To all whom it may concern:

Be it known that I, Joseph S. Cole, a citizen of the United States, residing at Muncie, in the county of Delaware and State of Indiana, have invented a new and useful Combined Latch and Hinge, of which the following is a specification.

This invention relates to hangers for swinging closures such as doors and gates. The object of the invention is to provide an apparatus of this character whereby the door or gate may be operated without hinges or latches, thereby giving a free and even action on either edge of the door or gate, and which opens either in or out of its frame on either the right or left of the door or gate.

Another object is to so construct such an apparatus, that all danger of the door to which it is applied sagging or getting out of order is avoided.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed without departing from the spirit of the invention, in the accompanying drawings:

Figure 1 represents a front elevation of a door and its frame with this improved hanger shown applied, parts of the door being broken out and in section to disclose the mounting of the hanger.

Fig. 2 is a transverse section taken on the line 2—2 of Fig. 1.

Fig. 3 is a detail longitudinal section taken on the line 3—3 of Fig. 1.

Fig. 4 is a detail horizontal section taken on the line 4—4 of Fig. 1, and

Fig. 5 is a detail section taken on the line 5—5 of Fig. 4.

In the embodiment illustrated, the apparatus constituting this invention is shown applied to a door 1 mounted in a frame 2, but obviously it may be applied to any closure. The sides 3 and 4 of the frame are equipped near their upper and lower ends on their inner faces with pockets 5 to receive spring pressed locking bars 20 presently to be described.

Metal plates or strips 6 are mounted in these pockets 5 and incline gradually upward from their ends toward their centers as shown in Fig. 2. These strips 6 are arranged transversely of the door frame so that when the door is closed, from either side the bars 20 and 20 will ride on these plates 6 and be gradually forced back against the tension of their springs, and when they reach the crown of the straps they will bindingly engage them and hold the door against lateral movement.

The side edges of the door 1 are grooved longitudinally as shown at 7 and in each of these grooves are mounted for longitudinal sliding movement two rods 8 and 9 threaded at their opposed ends with which are connected rod operating members or hand grips 10 and 11. These grips 10 and 11 are substantially T-shaped in form, the shank or stem thereof being provided with a threaded aperture for engagement with the threaded ends of the rods in connection with which it is to be used. Coiled expansion springs 12 are arranged between the members 10 and 11 and are designed to normally project the rods 8 and 9 in opposite directions to cause their outer ends to project beyond the top and bottom edges of the door and to extend into pockets 13 in the door frame 2 when the door is closed, thereby locking the door in closed position.

Four of these pockets 13 are formed, one at each corner of the frame 2, two being located in the upper and two in the lower cross members thereof so that when the four rods are engaged therewith, the door will be held securely closed and cannot be opened until one pair of the rods is retracted. When one pair is retracted which is accomplished by pressing the members 10 and 11 toward each other, the other pair operate as pintles on which the door swings and which permit the door to open in either direction.

The door 1 has recesses 14 and 14 in its upper and lower ends respectively, and in which are located the locking bars 20 which are carried by plates 15 secured in said recesses.

The plates 15 are apertured at their ends for the passage therethrough of the outer ends of the rods 8 and 9, said plates extending over the pockets 13 and the apertures therein registering with said pockets.

A U-shaped bracket 16 is attached by its cross bar to each plate 15 near one end thereof and at a point spaced inwardly therefrom is secured an L-shaped bracket 17, a post 18
being arranged between these brackets and supporting a cog wheel 10. The post 18 is made U-shaped in form and is arranged on the plate 15 opening in a plane at right angles to the bracket 16, the arms of said post 18 being designed to straddle bars 20, 21 and 22 which are disposed in the recess at the end of the door and are guided in the brackets 16 and 17 which are apertured for the passage therethrough of said bars. The bars 20 and 21 are arranged in spaced relation and the opposed faces thereof have teeth which mesh with the cog wheel 19 so that the reciprocation of one of the bars will operate through said cog to reciprocate the other.

