No. 898,031. PATENTED SEPT. 8, 1908.

E. BOMMER.

DOUBLE ACTING SPRING HINGE.

APPLICATION FILED OCT. 26, 1904.

2 SHEETS—SHEET 1.

Fig: 1.

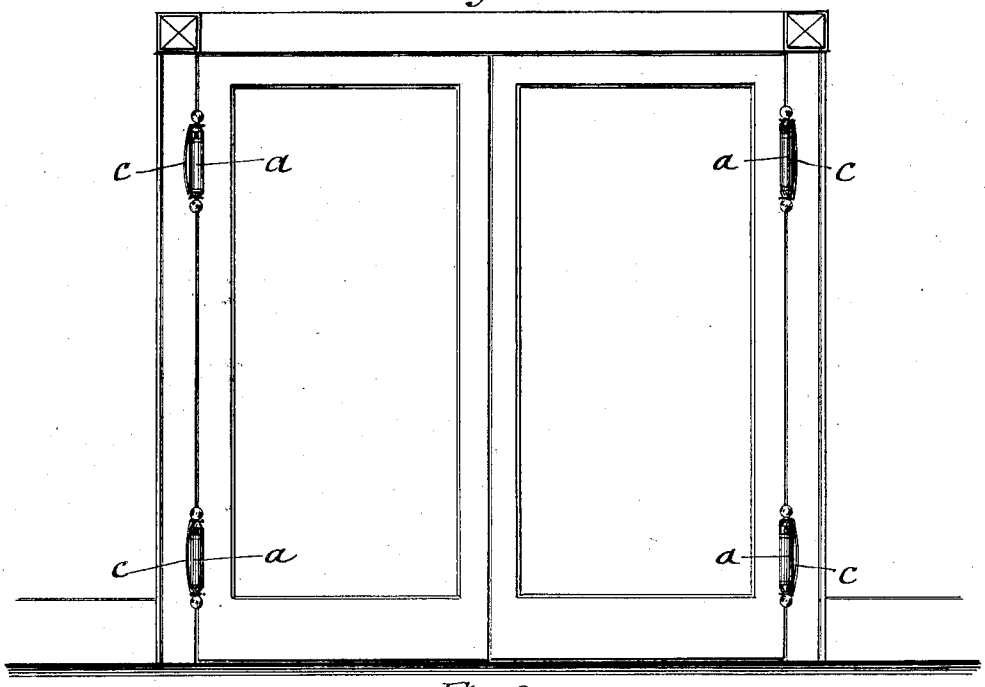
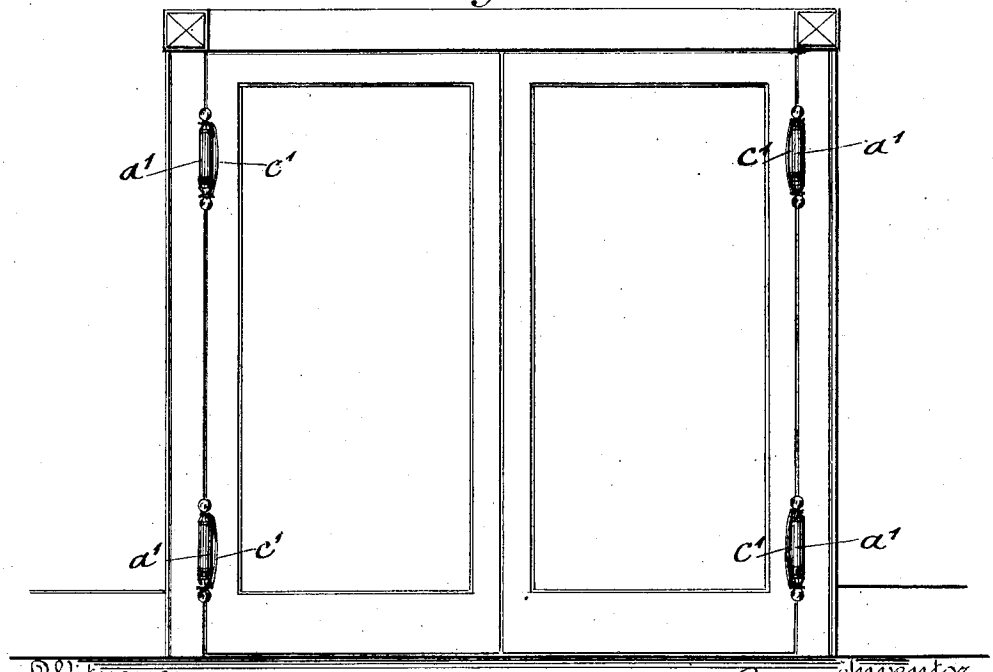


Fig: 2.



