

No. 646,003.

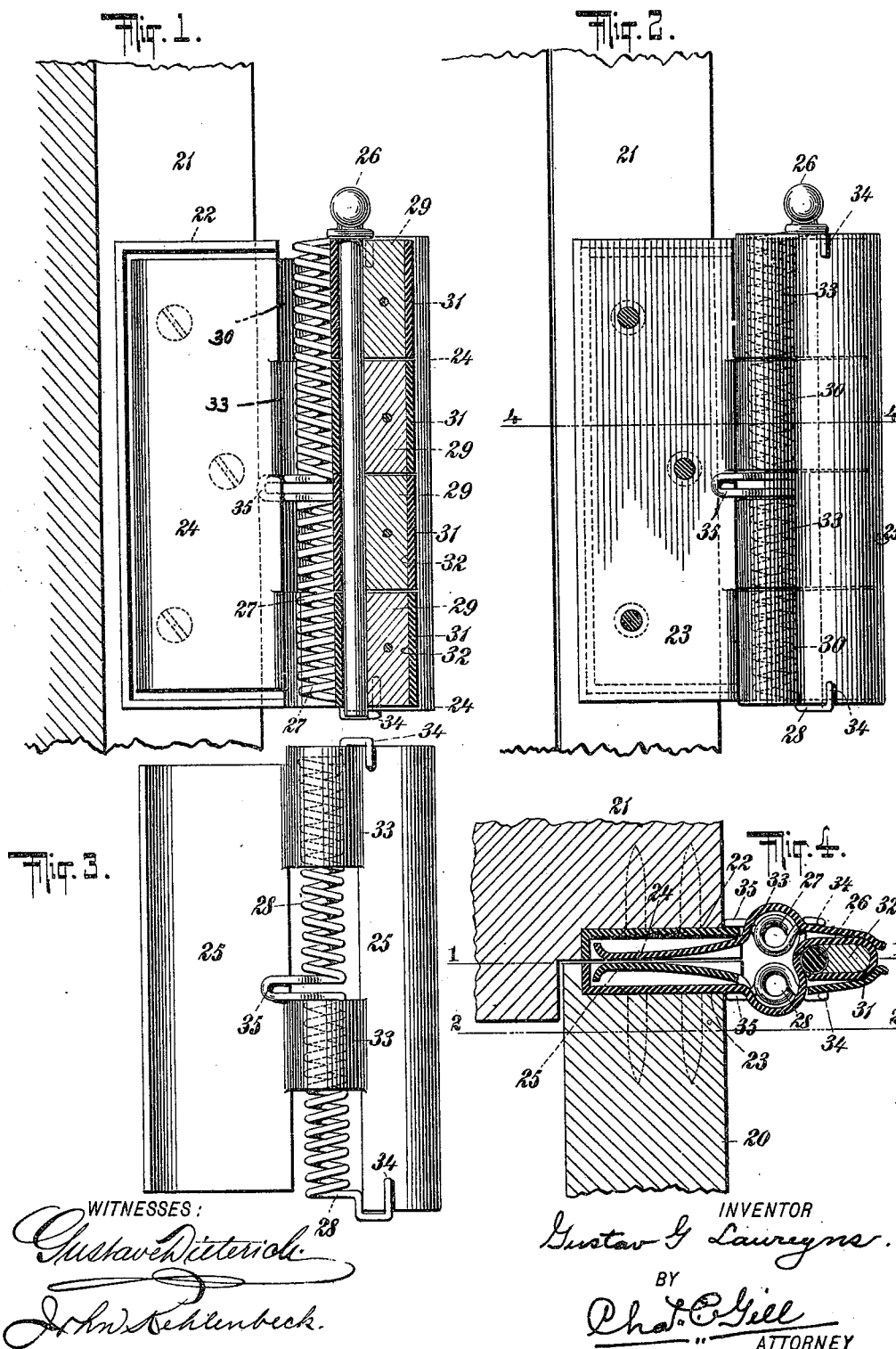
Patented Mar. 27, 1900.

G. G. LAUREYNS.
DOOR CHECK AND CLOSER.

(Application filed July 26, 1899.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES:

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3 Sheets—Sheet 2.

Fig. 5.

