

J. KUNZMANN & Z. ZIMMERMAN.

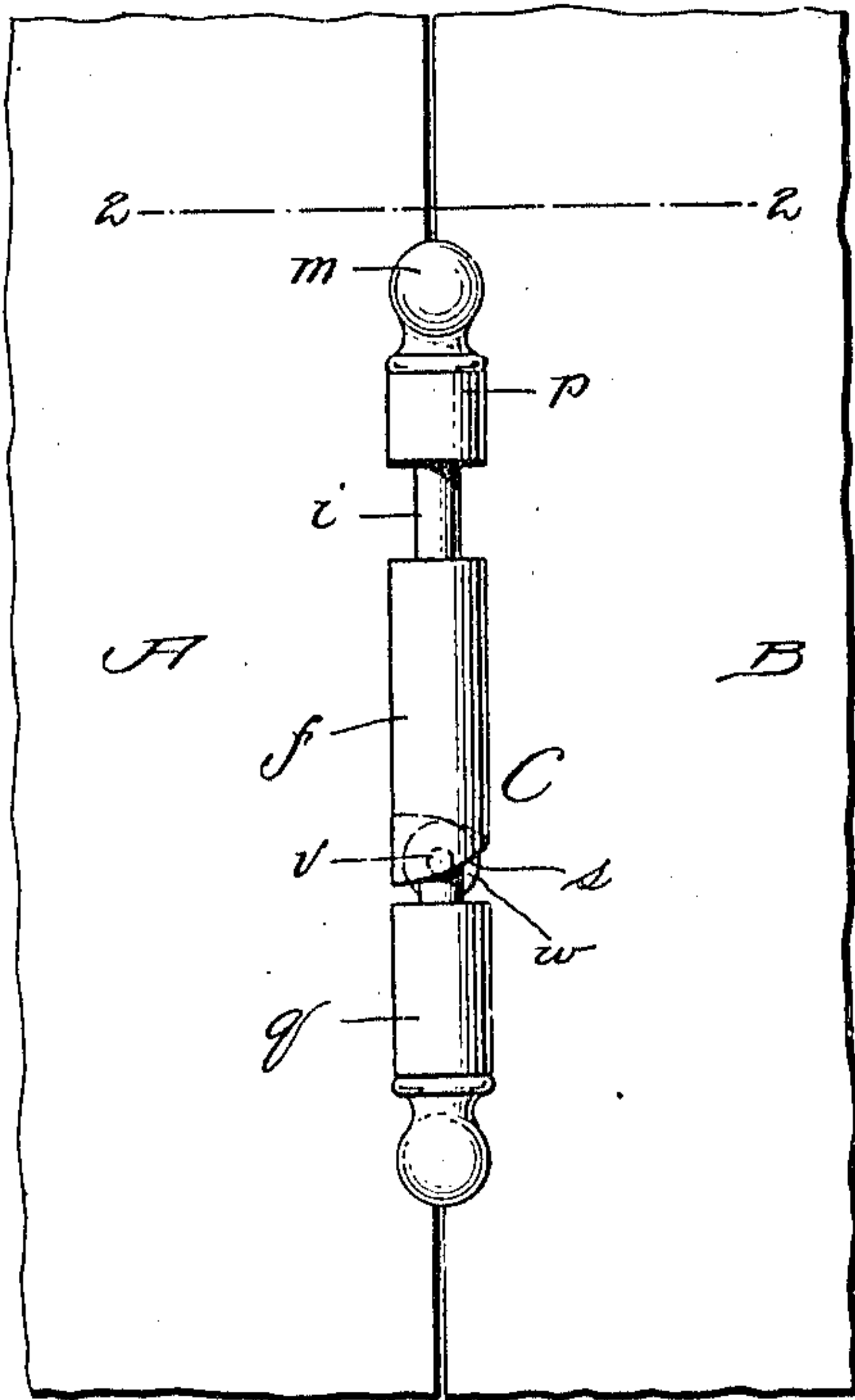
GRAVITATING HINGE.

APPLICATION FILED NOV. 24, 1909.

