No. 708,896. Patented Sept. 9, 1902.

E. MATHIS.

SPRING HINGE.

(Application filed Jan. 30, 1902.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1

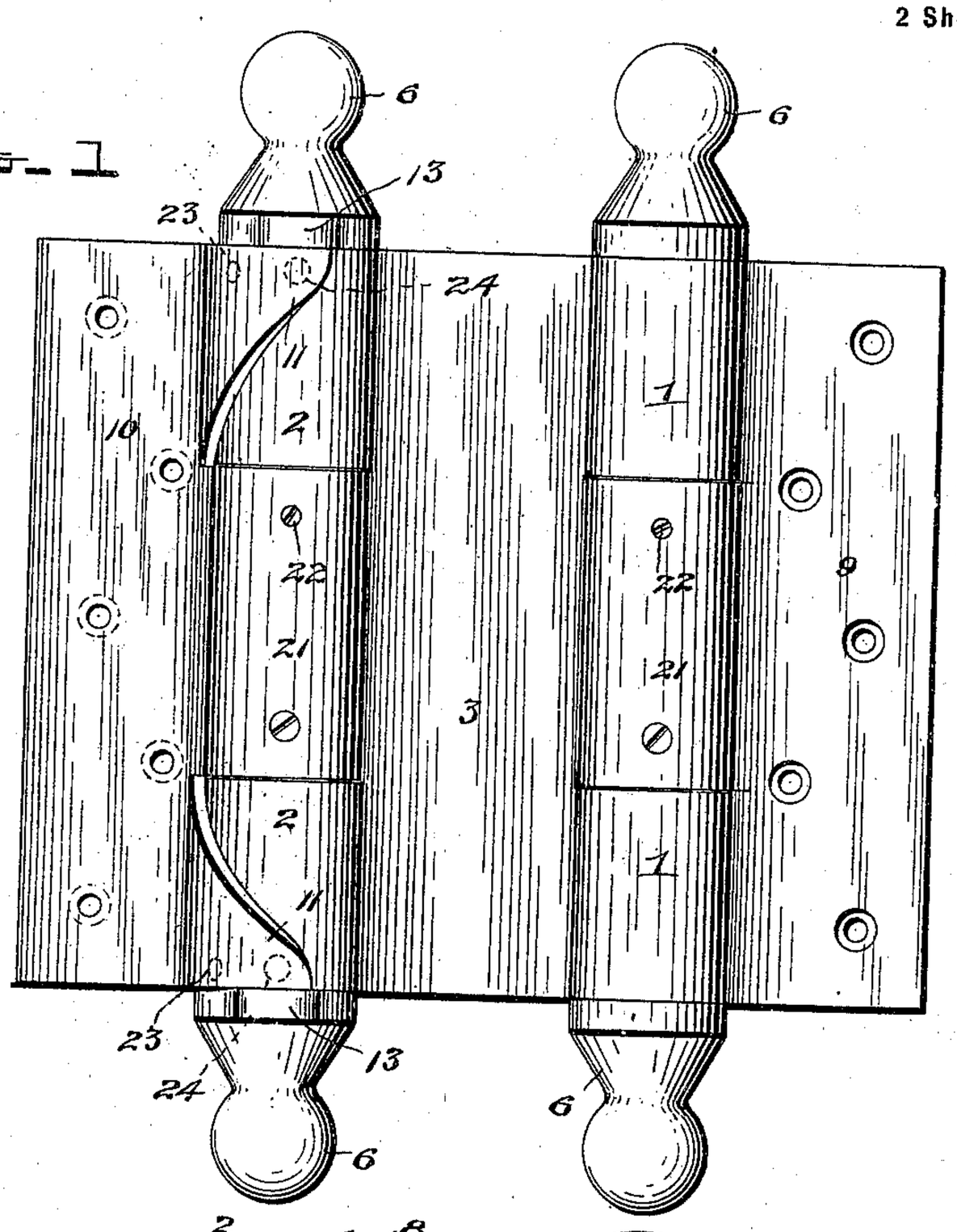


Fig. 2

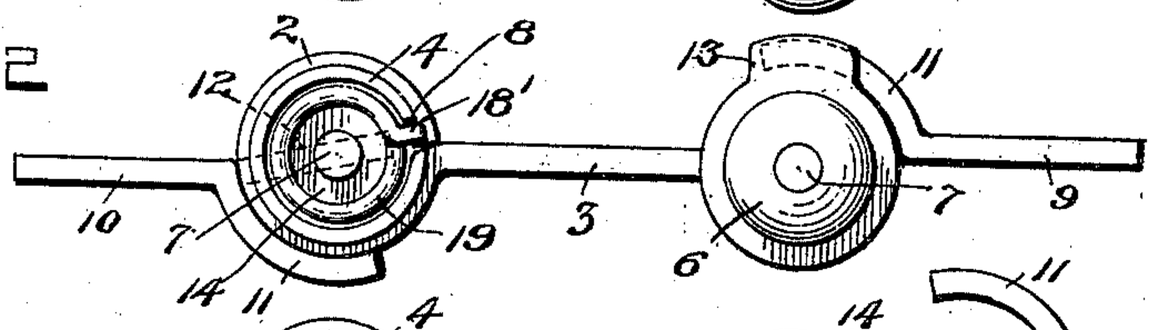


Fig. 3

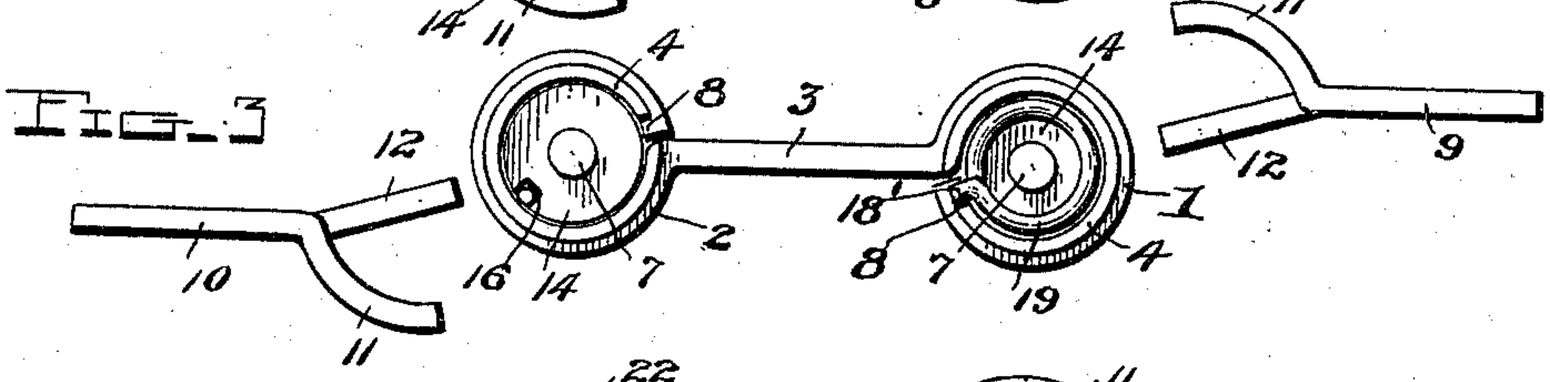
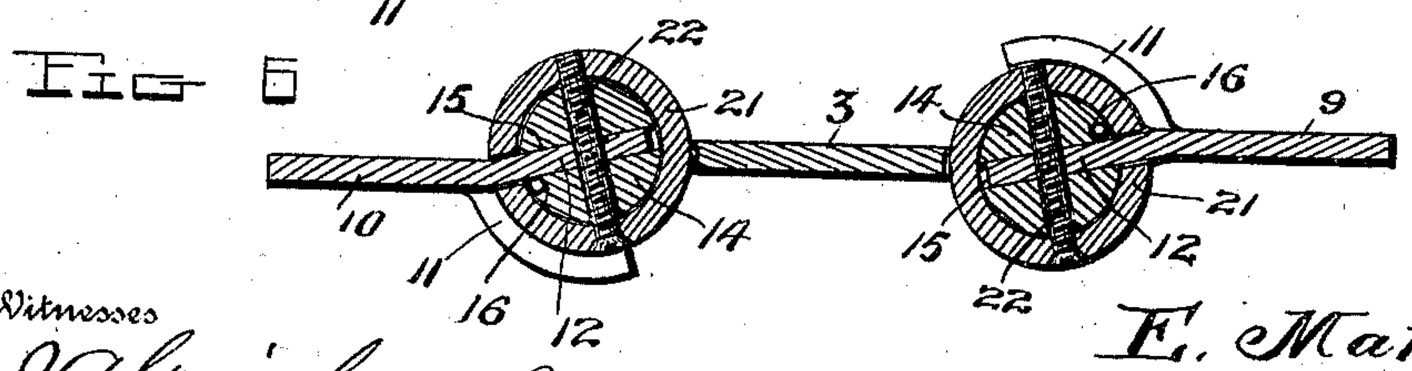