Witnesses

Henry J. Suhrbier.

H. C. Fackler

Inventor

Emil Bommer

By his Attorneys Goepel & Niles

THE NORRIS PETERS CO., WASHINGTON, D. C.

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Fig: 3.

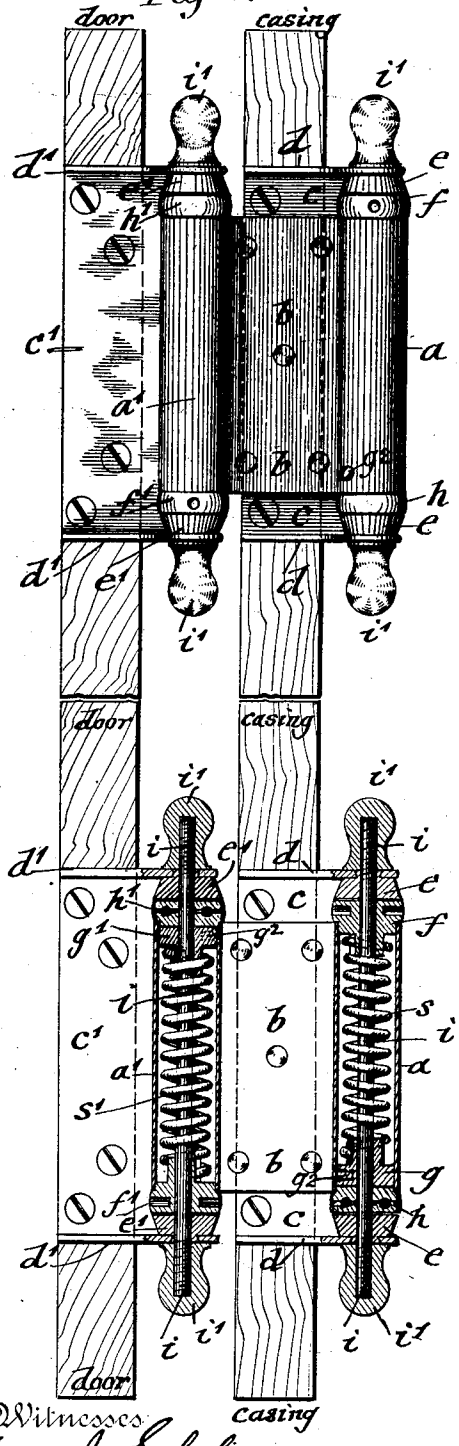
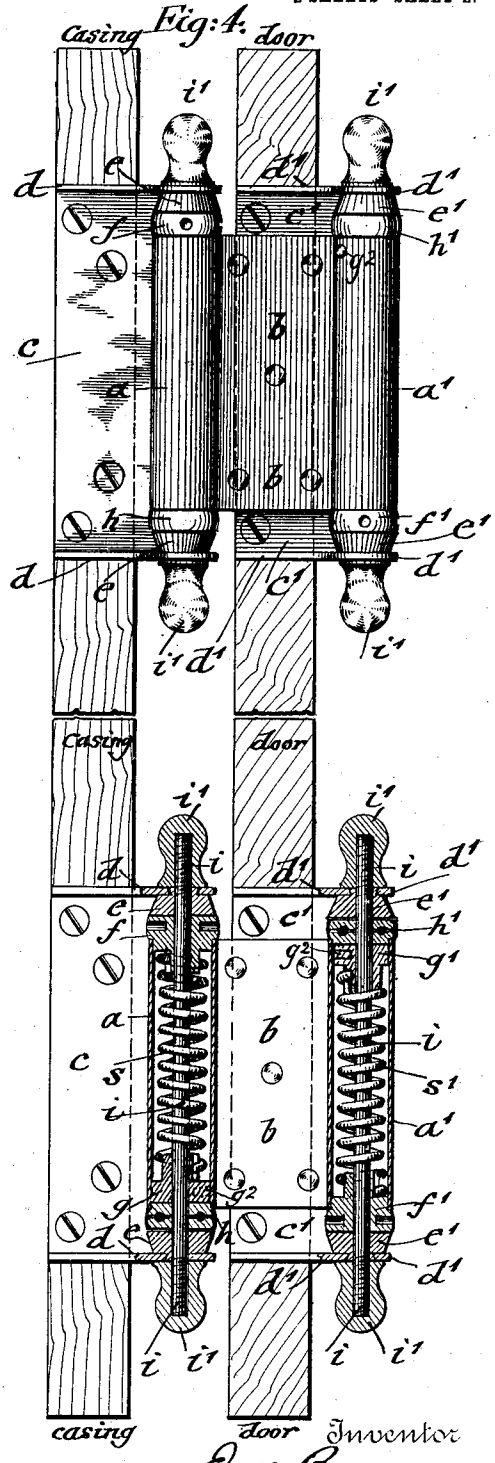