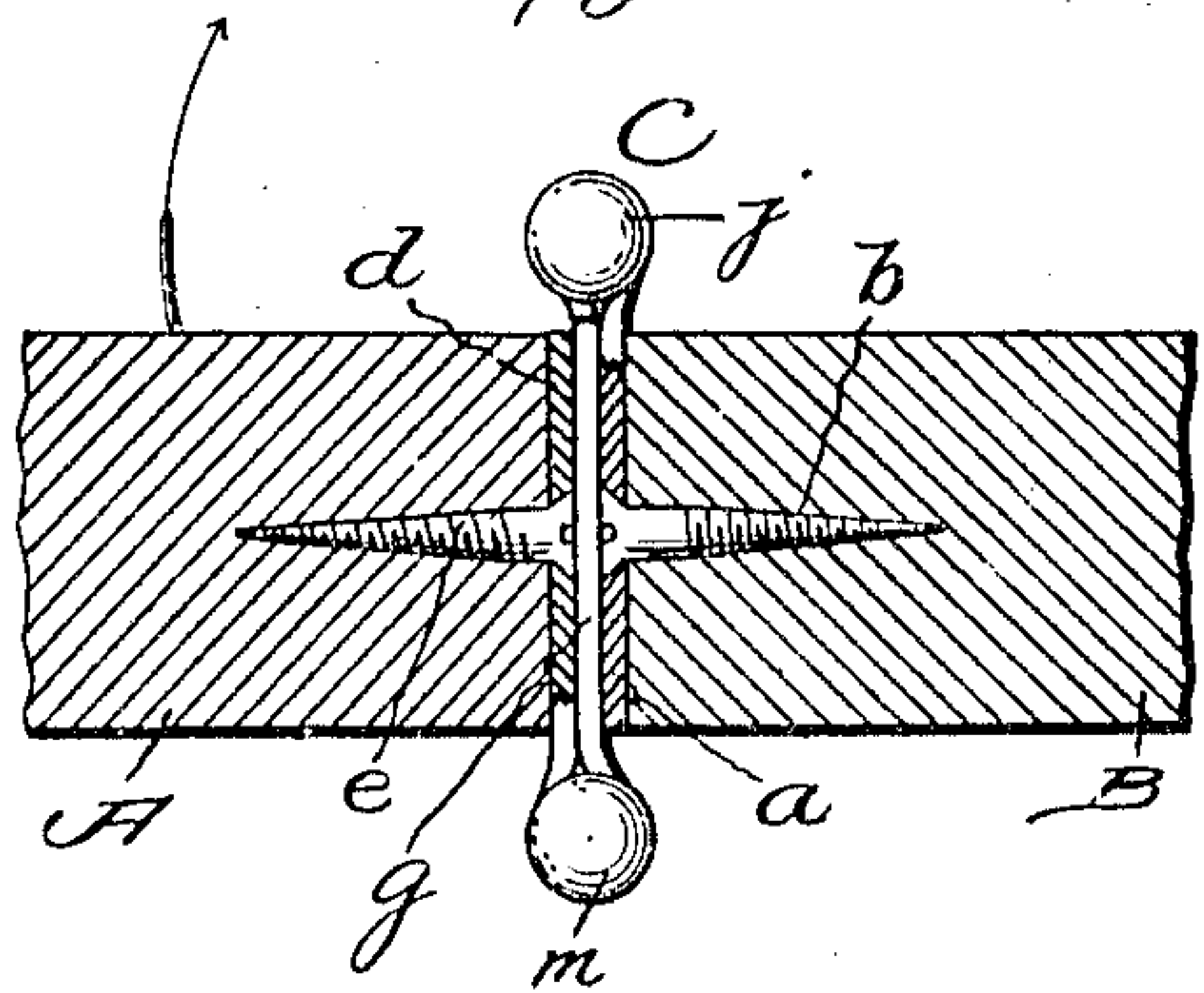
950,537.

Patented Mar. 1, 1910.