Fig. 6



Witnesses

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No. 708,896. Patented Sept. 9, 1902.

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SPRING HINGE.

(Application filed Jan. 30, 1902.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 4

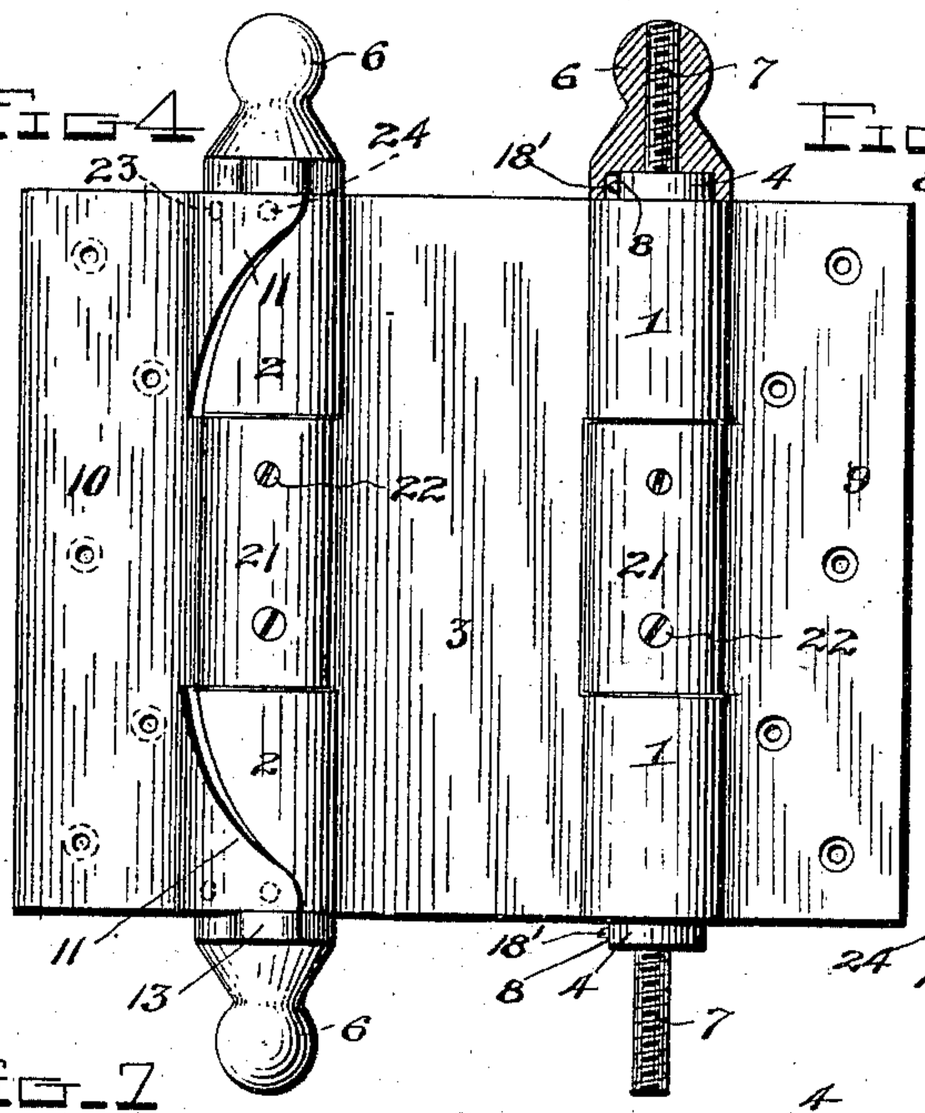


Fig. 5

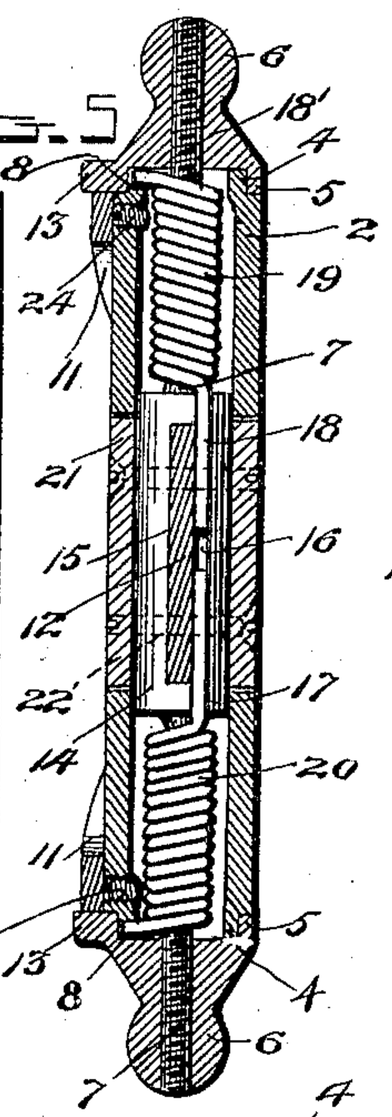


Fig. 9

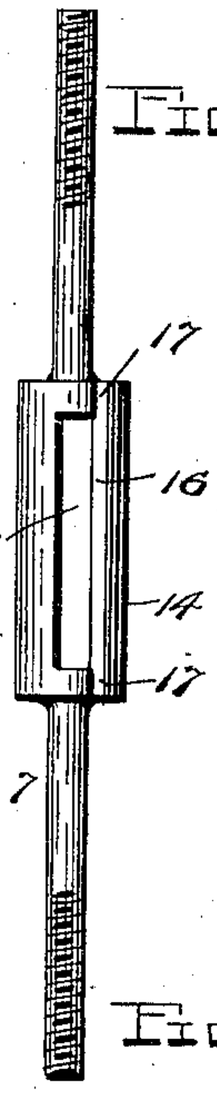


Fig. 7

Fig. 8

Fig. 10

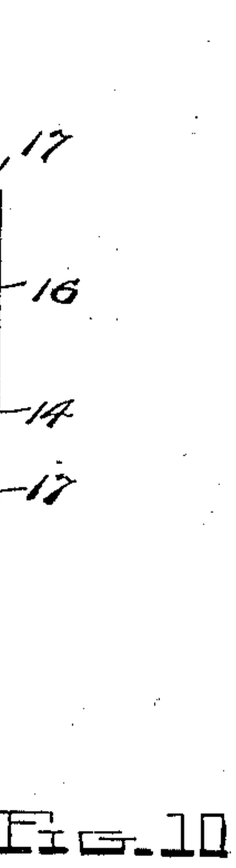


Fig. 11

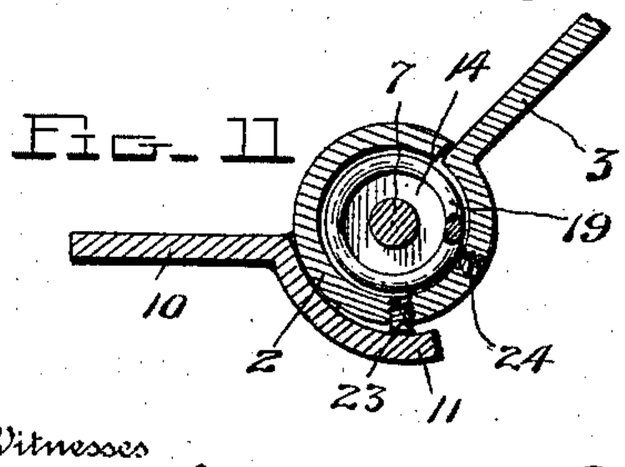
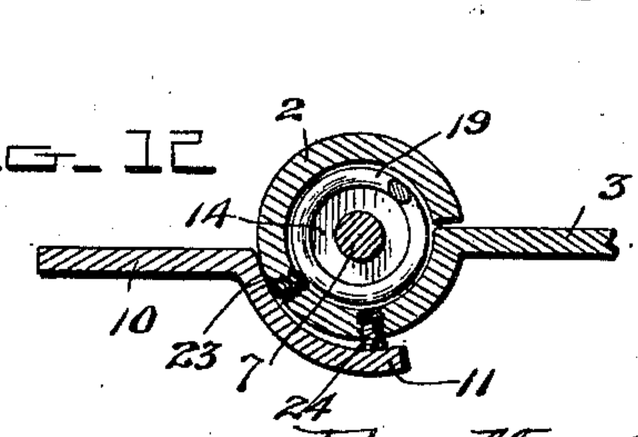


Fig. 12



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UNITED STATES PATENT OFFICE.

ELMER MATHIS, OF MILES, OREGON.

SPRING-HINGE.

SPECIFICATION forming part of Letters Patent No. 708,896, dated September 9, 1902.

Application filed January 30, 1902. Serial No. 91,865. (No model.)

To all whom it may concern:

