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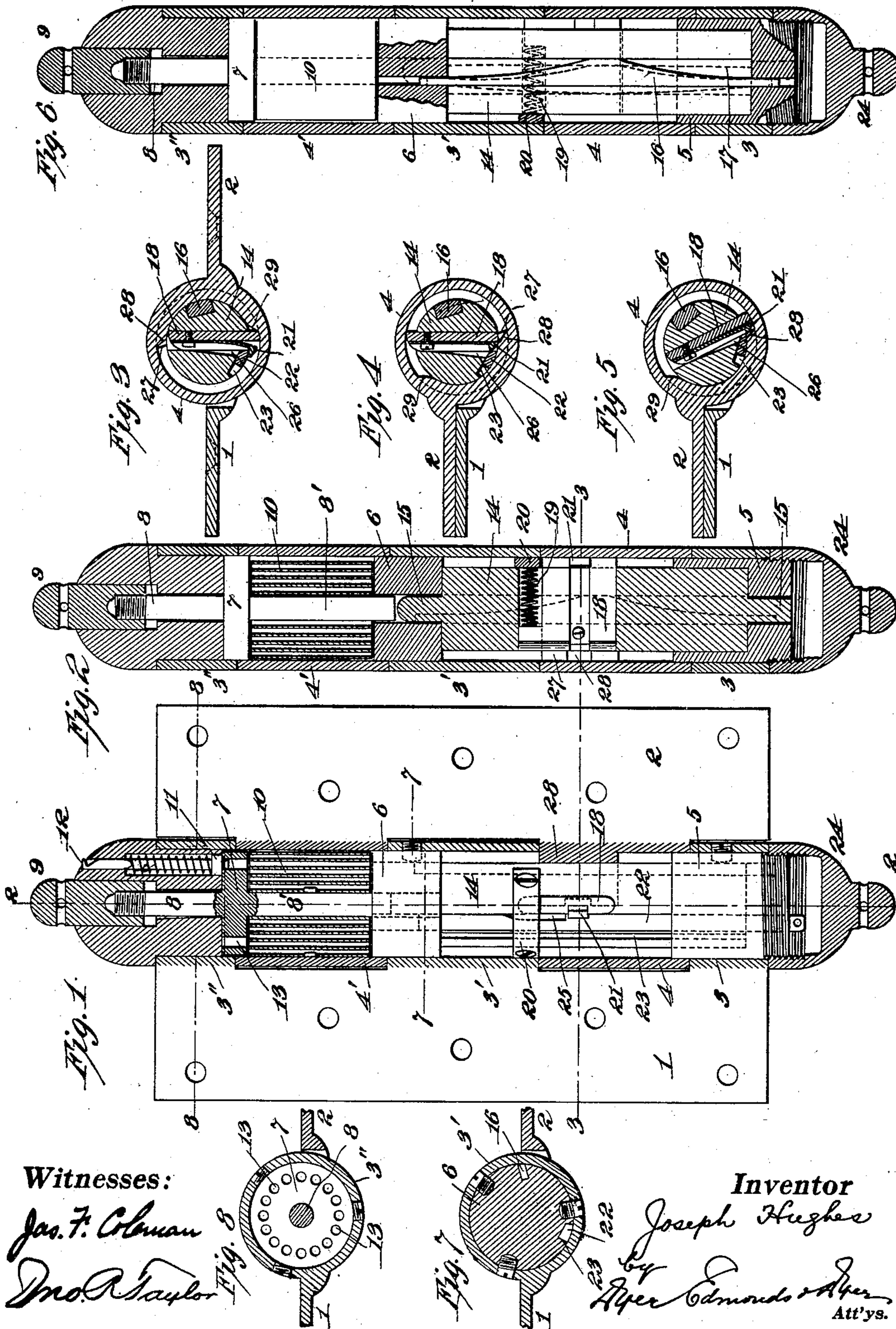
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COMBINED HINGE AND DOOR CHECK.

(Application filed Jan. 24, 1901.)

(No Model.)



