No. 687,320. Patented Nov. 26, 1901.

H. R. KUERSTEN.

HINGE ADJUSTMENT.

(Application filed May 20, 1901.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.

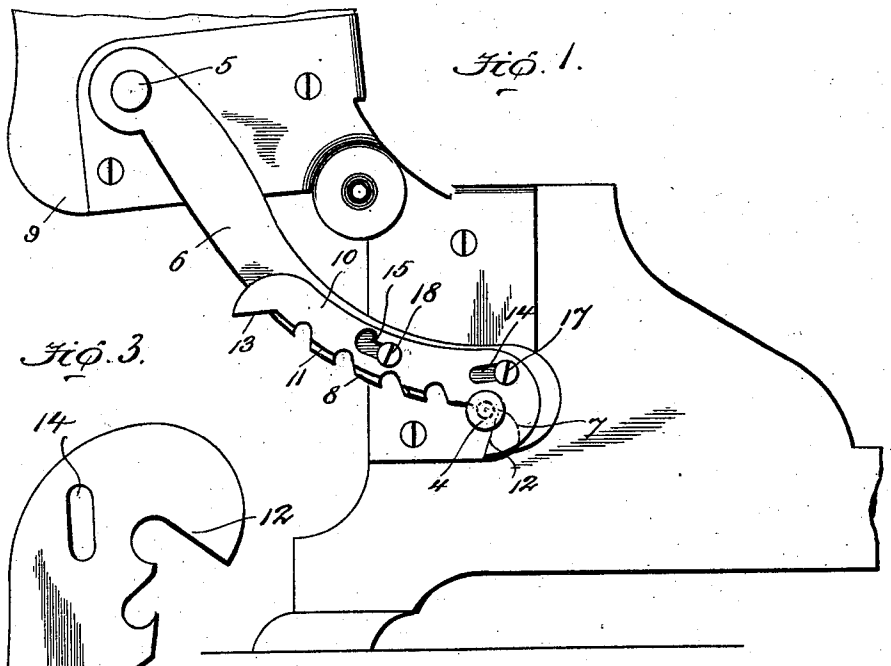


Fig. 3.

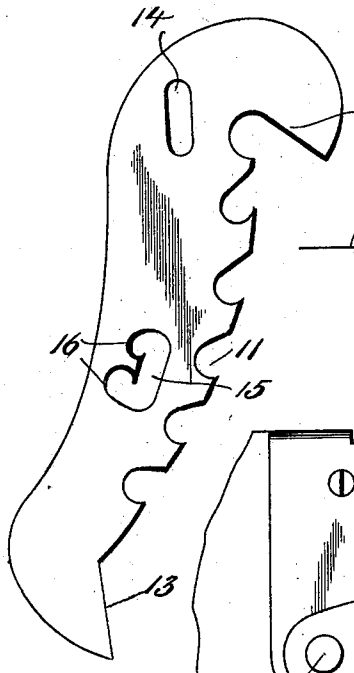
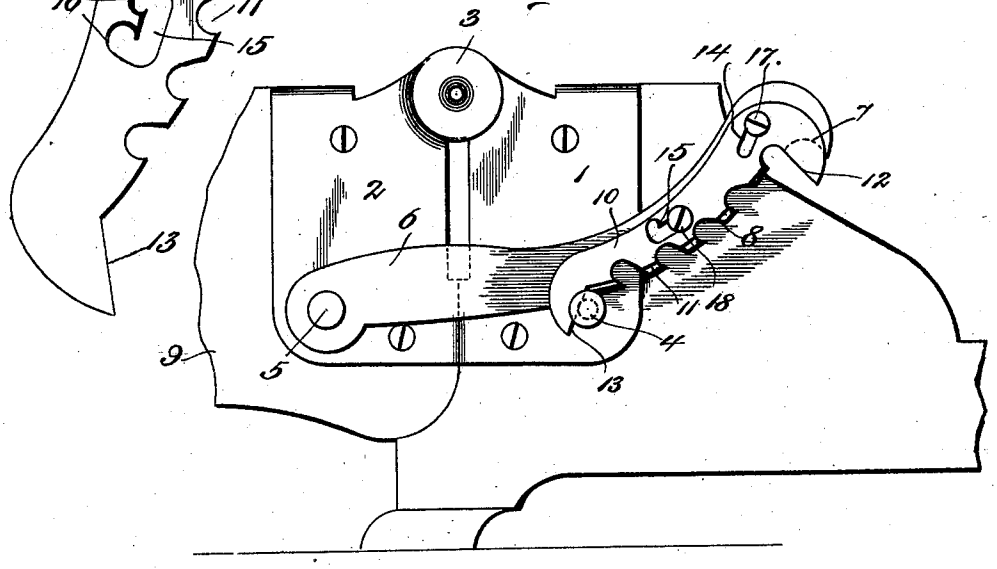


