

N<sup>o</sup> 6331



A.D. 1905

Date of Application, 25th Mar., 1905

Complete Specification Left, 20th Sept., 1905—Accepted, 22nd Feb., 1906

PROVISIONAL SPECIFICATION.

**Improvements in Signalling Apparatus.**

I, GEORGE HUGHES, Regent House, Lostock Park, Bolton-le-Moors, County of Lancaster, Mechanical Engineer, do hereby declare the nature of this invention to be as follows:—

5 This invention relates to apparatus for use on railways with the block telegraph or other form of signalling apparatus for automatically recording all signals sent and received in and between various signal cabins stations places or depots and the time at which such signals are sent and received.

The invention comprises in its construction

10 a. A pair or pairs of electro magnets connected in series with the instruments which receive and transmit the signals which are operated as each signal is received and sent and record the same.

b. Indicating or recording apparatus moved or operated by the electro magnets to record each signal as it is received or sent by the instruments.

c. A receiving medium upon which the record is made.

15 d. Clockwork or other mechanism to move forward the recording medium and to move the indicating or recording apparatus relatively thereto.

e. Mechanical and electrical connections necessary to connect the magnets with the block telegraph or other signal receiving and transmitting instrument and the motor mechanism with the recording apparatus.

20 In carrying out the invention the magnets in pairs are mounted upon a frame or carriage capable of being moved horizontally at intervals by a screw or by a rack and pinion or by a weight or spring and releasing pawl, or other suitable mechanical device. And the armatures of the magnets are provided with arms the ends or tips of which are fitted with pointers pens pencils or other form of recording instrument which at each time the magnets are excited are brought  
25 into contact with the recording medium and make a record thereon. One two three or more pairs of magnets may be mounted on one frame and the pointers of each pair are formed to make a different mark on the recording medium such as a dot dash cross and so forth to distinguish between two or more routes  
30 by which the signals may be transmitted or received.

A drum carrying a roll or loop or travelling band of paper or a horizontal tablet with paper or other surface to receive the record is mounted adjacent to the magnet arms and such is operated by clockwork or other motor at any given rate to bring continuously a fresh surface of the recording medium  
35 beneath the indicating instrument of the magnets so that a record is made thereon at each movement or operation of the electro magnets.

The driving mechanism is connected to the recording drum or tablet by spur or other gearing to give the desired motion thereto and with the screw or other mechanism for traversing the magnet and recording instrument at intervals  
40 across the recording medium at right angles to the direction in which the medium is travelling.

The magnets are connected in series with the receiving and transmitting instruments respectively and thus the transmitting and receiving instruments in any cabin station or other place are connected with the recorder by which

[Price 8d.]



*Hughes's Improvements in Signalling Apparatus.*

permanent record of all signals is obtained and the time at which they are received and sent.

Dated this 24th day of March, 1905.

J. OWDEN O'BRIEN,  
Successor to and late of W. P. Thompson & Co. of Manchester. 5  
Patent Agents.

## COMPLETE SPECIFICATION.

## Improvements in Signalling Apparatus.

I, GEORGE HUGHES, Regent House, Lostock Park, Bolton-le-Moors, County of Lancaster, Mechanical Engineer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:— 10

This invention relates to improvements in apparatus for use on railways tramways and the like using the block telegraph or other form of signalling apparatus, for automatically recording all signals sent and received in and between the various signal cabins, stations, places or depots, and the time at which such signals are sent and received, and is also applicable for recording other signals of any kind communicated electrically or by telegraph. 15

The apparatus hitherto constructed comprises one or more electro-magnets to be inserted in the line between the transmitting and receiving instruments, a recording pen carried by or operated by the armature of the magnets a drum to receive the record, and clockwork or other motor, to move forward the drum. 20

This invention relates to certain improvements by which the traversing movement of the instrument is obtained by means of a rack and pawl or escapement operated by an electromagnet and the record is made by a direct tap upon the recording medium. 25

The invention will be fully described with reference to the accompanying drawings.

Fig. 1. Front elevation of apparatus.

Fig. 2. Back elevation of apparatus. 30

Fig. 3. Plan.

Fig. 4. End elevation of apparatus.

Fig. 5. Front elevation enlarged with parts broken away showing striking apparatus and arrangement for moving magnets horizontally.

