(No Model.) 4 Sheets—Sheet 1.

J. RAMSEY, Jr., E. W. HARDEN & C. M. WILDER.

ELECTRIC SIGNAL AND SWITCH MOVING MECHANISM.

No. 458,489. Patented Aug. 25, 1891.

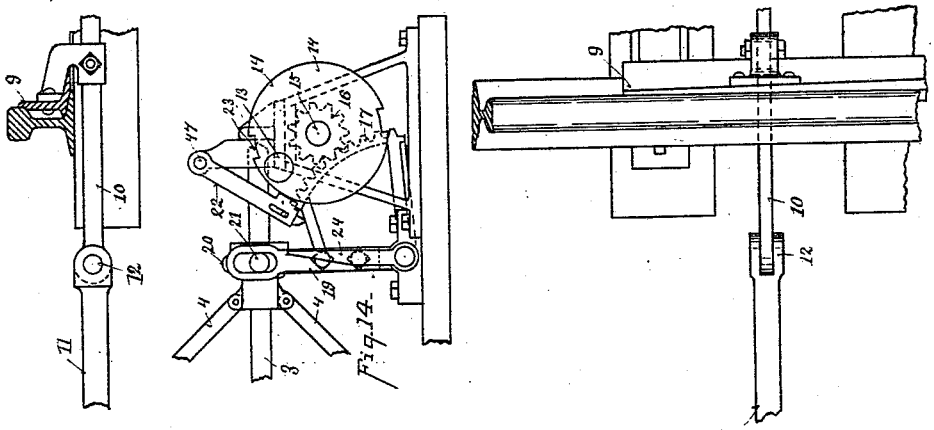


Fig. 1a.

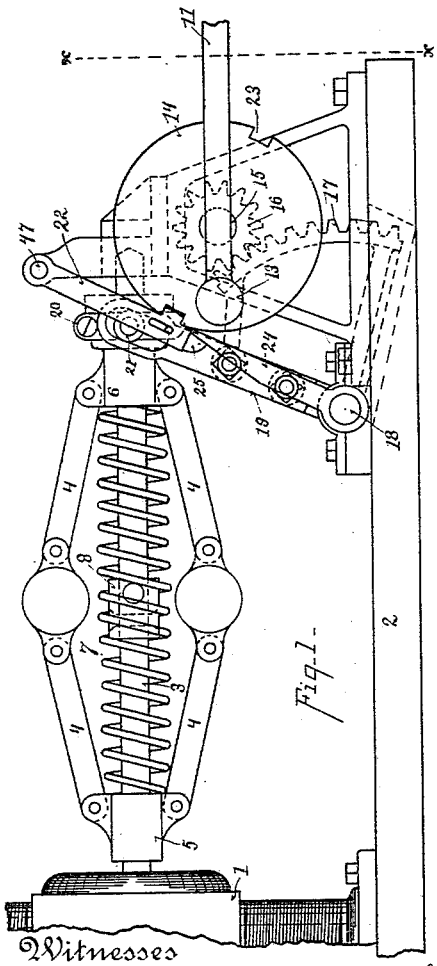


Fig. 1.

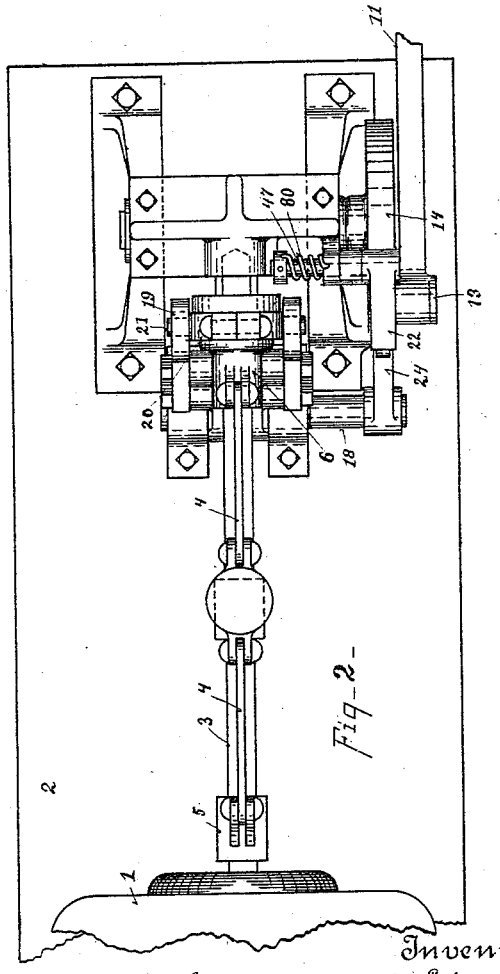


Fig. 2.