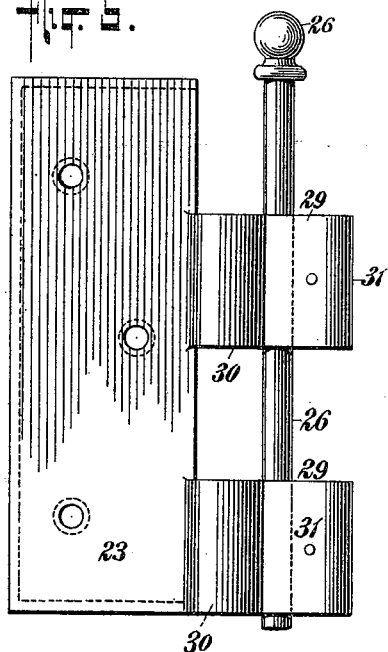


Fig. 6.

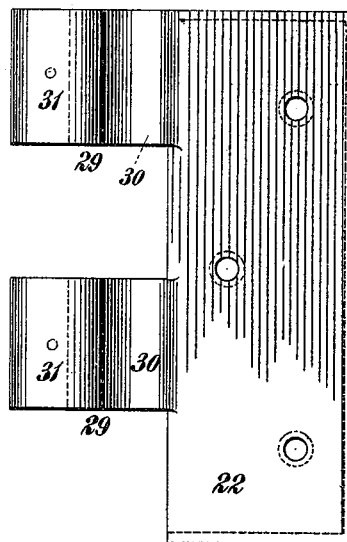
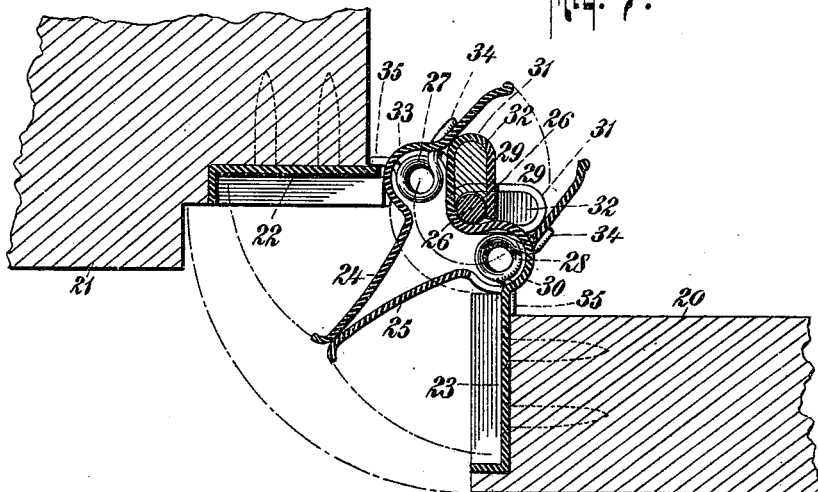


Fig. 7.



