No. 761,057. PATENTED MAY 31, 1904.

E. BOMMER.

SPRING HINGE.

APPLICATION FILED APR. 2, 1903.

NO MODEL. 3 SHEETS—SHEET 1.

Fig: 1.

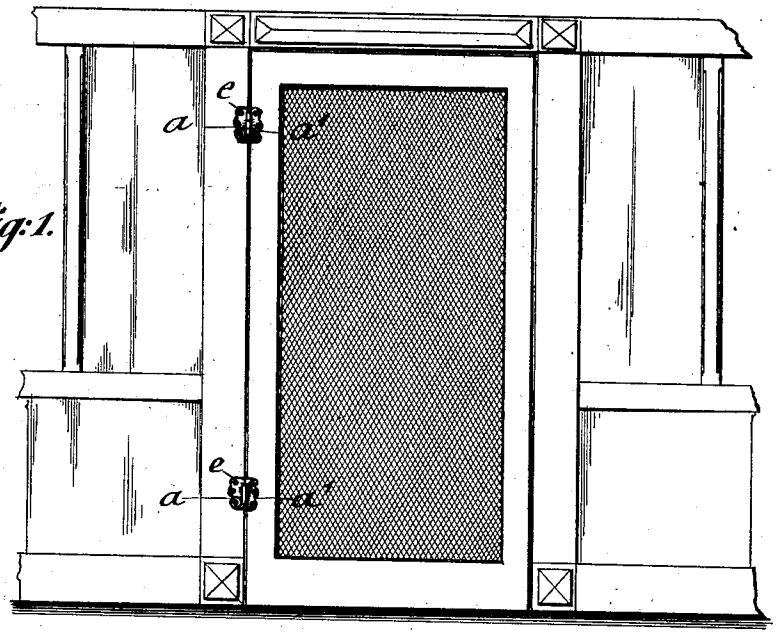
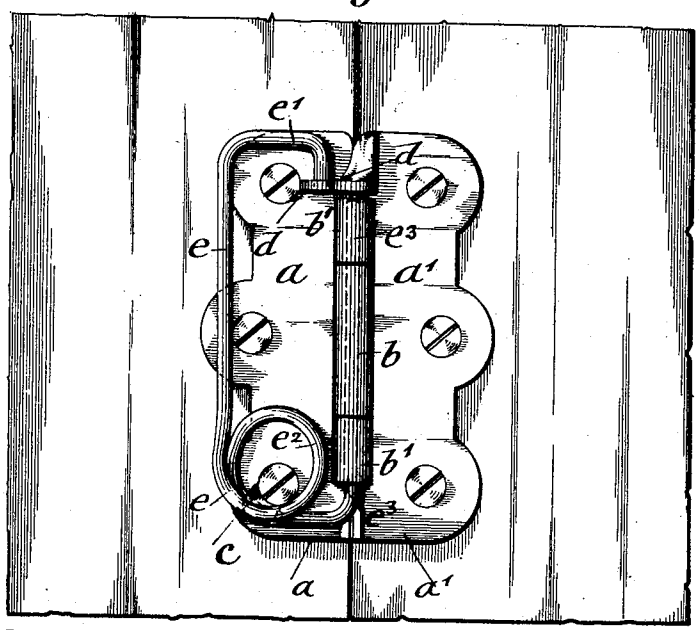


Fig: 2.

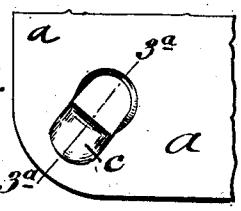


WITNESSES

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Fig: 3.



INVENTOR

Fig: 3a.



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by Spencer Nile

ATTORNEYS

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

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Fig: 4.

