E. ZUCKERMAN.

HINGE.

APPLICATION FILED JUNE 17, 1913.

1,108,308. Patented Aug. 25, 1914.

Fig. 1.

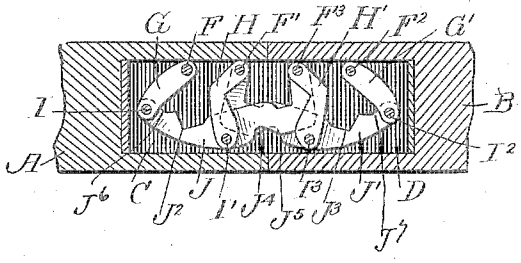


Fig. 2.

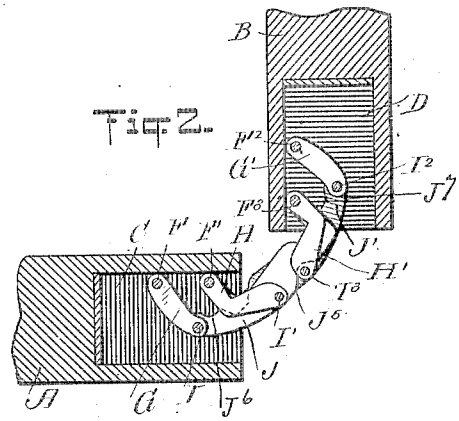


Fig. 3.

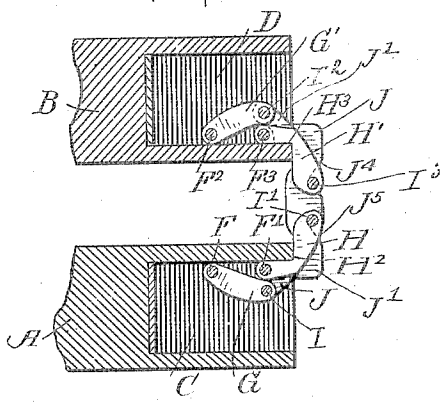


Fig. 4.

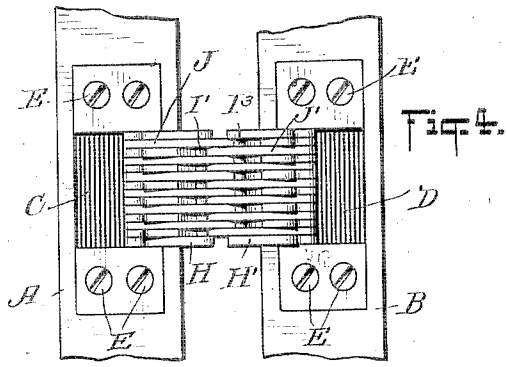


Fig. 5.

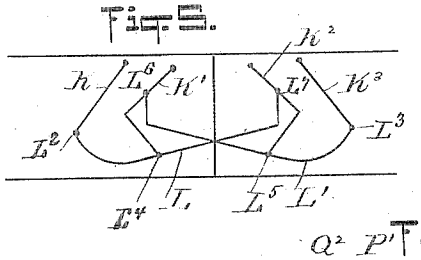


Fig. 6.

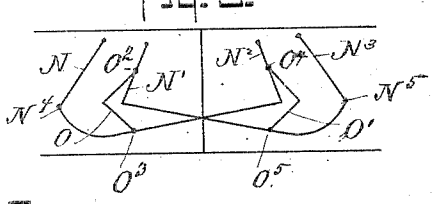
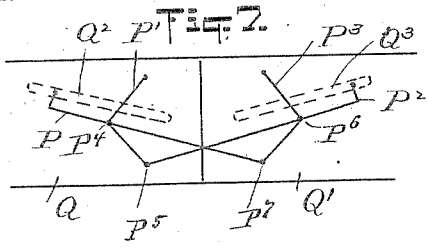


Fig. 7.



WITNESSES

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HINGE.

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Application filed June 17, 1913. Serial No. 774,135.

To all whom it may concern:

Be it known that I, EMIL ZUCKERMAN, a citizen of the United States, and a resident of Yonkers, in the county of Westchester and State of New York, have invented a new and Improved Hinge, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved hinge for use on doors, boxes, pianos, furniture and other articles and devices, and arranged to insure an easy swinging of the movable part of the device on which the hinge is used and without danger of binding the hinge members. In order to accomplish the desired result, use is made of attaching members arranged one for attachment to a fixed part and the other to a movable part of the device on which the hinge is used, a connection for connecting the said attaching members with each other, the said connection consisting of main links pivoted to the attaching members, connecting links connecting the main link of one attaching member with the main link of the other attaching member and guiding means connected with the attaching members and the said connecting links.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a sectional plan view of the hinge as applied to a door in closed position; Fig. 2 is a similar view of the same with the door partly open; Fig. 3 is a like view of the same with the door fully open; Fig. 4 is a face view of the same with the door fully open; and Figs. 5, 6 and 7 are diagrammatic views of modified forms of the hinge.

