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AUTOMATIC RAILWAY GATE.
APPLICATION FILED FEB. 9, 1905.

2 SHEETS—SHEET 1.

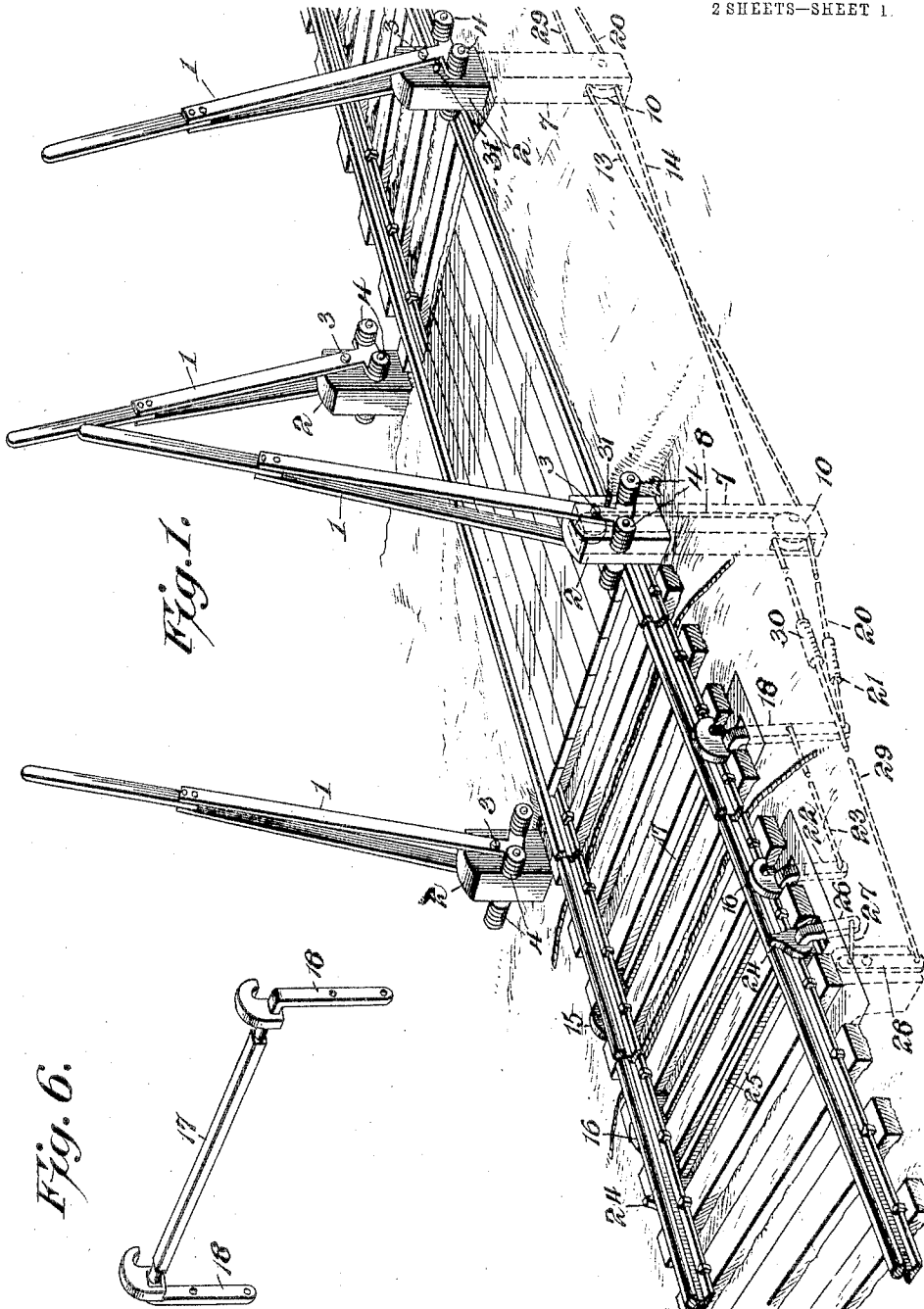


Fig. 1.

Fig. 6.