Fig: 4.



Witnesses
Henry J. Bubeker.
W. E. Rockwell

Inventor
Emil Bommer
By his Attorneys
Gould & Niles

THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE

EMIL BOMMER, OF NEW YORK, N. Y.

DOUBLE-ACTING SPRING-HINGE.

No. 898,031. Specification of Letters Patent. Patented Sept. 8, 1908.

Application filed October 26, 1904. Serial No. 230,089.

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, in the State of New York, have invented certain new and useful Improvements in Double-Acting Spring-Hinges, of which the following is a specification.

When double-acting spring hinges, of the type described in Letters Patent No. 747,680 granted to me on December 22, 1903, are used for hanging doors in pairs, they do not give a symmetrical appearance when both doors together are opened in the same direction, for the reason that when the tension-collars are uppermost on both pairs of hinges at both sides of the casing, then the right hand door when opened inwardly would leave one barrel of the hinge with its flange and the connecting-web of the barrels at the casing, while when the other door is opened inwardly these parts would move with the door, leaving only the flange to show on the casing. When in order to overcome this unequal appearance, the hinges on one door of a pair are inverted or hung upside down, then the hinges would not appear symmetrically because the tension-collars would be uppermost at one side of the casing and lowermost at the other side of the casing.

In the type of double-acting spring-hinges referred to, which consists of two barrels connected by an intermediate web, provided with two flanges having pintle-sockets and with tension-collars interposed between the barrels and the pintle-sockets, four ball-bearings were heretofore employed, one at the top and one at the bottom of each spring-barrel for diminishing friction and facilitating the working of the parts. As the adjustable tension-collar in every case moves with the flange against which the tension of the spring is exerted, it necessarily follows that when the door moves in one direction with its flange only, the friction is on the upper bearing of one barrel while when it moves in the opposite direction it carries the connecting web of the barrels along with its flange, and the friction is then transferred onto the lower bearing of the other barrel, these two bearings thus supporting the friction and weight of the door. It is therefore evident that in providing ball-bearings for double-acting spring-hinges, it would be necessary to provide only those two ball-bearings which carry the load when the door is in action, so that by placing a ball-bearing at the top of one barrel and a tension-collar at the lower end of the same barrel, and another ball-bearing at the bottom of the second barrel and a tension-collar at the top of the same barrel, both the ball-bearings and tension-collars would be respectively located diagonally to each other on the two barrels, and the entire load would be carried by the two ball-bearings, and a symmetrical appearance of all the spring-hinges on a pair of doors, whether the doors are in inward or outward position, would be obtained. But this can only be done when a right-hand spring is used in one of the barrels, and a left-hand spring in the other barrel, or vice-versa, as otherwise the door would stand open in one direction all the time, for the reason that when springs coiled in the same direction are used in both barrels of a double-acting hinge of this type and the tension is taken up at the top of one barrel and at the bottom of the other barrel, the tension of the two flanges would be in opposite direction and one flange would close upon the connecting-web and the other would open away from the connecting-web. Furthermore, with this arrangement, when in a double-acting spring-hinge, the spring of one barrel is coiled as a right-hand spring and the spring of the other barrel is coiled as a left-hand spring, then all the spring-hinges of both doors of a pair of doors will always match properly, because on one side of the pair of doors all the tension-collars will be at the top and on the other side all the tension-collars will be at the bottom, and when the doors are swung in one direction the flanges only will show on both doors of a pair of doors and when swung in the other direction the flanges and the connecting-webs of the barrels in conjunction will show on both doors. When in addition to this arrangement of the double-acting spring-hinge, the height and shape of the ball-bearings is made to correspond to the height and shape of the tension-collars, the same symmetrical appearance is obtained at both ends of each double-acting spring-hinge whichever end is placed uppermost. The ball-bearings and tension-collars being placed diagonally opposite to each other on the barrels of each spring-hinge, the flange having the tension-collar at the top must always be fastened to the door-casing, whereby any chance of improperly hanging the doors is avoided, the work of the carpenter in hanging the doors