Fig. 2.



Witnesses:

Grace S. Beall

by

Inventor:
Hugo R. Kuersten,

M. J. Durall
Attorney

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

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(No Model.) 3 Sheets—Sheet 2.

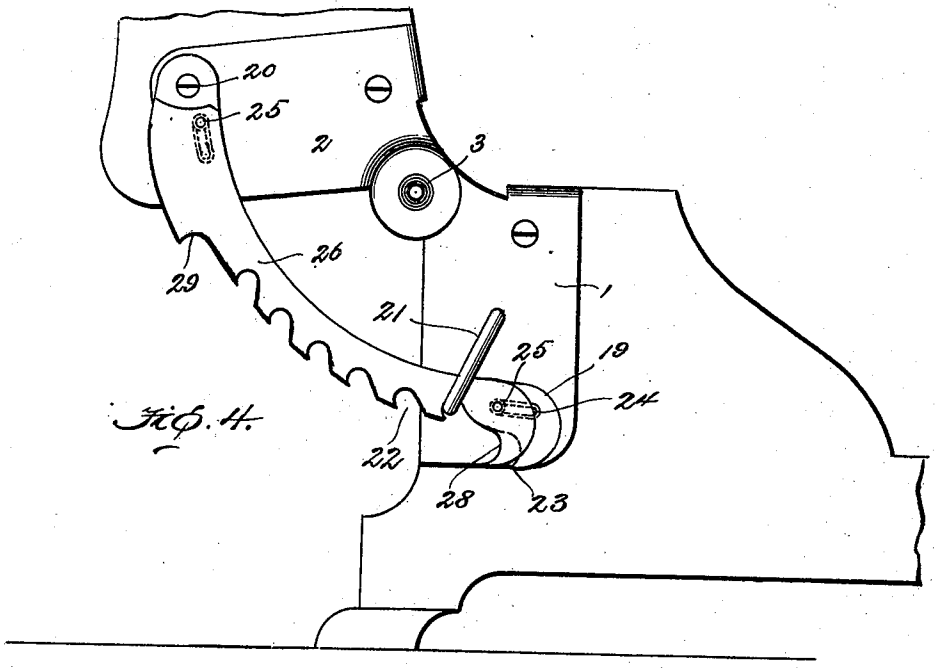


Fig. 4.

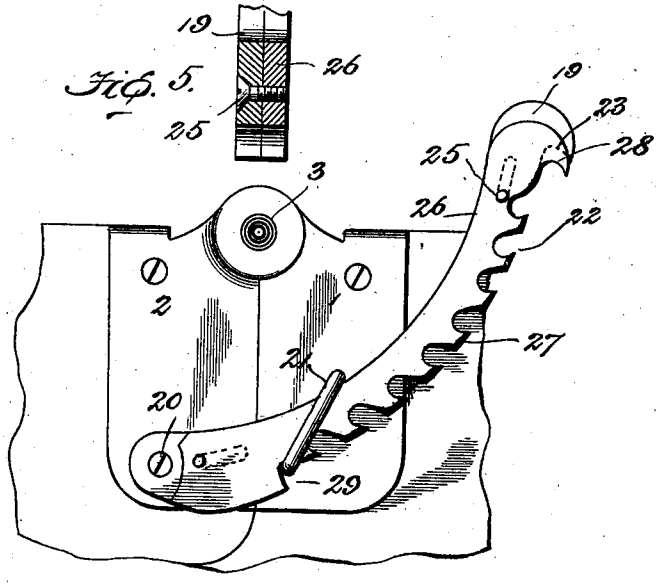


Fig. 5.