A coiled spring 24 is mounted on the innermost rod 21 between the legs of the bracket 16 and exerts its tension to normally hold the bar 20 in projected position and to return it to such position after it has been retracted.

The other end of plate 15 carries a substantially U-shaped bracket 25, one leg of which is shorter than the other and spaced inwardly from said bracket 25 is an L-shaped bracket 26 apertured for the passage therethrough of the bars 21 and 22 which extend entirely across the end of the door and between which is located another bar 20' which aligns with the bar 20 at the other end of the plate. The bar 20' and the bar 22 are provided on their opposed faces with rack teeth which mesh with a cog 27 supported in a bifurcated post 28 located between brackets 25 and 26. A coiled spring 29 is mounted on the rod 22 between the arms of the bracket 25 and operates to normally hold bar 20' in projected position and to return it to such position after it has been retracted.

The members 10 and 11 are mounted in recesses 30 formed in opposite side edges of the door 1, one pair of such members being located at either side of the door and have their finger grips projecting as shown at the right of Fig. 1 and in Fig. 5, the recesses 30 being covered by plates 31 having openings therein for the passage there-through and the movement of the ends of the members so that the members 10 and 11 may be moved toward each other against the tension of their springs 12 for retracting the rods 8 and 9 to withdraw them from the pockets 13 to release the door.

The rods 8 and 9 are provided at their outer ends with slots 32 and at points spaced inwardly from said slots with openings 23, see Fig. 3, through which the locking bars 20 and 20' are designed to project the slots 32 permitting the rods 8 to move longitudinally without affecting the bars 20 and 20'.

Mounted in the pockets 13 are outwardly bowed plates 35 having openings 36 therein to receive the outer ends of the rods 8 and 9 to assist in retaining said rods in said pockets and preventing wear.

In the use of this apparatus, the parts being mounted as shown in Fig. 1, when it is desired to open the door one pair of the latch members 10 and 11 are compressed to move the rods 8 and 9 toward each other a sufficient distance to disengage their outer ends from the sockets 13 and when said rods are so released, the door may be swung either in or out at the will of the operator, the bars 20 and 20' at the lower and upper ends thereof will ride out of the pockets 5 against the tension of their springs and automatically the bars 22 will be forced by springs 24 through the openings 23 in rods 8 and 9 on the opposite side of the door thus connecting the door to said rods which form pintles on which the door swings. When the door is closed the rods 20 are forced back by plates 5 and lock the door in closed position. The transversely locked bars are designed to retain the door locked on the opposite edge while it is being opened and closed on the other edge and without them the door could only be opened on one edge and if opened on the other edge would collapse.

It is of course understood that when the door is desired to be opened from the opposite side edge, the other pair of hand grips 10 and 11 are compressed in the same manner to release the rods at that side of the door, those at the other side operating as pintles.

By disengaging all four of the rods at both sides of the door, the door may be lifted bodily from its frame.

From the above description it will be obvious that a door hung as herein shown and described will be securely held against all possibility of its sagging, the engagement of the rods 20 and 20' with the pockets 5 preventing this.

I claim:

1. The combination with a supporting structure having an opening provided with a closure; of a hanger for said closure including a pair of longitudinally extending spring projected rods to enter sockets in the wall of said opening, means to retract said rods to release the closure, and transversely arranged spring projecting locking bars carried by said closure, metal strips arranged on said structure opposite the ends of said locking bars; said strips being bulged outwardly and inclining gradually upward from their ends toward their centers, said centers being designed to bindingly engage with said bars when the closure is closed, and held the closure against lateral movement, and means for releasing said locking bars.

2. The combination with a supporting structure, having an opening provided with a closure; of a hanger for said closure in-
including a pair of longitudinally extending spring projected rods to enter sockets in the wall of said opening, means to retract said rods to release the closure, transversely arranged spring projected locking bars carried by said closure to engage the side walls of said opening and hold the closure against lateral movement, said rods having elongated openings for the passage of said bars therethrough whereby the rods may be moved without affecting the bars.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature.

JOSEPH S. COLE.