

N<sup>o</sup> 1589



A.D. 1906

Date of Application, 22nd Jan., 1906

Complete Specification Left, 21st July, 1906—Accepted, 17th Jan., 1907

PROVISIONAL SPECIFICATION.

**Improvements in Signalling Apparatus for Railways and other purposes.**

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:—

This invention relates to apparatus for use on railways, tramways, and the like, with the block telegraph, or other form of signalling apparatus, for automatically recording all signals sent and received in and between various cabins, stations, places or depots, and the time at which such signals are sent and received, or for recording other signals communicated electrically or by telegraph such as described in the Specification of my prior Application for Patent No. 6331 of 1905.

1. The invention comprises in its construction a pair, or pairs of electro-magnets, connected electrically with the instruments receiving and transmitting the signals which are operated as each signal is received and sent, and record the same.

2. Indicating or recording apparatus, operated by the electro-magnets, to record each signal as it is received or sent by the instrument.

3. A recording medium on which the record is made.

4. Clock-work or other mechanism to move forward the recording medium.

5. Apparatus for automatically starting and stopping the clock-work or other mechanism when a signal is sent and received.

6. A small time clock having type figures arranged so that the time can be stamped upon the recording medium.

7. 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.

In carrying out the invention, the electro magnets are mounted in pairs on a frame or support. The armatures of the magnets are provided with arms, the ends of which have a striking pad, so placed that the pad covers the type figures of the time clock. The recording medium, together with an ink ribbon, travels between the type figures and the striking pad, so that when a signal is sent or received, the electro magnets are energised and attract the armature, and thus cause the striking pad to hit the recording medium and stamp the time upon it, a signal being understood by the number and placing of the time stamps as fixed in a pre-arranged code, thus getting the signal and the exact time the signal was sent and received.

The starting and stopping of the clock moving the recording medium is accomplished by means of electro-magnets connected with the block telegraph, or other signalling instrument, the armature of which forms part of a pivoted lever carrying a braking arrangement to gear into a brake fixed to some moveable part of the clock work, when no signals are being transmitted. When signals are being sent or received, the armature is attracted and so releases the brake and allows the clock to work, thus moving the recording medium only when a signal is sent or received, the armature is brought to the braking

[Price 8d.]



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position by means of a spring and the length of time the clock will operate after being started is regulated by means of a dashpot attached to the lever.

Dated this 18th day of January, 1906.

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

## COMPLETE SPECIFICATION.

**Improvements in Signalling Apparatus for Railways and other purposes. 10**

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;—

This invention relates to apparatus for use on railways or other places where a telegraph or other form of apparatus is employed for transmitting signals and is designed to provide means for automatically recording all such signals both sent and received, as a signal record expressed in the time the signal was transmitted. 15

The invention may be employed in connection with any signal cabins, stations, places or depots, from which signals are transmitted or received, or it may be employed in other ways and for any purposes. 20

The invention consists essentially in recording apparatus by which the signal as recorded is expressed in the time at which it was transmitted thereby recording as a single record—a "time stamp signal" record—comprising both the signal and the time it was recorded. Thus a single bell call or dash is expressed in time 5.20.2. and a double bell call or two dashes 5.30.5. 25  
5.30.5.

It will be fully described with reference to the accompanying drawings which form part of the specification. 30

Fig. 1. Front elevation of the apparatus.

Fig. 2. Plan of same.

Fig. 3. End elevation.

Fig. 4. Sectional end elevation (enlarged) of the brake apparatus.

Fig. 5. Plan of same. 35

Fig. 6. Diagram showing the electric connections.

The several parts of the apparatus or instrument are mounted upon a suitable frame A of brass wood or other material.

A pair of electro magnets B B<sup>1</sup> are connected electrically with the block telegraph or other signalling instruments or the line wire between the stations either direct or through a relay so that each signal or impulse therefrom passes through one of the magnets and energizes it causing the armature to be operated. The armatures D D<sup>1</sup> of the magnets B B<sup>1</sup> are attracted downwards on each impulse that energizes the magnet, and each is provided at one end with a striking pad E E<sup>1</sup>. 40  
45

Adjacent to the electro magnets a set or sets of time type wheels C are mounted to rotate under the striking pads E E<sup>1</sup> so placed that when the armatures are attracted downwards the pads strike the wheels. The type wheels C comprise hour, minute and seconds wheels that is wheels which are inscribed on their peripheries with type or printing numerals representing hours minutes and seconds respectively. 50

The time type wheels are driven by a clock F they are preferably mounted on hollow concentric spindles or sleeves geared by any suitable clock work gearing

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or they may be connected or driven as are the wheels of counting mechanism or paging or numbering machines.