Fig. 6. Transverse sectional elevation showing recording medium and striking apparatus. 35

A pair of magnets E connected with the block telegraph or other signalling apparatus are mounted by a frame or carriage upon rods or bars G attached to the frame A<sup>1</sup> and are capable of sliding from end to end thereof. The armatures P P<sup>1</sup> of the magnets are fitted at their tips F F<sup>1</sup> with a recording character such as a dot or dash by which a record of the message or signal transmitted is recorded. 40

The characters F F<sup>1</sup> are placed to strike a drum or roller or its equivalent C over which is passed a recording medium B such as a travelling band of paper an ink ribbon O being inserted between the recording character at F F<sup>1</sup> and the recording medium. 45

The recording medium is suitably calibrated to indicate the time in hours and minutes and is carried forward by the two sprocket or pin wheels C C<sup>1</sup> which are driven by the clock D at a regular and constant speed.

The clock D or other driving mechanism is connected with the recording 50

*Hughes's Improvements in Signalling Apparatus.*

drum or wheels C C<sup>1</sup> by spur or other gearing to give the desired movement thereto.

5 The magnets E are attached to a frame or carriage H which traverses the bars G horizontally and it is drawn from one side to the other by a weight L passing over a pulley M. Instead of a weight a spring may be employed to move the carriage H and magnets E from one side to the other.

The carriage H and magnets E are held in the desired position by a pawl or escapement J engaging a rack K supported above the frame A.

10 The pawl or escapement J is released by an auxiliary magnet N the armature *n* of which is affixed to one end of the pivoted pawl or escapement J. The magnet N is operated periodically by a contact maker N<sup>1</sup> in the clock work which throws the magnet N into the circuit once in twelve hours. The recording points F F<sup>1</sup> of the magnets E are thus periodically moved across the recording medium or band of paper B so that a fresh recording surface may be operated  
15 upon.

The apparatus may be utilised to connect two different sets of instruments by mounting a second set of magnets E<sup>2</sup> E<sup>3</sup> on a similar carriage on the frame A and placing them in such a position that recording points F<sup>2</sup> F<sup>3</sup> point upon the back of the paper B thus utilising both sides of the recording medium.  
20 In this case a printing pad O<sup>1</sup> is arranged for the recording point or character to strike against.

The inked ribbon or tape O against which the recording points or characters F F<sup>1</sup> strike to print the record upon the paper B is wound upon the drum R and the other attached to a reel R<sup>1</sup> which is geared to and rotated  
25 by the clock D thus gradually unwinding the inked ribbon O from R to R<sup>1</sup> and so constantly exposing a fresh surface under the recording points F F<sup>1</sup>.

A similar tape O<sup>1</sup> is arranged on the drums R<sup>2</sup> R<sup>3</sup> for the recording points F<sup>2</sup> F<sup>3</sup> which print on the back of the paper B.

30 Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. Apparatus for automatically recording signals sent between transmitting and receiving instruments constructed with electro magnets mounted on a carriage to traverse periodically from one side to the other, armatures for the  
35 magnets and recording points or characters mounted thereon, a traversing recording medium passing over a drum or support, a clock or other motor mechanism, to give a continuous constant movement to the recording medium, and a contact maker to periodically release the pawl or escapement holding the magnet carriage to bring the recording points over a fresh surface of the  
40 recording medium substantially as described.

2. Apparatus for automatically recording signals arranged to record on a recording medium the exact time that such signals are sent and received substantially as described.

3. Apparatus for automatically recording signals having the several parts  
45 constructed and arranged in combination either with or without duplicate recorder to print upon the second side of the paper, substantially as described.

Dated this 18th day of September, 1905.

