No. 648,666. Patented May 1, 1900.

J. O. KING.

SPRING HINGE.

(Application filed Jan. 10, 1900.)

(No Model.)

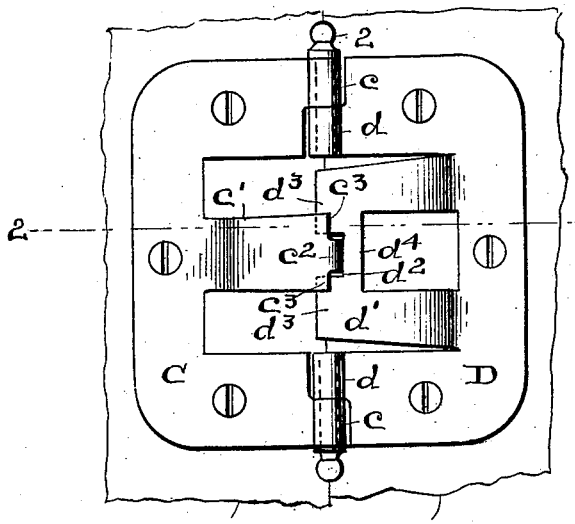

Fig. 1.

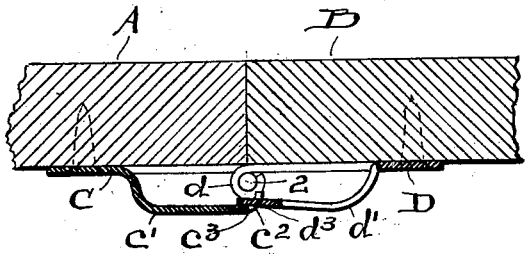

Fig. 2.

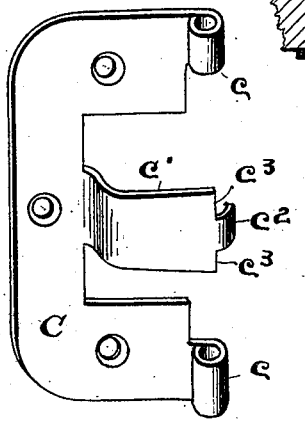

Fig. 4.

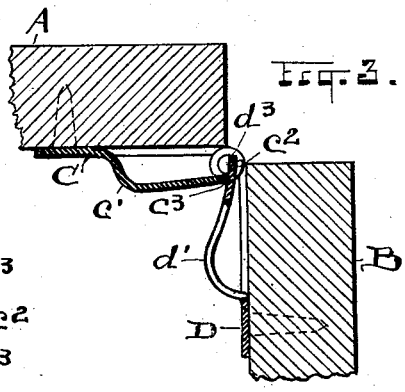

Fig. 3.

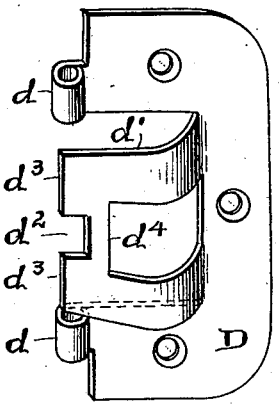

Fig. 5.

ATTEST.

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JAMES O. KING, OF CLEVELAND, OHIO.

SPRING-HINGE.

SPECIFICATION forming part of Letters Patent No. 648,666, dated May 1, 1900.

Application filed January 10, 1900. Serial No. 963. (No model.)

To all whom it may concern:

Be it known that I, JAMES O. KING, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Spring-Hinges; and I do declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to spring-hinges which are admirably adapted to screen-doors, but are not thus limited in their use and may be employed wherever a spring-hinge is desirable for either keeping the door open or closed. By using the word "door" of course I mean to include gates, lids, and hinged shutters of whatsoever kind and use and with or in which my improved hinge might be available or desirable.

Referring to the accompanying drawings, Figure 1 is a plain outside elevation of my improved hinge as it appears when the door is in closed position, a section of the door and door-casing being shown in that connection; and Fig. 2 is a cross-section on line 2 2, Fig. 1. Fig. 3 is a cross-section of the same parts and on the same line as Fig. 2, but showing the door and hinge as they appear when half-way open. Figs. 4 and 5 are perspective elevations of the two members or sections of the hinge in detail to more clearly disclose their individual features.