Witnesses
C. W. Miles
T. Simmons

Inventors
Joseph Ramsey Jr. Charles Morris Wilder & Edward W. Harden
By their Attorneys Wood & Boyd

(No Model.) 4 Sheets—Sheet 2.

J. RAMSEY, Jr., E. W. HARDEN & C. M. WILDER.

ELECTRIC SIGNAL AND SWITCH MOVING MECHANISM.

No. 458,489. Patented Aug. 25, 1891.

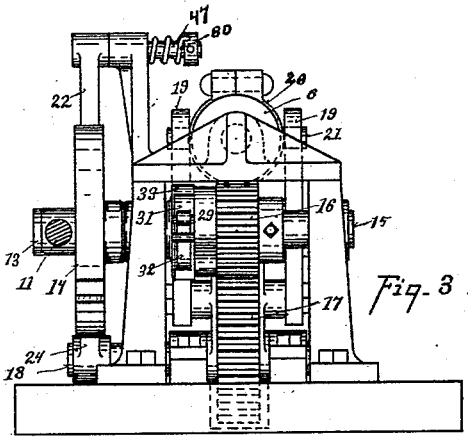
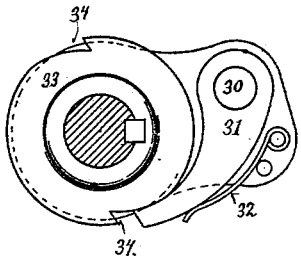


Fig. 3.

Fig. 4.



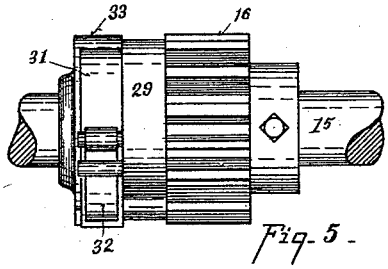


Fig. 5.

Fig. 7.

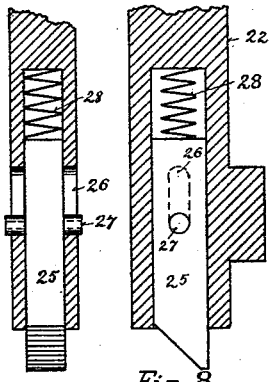
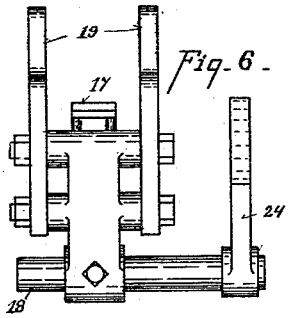


Fig. 8.

Fig. 6.



Witnesses
C. W. Wilder
T. Simmons

Joseph Ramsey Jr. Inventors
Charles Morris Wilder and Edward W. Harden
By their Attorneys Bakewell & Boyd

(No Model.) 4 Sheets—Sheet 3.

J. RAMSEY, Jr., E. W. HARDEN & C. M. WILDER.

ELECTRIC SIGNAL AND SWITCH MOVING MECHANISM.

No. 458,489. Patented Aug. 25, 1891.

