ABSTRACT OF THE DISCLOSURE

A combination hinge and gate closer having a torsion coil spring having its ends frictionally engaged in hollow cap members which are respectively secured against rotation relative to the gate and gate post.

This invention relates to fence hardware. More particularly, the invention relates to an improved combination hinge and automatic gate closer.

In a further aspect, the invention relates to an improved combination hinge and gate closer employing a torsional coil spring which is assembled with the other elements of the hinge and gate closer in such a manner as to avoid heat damage to the spring material.

In still another aspect, the invention relates to an improved combination hinge and automatic gate closer which is less critically dependent upon proper alignment of the fence components for efficient and positive operation.

In many fencing applications, especially where it is desired to prevent accidental entry into the fenced area by small children, animals, and the like, it is necessary to have some means for automatically closing the gate after it is opened. The prior art gate closers have ranged from the familiar weight-and-sashcord apparatus to rather complicated spring-return mechanisms. To date, however, no generally satisfactory apparatus has been developed for use where the gate must be closed with a positive return force such as is necessary to actuate a common gate latch. This is particularly true in the case of so-called "chain-link" fence-gate assemblies.

In chain-link fence-gate combinations, proper alignment of the various parts is more critical in order to insure the positive operation of an automatic gate closer such as are commonly employed in the prior art. Also, it is highly desirable to minimize the width of the opening between the gate post and the fence in order to deny access to the fenced area to small animals such as cats, puppies, and the like.

A wide variety of gate closers employing the principle of a power spring have been proposed. In a typical device of the prior art, a power torsion spring, designed to deliver a torque and generally in the form of a ribbon of heat-treated steel wound on itself, has been employed. However, in order to produce sufficient motive power to return the gate to its closed position with a sufficient positive force to actuate an automatic gate latch, it has been necessary to provide a power spring having such a great diameter that the spacing of the gate post and gate frame is undesirably large. Furthermore, such gate return devices are generally dependent upon more or less perfect alignment between the gate assembly components and are usually not adapted to standard fence openings.

Accordingly, it is a principal object of the present invention to provide an improved combination hinge and automatic gate closer.

Another object of the invention is the provision of a combination hinge and automatic gate closer which is less critically dependent upon proper alignment of the fence components.

Yet another object of the present invention is the provision of such a combination hinge and automatic gate closer which is adapted to be used with only the conventional spacing between the gate post and gate frame.

An even further object of the invention is the provision of an improved combination hinge and automatic gate closer which is less susceptible to damage due to unnatural stresses which occur when the components are assembled, as by welding.

These and other, further, and more specific objects and advantages of the invention will become apparent from the following detailed description thereof, taken in conjunction with the drawings in which:

FIG. 1 is a perspective view of the presently preferred embodiment of the invention;

FIG. 2 shows the device of FIG. 1 installed in a typical Hurricane-type fence assembly; and

FIG. 3 is an exploded perspective view showing the various elements of the device of FIG. 1 prior to assembly.

Briefly, in accordance with my invention, I provide improvements in a fence gate assembly which normally includes a stationary gate post, a gate, hinge means connecting the gate to the post, and means for positioning the gate in the closed position. The improvements comprise the combination hinge and automatic gate closer which includes a torsion coil spring having an upper end and a lower end, positioned substantially vertically between the gate post and the gate. A first hollow cap member receives and frictionally engages the upper end of the spring and a second hollow cap member receives and frictionally engages the lower end of the spring.

Means are provided for securing one of the cap members to the gate post without relative rotation between the cap member and the post and means are also provided for securing the other of said cap members to said gate without relative rotation between said other cap member and said gate.

Turning now to the drawings, in which like reference numerals identify the same elements, FIG. 1 depicts the presently preferred embodiment of the invention chosen for purposes of illustration and shows a device specially adapted for use in so-called Hurricane-type fence assemblies. The torsion coil spring 1 is received and frictionally engaged in hollow cap members 2 and 3. In the view shown in FIG. 1, the upper cap member 2 is secured by means of a pin 4 received in the hinge eye 5 of a clevis member 6 which is adapted to be secured to the fence post 7 by tightening the nut 8 of the bolt 9. In this manner, the cap member 2 is secured to the gate post 7 without relative rotation between the cap member 2 and the gate post 7.

Likewise, the lower cap member 3 is connected by means of a pin 10 received in the hinge eye 11 of a smaller clevis 12 which is shaped to be secured to the tubular frame member 13 of the gate 14 by tightening the nut 15 on the bolt 16.

It is important to note that the coil spring 1 is not welded to the cap members 2 and 3 but, rather, is frictionally engaged, as by means of a press fit, within the cap members. In this way, damage to the spring material and alteration of the spring characteristics, which would be encountered if the spring were welded into the cap members, is avoided.

In the embodiment chosen for purposes of illustration in the drawing, the pin members 4 and 10 are provided with plates 4a and 10a which are then secured to the caps 2 and 3 by welding. The pin members 4 and 10 are received in the hinge eyes 5 and 11 of the clevis members 6 and 12 and are secured against rotation in the hinge eyes by tack welding or, alternatively, by frictional engagement in the hinge eyes.
As will be apparent to those skilled in the art, the precise method of assembly of the cap members 2 and 3, plate members 4a and 10a, pin members 4 and 10 and hinge eyes 5 and 11 is not critical. For example, instead of the method illustrated in the drawings, the cap members, plates, pins and hinge eyes could be formed integrally in a single cast or machined unit.

As will be apparent to those skilled in the art, the gate closer-hinge combination illustrated in the drawings can be used alone or in combination with presently known gate hinges. When used alone, it is advantageous to employ a pair of the devices as shown in the drawings, one located near the top of the gate and the other located proximate the bottom of the gate. When used in conjunction with pre-existing gates, one or more of the devices of FIG. 1 can be attached at convenient points between the gate post and the gate not occupied by existing hinges.

Various changes in the devices chosen for purposes of illustration in the drawings will readily occur to persons skilled in the art having regard for the disclosure hereof. To the extent that such modifications and variations do not depart from the spirit of the invention, they are intended to be included within the scope thereof which is not limited to the devices specifically illustrated in the drawings but, rather, only by a just interpretation of the following claim.

Having fully described the invention in such manner as to enable those skilled in the art to understand and practice the same, the invention claimed is:

1. In a fence gate assembly including a stationary vertical gate post, a gate, hinge means connecting said gate to said post, and means for normally positioning said gate in the closed position, the improved combination hinge and automatic gate closer comprising:
   (a) a torsion coil spring having an upper and a lower end, positioned substantially vertically between said gate post and said gate;
   (b) a first hollow cap member receiving and frictionally engaging the upper end of said spring;
   (c) a second hollow cap member receiving and frictionally engaging the lower end of said spring;
   (d) means securing one of said cap members to said gate post without relative rotation between said cap member and said post; and
   (e) means securing the other of said cap members to said gate without relative rotation between said other cap member and said gate.

References Cited

UNITED STATES PATENTS
1,847,822 3/1932 Denton 49–386
2,724,142 11/1955 McNabb 49–386 XR

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