Fig. 6.

Witnesses:

Grace S. Beall

by

Inventor:
Hugo R. Kuersten,
W. S. Duvall
Attorney

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

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(No Model.) 3 Sheets—Sheet 3.

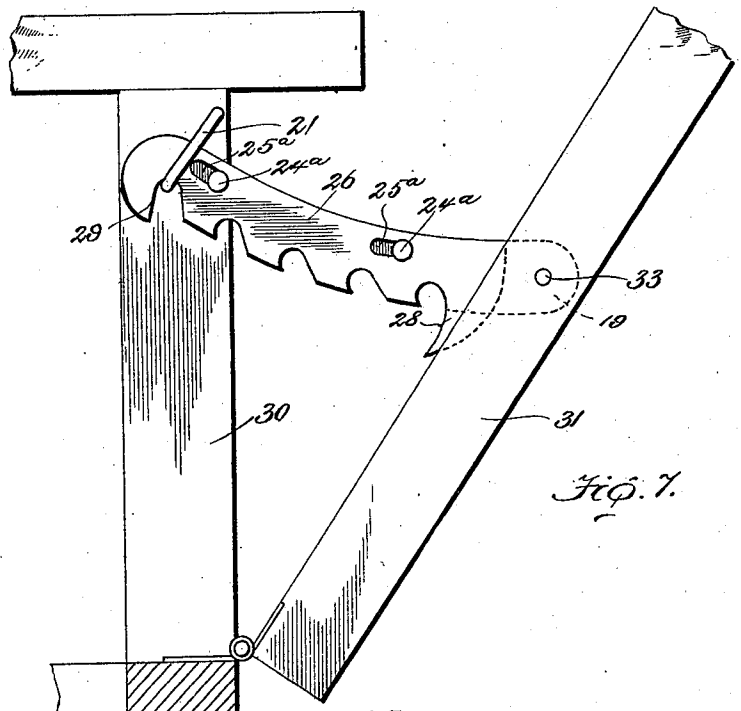


Fig. 7.

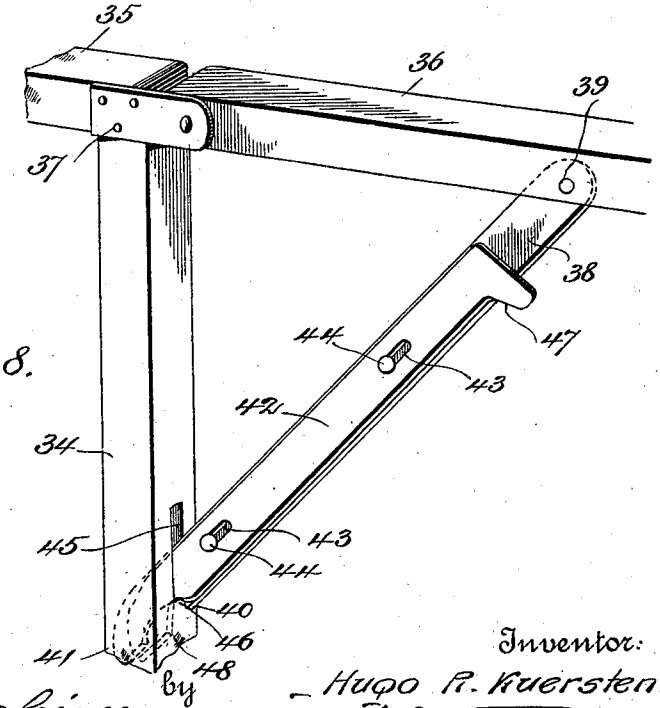


Fig. 8.

Witnesses:
Wm. C. Dashiell
Grace S. Beall

Inventor:
Hugo R. Kuersten,
by W. J. Duvall
Attorney

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

UNITED STATES PATENT OFFICE.