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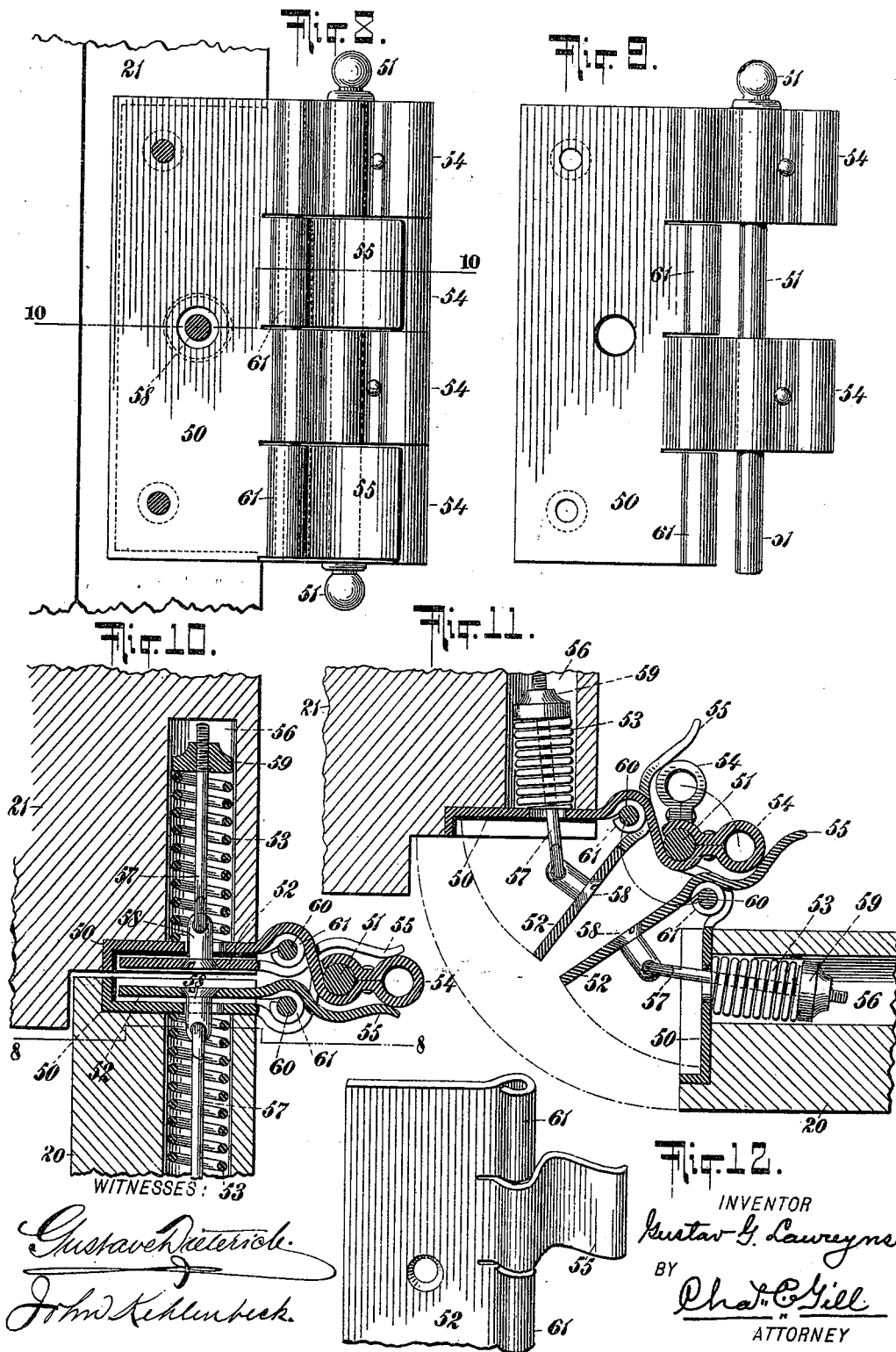
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3 Sheets—Sheet 3.



UNITED STATES PATENT OFFICE.

GUSTAV G. LAUREYNS, OF NEW YORK, N. Y., ASSIGNOR OF TWO-THIRDS
TO CHARLES F. SIMES AND HENRY C. TUM SUDEN, OF SAME PLACE.

DOOR CHECK AND CLOSER.

SPECIFICATION forming part of Letters Patent No. 646,003, dated March 27, 1900.

Application filed July 26, 1899. Serial No. 725,118. (No model.)

To all whom it may concern:

Be it known that I, GUSTAV G. LAUREYNS, a citizen of the United States, and a resident of New York, (Brooklyn,) in the county of Kings and State of New York, have invented certain new and useful Improvements in Door Checks and Closers for Doors and the Like, of which the following is a specification.

The invention relates to improvements in door checks and closers; and it consists in the novel features and combinations hereinafter described, and particularly pointed out in the claims.

In its preferred embodiment my invention consists in a hinge comprising, in addition to the leaves and pintle or pintles, a spring for closing the door and mechanical means for effecting a check to the action of the spring during the closing of the door, the said means serving to prevent a too sudden or violent closing of the door and yet permitting the door to close firmly until latched.

One of the main features of the hinge resides in the checking devices, and these consist in a cam or arm projection and a yielding contact-plate therefor, (or a series of two or more sets of said elements,) the said cam or arm projection being connected to turn against said plate during the opening and closing of the door and said plate offering a firm yielding resistance to said cam or arm projection.