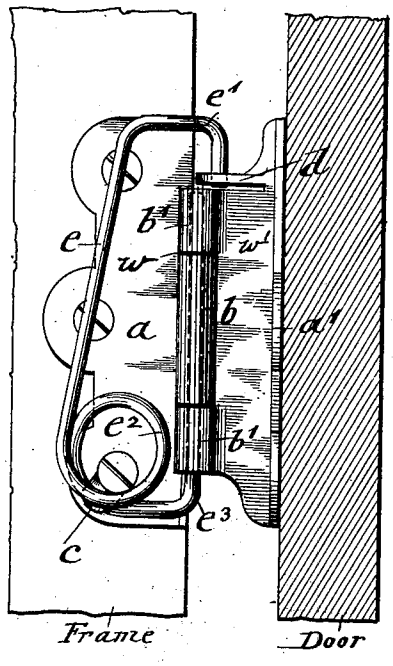


Fig: 5.

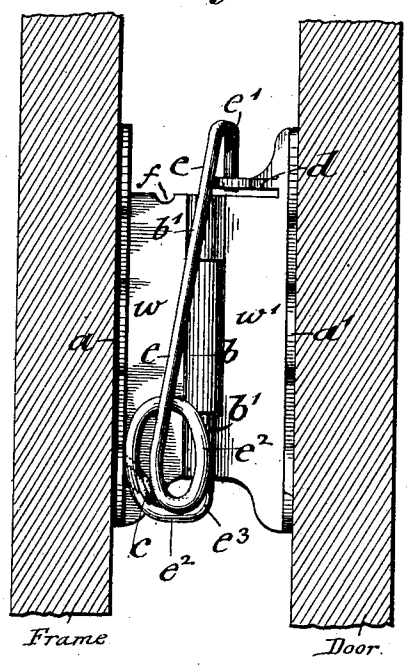


Fig: 4ª.

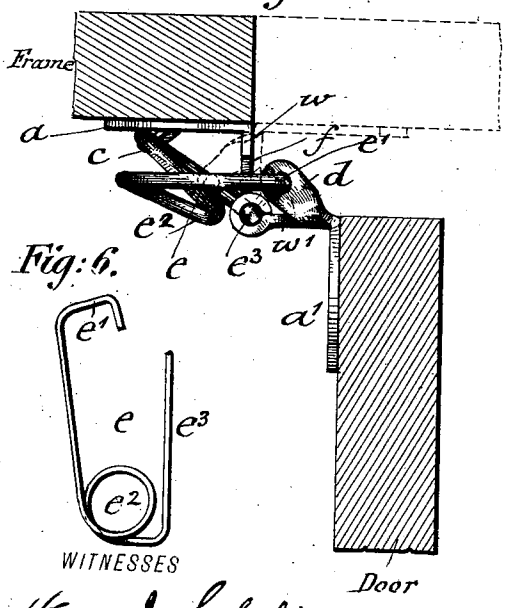
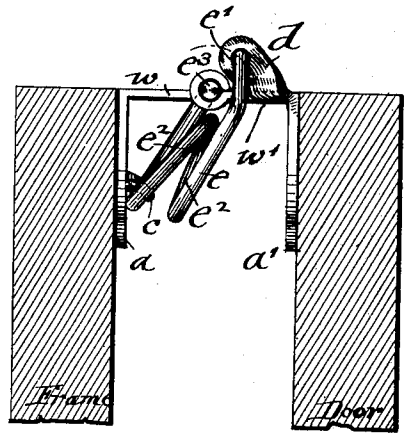


Fig: 6.

Fig: 5ª.



WITNESSES

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No. 761,057. PATENTED MAY 31, 1904.

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SPRING HINGE.

APPLICATION FILED APR. 2, 1903.

NO MODEL. 3 SHEETS—SHEET 3.

Fig. 7.

