

(No Model.)

W. R. SYKES, Jr. & J. P. O'DONNELL.  
SIGNAL REPLACER.

No. 528,997.

Patented Nov. 13, 1894.

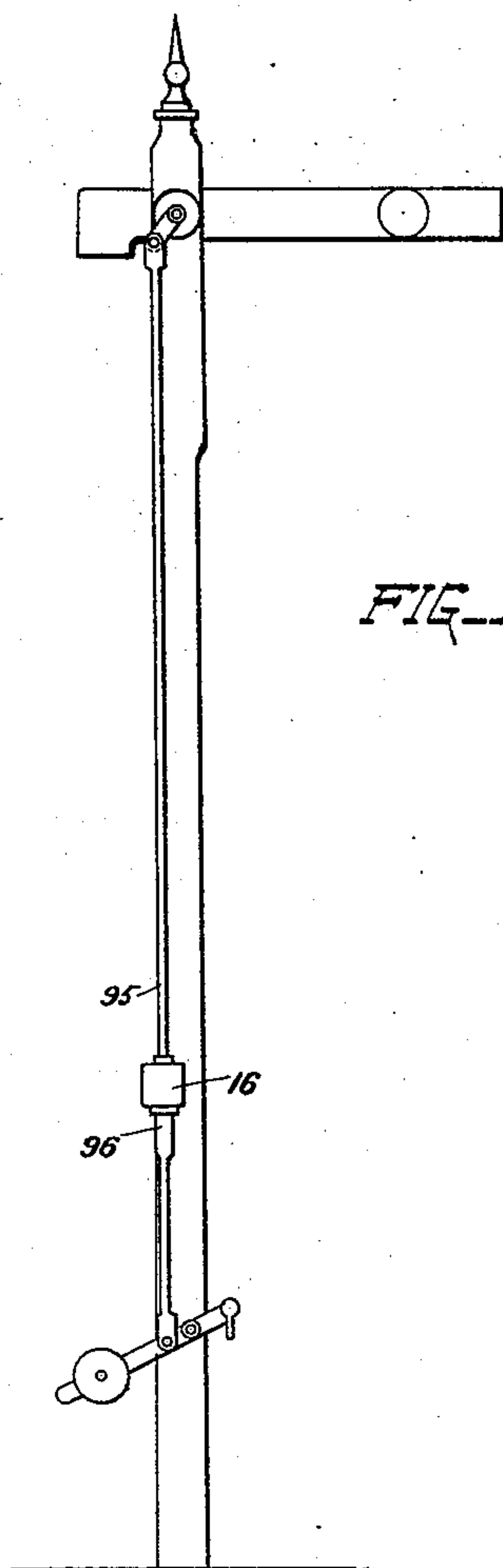


FIG. 1

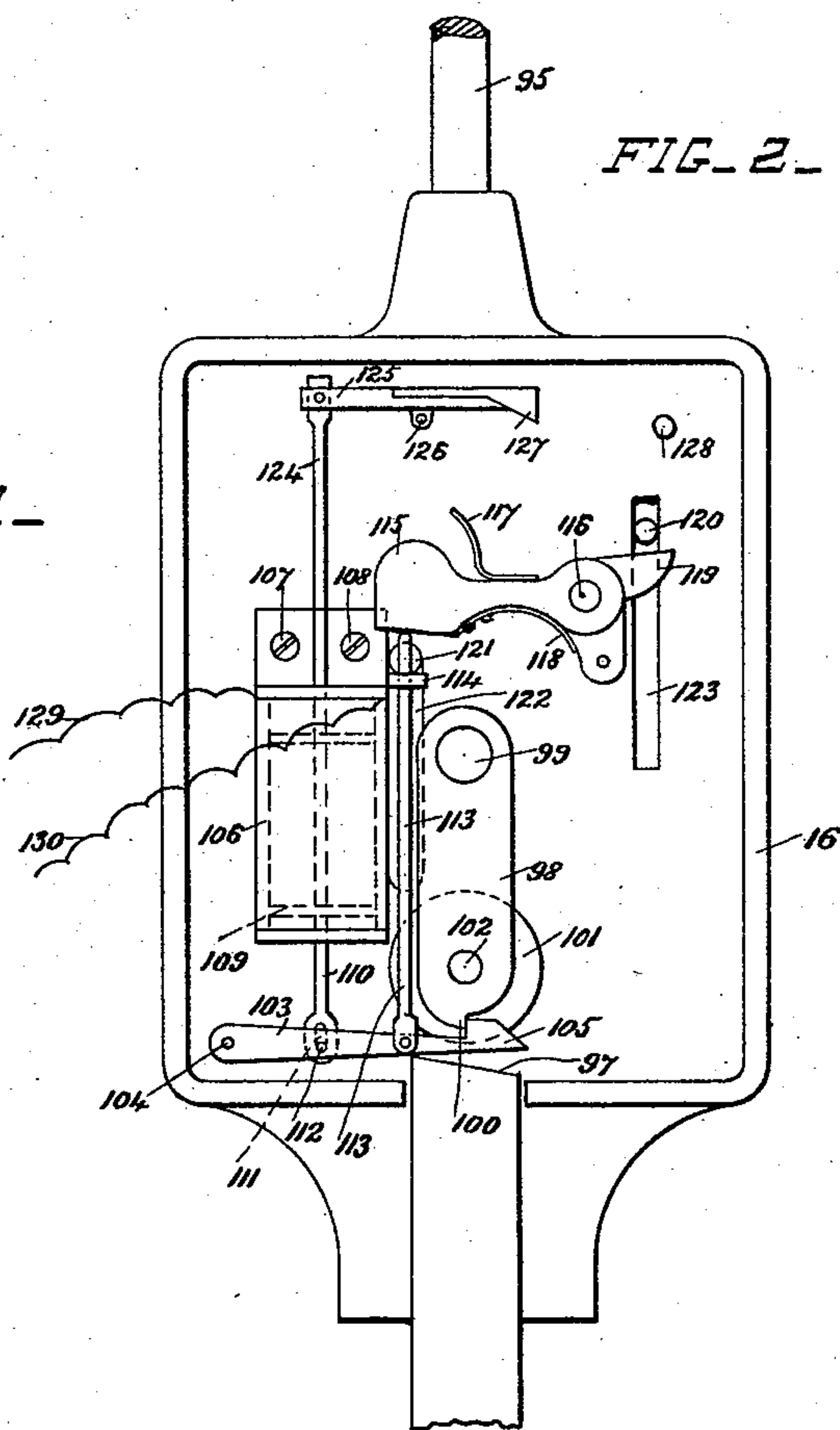


FIG. 2

WITNESSES:

*J. Stephen*  
*J. W. Milans*

INVENTORS

*W. R. Sykes Jr. & J. P. O'Donnell.*

BY

*Herbert W. Jenner.*  
ATTORNEY.

# UNITED STATES PATENT OFFICE.

WILLIAM R. SYKES, JR., AND JOHN PATRICK O'DONNELL, OF LONDON,  
ENGLAND.

## SIGNAL-REPLACER.

SPECIFICATION forming part of Letters Patent No. 528,997, dated November 13, 1894.

Application filed November 27, 1893. Serial No. 492,194. (No model.) Patented in England June 29, 1893, No. 12,775.

*To all whom it may concern:*

Be it known that we, WILLIAM ROBERT SYKES, Jr., residing at 43 Kent House Road, Beckenham, in the county of Kent, and JOHN PATRICK O'DONNELL, residing at 70 and 71 Palace Chambers, Bridge Street, Westminster, in the county of Middlesex, England, subjects of the Queen of Great Britain and Ireland, have invented a new and Improved Signal-Replacer, (for which we have obtained a patent in Great Britain, No. 12,775, bearing date June 29, 1893,) of which the following is a specification.

This invention relates to means for replacing a railway signal automatically or otherwise from a distant point; and it consists in the novel construction and combination of the parts hereinafter fully described and claimed.

In the drawings: Figure 1 is a side view of a signal post showing the novel apparatus 16 attached to the rod 95 between the operating lever and the signal arm. Fig. 2 is a front view of the apparatus 16 drawn to a larger scale and with the cover of the inclosing case removed.

95 is the upright rod connected from the arm to the top of our apparatus.

16 is our apparatus as referred to in Fig. 1.

96 is the lower portion of the upright rod connected to the balance lever and terminating in a beveled edge 97.

98 is a lever centered at 99 having a catch 100 at its lower end, and centered to its lower end a friction roller 101 centered at 102. A pawl 103 is centered at 104, terminating in a catch 105.

106 is an electro-magnet preferably of the long pull type, permanently fixed to our apparatus by set screws or their equivalents 107, 108.

109 is an armature in connection with the electro-magnet 106, and connected to the said armature is a rod 110 terminating in a loop 111 working about a pin 112 which works with the pawl 103. A rod 113 is connected to the pawl 103 moving through a guide 114, which maintains it in its vertical position.

