(No Model.) 2 Sheets—Sheet 1.

S. KELLER & W. A. SHARP.

AUTOMATIC RAILWAY CROSSING SIGNAL.

No. 533,600. Patented Feb. 5, 1895.

FIG. 1.

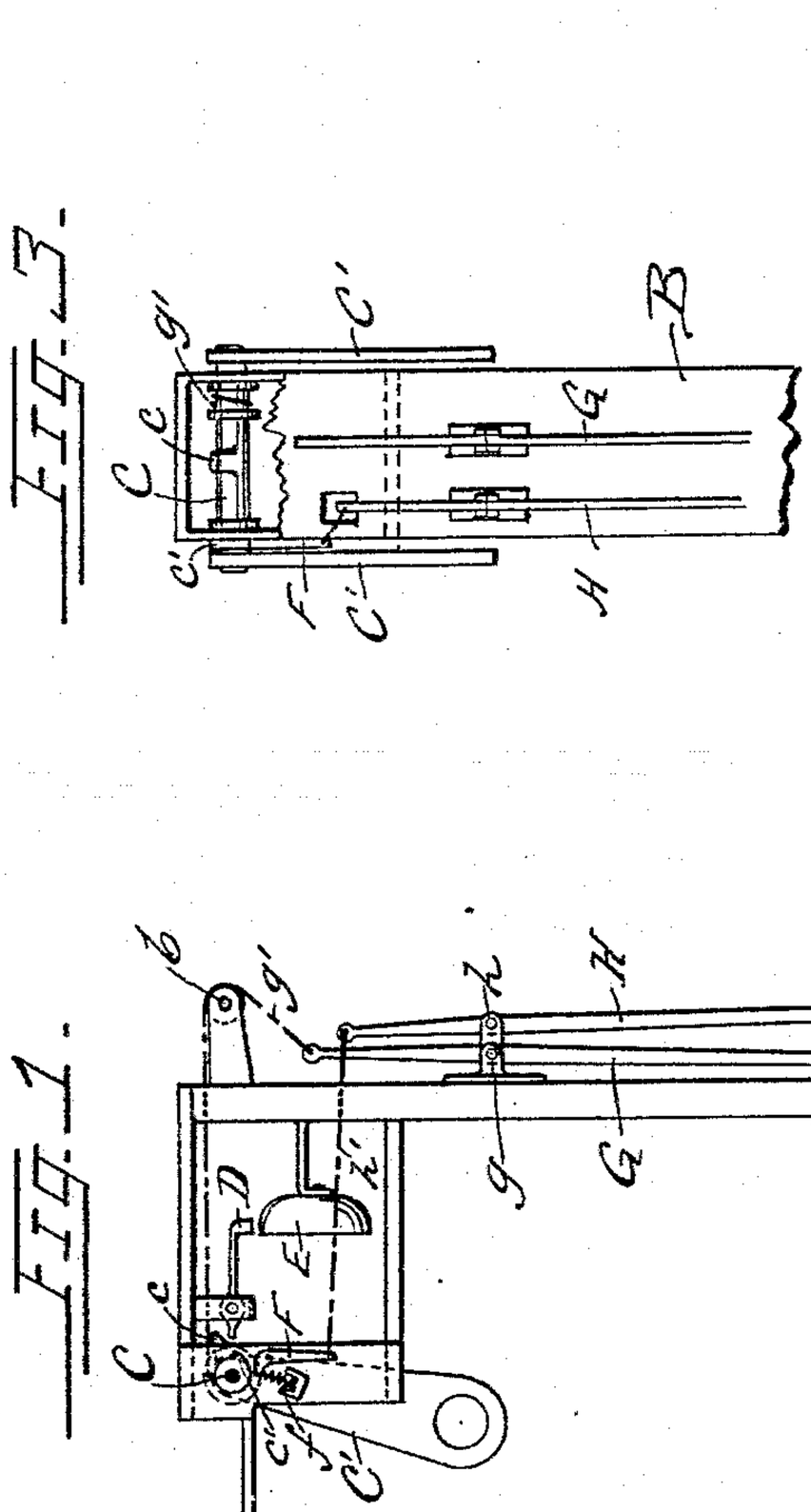

FIG. 3.