A recording medium G such as a ribbon of paper is caused to pass over the type wheels C and between them and the striking pads E E<sup>1</sup>. The ribbon G is wound upon the drum H and is withdrawn therefrom across the type wheels C onto a drum H<sup>1</sup> driven by any suitable mechanism preferably by a driving roller J provided with a tension roller K and driven by clockwork spring or other suitable motor L.

The motor L is separate from the clock F and is released simultaneously with the signal or impulse and draws the paper or medium G across the type wheels C and is permitted to continue running for a definite space of time to allow for a given movement of the paper for each signal. This may be effected by a suitable brake or stop mechanism which when released is slowly brought back to its position. The governor spindle V may be fitted with a stop pin or projection U with which a corresponding pin or projection T on a lever S engages to stop the motor L. When the lever S is operated and the pin T withdrawn from the pin U the motor starts. The lever S is brought back to its position of rest by a spring Y and to the lever S is connected a dash pot W and a weighted plunger X which governs the length of time that the motor is permitted to run.

Instead of a dash pot any other mechanism may be employed for the same purpose.

The lever S can be operated and controlled by the electro magnets B B<sup>1</sup>, or by an electro magnet O provided with two or more coils P P<sup>1</sup> connected electrically with the block telegraph or other signalling instrument or with the line wire A<sup>1</sup> through which the signal passes so that the motor L starts automatically on the transmission of the signal and draws forward the paper ribbon G.

An ink or carbon ribbon or tape M travels between the recording medium G and the type wheels C and is wound off the drum N onto the drum N<sup>1</sup> by the motor clock L.

In the diagram Fig. 6. A<sup>2</sup> is the block telegraph bell A<sup>3</sup> the battery and A<sup>4</sup> earth connection.

When a signal is transmitted one of the electro-magnets B B<sup>1</sup> is energized and attracts the armature D or D<sup>1</sup> and the striking pad E or E<sup>1</sup> is caused to press the recording medium G against the ink tape M and the type wheels C, thus stamping the time upon the recording medium G. The electro magnet O is at the same time energized and attracts the armature Q and pulls the stop pin T out of gear with the projection U, thereby allowing the motor clock L to work and move the recording medium G, or other mechanism can also be used for this purpose. A fresh surface of the recording medium G is thus brought under the striking pads E E<sup>1</sup> for the next signal. The travel of the paper after the armature Q is released is governed by the weighted plunger W and the spring Y to leave the desired space between each signal.

A signal is expressed on the record paper G by the position of the line of numerals—indicating line—and the number of such lines of numerals, one operation printing and recording both the signal transmitted and the time thus:—

- A single bell call or a dash is expressed in time in a single line:—5.20.2.
- A double bell call or two dashes is expressed in time in two lines:—5.30.5.

5.30.5.

A treble bell call with a pause between the second and third signal calls, is expressed in time in two lines, a space and a single line:—5.40.5.

5.40.5.

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5.40.6.

The following table is inserted as an example of a length of the recording ribbon or medium G showing the signals recorded thereon the messages being deciphered in the margins right and left.

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EXAMPLES OF COMPLETE SIGNALS.