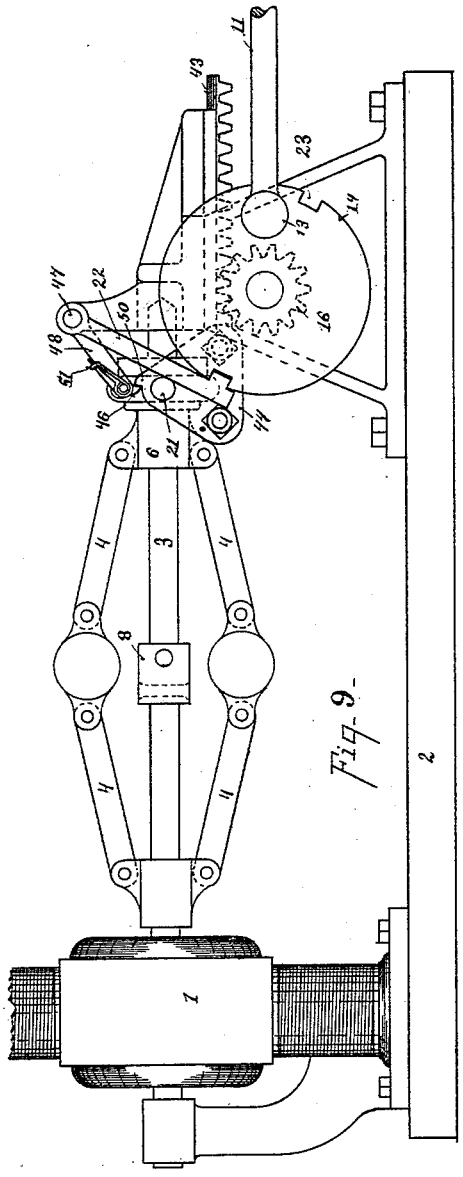


Fig. 9.

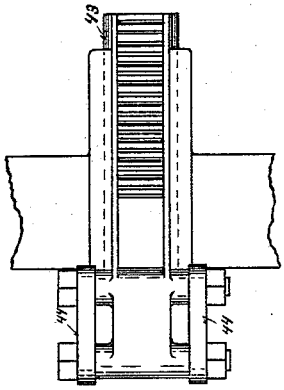


Fig. 11.

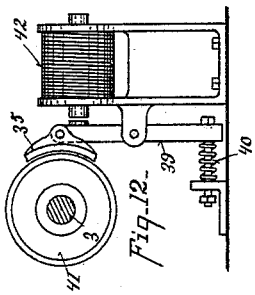


Fig. 12.

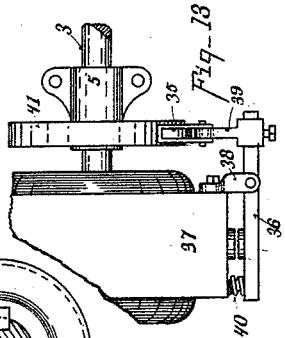


Fig. 13.

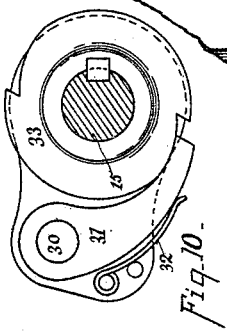


Fig. 10.

Witnesses
C. W. Miles
T. Summers

Joseph Ramsey Jr Inventors.
Charles Morris Wilder & Edward W. Harden
By their Attorneys Woodcock & Boyd

(No Model.) 4 Sheets—Sheet 4.

J. RAMSEY, Jr., E. W. HARDEN & C. M. WILDER.

ELECTRIC SIGNAL AND SWITCH MOVING MECHANISM.

No. 458,489. Patented Aug. 25, 1891.