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(No Model.) 2 Sheets—Sheet 2.

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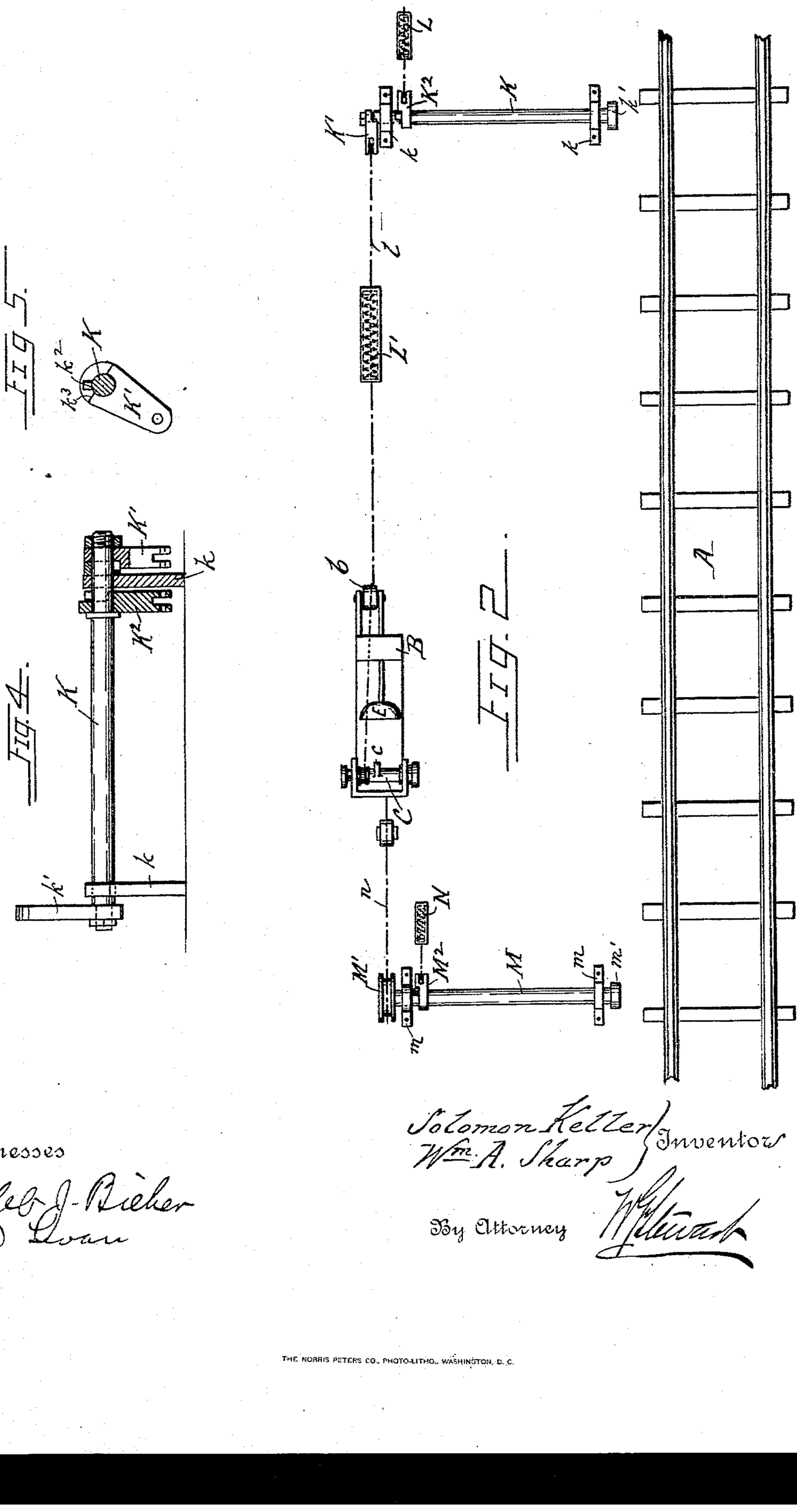

FIG. 2.