The invention and satisfactory means for carrying the same into effect will be fully understood from the detailed description hereinafter presented, reference being had to the accompanying drawings, in which—

Figure 1 is a central vertical longitudinal section through a checking spring-hinge constructed in accordance with and embodying my invention, the section being on the line 1 1 of Fig. 4. Fig. 2 is a side elevation, partly in section, of same, the section being simply through the securing-screws and on the dotted line 2 2 of Fig. 4. Fig. 3 is a detached side elevation of one of the yielding plates against which the cam or arm projection acts when the hinge is in operation. Fig. 4 is a horizontal section through the hinge and a part of the door and its casing on the dotted line 4 4 of Fig. 2. Fig. 5 is a detached side

elevation, looking at the outer side, of one leaf of the hinge. Fig. 6 is a like view of the same side of the other leaf of the hinge. Fig. 7 is a section corresponding with Fig. 4, but showing the position of the parts of the hinge when the door is open. Figs. 8 to 12, inclusive, illustrate a modified form of the invention, Fig. 8 being a vertical section of same on the dotted line 8 8 of Fig. 10, the door shown in Fig. 10 being omitted. Fig. 9 is a detached side elevation of one of the leaves of the hinge. Fig. 10 is a horizontal section through the complete hinge and a portion of the door and its casing on the dotted line 10 10 of Fig. 8. Fig. 11 is a like view of same, but showing the position of the parts when the door is open; and Fig. 12 is a detached perspective view of a portion of one of the yielding plates of the hinge.

I will first describe the construction and operation of the hinge shown in Figs. 1 to 7, inclusive, and referring to said figures, 20 designates the door, and 21 the door casing or frame to which said door by means of my invention is hinged.

22 and 23 respectively denote the two leaves of the hinge, and 24 and 25 the yielding plates.

26 denotes the pintle on which the leaves 22 and 23 turn, and 27 and 28 respectively designate the springs which act upon the plates 24 and 25 to close the door.

The leaves 22 and 23 are respectively secured to the door 20 and casing 21 by means of screws, as shown, and said leaves are preferably of box-like form and have at their outer edges the arms 29, each comprising the curved section 30 and the outwardly-projecting cam or arm portion 31, at whose inner end is formed the bearing for the pintle 26. In the present instance the leaves 22 and 23 are formed from sheet metal, and hence in the formation of the projecting cam or arm portions 31 the metal may be folded or wrapped around solid filling-pieces 32.

The bearings for the pintle 26 at the inner end of the cam or arm portion 31 of the hinge-leaves may be considered as constituting the knuckles of the hinge and that portion of the arms 31 extending outward from the pintle 26 may be considered as the projecting or cam portion proper. The curved sections 30

of the arms 29 are unimportant, except that they form suitable spaces for the springs 27 and 28, fastened upon the plates 24 and 25. The leaves 22 and 23 of the hinge are illustrated in Figs. 5 and 6, and said leaves substantially correspond with one another, except that the arms 29 of said leaves are not in horizontal alinement with one another, but like the knuckles of an ordinary hinge pass into vertical alinement with one another.

The plates 24 and 25 are formed with the curved sections 33 to form housings for the springs 27 and 28 and are separated by suitable spaces, as shown in Fig. 3, in order that the curved sections 30 of the arms 29 may pass into vertical alinement with them and house those portions of the said springs which are shown exposed between the said curved sections 33. The springs 27 and 28 correspond with one another, and each is secured in place by means of the bent ends 34 and arm or loop 35, (see Fig. 3,) which ends 34 and arm 35 are formed from the wire of the spring and constitute three contacting points for the spring. The bent ends 34 and arms 35 of the coiled springs 27 28 serve to retain the springs upon the plates 24 25, as illustrated in Fig. 3, and the arms 35 of the springs contact with the outer vertical edges of the leaves 22 and 23, as more clearly illustrated in Figs. 2, 4, and 7, in order that during the opening of the door the said springs may be placed under increased tension, whereby they are enabled to move the door to its closed position. The plates 24 and 25 extend outward beyond the pintle 26 and form effective contact-surfaces for the cams or projecting arms 31, as more clearly indicated in Figs. 4 and 7.

The leaf 23 of the hinge carries its arms 29, having the cam or projecting portions 31, and said leaf is supplemented by the plate 25, having the curved sections 33 and springs 28, the lower one of said projections 33 passing between the arms 29 (see Fig. 5) of the leaf 23 and the upper curved section 33 passing above the upper arm 29 of said leaf 23. The plate 25 is applied to the leaf 23 before the pintle 26 is utilized to connect the two leaves of the hinge, and thus it will be an easy matter to insert the arms 29 of the leaf 23 into the spaces formed between the curved sections 33 of the plate 25, so that the inner portion of said plate 25 shall be at the inner side of the leaf 23 and the outer portion of said plate 25 shall be at the outer side of the cam or arm projection 31 of said leaf, as shown in Fig. 7. The leaf 23 and plate 25 having been brought together in the manner just indicated, the spring 28 will be applied within the curved outlines formed by the curved sections 30 of the leaf 23 and 33 of the plate 25, the bent ends 34 of the said spring being turned upon the outer side of the rearwardly-projecting portion of the plate 25 and the arm or loop 35 of said spring being passed upon the outer edges of said leaf 23, the spring 28 when in its position

serving to bind the plate 25 and leaf 23 together and affording a means for closing the door.