Be it known that I, ELMER MATHIS, a citizen of the United States, residing at Miles, in the county of Baker and State of Oregon, have invented certain new and useful Improvements in Spring-Hinges; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in single and double acting spring-hinges, the main objects in view being to secure economy and strength in the construction of the hinge, to render the hinge reversible and its parts interchangeable, to reinforce the hinge to prevent sagging of the door, and to make provision for holding the door or closure supported by the hinge either completely or partially open at will.

With these and other objects in view, which will appear as the nature of the improvements is developed in the specification, the invention consists of certain novel features of construction, combination, and arrangement of parts, which will be hereinafter more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a view in elevation of a double-acting spring-hinge embodying my invention. Fig. 2 is a plan view with one of the pintle-caps removed. Fig. 3 is a top plan view showing both of the pintle-caps removed and also showing the leaves detached from the pintle. Fig. 4 is a view similar to Fig. 1, but showing one of the pintle-caps removed and the coöperating pintle-cap in section. Fig. 5 is a vertical longitudinal section through one of the spring-barrels. Fig. 6 is a cross-section through the pintle, showing the connection of the sleeve, springs, and leaf therewith. Fig. 7 is a plan view of the blank from which the leaves are made. Fig. 8 is a similar view of the blank from which the spring-barrels and connecting-web are made. Fig. 9 is a detail view of the pintle. Fig. 10 is a detail view of the springs, and Figs. 11 and 12 are views showing the manner in which the leaves are locked to hold the door open in two positions.