FIG. 3.

FIG. 4.

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UNITED STATES PATENT OFFICE.

SOLOMON KELLER AND WILLIAM A. SHARP, OF READING, PENNSYLVANIA.

AUTOMATIC RAILWAY-CROSSING SIGNAL.

SPECIFICATION forming part of Letters Patent No. 533,600, dated February 5, 1895.

Application filed August 6, 1894. Serial No. 519,546. (No model.)

To all whom it may concern:

Be it known that we, SOLOMON KELLER and WILLIAM A. SHARP, citizens of the United States, residing at Reading, county of Berks, State of Pennsylvania, have invented certain Improvements in Automatic Railway-Crossing Signals, of which the following is a specification.

This invention relates to that class of signals which are intended particularly to give notice and warning automatically of the approach of a train to a crossing.

The invention is described in connection with the accompanying drawings and is specifically pointed out in the claims.

Figure 1 is a side elevation of the complete apparatus, one of the signal arms being removed from its shaft to show the locking or spring catch mechanism more clearly. Fig. 2 is a plan view of the same showing the roof of the signal staff and the trip hammer for the gong removed. Fig. 3 is an edge view of the upper portion of the signal arm staff partly broken away to show the signal arm shaft. Fig. 4 is a somewhat enlarged longitudinal elevation, partly in section, of the transverse operating shaft K, and Fig. 5 is a cross sectional view of the same.

A represents the roadbed of the railway and B a signal staff located at any desired point a greater or less distance to one side of the track. At the top of this staff in suitable bearings is mounted a shaft C to the outer ends of which are fixed signal arms C′ which are intended and adapted to normally hang vertically as indicated in Fig. 1 but are raised to horizontal position by an approaching train as will hereinafter be described.

P represents a fixed lamp which may be used for night service in connection with red glass set in the outer ends of the signal arms.

The signal arm shaft C is operated by means of a chain or cord g' one end of which is fixed to it while the opposite end, after passing over a pulley b is connected to the upper end of a vertical lever G pivoted intermediately at g to the staff. The lower end of this lever has a connection l to a crank arm K′ mounted on a transverse operating shaft K which is of sufficient length to reach from the track outward to a distance corresponding with the location of the signal staff and is supported in suitable bearing pieces k. The end of this shaft adjacent to the track is provided with an arm k' which is adapted to come in contact with a projection provided on the side of the locomotive truck so that the latter in passing in the direction indicated by the arrow in Fig. 1 will turn the shaft and with it the crank arm K′ so as to operate the lever G and so raise the signal arms on the shaft C. As the signal arms are thus raised to horizontal position a stop c' on the shaft C passes beyond the point of a catch F pivoted to the staff and the latter is pressed outward by a spring f so as to engage the stop c' and thus lock the arms in horizontal position though the shaft K shall have been returned to its original position by the action of a spring L′ provided between the opposite ends of the connection l. At the same time that the signal arms are raised a gong or bell E is also sounded by the action of a cam or projection c on the shaft C upon a trip hammer D which is suitably pivoted.

The lowering of the arms is effected automatically by means of an entirely separate mechanism comprising a transverse shaft M having a head m' which is similarly operated by the passage of the locomotive, being connected by a chain n to the lower end of a lever H arranged parallel with the lever G and connected at its upper end to the spring catch F. As the train passes the shaft M in the direction of the arrow the shaft C is thus released and the signal arms are free to drop to their normal vertical position, while the shaft M is returned to its original position by the action of a spring N′ which is located between the ends of the connection n. This shaft has its bearings in the standards or frames m.

To provide for the passage of a train in an opposite direction upon the track without operating the signal or interfering with its proper setting for the next train running in the direction of the arrow, we provide crank arms K′, K^2 and M^2 on the shafts K and M which are mounted loosely on the shafts so as to be rotated with them only in one direction by the engagement of shoulders as k^3 on the crank arms with projections as k^2 on the shafts.