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COMBINED HINGE AND DOOR-CHECK.

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To all whom it may concern:

Be it known that I, JOSEPH HUGHES, a citizen of the United States, residing in the borough of Manhattan, city of New York, State of New York, have invented certain new and useful Improvements in a Combined Door Hinge and Check, of which the following is a description.

My invention relates to an improved combined door hinge and check which preferably provides within the hinge an adjustable closing-spring for closing the door, but which may be thrown out of operation when desired.

My improved hinge and check relates to the type of these devices wherein when the door is almost closed two mechanical devices are caused to yieldingly engage together to produce a checking effect. Preferably the tension of the closing-spring is adjusted so that this checking action operates only to retard or reduce the speed of the closing movement without arresting the same, so that the door will be closed and latched with the two mechanical devices engaging together under tension, whereby when the door is again unlatched it will be automatically opened for a short distance. By decreasing the tension of the closing-spring to reduce the velocity of the closing movement of the door the checking effect can be made to actually arrest the closing movement of the door before the latter is locked, whereby the door will rebound, thereby permitting the elements of the check to automatically disengage and allowing the door to close.

The object of my invention is to provide a combined door hinge and check which is of simple construction, which can be assembled readily, wherein an absolutely positive checking operation takes place irrespective of the speed with which the door may close, one wherein the check may be thrown out of operation when desired, and one wherein a closing-spring is preferably utilized within the hinge to effect the closing of the door.

Broadly stated, my invention comprises a hammer and an abutment carried by the stationary and movable elements of the door so as to be relatively movable and which are adapted to engage to secure the checking effect, the abutment being normally locked in the path of the hammer by a latch which en-

gages over a locking-rod and the latch being movable relatively to said locking-rod during the checking operation, a checking-spring being employed to permit the hammer and abutment when engaged together to move as a unit relatively to the stationary or movable element of the hinge, whereby when the hammer engages the abutment the latter will be moved against the tension of the checking-spring, while the latch will be moved relatively to the locking-rod so as to be disengaged therefrom. If the closing-spring is adjusted to secure a powerful closing effect, the friction between the hammer and abutment will keep the latter in its normal position, permitting the door to be closed and latched while the checking-spring is maintained under tension, so that when the door is unlatched the checking-spring will operate to effect a slight opening movement thereof. On the other hand, if the closing-spring is less powerfully adjusted the checking-spring will bring the door to rest before it can be latched, will then effect a rebound to reduce the friction between the hammer and abutment, and thereby permit the latter to be moved out of the path of the hammer and allow the door to close.

Preferably my invention also consists in mounting the locking-rod so that it may be moved longitudinally, whereby an opening therein may be brought into coincidence with the latch to prevent the latter from locking the abutment in its normal position and to thereby throw the check out of operation, as I shall more fully hereinafter describe.

My invention also preferably employs a closing-spring mounted within the hinge above the checking devices for effecting a closing operation, which spring may be adjusted in tension or thrown out of operation exteriorly of the hinge.

In order that the invention may be better understood, attention is directed to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a vertical sectional view through the hinge, showing the two leaves one hundred and eighty degrees apart and viewing the abutment in elevation; Fig. 2, a section on the line 2 2 of Fig. 1; Fig. 3, a section on the line 3 3 of Fig. 1, illustrating the abut-

ment as being locked in its normal position; Fig. 4, a similar section showing the hinge completely closed, the abutment being illustrated as moved out of the path of the hammer; Fig. 5, a similar section illustrating the parts in the full checking position, the latch for the abutment being moved out of engagement with the locking-bar, but the friction between the hammer and abutment preventing the latter from moving inward; Fig. 6, a vertical section similar to Fig. 1, but taken at right angles thereto; Fig. 7, a section on the line 7 7 of Fig. 1, and Fig. 8 a section on the line 8 8 of Fig. 1.

In all of the above views corresponding parts are represented by the same numerals of reference.