As illustrated in Figs. 1, 2, 3 and 4, the hinge is shown applied to a door casing A and a door B, and the hinge is provided with attaching members C and D, of any approved construction, and preferably mortised in the adjacent ends of the door casing A and the door B and fastened thereto by screws E, as plainly indicated in Fig. 4. In the attaching member C are arranged two vertically-disposed pivots F, F′ on which are mounted to swing links G and H, and similar links G′ and H′ are mounted to swing on vertically-disposed pivots F^2, F^3 attached to the attaching member D. The free ends of the links G and H are provided with pivot pins I, I′ pivotally connected with a connecting link J, the latter being also pivotally connected with the pivot F^3 in the attaching member D, and the free ends of the links G′ and H′ are provided with pivots I^2, I^3 engaged by a connecting link J′ pivotally connected with the pivot F′ in the attaching member C. It will be noticed that the series of links G, G′, H, H′, J and J′ may be arranged one above the other and connected in the manner described so as to provide any desired strength according to the use of the hinge on light or heavy doors and door casings.

It is understood that the links H, H′ are the main links and the links J, J′ are the connecting links, of which the connecting link J connects the main link H with the attaching member D, while the connecting link J′ connects the link H′ with the attaching member C. The links G, G′ by their connections with the connecting links J, J′ form guiding links to insure working in unison of the main and connecting links on opening and closing the door. By the arrangement described each attaching member C or D is provided with a pair of links G, H or G′, H′, and a pair of links in one attaching member are connected with each other by a connecting link which is also pivotally connected with the other attaching member at the corresponding outermost pivot F′ or F^3. When the door B swings into open position the pairs of links G, H and G′, H′ swing outwardly in the attaching members C and D owing to the action of the connecting links J, J′, and the outer links H and H′ overlie the connecting links J, J′ at the time the door is swung into a completely open position, so that the door is firmly supported while in open position. The outermost links H and H′ of the attaching members C and D are provided with angular notches H^2, H^3 to allow the door to be swung into full open position, the said notches being adapted to be seated on the outer edges of the door casing A and the door B when the latter is fully open, as plainly indicated in Fig. 3. The connecting links J, J′ are also provided with angular notches J^2, J^3 seated on the outer edges of the door casing A and the door B at the time the door B is opened to assist in relieving the pivots of undue strain. The connecting links J, J′ are also provided with notches J^4, J^5, of which the notch J^4 is adapted to be engaged by the pivot pin I^3

while the notch J^5 is adapted to be engaged by the pivot pin I′ at the time the hinge swings into open position, as indicated in Fig. 3, so as to limit the opening movement of the hinge, and the connecting links J, J′ are provided with curved notches J^6, J^7, arranged adjacent the pivots I, I^2 and adapted to engage the pivots F′, F^3 when the door is fully open to assist in limiting the opening movement of the hinge.

In the modified form shown in Fig. 5, the pairs of links K, K′ and K^2, K^3 are pivotally connected with each other by connecting links L, L′, that is, the guide links K and K^3 are pivotally connected at L^2, L^3 with the free ends of the connecting links L and L′, and the latter are pivotally connected at L^4, L^5 with the main links K′, K^2, and the link L is pivotally connected at L^7 with the main link K^2 and the link L′ is pivotally connected at L^6 with the main link K′. The operation is the same as above described in reference to the hinge shown in Figs. 1, 2, 3 and 4, the difference being that the connecting links L, L′ are connected with the links K^2, K^3 instead of the pivots F^3, F′ thereof.

In the modified form shown in Fig. 6 use is made of pairs of links N, N′ and N^2, N^3, of which the link N′ is extended and pivotally connects at N^5 with the link N^3 while the link N^2 is extended and is pivotally connected at N^4 with the link N. A connecting link O pivotally connects the main links N′, N^2 with each other at O^2, O^3, and within the attaching member C, and a connecting link O′ connects the main links N^2, N′ with each other at O^4, O^5 and within the attaching member D. It will also be noticed that the links O and O′ connect the links N′, N^2 and N^2, N′ with each other intermediate their ends.

The hinge shown in Fig. 7 consists of a pair of links P′, P^2 in one attaching member Q, and a similar pair of links P^2, P^3 is arranged in the other attaching member Q′. The links P′ and P^3 have fixed pivots in the attaching members Q and Q′, while the pivots of the links P and P^2 are mounted to swing and to slide in guide grooves Q^2, Q^3 formed in the attaching members Q, Q′. The link P′ is pivotally connected at P^4 with the link P and at P^5 with the free end of the link P^2, and the link P^3 is pivotally connected at P^6 with the link P^2 and at P^7 with the free end of the link P. In this case the links P and P^2 have their ends sliding outwardly in the guide grooves Q^2, Q^3 on swinging the door open, and an outward swinging movement is given to the links P′, P^3 during the opening of the door.