J. OWDEN O'BRIEN,  
Successor to and late of W. P. Thompson & Co. of Manchester.  
50 Patent Agents.

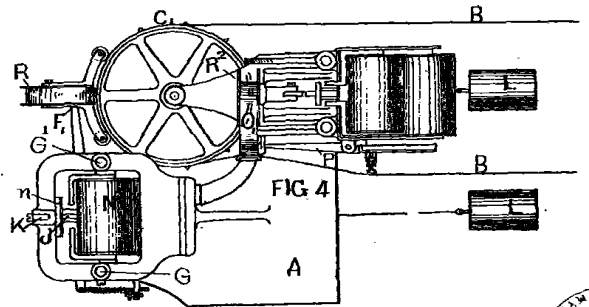
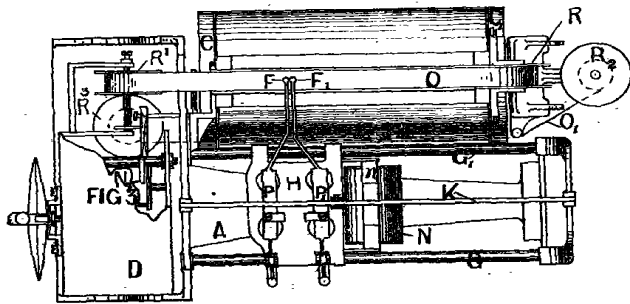
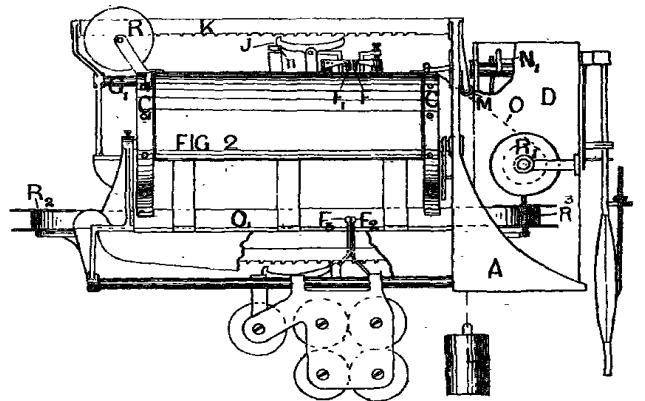
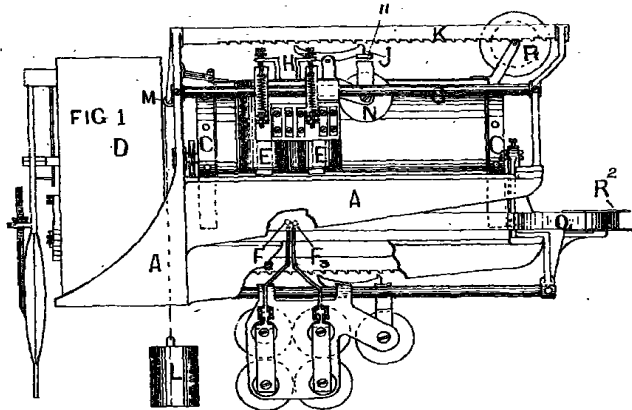
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SHEET 1.