	Ordinary Passenger Train	Express Passenger Train.	
Attention. - - -	5.20.2	7.15.4 - - -	Attention
Acknowledgement. - - -	5.20.4	7.15.8	Acknowledgement 5
Is line clear for ordinary Passenger Train ?	(5.20.5 (5.20.5 (5.20.5 (5.20.6	7.15.9) 7.15.9) - - - 7.15.9) 7.16.0)	Is line clear for Express Passenger Train ? 10
Yes, you may send ordinary Train through	- - - (5.20.6 (5.20.6 (5.20.6 (5.20.7	7.16.0) - 7.16.1) 7.16.1) 7.16.1)	Yes, you may send Express Passenger Train through 15
Train in section - -	- (5.21.8 (5.21.8	7.18.3) - - - 7.18.3) - - -	Train in section
Line clear, or Train out of section	- - - (5.22.1 (5.22.1 (5.22.2	7.20.1) - 7.20.1) 7.20.2)	Line clear, or Train out of section 20
	Branch Goods Train	Express Cattle Train	
Attention - - -	5.40	9.9.8 - - -	Attention
Acknowledgement - - -	5.40.4	9.10.1. -	Acknowledgement 25
Is line clear for Branch Goods Train ?	- (5.40.5 (5.40.6 (5.40.6	9.10.2) 9.10.3) 9.10.3) 9.10.4) 9.10.4)	Is line clear for Express Cattle Train ? 30
Yes, you may send branch Goods Train through	- - - (5.40.7 (5.40.8 (5.40.8	9.10.5) (9.10.6) 9.10.6) 9.10.6) 9.10.7)	Yes, you may send Express Cattle Train through. 35
Train in section - -	- (5.45.1 (5.45.1	9.12.1) - - - 9.12.1) - - -	Train in section
Line clear, or Train out of section	- - - (5.47.3 (5.47.3 (5.47.4	9.14.3) 9.14.3) - (9.14.4)	Line clear, or train out of section. 40

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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:—

- 5 1. Apparatus for recording signals in which the signal is expressed in the time at which it was transmitted thereby recording by the same impression both the signal and the time substantially as described.
- 10 2. Signal recording apparatus of the type having time type wheels and striking pads operating upon a record-ribbon, constructed with means for releasing and starting the traversing mechanism of the record-ribbon simultaneously with the transmission of the signal and permitting it to continue running after the record has been made and stopping it when a predetermined length of the ribbon has travelled forward substantially as described.
- 15 3. In signal recording apparatus of the type having time type wheels and striking pads operating upon a record ribbon, a separate clockwork or motor to draw the recording ribbon across the time type wheels and mechanism to release the clock or motor when the signal is given, and mechanism such as a dash pot or its equivalent by which it is permitted to continue running for a definite space of time to allow of a given movement of paper for each signal substantially as described.
- 20 4. In apparatus for recording signals of the kind referred to mechanism for automatically recording the signals transmitted between two cabins or stations upon a suitable medium constructed and arranged in combination substantially as described and shown.
- 25 5. In apparatus for recording signals of the kind referred to mechanism for drawing forward the recording medium at each impulse having the several parts constructed and arranged in combination substantially as described and shown in Figs. 4 and 5 of the drawings.
- 30 6. Apparatus for recording signals having the several parts constructed and arranged in combination substantially as described and shown.

Dated the 12th day of July. 1906.

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

SHEET 1

SHEET 2

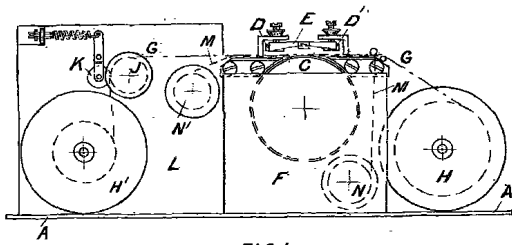


FIG. 1.

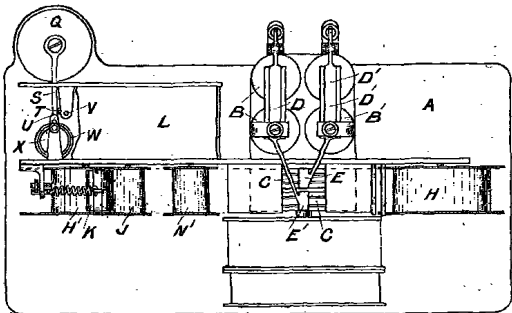


FIG. 2.

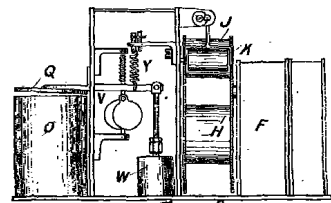


FIG. 3.

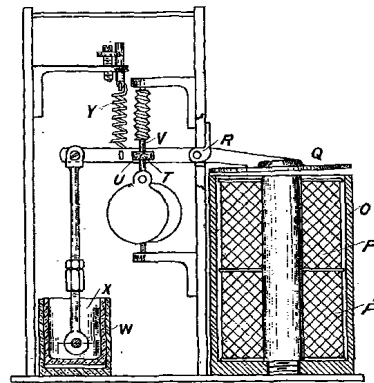


FIG. 4.