The guide links G, G′, shown in Figs. 1, 2, 3 and 4, may be omitted and the pivots I, I^2 may be made to slide in grooves or slots in the attaching members and similar to the grooves Q^2, Q^3 above mentioned. In a like manner the guide links K and K^3, shown in Fig. 5, may be omitted and the pivots L^2, L^3 made to slide in grooves in the attaching members. The links N, N^3 shown in Fig. 6 may be omitted and the pivots N^4, N^5 mounted to slide in guiding grooves in the attaching members and similar to the ones shown in Fig. 7.

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

1. A hinge, comprising attaching members arranged one for attachment to a fixed part and the other to a movable part of the device on which the hinge is to be used, a connection for connecting the said attaching members with each other, the said connection consisting of main links pivoted to the attaching members at the same sides thereof, and connecting links independent one of the other and each connecting the main link of one attaching member with the main link of the other attaching member.

2. A hinge, comprising attaching members, arranged one for attachment to a fixed part and the other to a movable part of the device on which the hinge is to be used, a connection for connecting the said attaching members with each other, the said connection consisting of main links pivoted to the attaching members at the same sides thereof, separate connecting links independent one of the other and each connecting the main link of one attaching member with the main link of the other attaching member, and guiding means connected with the attaching members and with the said connection.

3. A hinge, comprising attaching members arranged one for attachment to a fixed part and the other to a movable part of the device on which the hinge is to be used, main links pivotally connected with the said attaching members at the same sides thereof, connecting links each separately connected to the main links and connecting the main links with each other, and guide links pivoted in the attaching members and pivotally connected with the said connecting links.

4. A hinge, comprising attaching members arranged one for attachment to a fixed part and the other to a movable part of the device on which the hinge is to be used, and a connection for connecting the said attaching members with each other, the said connection consisting of two links separately pivoted on one attaching member and two links separately pivoted on the other attaching member, a connecting link connecting the links of one attaching member, and a connecting link connecting the links of the other attaching member, the free portions of the said connecting links crossing each other, and the free end of each of the

said connecting links connected with one of the links connected by the other connecting link.

5. A hinge, comprising attaching members, pivots held on the said attaching members, and extending in the same plane at the time the hinge is closed, links mounted to swing on the said pivots and connected with each other so that two of the links pivoted on one attaching member are connected to a link pivoted on the other attaching member, and a third link pivoted on the first-mentioned attaching member is connected to the other two links pivoted on the other attaching member.

6. A hinge, comprising attaching members, a pair of spaced pivots in each attaching member, a pair of links pivoted on each pair of pivots, and a connecting link for each pair of links, the connecting link of one pair of links being pivotally connected with a link of the other pair of links, the outermost link of each pair of links having a shoulder adapted to abut against the outer edge of its attaching member at the time tne hinge is open.

7. A hinge, comprising attaching members, a pair of spaced pivots in each attaching member, a pair of links pivoted on each pair of pivots, and a connecting link for each pair of links, the connecting link of one pair of links being pivotally connected with a link of the other pair of links, each connecting link having stop notches adapted to engage the pivots of the outermost links, at the time the hinge is open.

8. A hinge, comprising attaching members, main links pivotally connected with each attaching member, connecting links connecting the main links with each other, the said connecting links crossing each other, and each separately connected to the main links, and guide links pivoted in the attaching members and connected with the said connecting links.

9. A hinge, comprising attaching members, main links pivotally connected with each attaching member, crossed connecting links each separately connecting the main links of one attaching member with the main links of the other attaching member, and means for guiding the free ends of the said connecting links in the attaching members.

10. A hinge comprising attaching members, arranged one for attachment to a door and the other to a door casing, and a connection connecting the said attaching members with each other, the said connection consisting of two links swingingly connected with each attaching member, the free end of one link of each attaching member pivotally connected to the remaining link of the other attaching member intermediate the ends thereof, and a link connecting the free end of the said remaining link of each attaching member with the other attaching member.

11. A hinge comprising attaching members, arranged one for attachment to a door and the other to a door casing, a connection connecting the said attaching members with each other, the said connection consisting of two separated main links, two connecting links, independent one of the other, crossed one over the other and each separately connecting the main links with each other, and two guide links, one of which is connected to each connecting link.

12. A hinge comprising attaching members, links crossed one over the other and pivotally connected with the said attaching members, the link pivoted in each attaching member connected to guiding means connected to the other attaching member, and links independent one of the other, and each connecting the crossed links with each other.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EMIL ZUCKERMAN.

Witnesses:
THEO. G. HOSTER,
PHILIP D. ROLLHAUS.