The leaf 22, plate 24, and spring 27 are assembled in the manner above described with respect to the leaf 23, plate 25, and spring 28, and after the leaves and plates have been assembled the pintle 26 is applied for securing the leaves of the hinge together. In Fig. 4 the several parts of the hinge are shown in the position they assume when the door is closed. When the door is opened, the leaves 22 and 23 turn on the pintle 26 and cause their arms 29 to move against the outwardly-projecting portions of the plates 24 25, the cam or projecting portions 31 of said arms moving against the surfaces of said portions of said plates and exerting such force against the same as to move them outward from one another, as illustrated in Fig. 7. The outward motion of the outer portions of the plates 24 and 25 during the opening of the door increases the tension of the springs 27 and 28. Upon the release of the door the springs 27 and 28 will operate to press the outer portions of the plates 24 and 25 against the parts 31 of the arms 29 and close the door. It is during the closing action of the door that the parts 31 of the arms 29 operate to check any too sudden or violent action of the springs 27 and 28. It will be observed that the springs 27 and 28 are compelled during their closing action to drive the plates 24 and 25 against the outer edges of the cam portions 31 of the arms 29 and that the position or leverage of the said arms 29 is such that the springs while operating positively cannot exert a maximum force to violently close the door. During the closing of the door the springs 27 and 28 gradually become weakened owing to the release of tension therein, but notwithstanding this fact the door at its closing-point will be acted upon with sufficient firmness to insure the latching of the door, the position or leverage of the arms 29 at the closing-point of the door being such as to compensate for the weakening force of the springs 27 and 28. As the door gradually closes the outer edges of the projecting or cam portions 31 of the arms 29 gradually move outward toward the outer portions of the outwardly-extending parts of the plates 24 and 25, and thus as the door is reaching its closed position the longer leverage of the plates 24 and 25 is acting against the longer leverage of the arms 29, and thereby although the springs 27 and 28 have become weakened the door will close with sufficient firmness to insure of its becoming latched. During the opening of the door the outer portions of the arms 29 gradually approach the springs 27 and 28, and the more nearly they approach the said springs 27 and 28 the leverage force exerted by the outwardly-extending portions of the plates 24 and 25 will become lessened in point of efficiency owing to the direction of pressure, and consequently the active force of the springs in their clos-

ing action upon the door is as the arms 29 more nearly reach the springs checked or prevented from exerting their otherwise full force. The rearwardly-projecting portions 5 of the plates 24 and 25 afford yielding resistances, against which the arms 29 may act during the opening of the door and which act upon said arms during the closing of said door. By means of the arms 29 on the leaves of the 10 hinge, combined with the rearwardly-projecting portions of the plates 24 and 25, the latter being subject to spring tension, the important result is attained that the door is checked in its closing action by the relation 15 of the arms 29 to the rearwardly-projecting portions of the plates 24 and 25, aided by the friction created by the movement of said arms against said plates.

As the door opens and closes the angle of 20 direction of pressure with respect to the arms 29 and their coacting resistance plate or plates varies with the change of position of the parts, and hence all of the resulting forces and pressures affecting the various structural 25 parts vary in intensity, changing from the maximum pressure at the time the door is closed to the minimum when the door is widest open; but the relation of the several parts is such that the resultant forces are maintained 30 nearly constant.

In the form of hinge shown the leaf 22 possesses two arms 29, and the leaf 23 likewise possesses two arms 29, and thus, as shown in Figs. 5 and 6, the hinge contains four of the outwardly-projecting or cam portions 31, two of 35 the latter acting against the rearwardly-projecting portion of the plate 24 and the other two against the like portion of the plate 25; but my invention is not limited to the employment of any special number of arms 29 on the 40 leaves of the hinge nor to the duplication of the cam or projecting portion 31 on each leaf of the hinge, and for a simple light hinge the cam or projecting portion or portions 31 may 45 be omitted entirely from one leaf of the hinge and only used on the other leaf of the hinge.