In carrying my invention into practice a plate of metal, such as sheet-steel, of proper thickness and dimensions is first subjected to the action of the dies to give to the blank the general outline shown in Fig. 8 of the drawings, in which said blank is shown as being substantially of double T form. This blank is then by means of suitable dies first partially folded into form and subsequently to the finished shape shown in the remaining figures of the drawings. In bending the plate into form the portions 1 are turned into tubes or cylinders to form one of the spring-barrels of the hinge, while the opposite portions 2 are turned into tubular or cylindrical form to provide the other spring-barrel of the hinge, the two spring-barrels thus constructed being connected by the integral portion 3 of the blank, which constitutes a web rigidly uniting the two fixed sections of the double-acting hinge. The edges 4 of the portions 1 and 2 forming the spring-barrels are inwardly depressed to form annular flanges and shoulders, and thereby provide seats for the caps or nuts 6, which are provided with a screw-threaded bore and counterbore to provide rims 5, adapted to be seated on said flanges and shoulders, and thereby close the outer ends of the spring-barrels, whereby said rims serve to exclude dust and dirt therefrom and to protect said ends against injury. Each of these edges or flanges 4 is formed in its outer edge with a notch or recess 8, which is adapted to receive the outer ends of the coiled springs, as hereinafter described. The leaves 9 and 10 of the hinge are also constructed from a plate of sheet metal, which is first brought by suitable dies to the form shown in Fig. 7, and subsequently bent to assume the form shown in the remaining figures. Each leaf as thus constructed is provided with upper and lower projecting ears 11, extending from its inner edge, and a knuckle-flange 12 between said ears. The ears 11 in the completed hinge are segmentally curved to bear against and conform to the contour of the spring-barrels and are engaged by lugs or extensions 13, formed on the pintle-nuts 6. By this construction the leaves are supported and braced at their ends from the pintle, so as to prevent the same from yielding under the weight of the door or other closure hung therefrom and the consequent sagging of the door. As shown, the construction of each spring-barrel by the

bending or folding of the portions 1 and 2 into cylindrical form causes the production of a divided barrel—that is, a barrel composed of upper and lower cylindrical portions separated by an intermediate space or recess corresponding in depth to the length of the portion 3 of the blank which forms part of the web connecting the two spring-barrels together. Each pintle 7 extends through its spring-barrel and has fitted thereon the nut 6, which holds it in place. The central portion of the pintle has an enlargement 14, provided with a slot 15 and an interconnecting groove 16 in one edge or wall thereof. The groove 16 coincides with perforations 17, formed in the ends of the enlargement 14 and receives the inner ends 18 of the springs 19 and 20, whose outer ends 18′ are fitted in the recesses or notches 8 in the flanged portions 4 of the sockets, whereby one end of the spring is held fixed while the other is connected to the spindle to wind up the spring to produce the desired tension when the door is swung open to restore the parts to their normal position and close the door. A split tube or sleeve 21, suitably shaped from a plate of spring metal, incloses the enlargement 14 of the spindle and is secured thereto to rotate therewith by screws or other suitable fastening devices 22. The space or opening between the edges of this tube form a slot which registers with the slot 15 in the enlargement 14, and into these slots the tongue or projection 12 of the leaf is fitted and is also retained in position by the said screws or fastening devices 22, by which construction each leaf is connected with its pintle to rotate therewith and is detachably connected to the pintle, so that if it be desired to take down the door it is simply necessary to detach the leaf to which the door is secured from its pintle, thus obviating the necessity of unscrewing the leaf from the door. By means of the central connection of each leaf with the enlargement of the pintle and the coaction between the ears 11 and lugs 13 on the nuts 6 the leaf is held in rigid engagement centrally and at each end with the pintle, and is thereby reinforced, so as to effectually prevent yielding of the same under strain and sagging of the door suspended therefrom. A divided spring or two springs instead of a single spring is employed in order to permit of the mounting of the parts in the manner shown and described, and, further, to permit of the removal of either spring member and its ready replacement or the substitution of another spring therefor whenever it may be found necessary or desirable.

Inasmuch as the construction of the parts of the fixed and movable portions of the hinge is substantially the same throughout, the hinge is rendered reversible—that is, may be used with either end uppermost—so that the leaves are interchangeable with respect to their attachment to the jamb and door and at the same time the parts are also made interchangeable with respect to each other, so that their positions may be reversed whenever desired and duplicate parts readily procured to replace corresponding parts of the hinge, which may have become injured or broken.