with double-acting spring-hinges facilitated and the cutting out of recesses for the hinges of one door of a pair from the outside and for the hinges of the other door from the inside dispensed with, and the ball-bearings are properly located to support the weight and friction of the door.

The invention therefore consists of a double-acting spring-hinge, in which the spring-barrels are provided in one barrel with a right-hand spring and in the other with a left-hand spring, and in which the ball-bearings and tension-collars are placed diagonally opposite to each other at the ends of the web-connected barrels of the spring-hinge.

The invention consists further in certain additional details of construction which will be fully described hereinafter and more specifically pointed out in the claims.

In the accompanying drawings, Figure 1 represents an elevation of a pair of doors hung with my improved double-acting spring-hinges, taken from one side, Fig. 2 is an elevation of the opposite side of the same pair of doors, and Figs. 3 and 4 are side-elevations, showing respectively the appearance of one set of double-acting spring-hinges of one door when it is placed in open position in one direction and when it is placed in open position in the opposite direction, the lower spring-hinges of the set being shown in vertical section.

Similar letters of reference indicate corresponding parts.

The general construction of my improved double-acting spring-hinge remains the same as heretofore. It consists of two spring-barrels a, a^1, a connecting-web or plate b between the two spring-barrels, flanges c, c^1 provided with bent-up lugs, d, d^1 and having pintle-sockets e, e^1 for connection with the pintles of the spring-barrels, adjustable tension-collars f, f^1, which are provided at the inside of the spring-barrels with seats for one end of the springs, fixed tension-collars g, g^1 provided with seats for the opposite ends of the springs, said fixed tension-collars being rigidly attached to the end of the spring-barrel by a suitable pin g^2, ball-bearings h, h^1 interposed between the joints carrying the load, pintles i which pass centrally through the perforations of the bent-up lugs of the flanges, tension-collars, pintle-sockets, springs, barrels and ball-bearings, and ball-tips or terminals i^1 screwed or riveted to the ends of the pintles. The fixed tension-collar g is located in the extreme lower end of the spring-barrel a, and the fixed tension-collar g^1 in the extreme upper end of the other spring-barrel a^1, while the adjustable tension-collars f and f^1 are located respectively in the upper and lower portions of the spring-barrels a, a^1. The ball-bearing devices h and h^1 are interposed between the respective fixed pintle-sockets e, e^1, the respective lower and upper ends of the spring-barrels a and a^1 and the respective lower and upper faces of the pintle-sockets e and e^1. The barrels a, a^1 of each double-acting spring-hinge are provided with springs, s, s^1 coiled in different directions, that is to say, one barrel being provided with a spring coiled in the right-hand direction, and the other barrel provided with a spring coiled in the left-hand direction. On one barrel of each spring-hinge the adjustable tension-collar is located at the upper part and the ball-bearing is located at the lower part, and on the other barrel of each spring-hinge, the ball-bearing is located at the upper part and the adjustable tension-collar at the lower part of the barrel, as shown clearly in Figs. 3 and 4. This arrangement is made for the purpose of giving both hinges when applied to both doors of a pair of doors, the same appearance at opposite sides of the casing to which they are attached, and furthermore, to give a perfectly symmetrical appearance to both sets of double-acting spring-hinges whether viewed from the inside of the room or whether viewed from the outside of the room when the doors are in inwardly open or outwardly open position. The two ball-bearings for each spring-hinge are so arranged that one ball-bearing is placed at the top or upper end of one of the web-connected spring-barrels and the other ball-bearing at the bottom or lower end of the other web-connected spring-barrel, or vice-versa. The ball-bearings when so arranged will in every case where the flange with the tension-collar uppermost is fastened to the casing to properly locate the ball-bearings take up the entire load and friction on the hinge, because in a double-acting spring-hinge with two pintles, the door moves around two equidistant centers and when opened in one direction the friction is first taken up by the ball-bearing seated upon the upper edge of one barrel upon which bears the pintle-socket of the flange to which the door is fastened. As the door is moved over to the other center, the friction is transferred to the ball-bearing seated upon the lower edge of the other barrel and in turn bears upon the pintle-socket of the other flange fastened to the casing, or vice-versa when the door is opened in the opposite direction. It is therefore obvious that of the four ball-bearings which were heretofore used in double-acting spring-hinges at the ends of the spring-barrels, two can be dispensed with, for the reason that the two ball-bearings which are used in this improved construction take up the load and friction of the door whether the same is moved in one or the other direction.

