

Oct. 25, 1927.

J. E. JIMMIS

1,646,820

TRAFFIC SAFETY GATE

Filed May 2, 1927

Fig. 1.

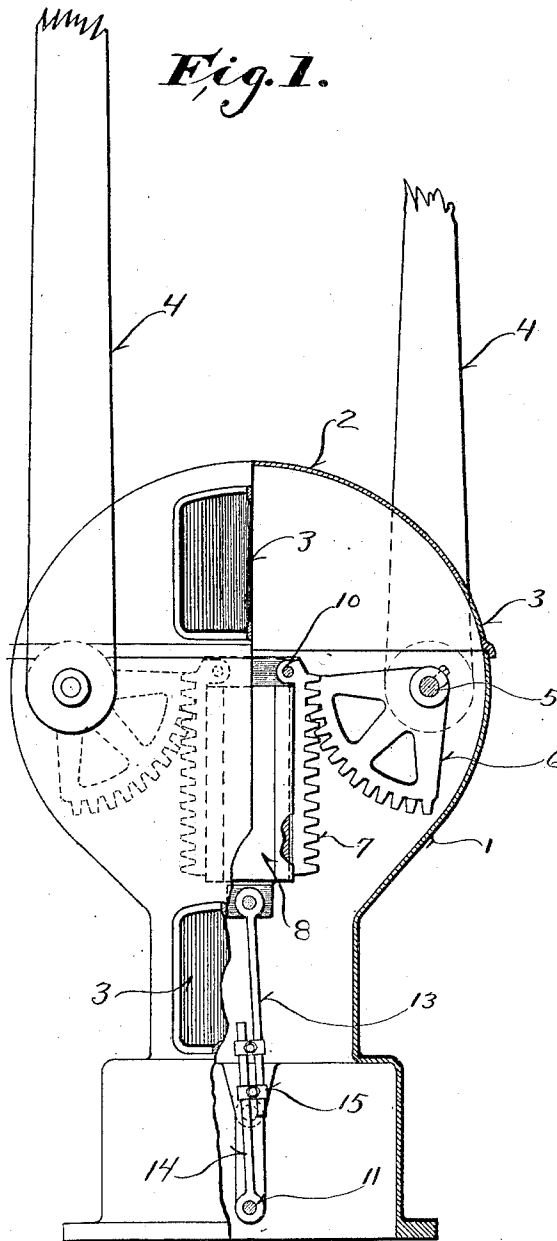
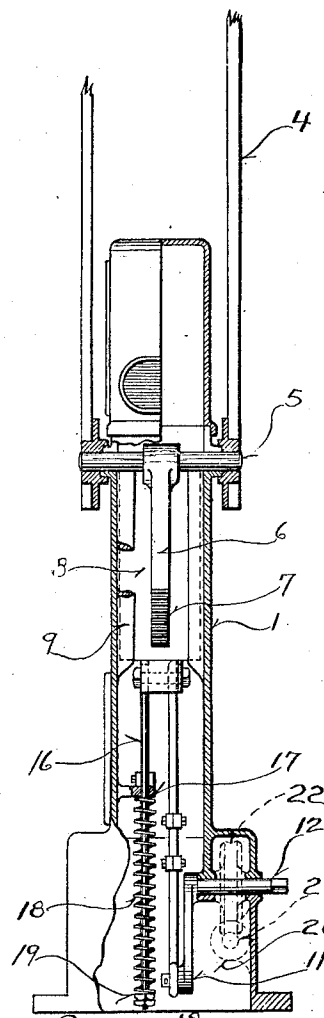


Fig. 2.



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TRAFFIC SAFETY GATE.

Application filed May 2, 1927. Serial No. 188,258.

This invention relates to traffic safety gates, such, for example, as gates used at railroad crossings. Objects of this invention are to provide a novel form of gate operating mechanism in which the gate arms are actuated by means of rack and pinion mechanism in turn operated from a crank, the mechanism being so constructed that the crank is permitted a complete revolution, thus dispensing with the necessity of a reversing motor or operated device.

Further objects are to provide a novel form of gate in which the gate arms are counterbalanced in a novel manner by mechanism enclosed within the housing of the head or main portion of the gate.

Further objects are to provide a gate construction of the character outlined above in which provision is made for the ready removal and replacement of the racks, and in which a main counterweight is supplemented by the action of a spring so that as the leverage of the descending gates increases, the counterbalance action of the mechanism also increases.

An embodiment of the invention is shown in the accompanying drawings in which:—

Figure 1 is a side elevation of the gate with parts broken away;

Figure 2 is a vertical sectional view at right angles to Figure 1.

Referring to the drawings, it will be seen that the gate comprises a housing 1 provided with a detachable upper portion or cap 2. Further, this housing is provided with inspection doors 3 which permit oiling, adjustment, or inspection of the parts.