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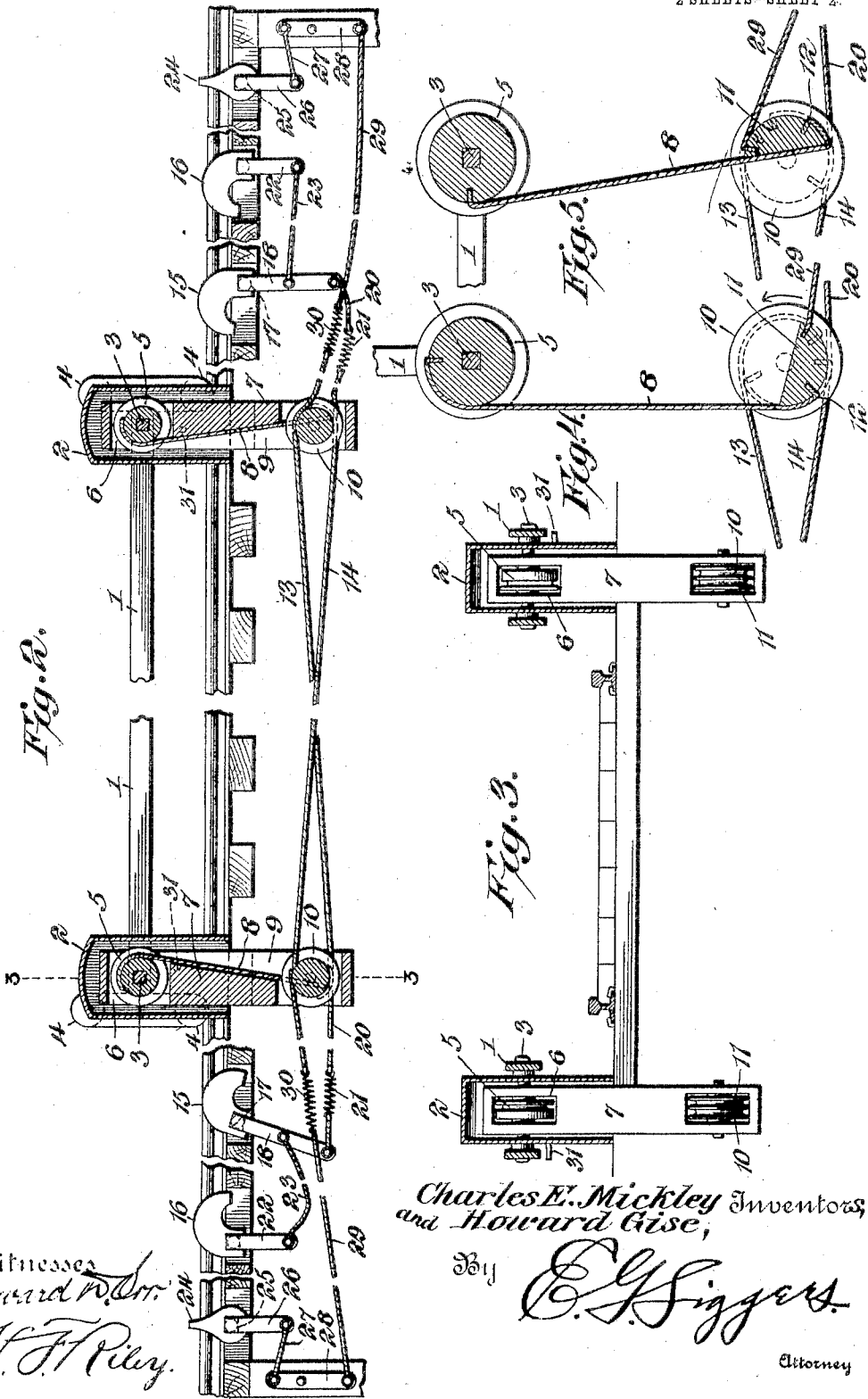
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE

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AUTOMATIC RAILWAY-GATE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, CHARLES E. MICKLEY and HOWARD GISE, citizens of the United States, residing at York, in the county of York and State of Pennsylvania, have invented a new and useful Automatic Railway-Gate, of which the following is a specification.

The invention relates to improvements in automatic railway-gates.

The object of the present invention is to improve the construction of automatic railway-gates and to provide a simple and comparatively inexpensive one of great strength and durability adapted to be readily mounted at railway-crossings and capable of being automatically operated by a train to indicate the approach of the same before closing and to close before the passage of a train and to open after a train has passed the crossing.

A further object of the invention is to provide a simple and efficient device designed for retaining automatically-closing gates in an open position and adapted to enable the force which closes the gates to be employed for retaining them in their open position, whereby after the gates at a crossing have been opened they will be positively retained in such position until a train has proceeded the desired distance beyond the crossing.

With these and other objects in view the invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended, it being understood that various changes in the form, proportion, size, and minor details of construction within the scope of the claims may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings, Figure 1 is a perspective view of an automatic railway-gate constructed in accordance with this invention and arranged at a crossing, the gate members being arranged at an inclination for indicating the approach of a train. Fig. 2 is a longitudinal sectional view of the same, the gate members being closed. Fig. 3 is a transverse sectional view on the line 33 of Fig. 2. Fig. 4 is a detail view of the upper and lower pulleys, illustrating the arrangement of the same and the operating connections when the gate members are open. Fig. 5 is a similar view illustrating the arrangement of the pulleys and the connections when the gate members are closed.