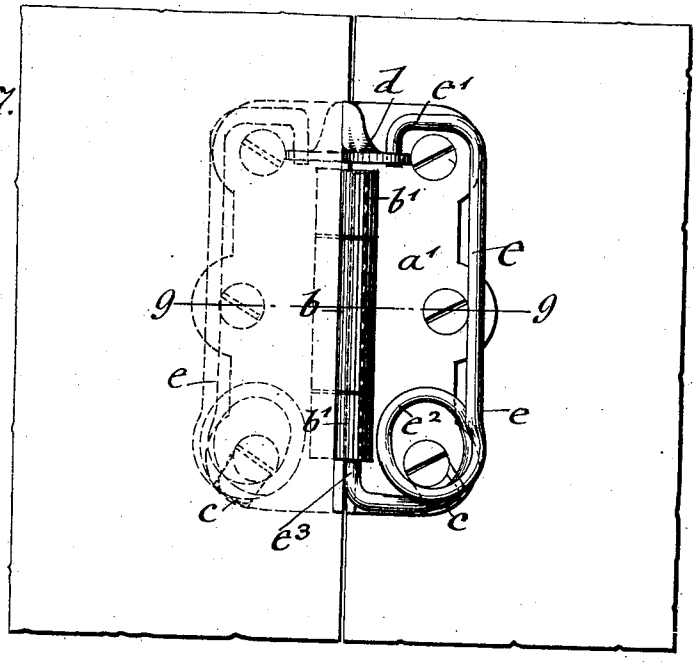


Fig. 8.

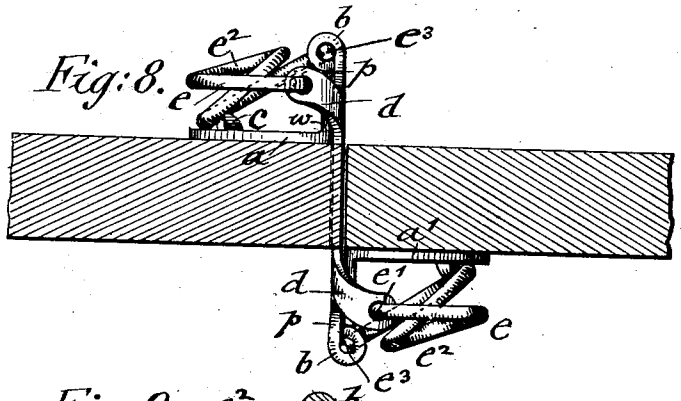
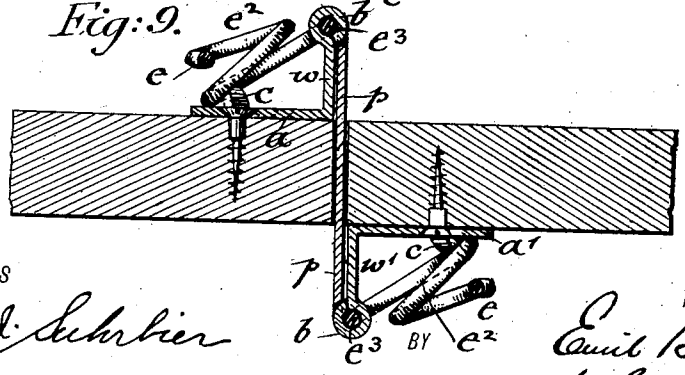


Fig. 9.



WITNESSES

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No. 761,057. Patented May 31, 1904.

UNITED STATES PATENT OFFICE.

EMIL BOMMER, OF NEW YORK, N. Y.

SPRING-HINGE.

SPECIFICATION forming part of Letters Patent No. 761,057, dated May 31, 1904.

Application filed April 2, 1903. Serial No. 150,797. (No model.)

To all whom it may concern:

Be it known that I, EMIL BOMMER, a citizen of the United States, residing in New York, borough of Brooklyn, and State of New York, have invented certain new and useful Improvements in Spring-Hinges, of which the following is a specification.

This invention relates to improvements in single and double acting spring-hinges which are intended for use on light swing-doors of all kinds, such as screen-doors and the like, and which are of simple, cheap, and effective construction and readily attached to the door-frames and doors with which they are to be used; and for this purpose the invention consists of certain details of construction and combinations of parts, which will be fully described hereinafter and finally pointed out in the claims.

