

E. B. HESS.
BALL BEARING.

APPLICATION FILED JUNE 12, 1909.

946;439.

Patented Jan. 11, 1910.

Fig. 1.

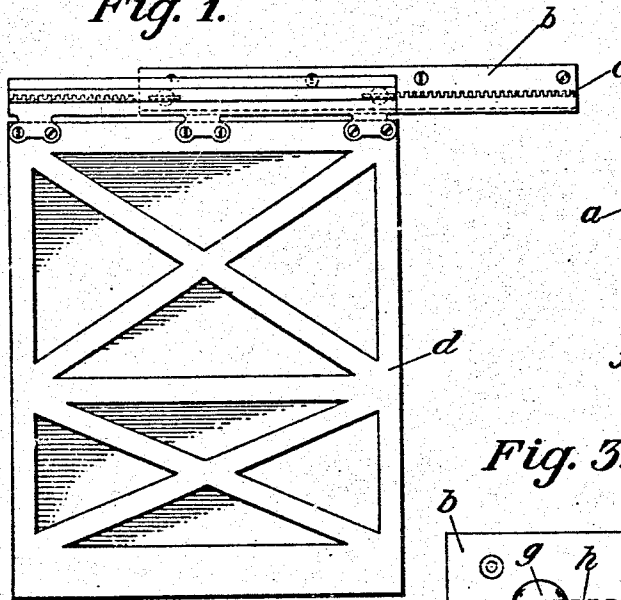


Fig. 2.

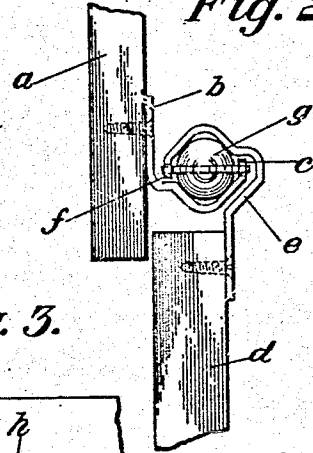


Fig. 3.

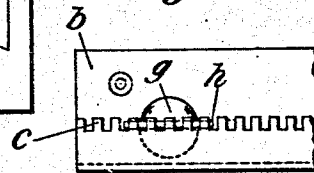


Fig. 5.

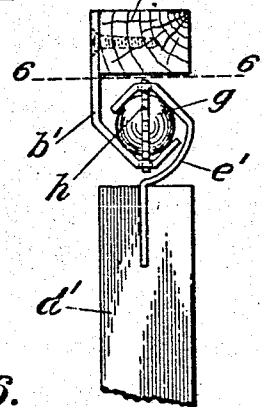


Fig. 4.

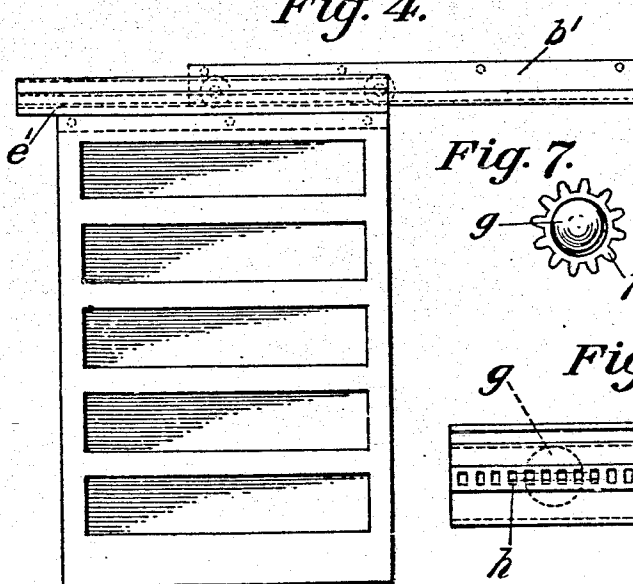


Fig. 7.

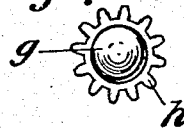
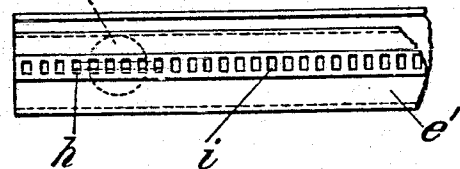


Fig. 6.



WITNESSES:

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UNITED STATES PATENT OFFICE.

EDWARD B. HESS, OF NEW YORK, N. Y., ASSIGNOR TO ROYAL TYPEWRITER COMPANY,
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BALL-BEARING.

946,439.

Specification of Letters Patent.

Patented Jan. 11, 1910.

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To all whom it may concern:

Be it known that I, EDWARD B. HESS, a citizen of the United States of America, residing in the borough of Manhattan, city, county, and State of New York, have invented a new and useful Improvement in Ball-Bearings, of which the following is a specification.

This invention comprises an organization wherein bearing balls traveling in a race-way are each diametrically surrounded by an annular gear that meshes with a rack or racks, the balls being thus maintained in proper relative position with respect to each other and to the movable part of the race-way. The annular or ring gears may be disposed vertically or otherwise.

The accompanying drawing shows the invention applied to the hanging of sliding doors. It is, however, useful in many other relations and the drawing is illustrative merely of one way in which the invention may be advantageously employed.

Figure 1 is an elevation showing a sliding door hung exterior to the frame: Fig. 2, an end view of Fig. 1 on a larger scale: Fig. 3, a detail elevation showing the lower part of the race-way and a ball and its ring gear therein: Fig. 4, an elevation showing a door swung within the frame: Fig. 5, an end elevation of Fig. 4: Fig. 6, a section on the line 6, 6, of Fig. 5: and Fig. 7, a detail view showing a bearing ball and its encircling ring gear.

In Figs. 1 and 2, *a* indicates the fixed frame to which is secured a bracket *b* shaped to constitute the lower half of a horizontal race-way and its upright outer edge formed with rack teeth *c*. *d* indicates the suspended door to which is secured a bracket *e*

shaped to overlie the projecting part of bracket *b*, thus forming the upper half of the race-way and having its downwardly extending edge formed with rack teeth *f*. *g* indicates the bearing balls, each of which is surrounded with a ring gear *h*, the opposite sides of which mesh with the racks *c*, *f*. In this case the ring gears are disposed horizontally.

In Fig. 4, there are brackets *b'*, *e'* one overlying the other, thus forming a race-way and secured respectively to the frame *a'* and sliding door *d'*. In this case, the ring gears encircling the balls engage apertures at the bottom and at the top of the race-way—the gears being disposed vertically. These apertures, in that part of the bracket *e'* constituting the upper part of the race-way, are shown in the top view, Fig. 6. The apertures are marked *i* and constitute in effect and in fact a rack with which the gears engage.

When the balls are loosely disposed within the ring gears, they are free to turn in any direction and there is, therefore, eliminated lateral strain on the gears. The organization is characterized by great delicacy or ease of operation.

I claim:

A ball bearing comprising a ball race, bearing balls therein, annular gears loosely encircling the balls, and racks, one movable and the other stationary, respectively engaged by opposite sides of the gears.

In testimony whereof, I have hereunto subscribed my name.

EDWARD B. HESS.

Witnesses:

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ANDREW J. SHERIDAN.