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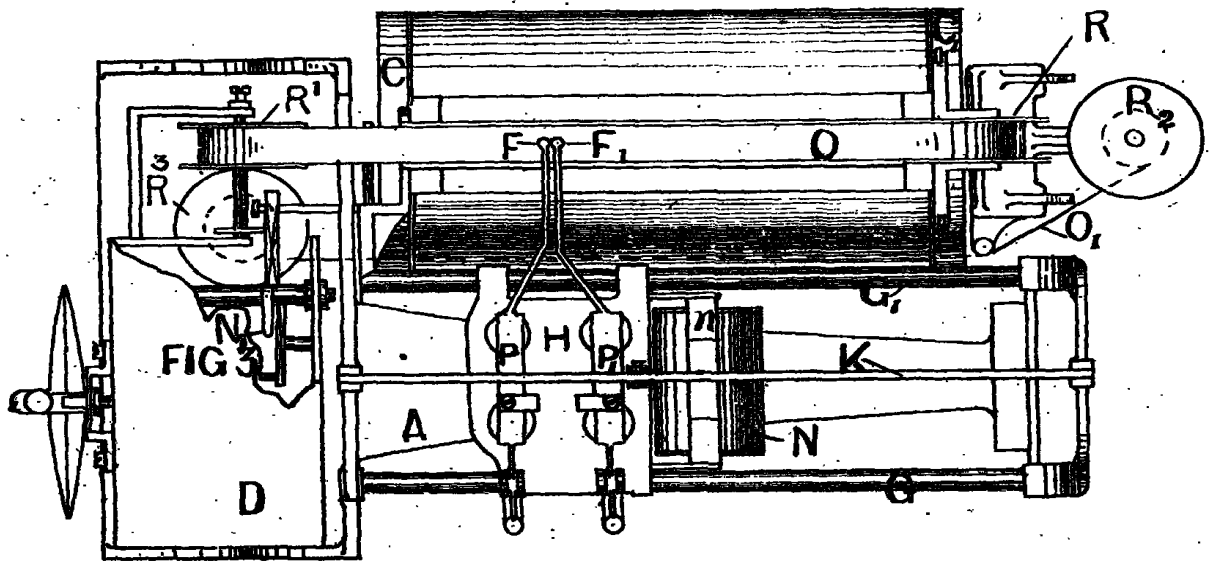