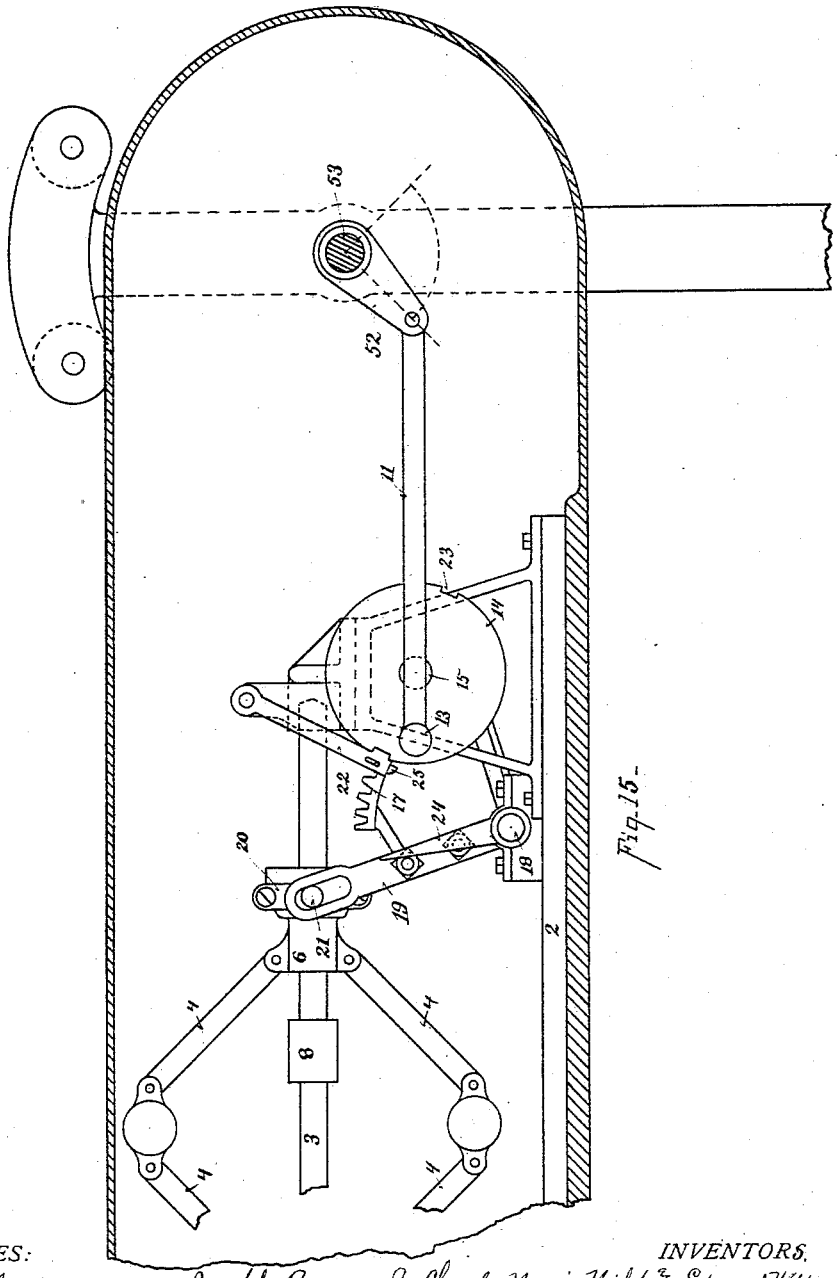


Fig. 15.

WITNESSES:

C. W. Miles.

T. Simmons

INVENTORS.

Joseph Ramsey Jr. Charles Morris Wilder & Edward W. Harden

BY Wood & Boyd

ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOSEPH RAMSEY, JR., EDWARD W. HARDEN, AND CHARLES MORRIS WILDER, OF CINCINNATI, OHIO, ASSIGNORS TO SAID RAMSEY, JR., AND FREDRIC C. WEIR, OF SAME PLACE.

ELECTRIC SIGNAL AND SWITCH MOVING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 458,489, dated August 25, 1891.

Application filed February 5, 1891. Serial No. 380,335. (No model.)

To all whom it may concern:

Be it known that we, JOSEPH RAMSEY, Jr., EDWARD W. HARDEN, and CHARLES MORRIS WILDER, citizens of the United States, and residents of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Electric Signal and Switch Moving Mechanism, of which the following is a specification.

The object of our invention is to provide a device which can be operated by electricity to move a switch-rail, signal, or gate, and is so constructed that the opening and closing of the same can be effected by the rotation of the armature of the motor employed, and so that the motive force is arrested at the completion of each movement—that is, the device will be locked when the switch, gate, or signal has been either opened or closed, whether the armature is stopped in its rotation or otherwise—and so that by the rotation in one direction alone the device to be moved is either opened or closed by the starting of the motor, which is employed as the moving power. By this construction the moving of the switches, signals, or gates in a railroad system may be done at a central office by simply cutting in and out of circuit the motor to open the switch, or to close it, as the case may be, so that any number of switches may be under the control of a single attendant.