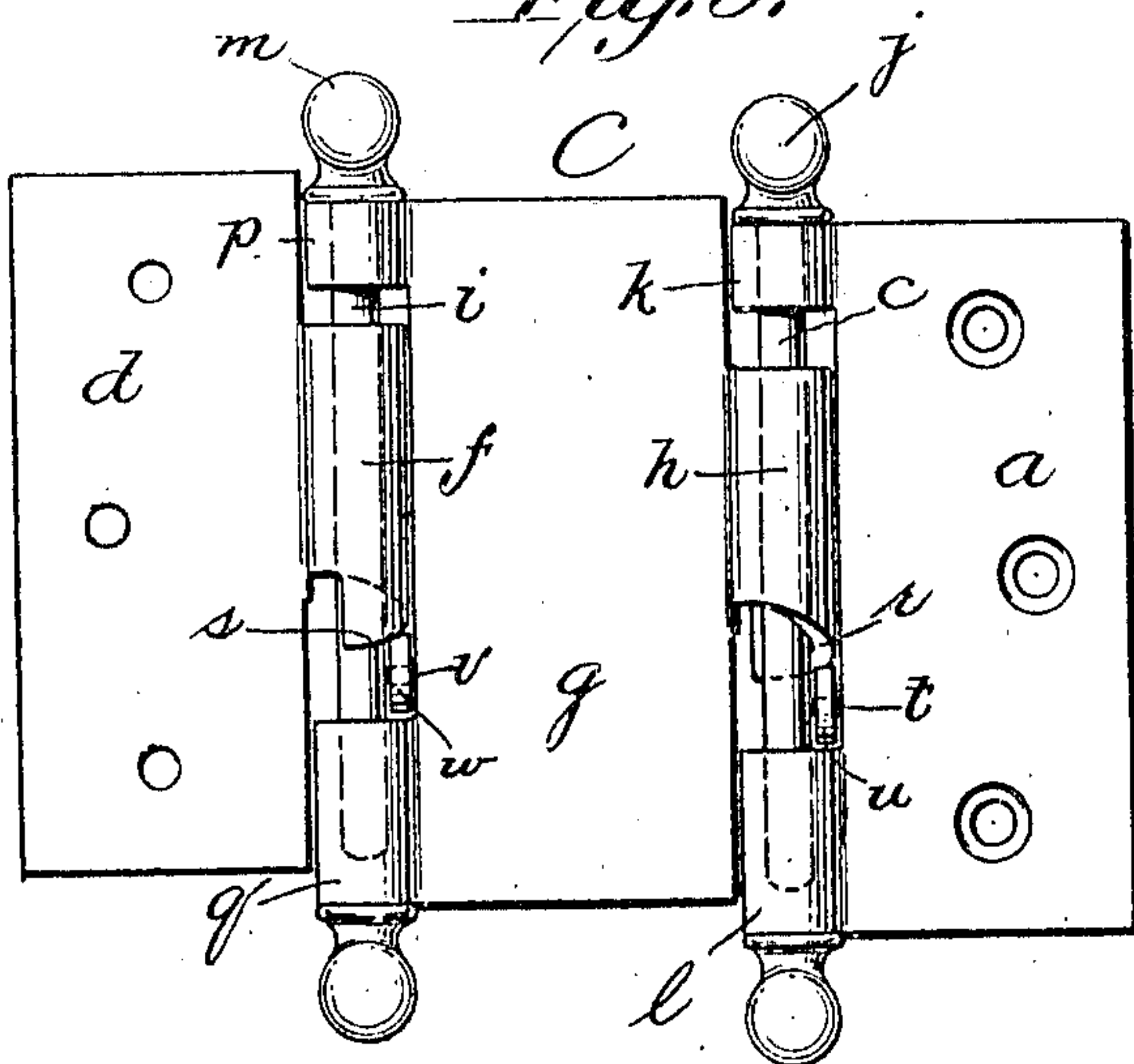
*Fig. 1.*



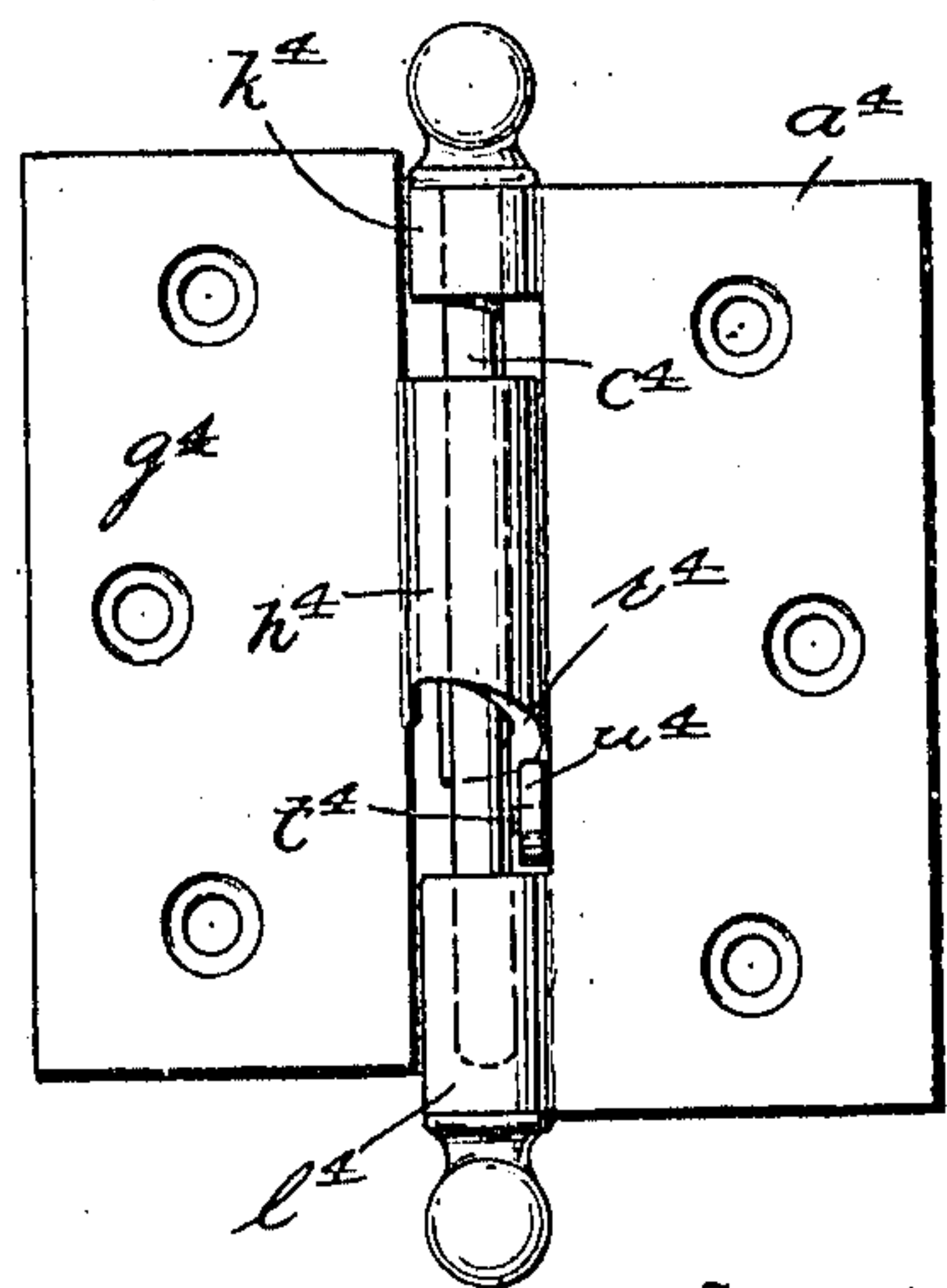
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



Witnesses

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# UNITED STATES PATENT OFFICE.

JACOB KUNZMANN AND ZANONI ZIMMERMAN, OF HIGHLAND, CALIFORNIA.

## GRAVITATING HINGE.

950,537.

Specification of Letters Patent.

Patented Mar. 1, 1910.

Application filed November 24, 1909. Serial No. 529,701.

*To all whom it may concern:*

Be it known that we, JACOB KUNZMANN and ZANONI ZIMMERMAN, citizens of the United States, residing at Highland, in the county of San Bernardino and State of California, have invented new and useful Improvements in Gravitating Hinges, of which the following is a specification.

Our invention relates to gravitating hinges, and contemplates the provision of a gravitating hinge that is at once inexpensive, compact and efficient, as well as strong and well adapted to withstand the weights and strain ordinarily imposed on such devices.

The invention also contemplates the provision of a gravitating hinge adapted to be interposed between a door and the frame thereof, and constructed in such manner as to permit of opening of the door in either direction, and also constructed and arranged with a view of enabling the inner vertical edge of the door to rest close to the opposed stile of the frame.

With the foregoing in mind the invention will be fully understood from the following description and claim when the same are read in connection with the drawings, accompanying and forming part of this specification, in which:

Figure 1 is an elevation illustrating as closed a door connected through the medium of our double hinge to the side stile of a frame. Fig. 2 is a horizontal section taken in the plane indicated by the line 2—2 of Fig. 1, looking downward, and showing the outer leaves of the hinge as partly in section, and the intermediate leaf thereof in plan. Fig. 3 is an elevation showing the double hinge as open. Fig. 4 is a similar view of a single hinge constructed in accordance with our invention.

Referring by letter to the said drawings, and more particularly to Figs. 1 to 3 thereof: A is a portion of a door. B is a portion of a side upright or stile of a door frame, and C is our novel double hinge, as a whole.