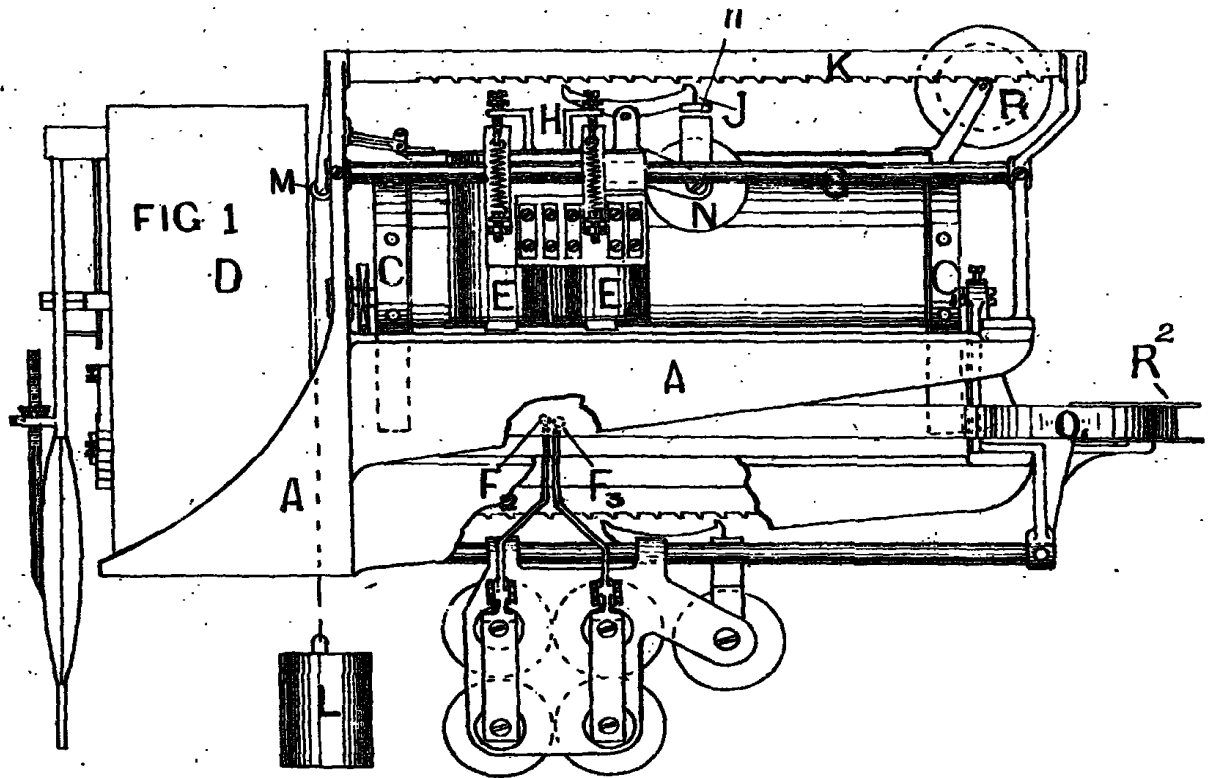
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