Fig. 6 is a detail perspective view of one of the rock-shafts.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 designates gate members, which are in the form of mast-gates and which are mounted on hollow posts or casings 2. The hollow posts or casings extend upward from the ground, and the gate members, which may be of any desired construction and which preferably straddle the posts or casings, are pivoted to the same by means of transverse shafts or spindles 3, which pass through the gate members near the lower ends thereof. The lower arms of the gate members are provided with weights 4, which may be varied in size and number to provide a sufficient weight for counterbalancing the upper or long arms of the gate members and to cause the latter to open automatically when they are free to move. The gates when open are arranged in a vertical position, and they are tilted inwardly or inclined, as illustrated in Fig. 1 of the drawings, on the approach of a train by the means hereinafter described in order to provide a visible signal for indicating the presence of such train. The gates when closed are swung downwardly to a horizontal position, as illustrated in Fig. 2 of the drawings. The shafts or spindles 3, which constitute the pivots of the gate members, are provided with centrally-arranged squared portions and receive upper pulleys 5, which may be keyed or otherwise secured to the shafts or spindles 3. The pulleys 5, which are mounted in openings 6 of uprights or supports 7, are grooved and receive the upper ends of flexible connections 8, which may consist of wire cables, chains, or the like and which are secured to and arranged on the upper pulleys and adapted to be partially unwound therefrom to rotate the shafts or spindles 3 for swinging the gate members downwardly. When the gate members are swung upwardly by their actuating-weights, the upper portions of the flexible connections 8 will be wound on the pulleys 5. The uprights or supports 7 are provided with longitudinal slots or openings 9 to receive the upwardly-extending flexible connections 8. The lower end of each flexible connection 8 is connected with a lower pulley 10, consisting of a complete pulley or sheave, and a mutilated pulley or sheave 11. The mutilated pulley or sheave 11, which is arranged at one

side of the pulley or sheave 5 and which is rigid with the same, consists of a segment of less than a semicircle, and the lower end 12 of the upwardly-extending flexible connection is attached to the mutilated pulley or sheave, as clearly shown in Figs. 4 and 5 of the accompanying drawings. When the lower pulley 10 is rotated in the direction of the arrow of Fig. 4 of the drawings, the mutilated pulley or sheave is carried around to the right and it occupies the right-hand portion of the lower pulley. (Shown in Fig. 5.) This rotary movement of the segment 11 carries the upwardly-extending connection to a point slightly beyond the center, whereby the weights of the gate members will hold the lower pulley against backward movement and will thereby maintain the gate members in their open position. The lower end of the upright flexible connection 8 may be eccentrically connected with the lower pulley 10 or other rotary element by any suitable means. The gate members are released and permitted to open automatically by slightly rotating the lower pulleys 10 to carry the flexible connections 8 to the opposite side of the center. This slight rotation is effected by tripping mechanism hereinafter explained.

The gate members, which are arranged in pairs at opposite sides of a railroad-track at a crossing, are caused to operate in unison by means of intermediate flexible connections 13 and 14 crossing each other and each extending from the top of one lower pulley to the bottom of the opposite lower pulley at the same side of the track. By this construction when one of the lower pulleys is rotated by the means hereinafter described the other will be correspondingly rotated and the gate members will be caused to swing upward and downward in unison. The lower pulleys are actuated to swing the gate members downwardly by inner and outer train-actuated operating devices, designed to be located at suitable distances from the crossing to first tilt the gate members to the position shown in Fig. 1 and then close them as shown in Fig. 2. The inner train-actuated operating devices each consist of a transverse rock-shaft 17, having round end portions arranged in suitable bearings at opposite sides of the track and provided with depending terminal arms 18, which may be formed integral with the shaft 17 or be attached thereto in any desired manner. The rock-shaft 17 also carries opposite substantially segmental arms 15, designed to be located at the outer sides of the rails in position to be engaged and depressed by the treads of the wheels. The segmental arms 15, which are curved and tapered, are provided at their inner ends with apertures to receive the shaft 17, and they are suitably secured to the same. The rock-shafts are of a length to extend entirely across the track, and when the automatic railway-gate is applied to