1 represents the stationary leaf, which is secured to the sash, and 2 the movable leaf, which is secured to the door. I shall employ this designation in the further description; but it will be of course obvious that the leaf 2 may be secured to the sash, by which that leaf will be stationary, and the leaf 1 secured to the door, so that in the further description in referring to the parts as being, respectively, "stationary" or "movable" it will be understood that they may perform reverse functions, and they are to be so regarded.

The stationary leaf is shown as being provided with knuckles 3, 3', and 3'' and the movable leaf with knuckles 4 and 4', which interlock in the usual way. Instead of a single pintle extending through the knuckles, as in ordinary hinges, I make use of a cylindrical block 5, secured to the knuckle 3 and arranged between the knuckles 3 and 4, a block 6, secured to the knuckle 3' and arranged between the knuckles 3' and 4', and an adjustable disk 7, rotatably carried by the knuckle 3'' and arranged between the knuckles 4' and 3''. The disk 7 is mounted on a stud 8, on which a nut 9 is screwed, said nut being provided above the hinge with openings therein, by means of which the nut and disk may be turned. The stud 8 is continued downwardly in the form of an extension 8', mounted within the knuckle 4', and between which and said knuckle is mounted a closing-spring 10, having sufficient tension to close the door. By rotating the nut 9 the tension of the spring 10 may be increased or diminished, as may be desired. In order to lock the disk 7 against movement with the movable leaf, I employ a spring-pressed locking-pawl 11, having a hook 12 at its upper end, extending above the hinge and by means of which said pawl may be elevated when it is desired to permit the closing-spring to entirely unwind, so as to be disabled. The locking-pawl 11 coöperates with a plurality of holes 13, formed in the disk 7 and with which said pawl successively engages as the disk is rotated in the winding up of the spring. Mounted in the space between the blocks 5 and 6 is a cylindrical plug 14, having bearings 15, whereby the plug will be per-

mitted to turn with respect to said blocks, which, it will be remembered, are secured to the knuckles 3 and 3', respectively, of the stationary leaf. During the checking operation the plug 14 moves slightly on the bearings 15, which movement is resisted by a checking-spring 16, mounted in a recess 17, extending longitudinally of the plug and being anchored at its ends in the blocks 5 and 6, as shown. The checking-spring 16 is preferably a bow-spring, its enlarged central part fitting the recess 17, whereby when the plug 14 moves relatively to the blocks 5 and 6 the checking-spring will be put under tension, as shown in dotted lines in Fig. 6. Mounted in a slide-way extending diametrically through the plug 14 is an abutment 18, which is provided near one side with an opening in which is seated a spring 19, the outer end of which bears against a strap 20, removably carried by the plug in line therewith, so that said spring tends to normally force the abutment inward, as will be explained. The abutment 18 is normally locked in position to be engaged by the hammer by a latch 21, having an elastic shank and which engages over a locking-bar 22, mounted in a longitudinal recess 23 in the plug 14. The locking-bar at its ends passes through openings in the blocks 5 and 6, respectively, so as to be prevented from partaking of movement relatively to said blocks, but the groove 23, in which said locking-bar is seated, is sufficiently large to permit the plug 14 to rotate relatively to said blocks, as before stated, during the checking operation. The lower end of the locking-bar 22 extends below the block 5 and may be provided with an opening therein, so that said locking-bar may be drawn downward. For this purpose the lower end of the hinge may be provided with a removable cap 24, which can be removed when it is desired to thus move the locking-bar longitudinally. The locking-bar is provided with a recess 25, which when it is thus moved is brought into coincidence with the latch 21 when it is desired to throw the check out of operation. The opening in the plug 14, in which the abutment is diametrically movable, is provided with a recess 26 therein for the reception of the latch 21 when the abutment is released and is moved by the spring 19. A hammer 27 is formed on the knuckle 4 and preferably constitutes simply a cast lug on said knuckle and is provided with a recess 28 in its face, so that the face of the hammer will engage the abutment 18 at substantially or before the instant the recess 28 engages the latch 21. The knuckle 4 is also provided with a resetting-cam 29, adapted to engage the end of the abutment opposite to the latch 21 for the purpose of resetting the abutment during the opening of the door, as will be explained.