In the accompanying drawings, Figure 1 represents a front elevation of a screen-door hung by my improved spring-hinges. Fig. 2 is a front elevation of the spring-hinge drawn on a larger scale. Figs. 3 and 3^a are respectively a detail front view and a vertical transverse section on line 3^a 3^a, Fig. 3, of the retaining-seat for the wire spring used in my improved spring-hinge. Fig. 4 is a front elevation of the spring-hinge, shown in a partly-open position. Fig. 4^a is a plan view of Fig. 4. Fig. 5 is a front elevation of the spring-hinge, showing the door in an entirely-open position. Fig. 5^a is a plan view of Fig. 5. Fig. 6 is a detail view of the wire spring, shown detached from the hinge; Fig. 7, a front elevation of a double-acting spring-hinge made according to my improved construction; Fig. 8, a plan view of Fig. 7; and Fig. 9, a horizontal section on line 9 9, Fig. 7.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, a a' represent the flanges of my improved spring-hinge, which flanges are attached to the door-frame and door, respectively. The flanges a a' are provided with webs w w', bent up, preferably, at right angles to the flanges, and with pintle-sockets b b' at the ends of said webs w w', said webs, flanges, and pintle-sockets being preferably stamped, by means of dies, from blanks of sheet-steel of suitable size and thickness. The flange a is provided at one end with a seat c, which is bent up from the stock of the flange a, preferably from the stock forced out of the lower screw-hole of the same, as shown in Figs. 3 and 3^a. At the opposite end of the flange a' a bracket d is bent up from the web w', which bracket is provided with a hole for supporting one end e' of a wire spring e, by which the power for closing the door is supplied. The bracket d is made integral with the flange a' and twisted, so as to be placed in horizontal position immediately above the upper pintle-socket b', but sidewise of the same, as shown clearly in plan view in Figs. 4^a and 5^a.

The wire spring e, by which the spring action is exerted on the swinging flange a', is made of stout wire, one end e' being made of inverted-**U** shape and inserted into the hole of the bracket d, while its middle portion is bent into a coil e^2, which is located near the bent-up seat c of the flange a and retained by the same. The opposite end e^3 of the wire spring e is bent approximately parallel with the main portion or body of the same in a direction toward the **U**-shaped end and inserted into the pintle-sockets of the flanges a a', so as to act as a pintle for the same. The wire spring e is clearly shown as detached from the hinge in Fig. 6 in a position of rest in Fig. 2 and in a position of tension in Figs. 4 and 5. It has the twofold purpose of serving as the tension-spring for the hinge and as a pintle for connecting the pintle-sockets of the flanges. On opening of the door the wire spring is set to tension and causes the bent upper end e' of the same, which is seated in the hole of the bracket d, to be moved in a downward direction in the bracket d. The upper edge of the bent-up web w is provided with a small recess f, as shown in Figs. 4^a and 5, so as to permit the upper end e' of the wire spring e to clear said web without abutting against the same during the opening and closing of the door. When the door is placed in a partly or entirely open position, it is retained in this position by the action of the wire spring, which assumes the position shown in Figs. 4 and 4^a, 5 and 5^a.