a double track the rock-shafts will be of a length to extend from the outer rail of one track to the outer rail of the other track and the curved arms will be duplicated. The lower ends of the depending arms 18 are connected by flexible connections 20 with the lower pulleys, and the flexible connections, which may be constructed in any desired manner, are arranged on the lower pulleys and adapted to be partially unwound therefrom to rotate the said lower pulleys for swinging the gate members downwardly. The flexible connections 20 are preferably provided with cushioning-springs 21 to relieve the connections of the jar and vibration incident to the wheels of a train passing over the operating devices. The outer operating devices, which are designed to be located a sufficient distance from the inner operating devices to permit the gates to be tilted and maintained in such position a sufficient length of time to serve as a signal, are constructed substantially the same as the inner operating devices and consist of rock-shafts having segmental arms 16 and depending arms 22. The depending arms 22 are connected with the arms 18 by short flexible connections 23. The tapering arms of the outer operating devices do not extend as far above the rails as the inner operating devices, so that when they are depressed the lower pulleys will be rotated only a sufficient distance to tilt the gate members. When the gate is operated by depressing the curved arms of the operating devices at one side of the crossing, the flexible connections of the operating devices at the opposite side of the crossing will be slackened, so that a train leaving the crossing will not affect the gate by depressing said operating devices. After a train has left the crossing the gate members are released and permitted to open by means of tripping devices 24, consisting of upwardly-tapered arms extending from rock-shafts 25 and adapted to be swung outwardly away from the crossing to release the gate members. The rock-shafts 25 are provided with depending arms 26, which are connected by short flexible connections 27 with the upper ends of upright levers 28. The upright levers 28 are fulcrumed between their ends on suitable supports, and their lower arms are connected by flexible connections 29 with the upper portions of the lower pulleys, whereby the latter will be rotated in a direction to carry the upwardly-extending flexible connections backward over the center. When the tripping device is swung inwardly, the flexible connection 27, which extends to the top of the lever 28, is simply slackened and does not affect the gate. The flexible connections 29 are provided with suitable cushioning-springs 30 to take up any jar or vibration, and the opening movement of the gate members is limited by suitable stops 31, which in practice will be in the form of cushions.

In practice the operating mechanism will

be housed within suitable casings; but for convenience of illustration these have been omitted. Also any suitable means may be provided for sounding a bell or other signal on the approach of a train.

It will be seen that the automatic railway-gate is exceedingly simple and inexpensive in construction, that it possesses great strength and durability, and that it is positive and reliable in operation. Furthermore, it will be clear that the gate first operates as a signal for warning persons of the approach of a train and that owing to this operation there is no liability of a person or vehicle becoming caught between the gate members by a sudden downward movement of the same.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination with an automatically-opened gate member, of a flexible connection for closing the gate member, and a rotary element having the flexible connection eccentrically connected with it and arranged to be carried by the rotary movement of the said element beyond the center, whereby the means for opening the gate member will serve to retain the same in its closed position, and means for moving the rotary element in the opposite direction to release the gate member.

2. The combination of a movable member, means for automatically moving the same in one direction, a rotary element, connecting means between the said member and the rotary element, said connecting means being arranged eccentrically with relation to the rotary element and adapted to be carried beyond the center by the rotary movement of such element to form a lock for the said member, and means for moving the rotary element in the opposite direction to release the said member.

3. The combination of a gate member having means for moving it in one direction and provided with a pulley, connecting means arranged to be wound on and unwound from the said pulley, and a rotary element having the said connecting means eccentrically connected to it and arranged to be carried beyond the center, whereby it is adapted to form a lock for holding the gate.

4. The combination of a gate member having a pulley and provided with means for automatically moving it in one direction, a rotary element provided with a segment, and a

flexible connection extending from the pulley to the segment and arranged to be carried beyond the center of the rotary element by the movement thereof to form a lock for holding the gate member.

5. The combination of a gate member provided with means for automatically moving it in one direction, an upper pulley movable with the gate member, a lower pulley having a segment, a flexible connection extending from the upper pulley to the segment and arranged to be carried by the latter beyond the center of the lower pulley, and operating mechanism for rotating the lower pulley.

6. The combination with a gate member provided with means for moving it in one direction, of a rotary element, means for connecting the gate member with the rotary element, said connecting means being eccentrically connected to the rotary element and arranged to be carried beyond the center by the rotary movement thereof, and an oscillatory tripping device having an arm for moving the same backward to release the gate member.

7. The combination with a gate member provided with means for moving it in one direction, of a rotary element, means for connecting the gate member with the rotary element, said connecting means being eccentrically connected to the rotary element and arranged to be carried beyond the center by the rotary movement thereof, a tripping device having an arm, a lever fulcrumed between its ends, and means for connecting the tripping device with one arm of the lever and for connecting the other arm of the latter with the rotary element.

8. The combination of gate members, means for automatically moving the same in one direction, inner and outer train-actuated operating devices, means for connecting the operating devices with the gate members, said connecting means being provided with a lock for holding the gate members, and tripping devices for releasing the gate members.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

CHARLES E. MICKLEY.
HOWARD GISE.

Witnesses:

JANE FACKLER,
JACOB E. WEAVER.