HUGO R. KUERSTEN, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE SENG COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

HINGE ADJUSTMENT.

SPECIFICATION forming part of Letters Patent No. 687,320, dated November 26, 1901.

Application filed May 20, 1901. Serial No. 61,098. (No model.)

To all whom it may concern:

Be it known that I, HUGO R. KUERSTEN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Hinge Adjustments, of which the following is a specification.

This invention relates to improvements in hinge adjustments for use in furniture—as, for instance, in the backs of the so-called "Morris" chairs, iron couches, head-rests for sofas, divans, and the like.

The main objects in view are to produce a device of this character that is of cheap and simple construction, may be applied to any of its varied uses, and which shall be automatical in any of its locking or unlocking functions in so far as extraneous devices employed for this purpose are concerned.

Various other objects and advantages of the invention will hereinafter appear, and the novel features thereof will be particularly pointed out in the appended claims.

Referring to the drawings, Figure 1 illustrates my improved hinge adjustment applied to what may be the head-rest of a couch or sofa or the arm of a divan, the head-rest or arm being illustrated as elevated to a point beyond its highest position for actual use and about to throw the latch and rack-bar out of register prior to a lowering of said head-rest or arm. Fig. 2 is a similar view, the head-rest or arm being shown as lowered and the adjustment in position to engage with the stud upon a subsequent raising of the head-rest or arm. Fig. 3 is a detail in elevation of the toothed latch. Figs. 4 and 6 are views similar to Figs. 1 and 2, illustrating a modified arrangement of the hinge adjustment, the former figure illustrating the head-rest or arm raised to its highest operative position and the latter figure illustrating the head-rest or arm in its lowest position. Fig. 5 is a cross-section of the toothed latch and rack-bar illustrated in Figs. 4 and 6. Figs. 7 and 8 illustrate the application of the hinge adjustment to a Morris chair and iron couch-frame, respectively.

Similar numerals of reference indicate similar parts in all the figures of the drawings.

In instances where the hinge adjustments are to be applied to such articles of furniture as couch heads or arms, &c., and hinge connections are desirable I preferably employ such members or leaves as 1 and 2, each having a hinge-eye and connecting-pintle 3. These leaves may be perforated for screws, flanged, &c., all as usual, for securing them in position.

Referring more particularly to Figs. 1 to 3, it will be seen that the lower or fixed leaf is provided with a headed stud 4, located at and extending outwardly from the outer lower corner thereof, while at a corresponding point on the other leaf, by a stud 5, there is pivoted one end of a loose gravity rack-bar 6, the same being preferably curved, terminating at its free end in a stop-shoulder 7 and in rear of the same having its lower edge provided with a series of inclined teeth 8, disposed toward the free end of said bar. It will be evident that inasmuch as the rack-bar rests upon the stud 4 the teeth of the former will successively engage the same as the head-rest 9 is raised, so that any adjustment desired for the head-rest may be readily obtained. Applied to the outer face of the gravity rack-bar 6 and somewhat conforming thereto in general shape is a latch 10, the same being shorter in this instance than the said rack-bar and having its lower edge to agree therewith, and provided with corresponding registering teeth 11, beyond which, at its front and rear ends, it is provided with depending stop-shoulders 12 and 13, respectively, oppositely inclined, the shoulder 12 substantially registering with the stop 7 of the rack-bar when the teeth of the two are out of register and being slightly in rear thereof when the teeth of the two are in register. The latch is provided near its forward or free end with an inclined slot 14 and intermediately with a similar slot 15, the opposite ends of the latter slot terminating in offsets or eyes 16. These slots 14 and 15 receive headed guide-studs 17 and 18, respectively, whereby the latch is loosely and slidably mounted upon the rack-bar, and therefore while moving with the latter yet have an independent movement thereon. When the studs are at the front ends of the slots 14 and 15, the latch will be retracted, and therefore the teeth of the latch, as