Referring to the shaft K the crank K′ will

be rotated with it only when moved as indicated by the arrow, while the crank K^2 will only be moved with it in the opposite direction against the tension of a spring L which returns the shaft to its operative position.

The crank M^2 on the shaft M is locked to the shaft (by means similar to those for locking cranks K′ and K^2 to shaft K) only when the shaft is rotated by a train running in the same direction as locks said crank K^2 to its shaft, and it is provided with a spring N which acts upon it to return the shaft to its normal position when the train has passed from over the shaft.

The shafts K and M may evidently be of any desired length so as to run under a number of intervening tracks; and they may be located at any desired distance from the signal in either direction, so as to adapt our automatic apparatus to the safety block system.

What we claim is—

1. The combination with the shaft carrying the signal arm, of a shaft adjacent to the track, said shaft having oppositely set cranks loosely mounted thereupon, one of said cranks having connection with the signal arm and being provided with means for locking it to the shaft when the latter is operated by a train running in one direction, and the other of said cranks having means for locking it to the shaft when the latter is operated by a train running in the opposite direction, and a spring connected to said latter crank and serving to return the shaft to its normal position, substantially as described.

2. The combination with the shaft carrying the signal arm, and the shaft located adjacent to the track and having projections, of oppositely set cranks—as K′ K^2—loosely mounted on said latter shaft and provided with shoulders, said cranks, shoulders and pins being so arranged that one crank will be locked to the shaft only when the shaft is rotated in one direction, and the other crank locked to the shaft only when the latter is rotated in the other direction, connections between crank K and the first mentioned shaft, and a spring acting upon crank K^2 to return the shaft to its operative position, substantially as described and for the purposes specified.

3. The combination with the shaft carrying the signal arm, a shaft K adjacent to the track having connection with said first-mentioned shaft, a means for returning said shaft K to its normal position when the train has passed beyond it, and means for retaining the signal arm in horizontal position, of a shaft M operated by the train for releasing said retaining means, a spring for returning said shaft M to its normal position when the train has passed beyond it, a crank loosely mounted upon said shaft M and provided with means locking it thereto only when the shaft is rotated in a certain direction, and a spring engaging said crank, substantially as described.

4. The combination with the shaft carrying the signal arm, a shaft K adjacent to the track, oppositely set cranks loosely mounted upon said shaft K, one of said cranks having connection with the signal arm and provided with means for locking it to the shaft when the latter is operated by a train running in one direction, and the other of said cranks having means for locking it to the shaft when the latter is operated by a train running in the opposite direction, and a spring engaging said latter crank, a retaining mechanism for the signal arm, a shaft M connected with said retaining mechanism and serving to release the same when engaged by a train, a spring for returning said shaft M to its normal position, a crank mounted loosely upon said shaft M and provided with a means which locks it thereto only when the shaft is rotated by a train running in a certain direction, and a spring engaging said crank, substantially as described and for the purpose specified.

5. The combination with the shaft carrying the signal arm, and the shaft adjacent to the tracks, of cranks loosely mounted upon the latter shaft, and means for locking said cranks to their shaft, one of said cranks being connected with the first-mentioned shaft and locked to and moved with its shaft only when the latter is rotated in a certain direction, and the other of said cranks being locked to and moved with its shaft only when the latter is rotated in a direction opposite that in which it moves the first-mentioned crank, substantially as described and for the purposes specified.

6. The combination with the shaft C and with shafts K and M, of cranks K′ and M^2 loosely mounted upon said shafts K and M, means for locking said cranks to their respective shafts when the latter are operated by a train running in a certain direction, a connection between crank K and shaft C, a signal arm upon said latter shaft, a detaining mechanism for said signal arm, said detaining mechanism being connected with said crank M^2, a crank K^2 loosely mounted on shaft K, means for locking said latter crank to its shaft when the latter is rotated by a train running in a direction opposite that above referred to, and means for returning said shafts and cranks to their normal positions, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

SOLOMON KELLER.
WILLIAM A. SHARP.

Witnesses:
CAMERON E. STRAUSS,
WASHINGTON P. PFLUM.