The operation will be as follows: Sufficient tension is imparted to the closing-spring 10 to close the door by turning the nut 9 so as to wind up the spring, the latter being held

in this condition by the engagement of the pawl 11 with the disk 7. In the open condition of the door the parts of the hinge occupy the positions shown in Fig. 3, the latch 21 being engaged over the locking-rod 22 and holding the abutment 18 in the path of the hammer 27 against the tension of the spring 19. Before the door closes the hammer 27 engages the abutment, and at that time or an instant afterward the recessed part of the hammer engages the latch 21. This engagement tends to slightly rotate the plug 14 with respect to the stationary blocks 5 and 6 and against the tension of the checking-spring 16, which will be bowed or flexed at its ends. The slight rotary movement of the plug will also carry the latch away from the locking-bar, which, it will be remembered, remains immovable with the blocks 5 and 6, so that in the full checking position the parts occupy the positions shown in Fig. 5. The friction between the hammer and the abutment is sufficient to prevent the spring 19 from forcing the abutment inward, so that the resisting effect of the checking-spring 16 is still experienced. If the tension of the closing-spring 10 is sufficient to effect a rapid closing operation, the door may be closed and latched while the hammer is still in engagement with the abutment and while the checking-spring is still under tension, so that the latter will open the door when it is unlatched, and this in many instances is the preferred operation. On the other hand, if the tension of the closing-spring 10 is weaker the resistance of the checking-spring will be sufficient to arrest the closing movement of the door before it can be latched, and the checking-spring will therefore cause the door to rebound, reducing the friction between the hammer and the abutment before the latch 21 can again engage over the locking-bar, and permitting the spring 19 to move the abutment to the position shown in Fig. 4 and out of the path of the hammer. The plug 14 will therefore occupy its normal position with respect to blocks 5 and 6, so that no tension will be imposed upon the checking-spring when the hinge-leaves 1 and 2 are brought to their completely-closed position. In opening the door from the position shown in Fig. 4 to that shown in Fig. 3 it will be seen that the resetting-cam 29 will engage the inner end of the abutment, forcing the same to its original position and again causing the latch 21 to spring into position over the locking-bar to again perform a checking operation upon the closing of the door. When it is desired to throw the check out of operation, the cap 24 is removed and the locking-bar drawn downward to bring the recess 25 into coincidence with the latch 21, so that the latter will not engage the locking-bar when the resetting-cam moves the abutment to its normal position. When in this condition, the closing movement of the leaf 2 permits the abutment to move to its withdrawn position immedi-

ately after the resetting-cam 29 has passed from beneath the abutment and before the hammer 27 can engage the abutment, so that no checking operation will take place.

Having now described my invention, what I claim as new therein, and desire to secure by Letters Patent, is as follows:

1. As a new article of manufacture, a hinge provided with a mechanical check therein, in combination with a rotatable stud mounted in one of the hinge members, an extension on said stud, a closing-spring coiled around said extension and connected to the other hinge member, a disk between the stud and said extension, said disk having a series of concentric holes therein, and a spring-pressed vertically-movable pawl carried by the first hinge member extending exteriorly thereof and cooperating with the holes in the disk, substantially as and for the purposes set forth.

2. In a combined hinge and door-check, the combination of the stationary and movable leaves, a plug mounted within the hinge so as to be capable of rotary movement with respect to the stationary leaf, a checking-spring for resisting the rotary movement of said plug, an abutment diametrically movable in said plug, a hammer movable with the movable leaf and adapted to engage said abutment, and means for normally locking the abutment in the path of the hammer but permitting the release of the abutment when the plug is moved relatively to the stationary leaf in the checking operation, substantially as and for the purposes set forth.

3. In a combined door hinge and check, the combination of the stationary and movable leaves, a plug rotatably mounted with respect to the stationary leaf, a checking-spring for resisting such rotary movement, an abutment diametrically movable with respect to the plug, a hammer movable with the movable leaf for engaging said abutment, a latch carried by the abutment for locking the same in the normal path of the hammer, and a locking-rod with which said latch cooperates and with respect to which the abutment is rotatably movable, substantially as set forth.

