

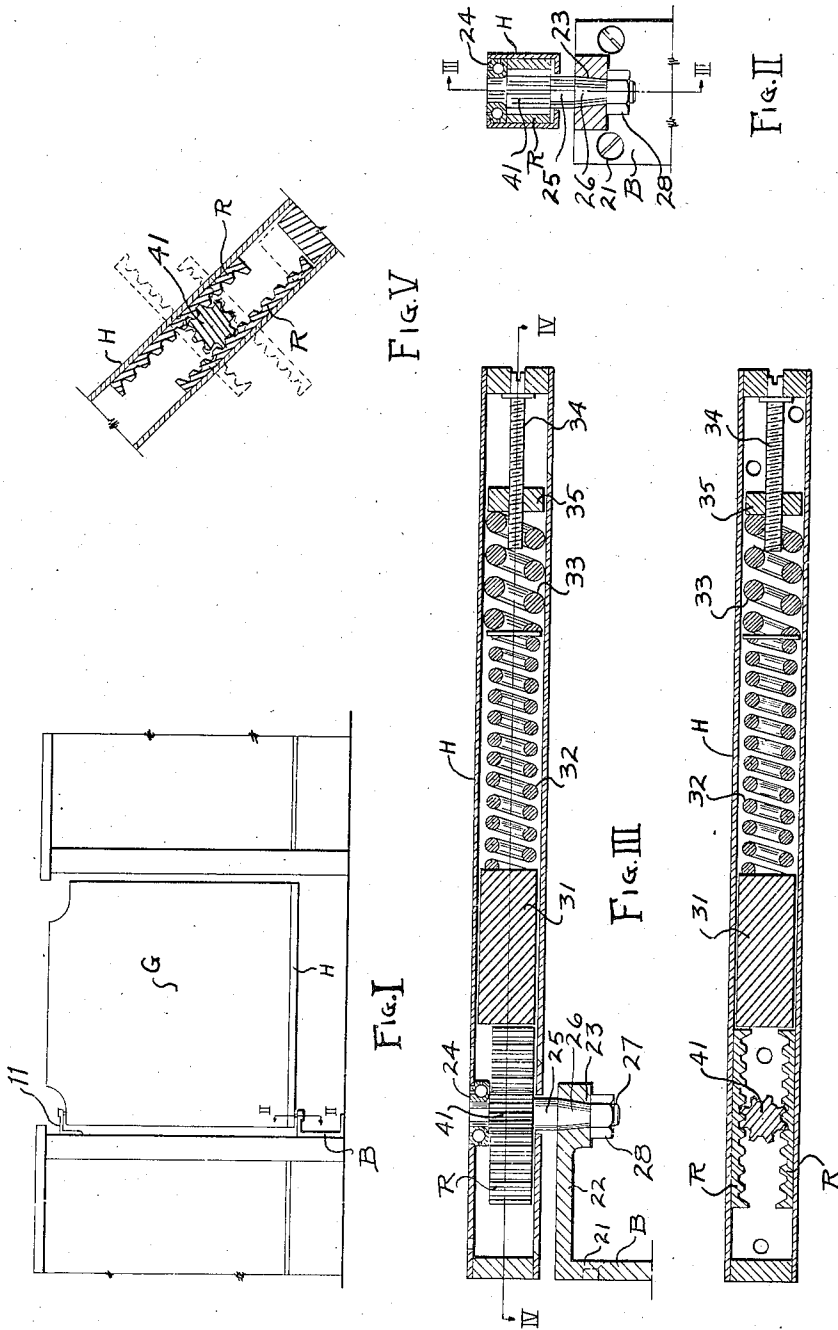
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DOUBLE ACTING PIVOT SPRING HINGE

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DOUBLE ACTING PIVOT SPRING HINGE

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This invention relates to pivot hinges for doors or gates of the double acting type. It is customary to mount such gates on pivots which permit them to swing in either direction from the closed position and such pivotal mountings are frequently further provided with springs which serve to return the door or gate to its normal closed position. Such springs generally function through a cam action which will not permit opening the gate one hundred degrees, or through a series of releasing lugs which become worn and do not center the door or gate when closed. It frequently occurs that such a door or gate is opened too far thereby fouling the strike post and subjecting the hinge to a considerable wrenching action, and it is desirable that this be avoided. It is also desirable to provide a hinge which will permit opening the door or gate a maximum amount and yet provide for returning to the same closed position in spite of wear.

To the accomplishment of the foregoing and related ends, the invention, then, consists of the features hereinafter fully described and particularly pointed out in the claims, the following description and the annexed drawing setting forth in detail one illustration of the various ways in which the principle of the invention may be applied.

In said annexed drawing:—

Fig. 1 is a front elevational view of a portion of a railing with a gate in closed position mounted on a pivot made in accordance with the invention; Fig. 2 is a transverse vertical section of the mounting on enlarged scale taken on a plane indicated by the line II—II, Fig. 1; Fig. 3 is a longitudinal vertical section taken on a plane indicated by the line III—III, Fig. 2; and Fig. 4 is a longitudinal transverse section along the line IV—IV, Fig. 3; and Fig. 5 is a similar fragmentary section showing the relation of the parts when the gate is opened in one direction and the dotted lines indicating the position when the gate is opened in the opposite direction.