While being moved into either of these positions the upper end of the wire spring *e* has passed over the recess *f* of the web *w* and beyond the axis of the pintle-sockets and forms a lock for holding the door in open position. On closing the swing-door the upper end of the wire spring *e* is returned by the motion of its supporting-bracket *d* back to the other side of the axis of the pintle-sockets and is then returned quickly by the tension of the spring into the closed position shown in Figs. 1 and 2. As the coiled portion e^2 of the wire spring *e* is retained in fixed position by the bent-up lug *c* on the lower corner of the flange *a* and as the upwardly-bent lower end e^3 of the wire spring *e* is held stationary in the pintle-sockets, the swing of the wire spring is confined to that portion between the seat of the coil and the upper end of the spring. This portion of the spring is set to tension by the action of the door on the middle portion of the wire spring and forms, with the coil, the active part of the spring, by which the return or closing motion of the door is produced after it has been set to tension by the opening of the door. The flanges are provided with a number of screw-holes, according to their size, by which they are attached, respectively, to the door-frame and the swing-door, the attaching of the hinges to the door-frame and door being not connected with any difficulty. The same construction of wire spring is also adapted for double-acting spring-hinges, in which the front and rear springs are connected by an intermediate plate *p*, as shown clearly in Fig. 9. From this plate the brackets *d*, which receive the upper ends of the springs and the pintle-sockets *b'*, are bent up in the same manner as in the single-acting spring-hinges, the lower ends of the wire springs being used as the pintles for the pintle-sections of the hinges.

My improved spring-hinge for light swing-doors is of extremely simple construction, being composed practically of three parts only—the two flanges, of which one is provided with the seat for the coiled portion of the wire spring and the other with a perforated bracket for the active end of the spring, and the wire spring, the opposite or lower end of which serves as the pintle connection for the pintle-sockets. Two spring-hinges are used for medium-sized doors, while for larger doors three may be employed. They are furnished in sets with the fastening-screws and attached by their flanges to the door-frame and door, respectively. The wire springs can be readily removed from the flanges for detaching the door by pushing the spring first in downward direction, so that the coil clears its seat, and then in upward direction until its upper end clears the hole of the bracket, after which the end of the spring forming the pintle is removed from the pintle-sockets, the flanges separated, and the door removed without unscrewing the flanges. The wire springs are replaced in position in an inverse order by first inserting the pintle end of the spring in the pintle-sockets, next inserting the bent upper end of the spring into the hole of the bracket, and then reseating the spring on the retaining lug or seat. To avoid the loss of the wire springs while the door is detached or stored away, they should be replaced in their position in the pintle-sockets and perforated brackets of the flanges fastened to the door. As the flange, pintle-sockets, the connecting-web between the flange and pintle-sockets, and the bracket are bent up, by means of dies, from one piece of sheet-steel, a very strong yet cheap spring-hinge is obtained, which is specially adapted for use with light swing-doors of all kinds.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A spring-hinge, consisting of a flange attached to the door-frame and provided with a retaining-seat at one end, a flange applied to the door and provided with a perforated bracket at the end opposite the seat, said flanges being provided with pintle-sockets, and a wire spring, the middle coiled portion of which is retained by the seat, while one end engages the perforated bracket and the other end the pintle-sockets, forming the pintle for the same, substantially as set forth.

2. A spring-hinge, consisting of two flanges, one attached to the door-frame and the other to the door, pintle-sockets bent up integrally with said flanges, a bent-up retaining-seat at the end of one flange, a perforated bracket bent up integrally with the other flange at the opposite end of the same bent up from the same into a position sidewise of the pintle-sockets, and a coiled wire spring having bent end portions adapted to connect the seat with the bracket and pintle-sockets, so as to act as a combined tension-spring and pintle for the flanges, substantially as set forth.

3. A spring-hinge, consisting of two flanges for the door-frame and door respectively, provided with webs having pintle-sockets, a retaining-seat on one flange, a perforated bracket on the other flange, and a wire spring connecting the seat with the perforated bracket and pintle-sockets, the web of the door-frame flange adjacent the upper end of the wire spring being recessed to permit the clearance of the upper end of the spring over the upper end of said web, in opening and closing the door, substantially as set forth.

4. A spring-hinge, consisting of flanges provided with pintle-sockets and a tension-spring bent up from one piece of spring-wire and provided with a straight main portion one end

of which is secured to one of the flanges, a coil at the other end of the main portion secured to the other flange, and a straight end portion bent up from the coiled portion approximately parallel with the main portion of the spring and passing through the pintle-sockets, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

EMIL BOMMER.

Witnesses:

PAUL GOEPEL,

HENRY J. SUHRBIER.