4. In a combined door hinge and check, the combination of the stationary and movable leaves, a plug rotatably mounted with respect to the stationary leaf, a checking-spring for resisting such rotary movement, an abutment diametrically movable with respect to the plug, a hammer movable with the movable leaf for engaging said abutment, a latch carried by the abutment for locking the same in the normal path of the hammer, a locking-rod with which said latch cooperates and with respect to which the abutment is rotatably movable, said locking-rod being provided with a recess therein, and means for moving said rod longitudinally to bring said recess into coincidence with the latch to disable the check, substantially as set forth.

5. In a combined door hinge and check, the combination of the stationary and movable

leaves, a plug rotatably mounted with respect to the stationary leaf, a checking-spring for resisting such rotary movement, an abutment diametrically movable with respect to the plug, a hammer movable with the movable leaf for engaging said abutment, a latch carried by the abutment for locking the same in the normal path of the hammer, a locking-rod with which said latch coöperates and with respect to which the abutment is rotatably movable, and a resetting-cam movable with the movable leaf for resetting the abutment on the opening movement of the door, substantially as set forth.

6. In a combined door hinge and check, the combination of the movable and stationary leaves, a plug mounted within the hinge and capable of rotary movement with respect to the stationary leaf, a bow-spring mounted within a recess in the plug and connected at its ends to the stationary leaf for checking the rotary movement of the plug, an abutment diametrically movable in the plug, and a hammer movable with the movable leaf for engaging said abutment so as to move the plug with the movable leaf against the tension of the checking-spring, substantially as set forth.

7. In a combined door hinge and check, the combination of the movable and stationary leaves, a plug mounted within the hinge and capable of rotary movement with respect to the stationary leaf, a bow-spring mounted within a recess in the plug and connected at its ends to the stationary leaf for checking the rotary movement of the plug, an abutment diametrically movable in the plug, a hammer movable with the movable leaf for engaging said abutment so as to move the plug with the movable leaf against the tension of the checking-spring, and means for withdrawing the abutment out of the path of the hammer on the rebound, substantially as set forth.

8. In a combined door hinge and check, the combination of the movable and stationary leaves, a plug mounted within the hinge and capable of rotary movement with respect to the stationary leaf, a bow-spring mounted within a recess in the plug and connected at

its ends to the stationary leaf for checking the rotary movement of the plug, an abutment diametrically movable in the plug, a hammer movable with the movable leaf for engaging said abutment so as to move the plug with the movable leaf against the tension of the checking-spring, means for withdrawing the abutment out of the path of the hammer on the rebound, and means for resetting the abutment on the opening movement of the movable leaf, substantially as set forth.

9. In a combined door hinge and check, the combination of the stationary and movable leaves, a plug mounted in the hinge and capable of rotary movement with respect to the stationary leaf, a checking-spring for resisting such rotary movement, an abutment diametrically movable in the plug, a latch carried by the abutment, a locking-bar mounted in a recess in the plug and anchored at its ends to the stationary leaf so that when the plug is moved rotatably the latch will be disengaged from the locking-bar, and a hammer for engaging the abutment and latch for moving them rotatably away from the locking-bar, substantially as set forth.

10. In a combined door hinge and check, the combination of the stationary and movable leaves, a plug mounted in the hinge and capable of rotary movement with respect to the stationary leaf, a checking-spring for resisting such rotary movement, an abutment diametrically movable in the plug, a latch carried by the abutment, a locking-bar mounted in a recess in the plug and anchored at its ends to the stationary leaf so that when the plug is moved rotatably the latch will be disengaged from the locking-bar, a hammer for engaging the abutment and latch for moving them rotatably away from the locking-bar, and means for resetting the abutment on the opening movement of the movable leaf, substantially as set forth.

This specification signed and witnessed this 21st day of January, 1901.

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