By the arrangement described, the expense of the double-acting spring-hinges for a pair of doors is considerably reduced, mistakes in hanging the doors prevented and a great im-

provement in the appearance of the spring-hinges obtained, as the symmetrical hanging of a pair of doors is accomplished by four spring-hinges which are all exactly alike.

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

1. A double-acting spring-hinge comprising in its construction two spring-barrels, a web connecting said barrels, flanges jointed to the respective barrels, and two ball-bearings interposed between the barrels and the joints carrying the load diagonally to each other, one at the lower end of one spring-barrel and the other at the upper end of the other spring-barrel.

2. A double-acting spring-hinge comprising in its construction two spring-barrels, a web connecting said barrels, flanges jointed to the respective barrels, and two ball-bearings interposed between the fixed tension-collars and the respective lower and upper ends of the spring-barrels and the adjacent pintle-sockets and located diagonally to each other, one at the lower end of one spring-barrel and the other at the upper end of the other spring-barrel.

3. A double-acting spring-hinge comprising in its construction two spring-barrels, a web connecting said barrels, flanges jointed to the respective barrels, two ball-bearings interposed between the barrels and the joints carrying the load diagonally opposite to each other, one being interposed between the upper end of one spring-barrel and the joint carrying the load and the other between the lower end of the other spring-barrel and the joint carrying the load, and two adjustable tension-collars, also placed diagonally opposite to each other and located respectively one at the extreme lower end of the first spring-barrel and the other at the extreme upper end of the second spring-barrel.

4. The combination with a double-acting spring-hinge, comprising in its construction two spring-barrels, a web connecting said barrels, and flanges jointed to the respective barrels, of fixed tension-collars located diagonally opposite to each other, one at the lower end of one spring-barrel and the other at the upper end of the other spring-barrel and adjustable tension-collars located diagonally opposite to each other, one at the upper end of the first spring-barrel and the other at the lower end of the other spring-barrel, and springs interposed between the respective tension-collars in said barrels and coiled respectively in opposite direction to each other.

5. The combination, with a double-acting spring-hinge comprising in its construction two spring-barrels, a web connecting said barrels, and flanges jointed to the respective barrels, of fixed tension-collars in the extreme upper and lower ends of the respective spring-barrels, ball-bearings interposed between the respective fixed tension-collars and the joints carrying the load, two adjustable tension-collars at the extreme lower and upper ends of two respective spring-barrels, and springs interposed between the respective tension-collars in said barrels and coiled respectively in opposite direction to each other.

6. A double-acting spring-hinge, consisting of two spring-barrels, a web connecting the same, a flange for each spring-barrel provided with pintle-sockets at its upper and lower ends, fixed tension-collars located in the extreme lower and upper portions of the spring-barrels, two ball-bearings located diagonally opposite to each other and being respectively interposed between the fixed tension-collars in the extreme lower and upper portions of the respective spring-barrels and the pintle-sockets of the respective flanges, two adjustable tension-collars located diagonally opposite to each other and being interposed between the extreme upper and lower ends of the respective spring-barrels and the pintle-sockets, and springs interposed between the fixed and adjustable tension-collars in said spring-barrels and coiled respectively in opposite direction to each other.

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.