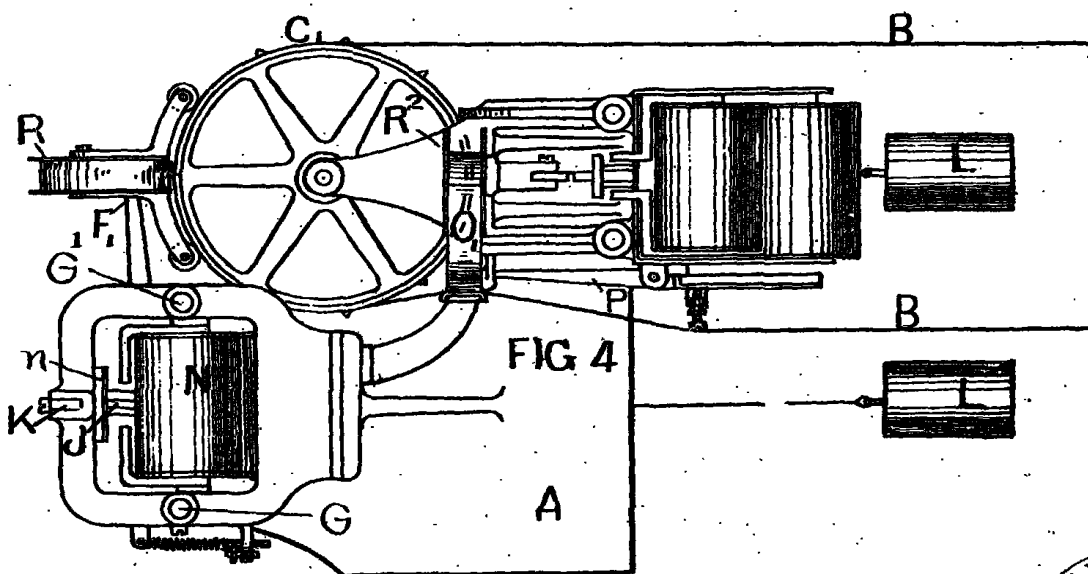
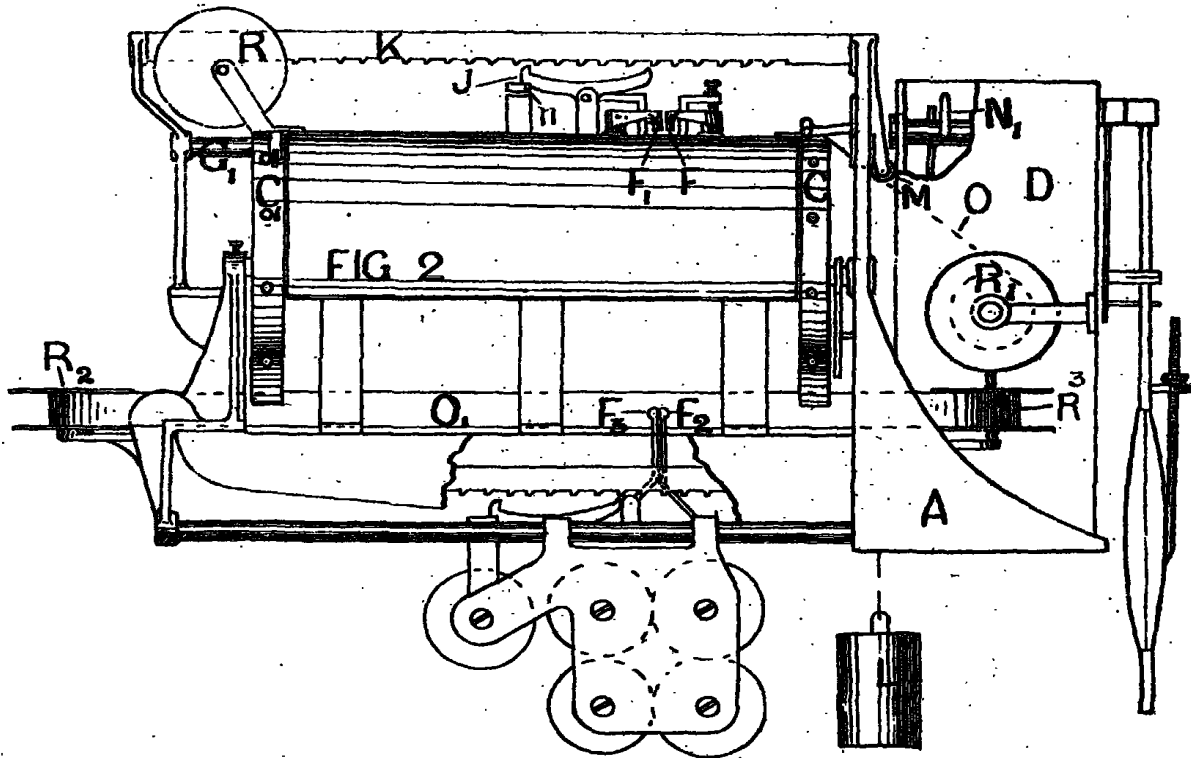
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