A and B respectively represent sections of a door and a door-casing, and C and D the members or sections of the hinge. It is immaterial which member is secured to either door or casing, and the operation will be precisely the same in either case. Hence they are interchangeable and no mistake can be made if they are originally set one way or the other. The hinge thus shown has several distinctively-novel features which render it exceptional in the art and valuable as an article. In the first place it is a sheet-metal product, being struck up from spring-steel of any suitable weight, according to the size of hinge wanted, and curled at its ears c and d for engagement by the pintles 2, two of which are used, as here shown. This avoids possible conflict by the pintle with the operation of the springs of the hinge, as would occur were they made of no greater elevation relatively than is here shown; but if they stood out farther from the flat surface of the hinge a single full-length pintle could be used instead of one for each set of ears as now, and the pintle would not be in the way.

Now coming to the more strikingly original and characteristic portions of the hinge it will be noticed that the section C has a central arm c' with a small tongue c^2 on its extremity, and that said arm is an integral portion of the section and stands out from its surface normally about as seen in Fig. 2. This arm also is a spring member in the organization here shown, but not necessarily—that is, there might be such ample room afforded in its engagement with the opposite section that a rigid arm would answer my purpose; but a spring-arm is greatly to be preferred in operation and avoids the common danger of breakage which comes to a rigid arm.

The section or member D has at its middle, between its ears d, a combined spring and bearing portion d', shaped, preferably, as here shown, but not necessarily, the only really-necessary features being that it should be a spring and afford a bearing for the arm c'. The character of this bearing is twofold, as disclosed in the present case—that is, it locks the arm c' with the spring d' when the door opens to or past the half-way-open point, as seen in Fig. 3, and makes a spring also of the said arm, and especially does the spring d' afford a bearing-surface for the shoulders c^3 on arm c' and through which the two portions c' and d' are made effective for all the spring action and pressure obtained by this hinge. Of course this is to be interpreted along with the fact that both arm c' and spring d' stand out such a distance from the plain surface of the hinge-body as to form a leverage outside the axis of the hinge through the pintles 2. This is illustrated in Fig. 3, where the spring d' is under its strongest tension or deepest depression by shoulders c^3, and hence is exerting its utmost push against arm c' to close the door. Hence also the door may swing half-way open and yet not reach the dead-center point, so that when thus opened the spring would automatically close it. The dead-center is farther back, nearly half-way to its farthest back position, where the spring

holds the door, as in this case the two parts c' and d' lie back to back.

The so-called "tongue" c^2 is of service chiefly in compelling coöperation of arm c' at the time of strain on the spring when the door is being opened and the spring-depressing shoulders c^3 slide on their bearings d^3 on the spring d'. The tongue c^2 being hooked beneath spring d' in or through its recess d^2, the shoulders c^3 are forced to do their work. However, if arm c' were an unyielding or rigid arm and the bridge portion d^4 of the spring were removed, the arm would work without a tongue. It will be understood, too, that I can change the appearance and the relations of the working portions of arm c' and spring d' without altering their joint effect or departing from the spirit of my invention, and all equivalent constructions of these parts are understood to be covered by my claims. Finally and as already indicated, the leverage of the spring and arm to do their work is dependent on their arrangement outside the axis of the hinge vertically and their distance from the said axis laterally to their shouldered connection and rise from the body of the hinge-sections, of which they are each a part.

Under the foregoing description the portion d' of hinge-section D is treated as the spring proper, and this view also enters into the claims if a single spring be mentioned or properly inferred from the language employed; but as already stated the arm c' is here a spring-arm and coacts with the spring proper in affording the desired spring effects.

What I claim is—

1. In spring-hinges, a set of separable members formed from sheet metal and having ears at top and bottom for pintles, and each member having a spring integral therewith extending across the axis of the hinge wholly outside thereof at the rear, said springs constructed to overlap and having positive and sliding engagement with each other at their inner ends, substantially as described.

2. A hinge consisting of two members having each a spring-arm at its rear extending inwardly behind and apart from the axis of said members, one of said arms having an overlapping portion adapted to positively engage and bear on the other arm, whereby said overlapping arm is prevented from sliding when the hinge begins to open and the inner arm is depressed and spring action is produced as the hinge is opened, substantially as described.

3. In spring-hinges, a pair of separable sections pivotally connected at top and bottom, an integral spring-arm on each section extending inwardly and overlapped behind the axis of said sections, one arm having a recess in its inner edge and flat surfaces at the sides thereof, and the other arm having shoulders bearing on said flat surfaces and an inward projection entering said recess, whereby when the hinge starts to open the said projection forms a positive stop between said arms to prevent sliding and the said shoulders depress the inner arm and develop its spring action, and the said shoulders are enabled to slide outward on the opposite arm when the door passes the half-way point rearward, substantially as described.

Witness my hand to the foregoing specification this 6th day of January, 1900.

JAMES O. KING.

Witnesses:
H. E. MUDRA,
R. B. MOSER.