In order to adapt the door or other closure suspended from the hinge to be held fully or partly open, I provide one or both of the spring-barrels with upper and lower sets of adjustable stops 23 and 24 to coöperate with the ears 11 on the leaf secured to the jamb of the door-frame. These stops are shown in the present instance in the form of screws and are so arranged that when the door is swung partly open the stops 23 may be adjusted to lie in the path of the ends of the ears, so as to prevent the door from being swung to a closed position by the springs. When the door is fully swung open and it is desired to hold it in this position, the stops 24 may be adjusted to lie in the path of the ears 11 to similarly prevent the door from being closed. By this construction the stops are adapted to be thrown into and out of operative position at will, and the stops when screwed into their sockets lie out of the way, so as to avoid interference with the parts of the hinge and injury to the clothes or person of those coming in contact with the hinge or engaged in hanging and taking down the door.

The drawings show the invention as embodied in a double-acting spring-hinge; but it is manifest that the essential features of the invention may be embodied without departing from the spirit thereof in a single-acting spring-hinge—namely, a hinge in which but a single spring-barrel is employed.

From the foregoing description, taken in connection with the accompanying drawings, the construction and mode of operation of the invention will be readily understood, and it will be seen that the leaves of the hinge may be readily connected to and disconnected from the other parts of the hinge by simply removing and replacing the screws 22, so as to avoid the necessity of taking out screws from the door-jamb or door in case the door or similar closure is to be temporarily removed. It will also be seen that liability of sagging of the door is diminished to an appreciable extent and provision made whereby the door may be held fully opened or partially open, as desired.

Other advantages of the invention will be readily apparent from the foregoing description.

Various changes in the form, proportion, and minor details of construction may be made within the scope of the invention without departing from the spirit or sacrificing any of the advantages thereof.

Having thus described my invention, what I desire and claim by Letters Patent is—

1. A spring-hinge having a barrel formed of two portions divided by an intermediate

space, a pintle, a spring coöperating with the pintle, and a leaf having a tongue occupying said space and detachably connected to the pintle, substantially as described.

2. A spring-hinge having a barrel formed of spaced sections, a pintle, a spring coacting with the pintle, a split sleeve surrounding the stem between the barrel-sections, and a leaf having a tongue inserted in said sleeve and pintle, and detachably connected to the pintle, substantially as described.

3. A spring-hinge having a bifurcated barrel, a pintle extending therethrough and having an enlarged intermediate portion, a spring in each section of the barrel and detachably connected to the barrel and spindle, a sleeve surrounding the enlarged portion of the pintle between the barrel-sections, cap-nuts on the spindle and closing the ends of the barrel-sections, a leaf having a tongue inserted into said sleeve and enlargement of the pintle, and fastening means detachably connecting the sleeve and tongue to the pintle, substantially as described.

4. A spring-hinge comprising a barrel, a spring-controlled spindle, a leaf detachably connected to the spindle, adjustable stops on the barrel, and ears on the leaf to engage said stops to hold the leaf from returning to its normal position, substantially as described.

5. A double-acting spring-hinge having a barrel formed of a double T-shaped blank of sheet metal, the wings of the blank forming bifurcated barrels and having flanges at their outer edges, and the cross-piece forming a web connecting said barrels, substantially as described.

6. A double-acting spring-hinge having bifurcated barrels and an interconnecting web formed of a single piece of sheet metal, pintles extending through the barrels and having central enlargements, a cap-nut threaded upon each end of the spindle and closing the ends of the barrel, springs in each section of the barrels and detachably connected thereto and to the pintles, sleeves surrounding the enlarged central portions of the pintles between the sections of the barrels, leaves having tongues inserted in said sleeves, fastenings detachably connecting the tongues and sleeves to the pintles, ears upon the leaves, lugs upon the cap-nuts coöperating with the ears to reinforce the leaves, and adjustable stops upon the barrels coöperating with the ears to hold the movable portion of the hinge in adjusted position against the tension of said spring, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ELMER MATHIS.

Witnesses:
CHAS. F. HYDE,
WM. J. LACHNER.