The gate arms 4 are carried by rock shafts 5 which extend through the housing as shown in Figure 2, and each of these shafts carries a segmental gear 6. The gears 6 are operated by means of racks 7 which are carried by a counterweight or heavy sliding plunger 8. This plunger operates between guides 9 which may be integral with the sides of the housing 1, as shown most clearly in Figure 2. Preferably, the racks 7 are detachably held by means of pins 10 passing through their upper ends and into the counterweight so that they may be removed and replaced as occasion demands.

The lower end of the counterweight 8 is connected to a crank 11 carried by a rotary shaft 12 by means of an adjustable link or pitman composed of the parts 13 and 14. These parts are clamped together by means

of the clamps or clips 15, so that the exact position of the gate arms, with reference to either extreme position of the crank, may be readily attained. Further, it is to be noted that the counterweight is additionally guided by means of the rod 16 which passes through an apertured lug 17, and carries a compression spring 18, such spring bearing at one end against the lug 17, and at its other end against lock nuts 18 screwed upon the lower end of the rod 16 and provided for adjustment of the spring pressure.

The rotary shaft 12, which is in reality the crank shaft, may be driven in any suitable manner, as by electrical, pneumatic, or manual means. For the purpose of illustration, an electric motor 20 (see Figure 2) has been indicated as provided with a worm 21 meshing with a worm wheel 22, such worm wheel being rigidly carried by the shaft 12.

In operation, the motor is started and is operated a sufficient length of time to cause a half revolution of the shaft 12. This rocks the crank into its uppermost position and forces the counterweight or plunger upwardly. The racks transmit this motion to the segmental gears and, consequently, rock the gate arms approximately 90° into a horizontal position. When the motor is again started, the crank completes its revolution and the gate arms are, consequently, raised to their initial position.

It is to be noted that the plunger or counterweight may be made relatively heavy so as to approximately balance the weight of the gate arms and associated mechanism. However, as the leverage of the gate arms increases as they are swung towards horizontal position, the spring 18 exerts greater and greater downward pressure and, consequently, supplements the action of the counterweight and balances the additional leverage of the gate arm.

It is to be noted particularly that the adjustable pitman could, of course, be replaced by a fixed pitman but the adjustable feature is preferred as it permits the accurate adjustment of the gate arms in their initial and final position.

It will be seen further that the entire device is very simple and of rugged and practical construction. Further, it will be seen that reversal of the driving motor is not required. The motor operates in the same direction both for raising and for lowering the gate.

Although the invention has been described in considerable detail, such description is intended as illustrative rather than limiting as the invention may be variously embodied and as the scope of such invention is to be determined as claimed.

I claim:

1. A safety gate comprising a housing, a relatively heavy plunger slidably carried within said housing and adapted to execute vertical reciprocatory motions, said plunger having a pair of racks carried thereby, a pair of rock shafts carried by said housing and having segmental gears meshing with said racks, a pair of gate arms carried by said rock shafts, a rotary shaft carried by said housing, means for operating said shaft, a crank carried by said rotary shaft, and a pitman connecting said plunger and said crank.

2. A safety gate comprising a housing, a relatively heavy plunger slidably carried within said housing and adapted to execute vertical reciprocatory motions, said plunger having a pair of racks carried thereby, a pair of rock shafts carried by said housing and having segmental gears meshing with said racks, a pair of gate arms carried by said rock shafts, a rotary shaft carried by said housing, means for operating said shaft, a crank carried by said shaft, and a pitman connecting said plunger and said crank, said pitman being adjustable.

3. A safety gate comprising a main housing, a plunger guided by said housing, a rack removably carried by said plunger, a segmental gear mounted upon a transverse shaft and meshing with said rack, a gate arm carried by said shaft, a crank shaft mounted adjacent the lower portion of said housing, and a pitman connecting said plunger and said crank.

4. A safety gate comprising a main housing, a relatively heavy counterweight plunger slidably carried within said housing and guided for vertical motion, a pair of racks carried by said plunger, a pair of transverse rock shafts carried by said housing and having gate arms at their outer ends, segmental gears secured to said rock shafts and meshing with said racks, a downwardly extending rod secured to said plunger and passing through an apertured lug carried by said housing, a compression spring loosely surrounding said rod and operatively connected thereto at one end and bearing against said lug at the other end, a crank shaft mounted within said housing, a pitman connecting said plunger and said crank, a worm wheel rigidly mounted upon said crank shaft, and a worm for driving said worm wheel.

In testimony that I claim the foregoing I have hereunto set my hand at Oshkosh, in the county of Winnebago, and State of Wisconsin.

JOHN E. JIMMIS.