. 2.

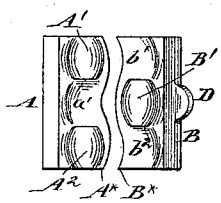


Fig. 3.

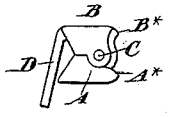


Fig. 4.

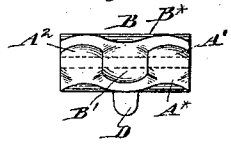


Fig. 7.

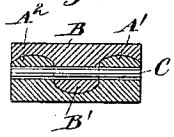


Fig. 5.

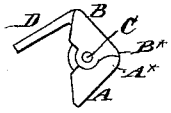
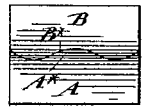


Fig. 6.



Witnesses:
Charles K. Searle,
Chas. S. Barton.

Inventor
Charles Osborne
by his attorney
Thomas Drew Stetson.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHARLES OSBORNE, OF NEW YORK, N. Y., ASSIGNOR TO THE WHITING MANUFACTURING COMPANY, OF SAME PLACE.

HINGE.

SPECIFICATION forming part of Letters Patent No. 481,732, dated August 30, 1892.

Application filed April 8, 1890. Serial No. 347,107. (No model.)

To all whom it may concern:

Be it known that I, CHARLES OSBORNE, of the city and county of New York, in the State of New York, have invented a certain new and useful Improvement in Hinges, of which the following is a specification.

I have discovered that by giving a certain form to the parts they may be produced by drop-press, thereby greatly cheapening the cost and perfecting the manufacture of flexible joints or hinges.

I have in my experiments applied the invention for small hinges for boxes, and will describe the invention as so applied, although it is obvious that hinges may be of larger size and adapted for other uses.

The following is a description of the invention.

The accompanying drawings form a part of this specification.

Figure 1 is a central section through a box having my hinge. The remaining figures are on a larger scale and show the hinge detached. Fig. 2 is a face view of the two portions separated. Fig. 3 is an end view showing the hinge closed. Fig. 4 is a corresponding view from the back. Fig. 5 is an end view showing the hinge opened. Fig. 6 is a corresponding view from the back. Fig. 7 is a longitudinal section through the hinge on the line of the axis.

Similar letters of reference indicate corresponding parts in all the figures where they appear.

A is the plate or body of the two bosses, the hinge being of the class known as "three-knuckle"—that is to say, one part having two bosses a proper distance apart and the other having one boss adapted to fit between, the pivot-pin being extended centrally through the three bosses and secured. The bosses are marked A′ and A^2. The opposite plate is marked B and its single boss is marked B′. The pivot or axial pin is marked C. Instead of making these bosses cylindrical, as usual, I make them swelled, each being much larger at its mid-length than near each end, and the extreme ends of each boss instead of being plane at right angles to the axis are domed or rather semi-domed, the portion which is at a plane at right angles to the axis being only of equal diameter to the pivot or a very little in excess. This peculiar shape is an important feature of my improvement, for the reason that it not only insures the production of a cheap and smooth-working hinge, but also avoids the common objection that squarely-formed corners and meeting surfaces are hard to produce by stamping or drop-forging. I make in each part corresponding concaves matching closely to the swells in the other part. The plate or body is extended sufficiently past the axis to form a reliable stop. I have marked the portion thus extending from the body A with a star A* and the part which extends from the body B with a star B*. These extensions A* and B* are upon curved lines following the contour of the bosses, as seen in Fig. 6, so that when the hinge is thrown open the extensions not only abut and resist further opening, but also interengage, as seen in said Fig. 6, and are thus fitted to better withstand strains parallel with the pivot C, and thus prevent injury to the hinge when open by pressure thereon or by its hitting against or by being hit by anything. Were the stops formed upon straight lines side strains on the cover of the box would tend to bend the pivot and prevent perfect shutting of the lid. I consider this curved interengaging of the extensions as important. The spheroidal cavity in A, which receives the swelled boss B′, is marked a'. The corresponding cavities in B, which receive the bosses A′ and A^2, respectively, are marked b' and b^2.

The important advantage due to my invention is that when the parts are made from metal which is reasonably ductile or malleable the parts can each be produced at one blow in a die-press. I have in my experiments, using silver as the material, produced in dies pieces of sufficient length to each make parts of a number of hinges, each being at a later stage sawed off into lengths and drilled and applied together. Besides this advantage, the use of the spheroidal bosses or bosses curved lengthwise of the pivot-pin as well as at right angles thereto has the advantages over cylindrical bosses of diminishing the weight of the hinge and decreasing th resistance of opening and shutting the same, and it also renders the hinge more re-

sistant to side strains, since each boss is held between the end walls of its cavity, which therefore oppose motion of the box-lid lengthwise of the pivot-pin. I can make the arm to operate with a spring at the same time and as a part of the same piece, making as many arms as are necessary, so that when sawed off into lengths and parts are properly reversed and applied together there will be only one arm on each hinge. I have shown such arm on the part B and have marked it D.

I claim as my invention—

1. The improved hinge herein described, composed of a plate A, having upon its face the spheroidal bosses A′ and A² and similarly-shaped cavity *a′* lying between said bosses, and the plate B, provided with boss B′ and cavities *b′* and *b²* upon each side thereof and adapted to closely engage, respectively, with the cavity and bosses on the plate A, and the pivot-pin C, passed through all of the bosses, said plates being formed with interengaging extensions A* and B*, respectively, formed upon curved lines conforming to the outlines of the bosses and adapted to serve as stops, and the plate B, formed upon the opposite side of the pivot-pin C from said curvilinear extensions, with an arm D extending angularly therefrom, substantially as specified.

2. A hinge provided at the back with abutting stops adapted to interlock when the hinge is open, so as both to arrest the opening of the hinge and when said hinge is open to restrain the movement of its parts upon each other lengthwise of the pivot-pin, substantially as described.

3. A hinge composed of a pivot-pin, in connection with plates having on their opposing faces spheroidal bosses and cavities curved in the direction of the axis of the hinge as well as transversely thereto, the said opposing faces being of greater width than the diameter of said bosses and cavities, and the said cavities inclosing the greater part of the convex surfaces of said bosses both in a direction transverse to the said axis and longitudinally thereof, substantially as described.

4. A hinge provided at the back with abutting stops and at the front with an angular arm, said stops being adapted to interlock when the hinge is open, so as at such times to restrain the movement of its parts upon each other lengthwise of the pivot-pin, and said arm being adapted to receive the pressure of a spring, substantially as described.

In testimony whereof I have hereunto set my hand, at New York city, this 14th day of March, 1890, in the presence of two subscribing witnesses.

CHARLES OSBORNE.

Witnesses:
HENRY H. COOK,
H. B. BRITTEN.