115 is a hammer fulcrumed at 116 and on the upper part of the hammer is a spring 117. A spring 118 is used to keep the piece 119 in position.

120 is a pin fixed firmly to the signal post itself. 121 is also a pin fixed permanently to the post.

122 is a slot in the apparatus in which the pin 121 works in the travel of our apparatus, and 123 is another slot which works about the pin 120 when our apparatus is moved up and down.

124 is the upper part of the rod, the lower part of which is 110, and which is practically a continuous one from the pawl 103 to the detent 125 fulcrumed at 126, terminating at its end in a spring click 127.

The pawl 103 is shown normally in gear with the catch at the end of the lever 98. In actual practice these two would be normally disconnected and this would be so when sanction has not been given by the cabin in advance.

Suppose that sanction of the cabin in advance had not been given and the signalman in the cabin operating the signal on which our apparatus is fixed were to move his lever referring to the arm he would simply move upward the lower portion of the up-

right rod 96, thrust aside, by means of the beveled edge acting upon the roller, the lever 98, but the arm would not be deflected. Assuming that sanction has been given by the cabin in advance 100 and 105 are still disconnected until the signalman to which the signal applies moves his lever, making contact,

when the pawl 103 is moved upward by means of the electro-magnet 106 being excited, the armature 109 being drawn in and the end 105 being drawn in contact with the catch 100 as shown. Upon the signalman now completing the movement of his lever, the upright rod 96 being held in position by its guide through the casting would force upward the roller 101 and by that means the whole of our apparatus would move upward and the upper part of the upright rod, the result being that the arm would be deflected, and in moving upward, the pin 120 would move down the slot 123, operate the piece 119, move upward the hammer 115, and the face of the hammer would get caught behind the spring click 127.

In this position the spring 117 would be pressed against the pin 128. The object of this spring pressing against the pin 128 is that when the armature is free and the spring click



127 moves away thereby freeing the hammer 115, the spring 117 being in compression and moving into expansion or away from the pin would tend to assist the initial movement of the hammer 115 returning to its normal position.

Assuming that the signalman does not replace the arm to "danger," when the train arrives at the treadle in advance of the said signal upon breaking the circuit at the treadle the electro-magnet 106 would be demagnetized, the armature 109 would drop half of its movement through the looped end or slot on the rod 110, sufficient to release the click 127 from the hammer 115. The hammer would then drop and striking the rod 113 would force the pawl 103 downward, the end 105 being thereby freed from the catch 100 on the lever 98. By this means the arm would return to "danger" and remain in that position.

129 and 130 are the wires leading from the electro-magnet 106. 130 goes to earth and 129 goes to any conveniently arranged circuit maker and battery for energizing the electro-magnet 106.

It should be mentioned that in the falling of our apparatus the piece 119 strikes the pin 120 and gets to its original position above the piece ready for the next movement.

What we claim is—

1. The combination, with the signal operating rod 95, and the case attached thereto; of the rod 97 provided with a beveled edge and sliding in the lower part of the case substantially in line with the rod 95, the pivoted lever 98 provided with the catch 100 and the roller 101, the electro-magnet 106, the armature 109, the pivoted pawl 103, the rod con-

necting the said pawl and armature whereby the said pawl engages with the catch 105 when the electro-magnet is energized, the rod 113 connected to the pawl 103, a pivoted hammer arranged to strike the end of the rod 113 and disengage the said pawl, and a spring click normally supporting the said hammer and operatively connected with the armature, whereby the said hammer is released when the circuit is broken, substantially as set forth.

2. The combination, with the vertically movable case, and the pivoted lever 98 provided with the catch 100 and the roller 101; of the pivoted pawl 103, the electro-magnet 106, the armature 109, the rod 110 provided with a loop 111 and connecting the said armature and pawl, the rod 113 connected to the pawl 103, a pivoted hammer provided with the projecting piece 119 and arranged to strike the end of the rod 113 and move the pawl from engagement with the catch 100, a spring click normally supporting the said hammer and operatively connected with the armature, whereby the said hammer is released when the circuit is broken, and a stationary projection arranged in the path of the projecting piece 119 whereby the hammer is caused to engage with the said spring click when the case is moved upward in the action of lowering the signal arm, substantially as set forth.

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

W. R. SYKES, JR.

JOHN PATRICK O'DONNELL.

Witnesses:

WILLIAM H. CANDY,  
FREDERICK J. DAUM.