My invention in its broader scope is not confined to the details shown, but comprises a hinge having an arm projecting outwardly 50 beyond the knuckle or pintle thereof and a plate affording a yielding resistance for cooperation with said arm during the opening and closing of the door, the relation of the parts being such that during the closing of 55 the door the said parts will move against one another and toward a parallel relation with respect to one another.

Having fully described the construction presented in Figs. 1 to 7, inclusive, I will now 60 describe the structure illustrated in Figs. 8 to 12, inclusive. The hinge illustrated in Figs. 8 to 12, inclusive, presents a modified form of the invention, and aside from details of form differs from the hinge illustrated 65 in Figs. 1 to 7, inclusive, in respect of the arrangement of the spring or springs, the spring shown in Figs. 1 to 6, inclusive, being ar-

ranged to exert a yielding pressure directly against the outer projecting ends of the plates 24 and 25, while the springs shown in connection with the hinge presented in Figs. 8 to 12, inclusive, indirectly press the outer projecting ends of the plates by exerting a pull on the inwardly-projecting portions of said plates.

Referring to Figs. 8 to 12, inclusive, 50 50 denote the leaves of the hinge. 51 designates the pintle therefor. 52 52 denote the hinged plates, 53 53 the springs for said plates, and 54 54 the outwardly-projecting cam portions or arms carried by the leaves 50 and adapted during the opening and closing of the door to move against the outwardly-projecting portions 55 55 of the plates 52. The 85 springs 53 are inclosed in the sockets 56, provided in the door and the door-casing, and are held upon rods 57, whose outer ends are pivotally secured to the rotatory studs 58 and whose inner ends are threaded and receive the nuts 59. The studs 58 have screw-heads 90 held freely in apertures in the plates 52. The leaves 50 turn on the pintle 51, and the plates 52 may turn on the pins 60. When the door possessing the hinge shown in Figs. 8 to 12, inclusive, is in its closed position, the cam or 95 projecting arms 54 are in vertical alinement with one another and are substantially parallel with the outwardly-projecting portions 55 of the plates 52, as illustrated in Fig. 10, and when the door is opened the cam-projecting portions or arms 54 of the leaves 50 100 turn outward from one another and against the outwardly-projecting portions 55 of the plates 52, as shown in Fig. 11, the force of the cam-projecting portions or arms 54 during the opening of the door operating to drive in a direction from one another the said outwardly-projecting portions 55 of said plates 52, whereby the inner portions of said plates are brought toward one another and the 110 springs 53 are compressed. The plates 52 thus afford a yielding resistance to the cam projections or arms 54, and the springs 53 are brought under sufficient tension to close the door. The cam or arm projections 54 of the 115 leaves 50 cooperate with the outwardly-projecting portions 55 of the plates 52 in the manner above described with respect to the construction shown in Figs. 1 to 7, inclusive, and therefore a further detail explanation of 120 said operation is not required. In the hinge shown in Figs. 8 to 12, inclusive, the leaves 50 are formed with the curved sections 61 to receive the pins 60, and said pins furnish axes for the plates 52 in substantially the same 125 manner that the springs 27 and 28 of Fig. 4 form pivotal points for the plates 24 and 25.

Figs. 8 to 12 are presented to illustrate that the present invention is not limited to the special form of spring or springs shown in 130 Figs. 1 to 7, inclusive, and also that the parts of the hinge may as to their details of form and construction be modified without departing from the spirit of the invention.

The invention is not, therefore, limited to details of form or construction, and the same will be modified at will to suit the various sizes of hinges which may be manufactured and the nature of the metals which may enter into their manufacture. The hinges shown in the drawings will preferably be formed of stamped metal. If it should be desired to cast the several parts of the hinges shown, the form of said parts will of course vary within the judgment of the manufacturer.

As will be observed in the drawings, the inner portions of the resistance-plates of either the form of hinge shown in Fig. 4 or that illustrated in Fig. 10 are housed within the leaves of the hinge when the door is in its close position.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A hinge comprising the leaves and the pintle connecting the same, combined with a cam or arm projection extending from each of said leaves beyond said pintle, resistance-plates against which said projections act when they turn from or toward one another during the opening and closing of the door, and means for yieldingly maintaining the firm contact of said projections and plates during the movement of the door and arranged to close the door; substantially as set forth.