As best shown in Figs. 2 and 3, the double hinge comprises a leaf *a* arranged flat against the frame portion B and fixedly connected thereto by fastening devices such as screws *b* and having a vertical pintle *c* at one of its edges; a leaf *d* opposed to and connected by screws *e* to the inner vertical edge of the door and having a vertically disposed knuckle *f* on one of its vertical edges; and an intermediate leaf *g* having a verti-

cally disposed knuckle *h* that receives the pintle *c* of leaf *a*, and also having a pintle *i* on its opposite vertical edge, with reference to the knuckle *h*, loosely arranged in the knuckle *f* of the leaf *d*. The pintle *c* of the leaf *a* is preferably a pin that is headed at its upper end *j* and is removably arranged in a knuckle *k* and a socket *l* integral with the leaf *a* as well as in the knuckle *h* of the intermediate leaf *g*. By preference, the pintle *i* of leaf *g* is a pin having a head *m* at its upper end; the said pin being removably arranged in a knuckle *p* and socket *q* integral with the intermediate leaf *g*, and also in the knuckle *f* of the door leaf *d*. It will also be observed by reference to Fig. 3 that the knuckle *h* of leaf *g* has an inclined plane *r* at its lower end, and that the knuckle *f* of leaf *d* has an inclined plane *s* at its lower end, arranged reversely to the inclined plane *r*. Loosely mounted on a journal *t* fixed to leaf *a* and extending from the inner vertical edge thereof is an anti-friction wheel *u* on which the inclined plane *r* bears, and is adapted to move, and similarly mounted on a journal *v* fixed to and extending from the outer edge of the leaf *g* is an anti-friction wheel *w* on which bears the inclined plane *s* at the lower end of the knuckle *f* of leaf *d*.

It will be noted by comparison of Figs. 1, 2 and 3, that the double hinge enables the inner vertical edge of the closed door A to rest quite close to the opposed portion B of the door frame, and that the double hinge as a whole is compact and strong and durable. It will also be noted that the door A is free to be swung open in the direction indicated by arrow in Fig. 2, or in the opposite direction. In the first case the intermediate leaf *g* will move with the door, and the knuckle *h* of said leaf will turn and move upward on the wheel *u*, with the result that when the door is released it will gravitate in the direction opposite to the arrow to its closed position. In the other case, the intermediate leaf *g* will remain flat against the leaf *a*, while the knuckle *f* of leaf *d* will turn and move upward on the wheel *w*. From this it follows that when the door opened in the direction opposite to that indicated by the arrow is released, it will gravitate to and remain in the position shown in Fig. 2.

The single hinge embodiment of our invention, shown in Fig. 4, is generally similar in construction to part of the double hinge, in that it is made up of a leaf *a*<sup>4</sup> having a



knuckle  $h^4$  and a socket  $l^4$ , a pin  $c^4$  removably arranged in said knuckle and socket, an anti-friction wheel  $u^4$  mounted loosely on a journal  $t^4$  fixed to the inner edge of the leaf, and  
5 a leaf  $g^4$  having a knuckle  $h^4$  which loosely receives the pin  $c^4$ , and also having an inclined plane  $r^4$  at the lower end of said knuckle, disposed and movable on the said anti-friction wheel of the leaf  $a^4$ .  
10 In the practical use of the modified embodiment, the leaf  $a^4$  is fixed to the door frame, and the leaf  $g^4$  is fixed to the door. Hence when the door is opened, the inclined plane  $r^4$  will move upward on the anti-fric-  
15 tion wheel, and when the opened door is released it will gravitate to its closed position. By virtue of the arrangement of the knuckle having an inclined plane at its lower end in the manner shown relative to the anti-  
20 friction wheel—that is to say, above and in the same vertical plane as the said anti-friction wheel, it will be observed that the leaves are brought close together, and the compactness and strength of the hinge as a whole is  
25 materially increased.

Because of the similarity of the constructions, the single hinge of Fig. 4 is possessed of the practical advantages hereinbefore

ascribed to parts of the double hinge shown in Figs. 1 to 3. 30

Having described our invention, what we claim and desire to secure by Letters-Patent, is:

A gravitating hinge comprising a leaf having on one of its edges a vertically dis- 35 posed knuckle that is provided at its lower end with an inclined plane, and a second leaf having a vertical pintle spaced from one of its vertical edges and also having a journal fixed to and extending from said edge and 40 an anti-friction wheel mounted to turn on said journal and arranged intermediate the said edge and the pintle and located below and in the same vertical plane as the knuckle of the first-named leaf and in supporting 45 engagement with the inclined plane at the lower end of the knuckle.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

JACOB KUNZMANN.  
ZANONI ZIMMERMAN.

Witnesses:

GEO. HIDDEN,  
D. D. YARNELL.