shown in Figs. 1 and 2, will register with those of the rack-bar, and the teeth of the two will be in relative position to successively engage the stud 4, and, on the other hand, when the studs 17 and 18 are at the rear ends of the slots 14 and 15, as when the head-rest is raised, the teeth of the latch and rack-bar will be out of register or at a variance, and hence the lower edge of the latch and rack-bar will combine to form an unbroken edge or surface which will readily ride over the stud 4 without engaging the same. This shifting of the latch is entirely automatic and is caused by, in the present instance, the raising and lowering of the head-rest 9. For instance, taking the parts in the position shown in Fig. 1, wherein the head-rest has been raised slightly beyond its highest position for actual use, to lower the head-rest the latter is still further elevated, so that while the stop-shoulder 12 of the latch is engaged and held by the stud 4 the rack-bar moves a short distance with the head-rest, such distance corresponding with the length of the slots 14 and 15, which will thus bring the teeth of the rack-bar at a variance or out of register with those of the latch, produce the unbroken surface mentioned, and permit of a subsequent complete lowering of the head-rest in a manner obvious. As the head-rest approaches its lowest point the stud 4 abuts against the stop-shoulder 13 of the latch and holds the same while the head-rest completes its lowering movement. This engagement of the latch and continued movement of the rack-bar serves to return the rack-bar to former position—*i. e.*, one in which the teeth of the latch and rack-bar register, and hence by reëlevating the head-rest the teeth of the rack-bar and latch may be successively engaged with the stud 4, and thus any desired elevation of the head-rest may be obtained. It will be observed that in either of its positions the latch becomes locked by the guide-stud 18 engaging with one or the other of the offsets 16, so that no shifting of the latch can take place except at the end of the movement of the rack-bar. When such points are reached, the formation of the shoulders of the latch causes the latter to be first slightly elevated, so as to disengage said guide-stud from the offsets before any shifting of the latch can occur.

Referring more particularly to Figs. 4, 5, and 6, 19 designates the rack-bar, the same being preferably segmental or substantially so, pivoted at its rear end, as at 20, to the hinge-leaf 2, as before, and adapted to engage with either a stud, as before, or it may be a staple 21, extending from the face of the companion leaf 1. The under side of the rack-bar is provided with inclined teeth 22 and beyond the same with abrupt stop-shoulders 23. The rack-bar is, furthermore, provided with countersunken segmental slots 24, resting in which are the headed guide studs or screws 25, which project from the inner face of the latch 26. This latch is somewhat similar in shape to the rack-bar 19, though not so long, and like it it is provided along its under edge with inclined teeth 27, that correspond to those of said rack-bar. This latch is further provided at its ends, and therefore beyond its teeth, with front and rear stop-shoulders 28 and 29, respectively. I may employ in this arrangement the engaging stud 4, as in the previously-described construction, or, as shown, the staple 21, as heretofore mentioned. It will be observed that when the rack-bar is moved to the front and the latch held stationary the teeth of the rack-bar and latch register, as shown in Fig. 6, so that practically, a rack-bar resulting, any one of the teeth thereof can be engaged with the staple 21, and thus the head-rest given any desired adjustment. By means of the screws 25 the latch and rack-bar may be held in frictional contact, so that the two will retain their relative positions during the movements of the adjustment and until such relation is positively changed by one or the other of the shoulders 28 or 29 coming in contact with the stud or staple 21. The operation of this adjustment is very similar to that of the adjustment previously described, with the exception that in the first the latch is loose and held in its two positions by the guide-stud engaging with the offsets of the slot 15, while in the second the latch is held in either of its positions by frictional contact regulated by the screws 25.