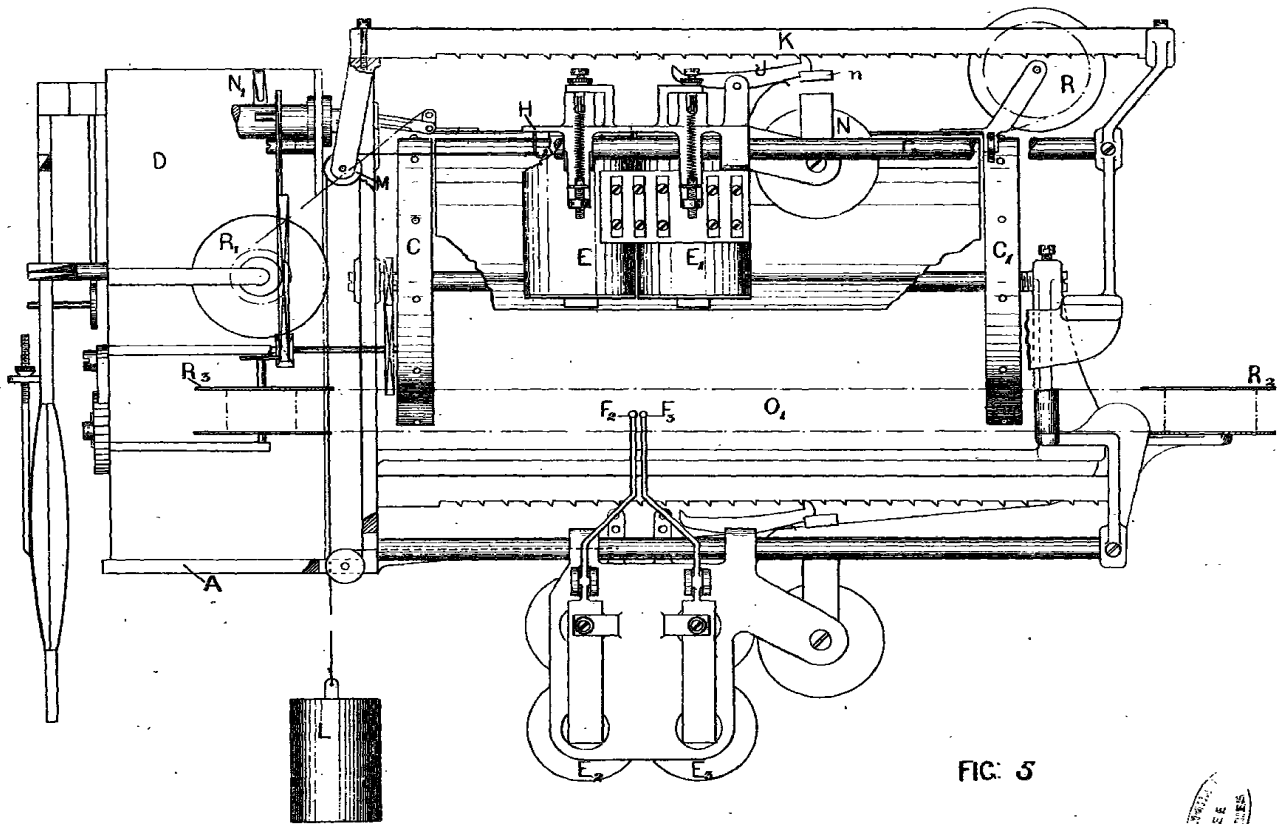
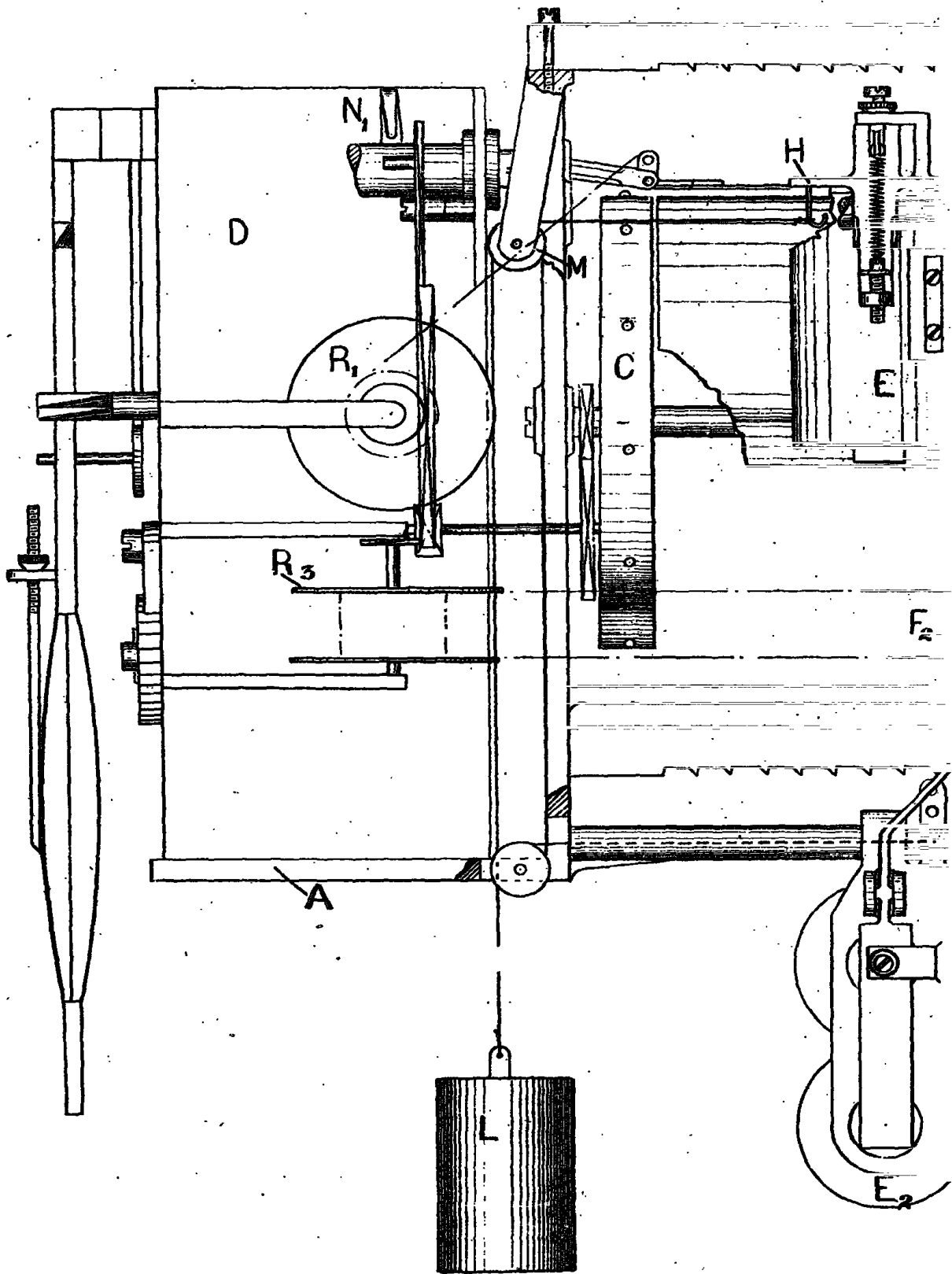