In the embodiment illustrated, the hinge assembly is constructed of a housing H which may take the form of a rectangular tube or be otherwise constructed to contain the elements enumerated hereafter. Such housing is rigidly secured to a door or gate G, usually at the bottom although it may be mounted at the top or duplicated at both top and bottom. A support-plate or bracket B of height desired is secured to the floor or gate post or both, as for instance by screws or bolts 21. This plate or bracket may present an extending arm 22 having a tapered hole 23. The

housing H is provided with a suitable bearing, as for instance the ball bearing 24, in which a pintle 25 may rotate. The pintle carries a pinion gear 41 securely keyed thereon or made integrally therewith and is also provided with a tapered portion 26 and a threaded portion 27.

Two racks R are mounted to engage the pinion 41, one at each side, and when meshed therewith slidably engage the vertical walls of the housing H. At the end of the racks a plunger or piston 31 is slidably mounted within the housing H, and is forced in contact with the racks R by a spring 32. As seen from such construction, the racks can be set with respect to each other and the pinion as desired, when the housing is opened, thus adjusting the throw of the door. The housing H is secured to the lower edge of the door or gate with the pintle 25 projecting downward so that the tapered portion 26 may engage in the tapered hole 23 in the bracket. The gate is placed in normal closed position and a nut 28 is set on the threaded portion of the pintle and tightened to lock the pintle in the bracket at this position.

A pivot 11 at the top of the door or gate may comprise a suitable bracket or socket and pin, and this pivot is preferably the same distance from the hinge post as the lower pintle.

It will be noted from Fig. 5 that with the pintle and gear 41 in fixed position, when the door or gate is swung in one direction one of the racks R will move away from the pinion thereby forcing the plunger 31 to slide away from the pinion against the compression of spring 32. When the door or gate is swung in the opposite direction the other rack will force the plunger against the compression of the spring. The gate will assume its normal closed position when the plunger is engaging both racks equally, there being little or no lost motion.

Where it is desired to control the degree of opening of the gate and provide a buffer to prevent wrenching we apply a second spring 33 of greater compressive strength. When the spring 32 is tightly compressed, the spring 33 comes into play, and since this spring is much stronger it serves to snub the door or gate when thrown violently open. As a means of controlling the power of the spring 32 at neutral position or to control the point at which the heavier spring 33 starts to act, a spring adjusting means is provided and this may take the form of a screw 34 having a nut 35 mounted thereon.

It will thus be seen that our construction presents an applicability of wide scope, and a door or gate so mounted may be opened to any degree

of angularity desired in either direction and will always return to a neutral or closed position. It will further be seen that the neutral or closed position of the gate will remain fixed as wear will produce very little lost motion. Trouble from wrenched pivots is substantially also eliminated as adequate snubbing action is provided.

In the form illustrated, we have shown a housing of the width of the gate made up of square tubing and having end plugs to retain grease or other lubricant within, but a cast box having means for inserting the various parts may of course be used with equal facility.

Other modes of applying the principle of the invention may be employed, change being made as regards details disclosed provided the means stated by any of the following claims or the equivalent of such be employed.

We therefore particularly point out and distinctly claim as our invention:

1. A double acting pivot hinge, comprising a fixed pintle having a pinion thereon; a housing swingable about said pintle and having a bearing therefor; two racks slidable within said housing and engaging the pinion; and means for equalizing the position of said racks with respect to the pinion for returning the housing to a predetermined position, said means including a plunger actuated by forward motion of either rack and a spring returning the plunger to contact with both racks and means for regulating the power of said spring.

2. A double acting pivot hinge, comprising a fixed pintle having a pinion thereon; a housing

swingable about said pintle and having a bearing therefor; two racks slidable within said housing and engaging such pinion; and means for equalizing the position of such racks with respect to such pinion for returning the housing to a predetermined position, such means including a piston actuated by forward motion of either rack and a spring returning such piston to contact with both racks and a snubbing spring effective when said first spring reaches the limit of its resiliency.

3. A double acting pivot hinge, comprising a fixed pintle having a pinion thereon; a housing swingable about said pintle and having a bearing therefor; two racks slidable within said housing and engaging such pinion; and means for equalizing the position of such racks with respect to such pinion for returning the housing to a predetermined position, such means including a piston actuated by forward motion of either rack and a spring returning such piston to contact with both racks and a snubbing spring effective when said first spring reaches the limit of its resiliency and means for regulating the position at which said first spring reaches such limit.

4. A double-acting pivot hinge, comprising a fixed pintle having a pinion thereon; a housing swingable about said pintle and having a bearing therefor; two racks unconnected to each other slidable within said housing and engaging the opposite sides of the pinion, and a common spring means adapted to coact with each of said racks.

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