The various features of our invention will be fully set forth in the description of the accompanying drawings, making a part of this specification, in which—

Figure 1 is a side elevation of our improvement in position for use. Fig. 2 is a top plan view of Fig. 1. Fig. 3 is an end view on line *x x*, Fig. 1. Fig. 4 is a side view of the transmitter. Fig. 5 is a top view of the same. Fig. 6 is a detail view of transmitting and tripping mechanism. Fig. 7 is an enlarged longitudinal sectional elevation of the tripping-lever. Fig. 8 is a transverse view of Fig. 7. Fig. 9 is a modification of Fig. 1. Fig. 10 is an elevation of the transmitter employed in Fig. 9. Fig. 11 is a bottom plan view of the rack-bar. Fig. 12 is an elevation of the brake mechanism. Fig. 13 is a modification of Fig. 12. Fig. 14 is a side elevation showing the link-moving mechanism in position of part movement. Fig. 15 is an elevation of our invention adapted to a gate or signal.

1 represents an electric motor; 2, the base on which the same is placed.

3 represents the driving-shaft of the motor.

4 represents links for transmitting motion from shaft 3 to the switch-moving device. One end of said system of links is connected to the collar 5, which is keyed or rigidly connected to shaft 3. The other end of the system is connected to the sliding sleeve 6, so that the rotation of the motor-shaft imparts a gyratory motion to the links.

7 represents a spring, which serves the purpose, chiefly, of pushing the sleeve 6 back when the motor is cut out of circuit.

8 represents a stop, which is attached to shaft 3, against which the sleeve 6 strikes. This stop might be made upon the link joints or arms; but it is not absolutely essential in our device, as we have provided a locking mechanism to arrest the movement of the transmitter at each half of the revolution; but said stop is a desirable auxiliary.

9 represents one of the pair of switch-rails; 10, the switch-bar; 11, a pitman, which is hinged by center 12 to the switch-bar at one end and to the crank-pin 13 at the opposite end.

14 represents a crank-wheel keyed upon shaft 15; 16, a gear-wheel loosely attached to shaft 15. Said gear-wheel is rotated by the segmental rack 17, oscillating upon shaft 18, to which it is keyed.

19 represents a pair of rocking arms journaling upon said shaft 18 and connected to the segment 17 upon opposite sides by bolts. Said rocking arms are loosely hinged to the collar 20 by stud 21. Said collar 20 is swiveled upon the sleeve 6 and moves laterally with it; but the sleeve 6 revolves, while the collar 20 is non-rotating.

22 represents a lock-lever provided with a lug engaging in notches 23 of the disk 14. Said notches are opposite each other and with the locking-lever arrest the movement at the end of each half-revolution of said crank-shaft, the parts being constructed so that the

swing is moved—say opened—at one half the revolution of the crank-wheel and closed by the other half of the revolution.

24 represents a trip, which is operated to lift the lever 22 out of engagement at the initial movement of the shaft 3 in starting the movement of the transmitting parts. The engagement between trip 24 and the locking-bar is formed by means of the bolt 25, which slides laterally in the tripping-arm 22, which is provided with the slot 26, in which works a pin 27, attached to the bolt 25.

28 represents a compressing-spring, which shoots bolt 25 after the tripping-lever has passed it. In Fig. 14 the tripping-lever is shown disengaged from the locking-arm 22.

In Fig. 5, 29 represents a projection of the hub of gear-wheel 16, on the end of which is fastened a pin 30, on which is journaled a spring-pawl 31. 32 represents a spring for holding this pawl in engagement with the clutch-wheel 33 by means of notches 34, which are placed opposite each other and with which the pawl 31 alternately engages to transmit motion in one direction only.

Mode of operation: When the parts are connected up, as shown in Fig. 1, and the motor 1 is started, the shaft 3 revolves and the gyratory transmitting-links 4 commence to move outward by the centrifugal force, drawing the sleeve 6 laterally on shaft 3, which oscillates the rocking arms 19, (two of which are preferably employed, one upon each side of the shaft,) thereby oscillating the segmental gear 17. This segment 17 drives the pinion and also operates the tripping-lever 24, which throws the lock-lever 22 out and releases the crank-wheel, this being accomplished before the pawl 31 (see Fig. 4) engages the clutch-wheel 33. After the crank-wheel 14 has commenced to move the lever 24, still traveling outward, releases the lever 22, which is thrown back by spring 80 and rides on the periphery of the crank-wheel 14 until the opposite notch 23 comes beneath the lug, when the lug drops in and locks it against further movement in either direction. The crank-wheel 14 and shaft 15 are rotated by pinion 16 through pawl 31 and clutch-wheel 33, which is fast on the shaft 15. The spreading movement of the links 4 continues until disk 14 has made half a revolution, when the lug of the locking-arm 22 engages with one of the notches 23 and stops further rotation. This half of the revolution of the shaft 15 has made one full throw of the pitman 11, and consequently moved the switch-rail 9 the required distance for opening or closing the same, as the case may B. The stop 8 would arrest the forward movement of sleeve 6, but would not arrest the movement of the clutch-wheel 33, as the pawls 31 are not stop-pawls. The spring 7 will force the sleeve 6 back into its initial position after the current is cut off. As the tripping-arm 24 comes back with the oscillating lever 19, it strikes the incline of the lock-bolt 25 and moves it backward within the lever 22, and as the tripping-lever passes it the spring 28 throws the bolt forward and the locking-lever has engaged therewith, so that the tripping-arm will lift the lock-lever at the next initial movement of the oscillating arms 19.