2. A hinge comprising the leaves and pintle, combined with a cam or arm projection extending beyond said pintle, a yielding plate against which said projection acts during the opening and closing of the door, and a spring retaining said projection and plate in firm contact with one another and arranged to close the door; substantially as set forth.

3. A hinge comprising the leaves and pintle, combined with a cam or arm projection extending beyond said pintle, a plate adapted to have a pivotal action and afford contact-surfaces for said projection, and a coiled spring whose tension is exerted to maintain the contact of said projection and plate with one another; substantially as set forth.

4. A hinge comprising the leaves, the pintle, and the cam or arm projection extending beyond said pintle, combined with the resistance-plate against which said projection acts during the opening and closing of the door, and means for yieldingly maintaining the firm contact of said projection and plate during the movement of the door and arranged to close the door, the said plate and projection being normally in substantially-close parallel relation to one another with the facing sides of same in contact with one another, whereby when the door is reaching its closed position the longer leverage of said projection will be acted upon by said plate, and as the door opens the said projection will approach an angular relation to said plate and thus vary the direction of pressure on the door; substantially in the manner and for the purposes set forth.

5. A hinge comprising the leaves and pin-

tle, combined with a cam or arm projection extending from each of said leaves beyond said pintle, and yielding resistance-plates against which said projections act when they turn from or toward one another during the opening and closing of the door; substantially as and for the purposes set forth.

6. A hinge comprising the leaves and pintle, combined with a cam or arm projection extending from each of the said leaves beyond said pintle, yielding plates against which said projections act when they turn from or toward one another during the opening and closing of the door, and springs acting against said plates to yieldingly retain them in firm contact with said projections; substantially as set forth.

7. A hinge comprising the leaves and pintle, combined with a cam or arm projection extending from each of said leaves beyond said pintle, yielding resistance-plates adapted to have a pivotal action and afford contact-surfaces for said projections during the opening and closing of the door, and coiled springs acting against said plates to maintain the contact of the same with said projections and to close the door; substantially as set forth.

8. A hinge comprising the leaves and pintle, said leaves being formed with the knuckles to receive said pintle and having beyond said knuckles the cam or arm projections, combined with the pivotally-mounted plates furnishing at their outer portions contact-surfaces for said projections, and coiled springs whose pressure is exerted to maintain said surfaces against said projections, and whose pressure is increased during the opening of the door by the movement imparted to said plates by said projections; substantially as set forth.

9. A hinge comprising the leaves and pintle, said leaves being formed with the knuckles for said pintle and also with the cam or arm projections extending beyond said pintle, combined with the pivotally-mounted plates interlocked upon said leaves and whose axes are independent of said pintle, and springs for maintaining the outer portions of said plates in contact with the said projections; substantially as set forth.

10. The hinge comprising the leaves and pintle, combined with the cam or arm projections extending from each of said leaves and beyond said pintle, the yielding resistance-plates against which said projections act when they turn from or toward one another during the opening and closing of the door, and the coiled springs housed in curved sections of said leaves and said plates and exerting their force to maintain said plates against said projections; substantially as set forth.

11. The hinge comprising the leaves and pintle, said leaves being of box-like form where they engage the door and door-casing, combined with the cam or arm projections extending from each of said leaves and beyond said pintle, and the yielding resistance-plates

against which said projections act when they turn from or toward one another during the opening and closing of the door, the outer portions of said plates furnishing contact-sur-
5 faces for said projections, and the inner portions of said plates being adapted to enter the box-like portion of the said leaves when the door is closed; substantially as set forth.

12. The hinge comprising the leaves having
10 the arms 29 which afford the bearings for the pintle and form the cam or arm projections 31 extending beyond said pintle, and the pintle for connecting said leaves, combined with the yielding resistance-plates having the curved

sections 33 to correspond with similar curved 15 sections 30 of said leaves, and also having the openings intermediate said curved sections 33 through which the said arms 29 may be passed in assembling the parts of the hinge; substantially as set forth. 20

Signed at New York, in the county of New York and State of New York, this 24th day of July, A. D. 1899.

GUSTAV G. LAUREYNS.

Witnesses:

CHAS. C. GILL,
GUNDER GUNDERSON.