FIG. 5



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*[This Drawing is a reproduction of the Original on a reduced scale.]*





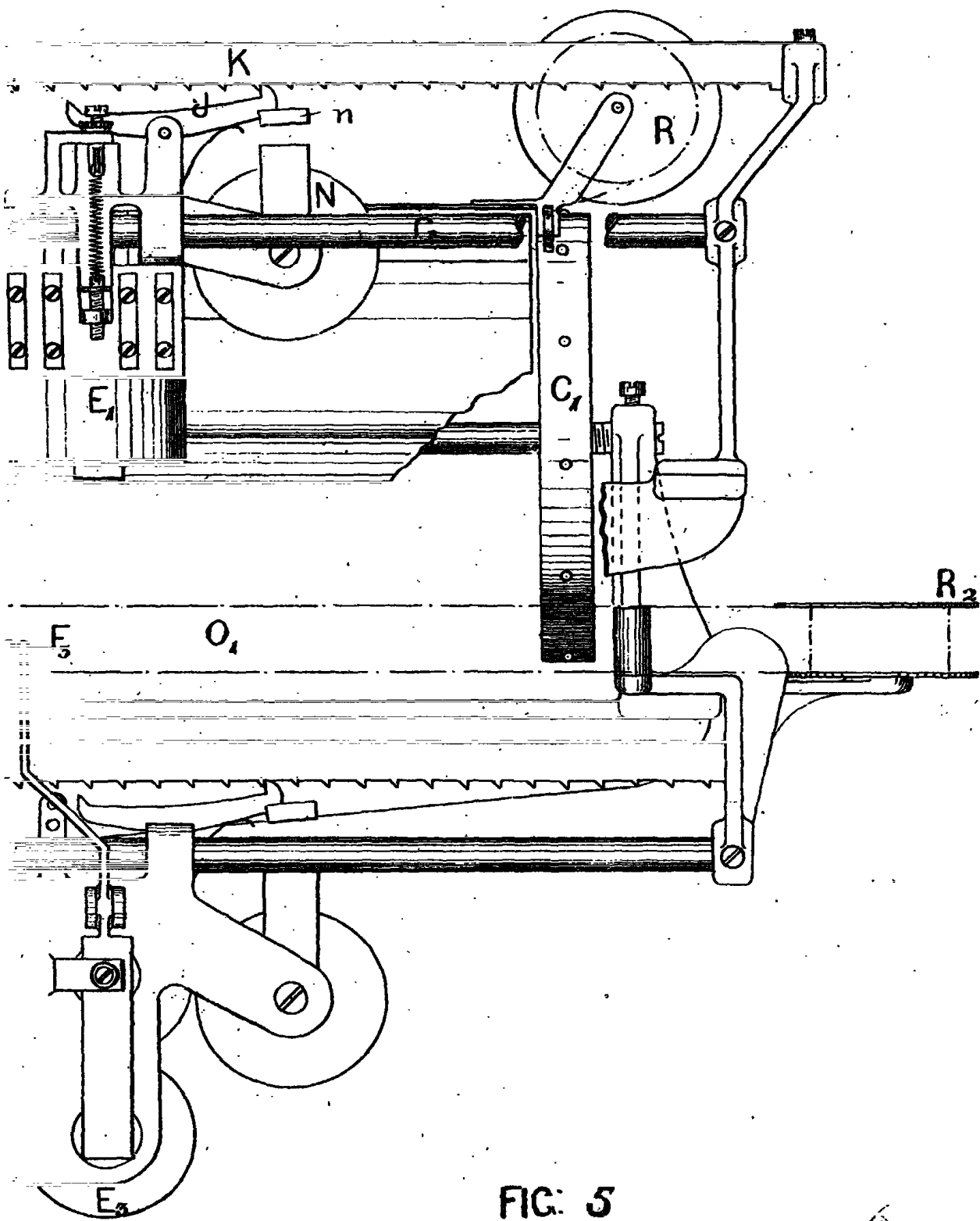


FIG. 5



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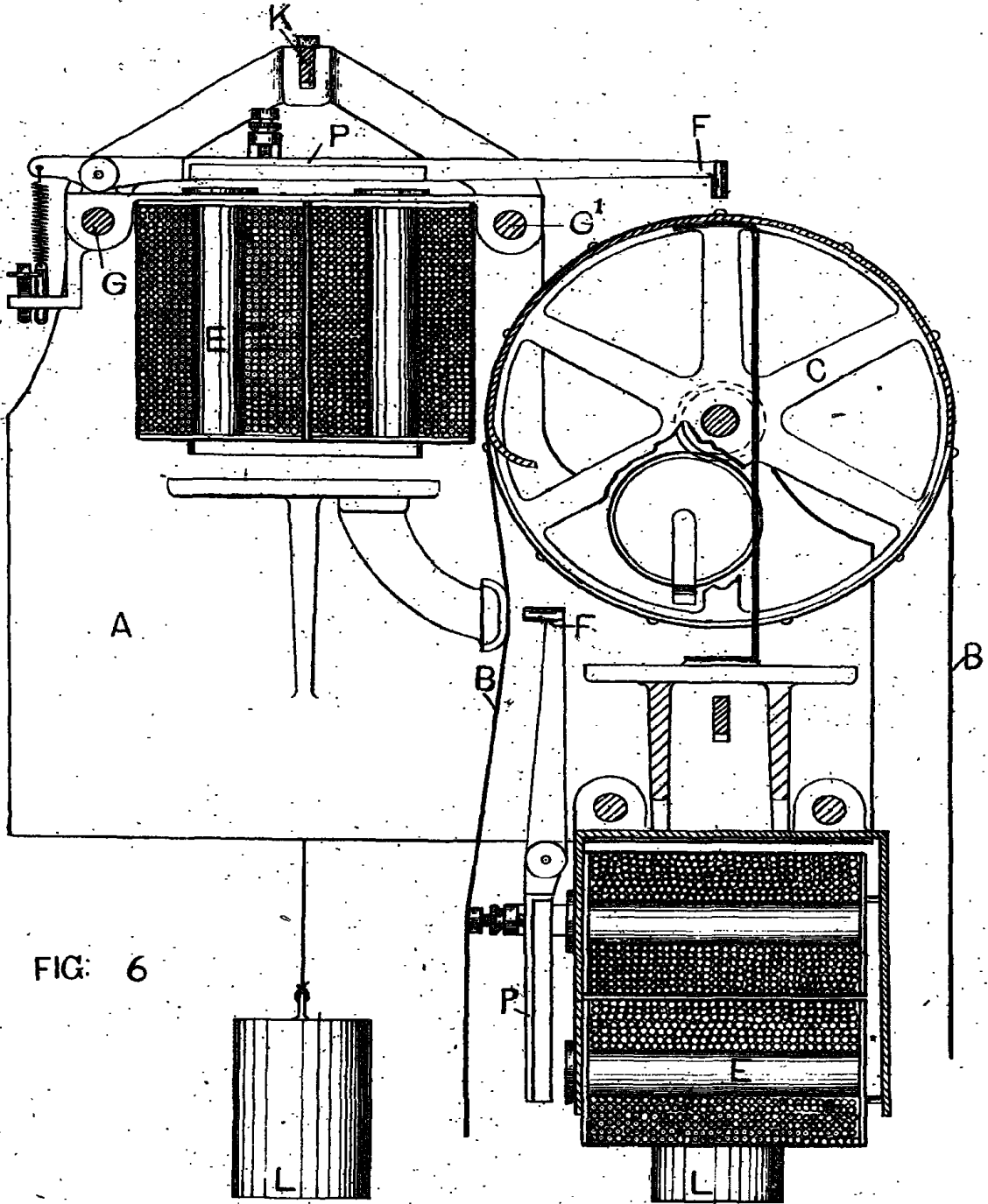


FIG: 6

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