In order to arrest the rotation of shaft 3 due to the momentum after the current is cut out, a brake 35 is applied, preferably as shown in Figs. 12 or 13. As shown in Fig. 13, 36 represents an armature which is attracted by the field-magnet 37 of the motor. This armature 36 is pivoted by the stud 38 to the frame of the motor. 39 represents the brake-arm, the outer end of which is moved away from the brake-wheel when the field of the motor is excited. As soon as the current is cut out the spring 40 moves the armature 36, forcing the brake 35 against the disk 41, which is keyed upon shaft 3. The friction of the brake arrests the movement of the shaft 3.

In Fig. 12 we have shown the brake-arm operated by the independent magnet 42, which is in parallel circuit with the motor.

The modification shown in Figs. 9, 10, and 11 is employed instead of employing the rocking arms and tripping mechanism shown in Figs. 6, 7, and 8, and rack-bar 43 is employed as the transmitter, which is connected to the sleeve 6 by means of the arms 44, to which the rack-bar is bolted. Said arms are connected to the collar 20 by means of pins 21. 46 represents a spring-catch pivoted to the tripping-arm 48 by means of a knuckle-joint. When the shaft 3 is started to rotate and the sleeve 6 moves forward, the catch 46 is moved outward, lifting the tripping-arm 48, which is keyed to the shaft 47, to which shaft also the locking-arm 22 is keyed, and by the oscillation of the shaft 47 the locking-arm 22 is lifted out of engagement with the disk 14. The links 4 and spring 7 are employed as shown in Fig. 1. When the sleeve is forced back by the retractile spring 7, the catch 46 strikes the tooth 50 moves the catch 46 inward until it is past said tooth, when the retractile spring 51 draws it back into position, thus serving to arrest the revolution of wheel 14 by the momentum of the parts.

In Fig. 15 we have shown our device applied to the moving of a railway-gate or a signal-arm, and the construction of the apparatus is entirely the same, the only difference being that the pitman 11, instead of being connected to the switch-bar, is connected to the crank 52, which crank is connected to the gate or signal-arm 53. The movement of the gate-bar and the arm of the signal being preferably the same, they are each designed to move one-fourth of a revolution, instead of one-half revolution, which the crank-pin moves at each operation of the motor when constructed as herein shown, which is the preferred form. The crank 52 is shown as the simplest form of reducing the motion.

Having described our invention, what we claim is—

1. In combination with a motor having gyratory transmitting-links, devices for converting rotary into reciprocating movement, a crank, and a pitman connected directly to the switch-rails, substantially as specified.

2. In combination with a motor having gyratory transmitting-links, devices for converting rotary into reciprocating movement, a crank-wheel and a pitman connected directly to the device to be moved, and locking mechanism for arresting the crank-wheel alternately at each half-revolution, substantially as described.

3. In combination with the crank-wheel, a gyratory transmitter, and mechanism for locking the same at each half-revolution, the tripping mechanism operated by the transmitter to release the locking mechanism at its initial movement, substantially as specified.

4. In combination with a motor having gyratory transmitting-links driving a crank and pitman, the braking mechanism operated by a magnet to hold the brake out of contact when the motor is cut in, substantially as specified.

In testimony whereof we have hereunto set our hands.

JOSEPH RAMSEY, JR.
EDWARD W. HARDEN.
CHARLES MORRIS WILDER.

Witnesses:
T. SIMMONS,
C. W. MILES.