In Figs. 7 and 8 I have illustrated two applications of my improved adjustment, the same being appropriately modified to suit each instance. In the first figure referred to 30 designates the stump of a Morris chair, and 31 the back of the same. Upon the inner side of the stump is located the staple 21, in which is free to move the rack-bar 19 and the latch 26, the two being held in frictional relation by the screws and slots 24^a and 25^a, respectively. The rack-bar is pivoted at its rear end, as at 33, to the back, and taking the parts in the position in which they are shown in Fig. 7 it will be apparent that by swinging the back forward the teeth of the rack and latch may be successively engaged. After reaching its most nearly vertical position for use, wherein the last tooth will be engaged, a still further forward movement brings the shoulder 29 of the latch against the staple, and thus holds the latch while the rack-bar proceeds, whereby the teeth of the one are thrown out of register or alinement with the other, and the spaces between the two sets of teeth combine to form an unbroken edge that readily rides over the staple, so that the back may be swung entirely back. When its rearmost point is reached, a reversal of movement takes place by the opposite shoulder abutting against the staple, and the teeth of the latch and rack-bar again register. In Fig. 8 the invention is shown applied to what are known as "iron couches,"

wherein 34 designates the upright or leg of the couch, 35 the cross-rail, and 36 the end bar of the side extension, the latter being hinged, as at 37, to the main frame of the couch. In this instance the rack-bar 38 is pivoted to the end bar 36, as at 39, the end bar taking the place of the hinge-leaf 2, while the main frame likewise serves the function of the hinge-leaf 1. There being but two adjustments here desired, of course the rack-bar has but one notch 40 and that near its free or front end immediately in advance of a shoulder 41. The latch 42 is slotted, as at 43, and guide-studs 44 extend from the rack-bar therethrough. The latch may be either loose or frictionally held, as described. Also a stud or staple may be employed; but I prefer simply an opening or slot 45, formed in the leg of the couch. The latch 42 is also provided with a single tooth 46 and with stop-shoulders 47 and 48, which being brought alternately against the edge of the opening 45 will alternately cause the teeth of the rack-bar and latch to alternately register and otherwise, as will be obvious. Taking the parts in the position shown in Fig. 8, to lower the side extension the same is simply raised, and the latch-shoulder being in advance of that of the rack-bar the former is held while the rack-bar moves, so as to cover the notch of the latch and raise the notch of the same out of engagement with the lower edge of the slot 45, thus permitting the side extension to be lowered. As the said side extension is lowered the stop-shoulder 47 of the latch is brought against the lower edge of the slot 45, so that the latch is retracted again, exposing its tooth, so that a subsequent raising of the said extension will cause the rack-bar and latch to again engage the slot 45.

From the foregoing description, in connection with the accompanying drawings, it will be apparent that I have produced a very simple and effective form of adjustment that is capable of being automatically operated and of being applied to various uses in furniture construction, some few of which I have illustrated.

It will of course be understood that the application of the invention is not limited to those herein described and illustrated, and also that it is capable of such modification as to details as will most readily adapt it to any particular use without a departure from the principle of the invention or a sacrifice of any of its numerous advantages.

Having described my invention, what I claim is—

1. The combination of two hinged parts, and an adjustment, comprising a rack-bar loosely pivoted to one of said hinged parts, and a latch having teeth coincident therewith, a rack-tooth-engaging device, and means for shifting the relative positions of said rack-bar and latch, whereby the teeth of the two are caused to be thrown into and out of alinement.

2. The combination of two hinged parts, and an adjustment comprising a rack-bar loosely pivoted to one of said hinged parts, and a latch having teeth coincident with those of the rack-bar, and a rack-tooth-engaging device in the path of the rack-bar, said hinged parts being adapted to shift the relative positions of the latch and rack-bar when said parts reach a predetermined point of their travel, whereby the teeth of the rack-bar and latch are caused to be thrown into and out of alinement.

3. The combination of two hinged parts, and an adjustment comprising a rack-bar loosely pivoted to one of said hinged parts, and a latch mounted on said rack-bar and having teeth coincident therewith, a rack-tooth-engaging device carried by the other of said hinged parts, said rack-bar and latch being adapted to be relatively shifted by the said hinged parts at the ends of their movements, whereby the teeth of the rack-bar and latch are caused to be thrown into and out of alinement.

4. The combination of two hinged parts, and an adjustment comprising a rack-bar loosely pivoted to one of said hinged parts, and a latch mounted on said rack-bar and having teeth coincident therewith, a rack-tooth-engaging device carried by the other of said hinged parts, and means for shifting the relative positions of said rack-bar and latch when said parts reach a predetermined point of their travel, whereby the teeth of the rack-bar and latch are caused to be thrown into and out of alinement, and means for locking the rack-bar and latch together between the times of shifting.

5. The combination of two hinged parts, and an adjustment therefor, the same comprising a rack-bar loosely pivoted to one of said hinged parts, and a latch mounted loosely on the rack-bar and having teeth corresponding therewith and depending shoulders, and an engaging device carried by the other of the hinged parts and arranged in the path of the teeth of the rack-bar and latch and between the stop-shoulders of the latter and adapted to alternately contact with said stop-shoulders, whereby the latch is shifted in alternate direction and its teeth thrown into and out of alinement with those of the rack-bar.

6. The combination of two hinged parts, and an adjustment therefor, comprising a rack-bar loosely pivoted to one of said hinged parts and at its opposite end terminating in a shoulder, and a latch mounted for sliding loosely on the rack-bar and provided with intermediate teeth corresponding with those of the rack-bar and terminating in opposite shoulders, one of which is located immediately in advance of the shoulder of the rack-bar, an engaging device carried by the other of the hinged parts and adapted to engage the teeth of the rack-bar and latch and alternately strike the opposite stop-shoulders of

the latter, whereby the teeth of the latch and rack-bar are caused to be thrown into and out of alinement.

7. The combination of two hinged parts, and an adjustment therefor, comprising a rack-bar loosely pivoted to one of said hinged parts and at its opposite end terminating in a shoulder, and a latch mounted for sliding loosely on the rack-bar and provided with intermediate teeth corresponding with those of the rack-bar and terminating in opposite shoulders, one of which is located immediately in advance of the shoulder of the rack-bar, an engaging device carried by the other of the hinged parts and adapted to engage the teeth of the rack-bar and latch and alternately strike the opposite stop-shoulders of the latter, whereby the teeth of the latch and rack-bar are caused to be thrown into and out of alinement, and means for locking the latch and rack-bar together during their travel and for unlocking these parts prior to the time their relative positions are changed.

8. The combination of two hinged parts, and an adjustment comprising two toothed members having their lower edges correspondingly toothed and mounted to slide one upon the other, one of said members being pivoted to one of the hinged parts, an engaging device carried by the companion hinged member, and means for shifting said members one upon the other the distance of one tooth, whereby the teeth of the two are out of alinement and the spaces between the same combine to form an unbroken surface adapted to ride over said engaging device.

9. The combination with two hinged parts, of the rack-bar 6, pivoted as at 5, and provided with the end shoulder 7 and intermediate teeth 8, the loose latch 10, having the slots 14 and 15, the latter provided with the offsets 16, and having the end shoulders 12 and 13 and intermediate teeth 11, the guide-studs 17 and 18 extending from the rack-bar through the said slots 14 and 15 respectively, and the engaging stud 4 extending from the face of the companion hinged part.

10. An adjustment, comprising a pair of hinged parts, a toothed rack-bar pivoted to one of the same, a rack-bar-engaging device located in the path of the toothed rack-bar, and a latch carried by the toothed rack-bar and adapted to be moved so as to form a support for the rack and for movable contact with the rack-bar-engaging device.

11. An adjustment, comprising a pair of hinged parts, a toothed rack-bar pivoted to one of the same, a rack-bar-engaging device located in the path of the toothed rack-bar, a latch carried by the toothed rack-bar and adapted to be moved so as to form a support for the rack and for movable contact with the rack-bar-engaging device, and means for shifting the position of the said latch through the movement of one of the hinged parts, whereby said latch is caused to assume its operative and inoperative positions.

12. An adjustment, comprising a pair of hinged parts, a bar carried by one of said parts and provided with a tooth, a tooth-engaging device located on the other of said hinged parts, and a device carried by said bar, said device being adapted to be operated through a manipulation of said hinged parts whereby it forms a support for the bar during a closing of said hinged parts and prevents the tooth of the bar from engaging with the tooth-engaging device.

In testimony whereof I affix my signature in presence of two witnesses.

HUGO R. KUERSTEN.

Witnesses:
F. J. SENG,
G. J. BIEHL.