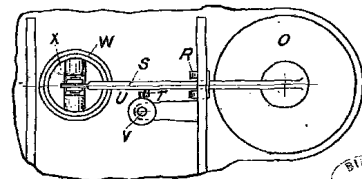


FIG. 5.

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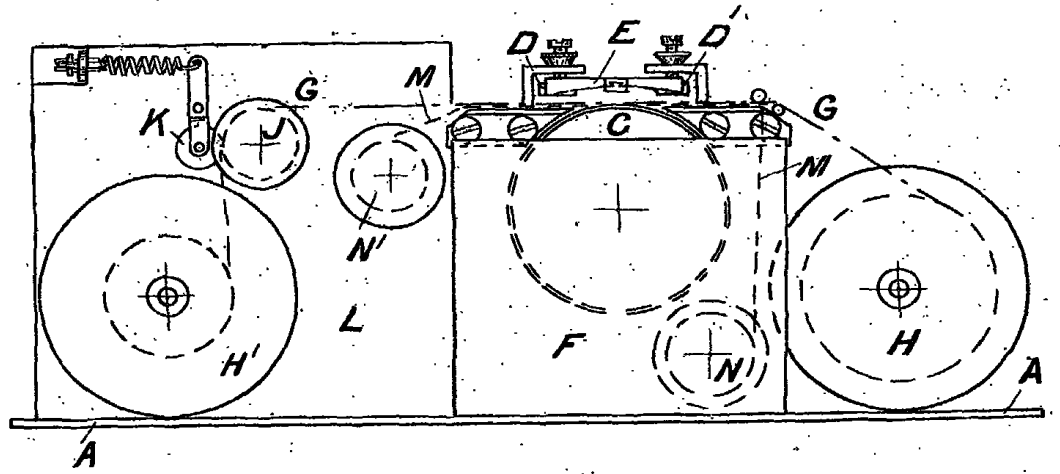


FIG. 1.

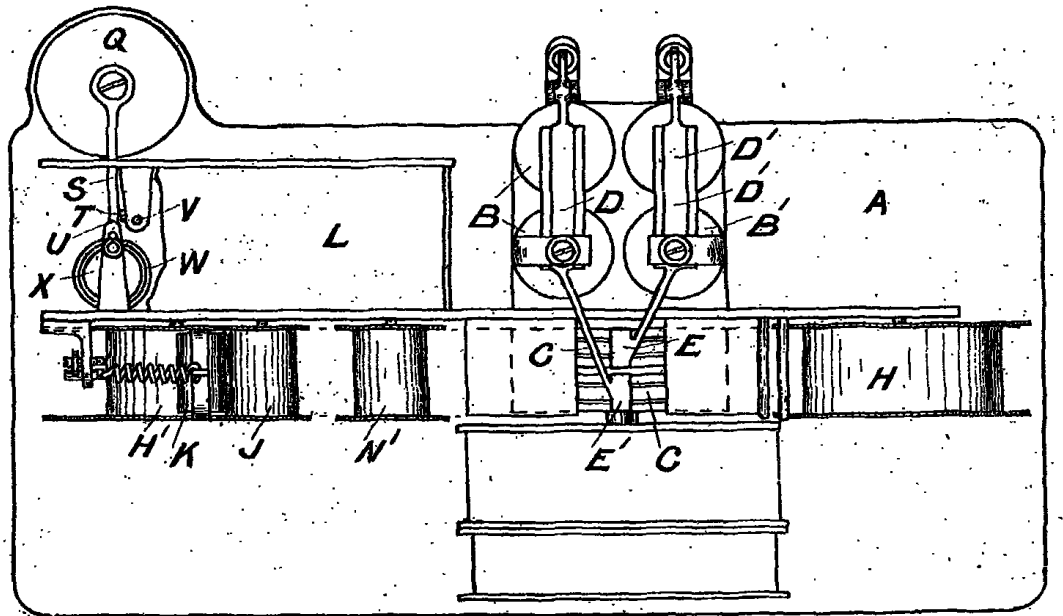


FIG. 2.

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

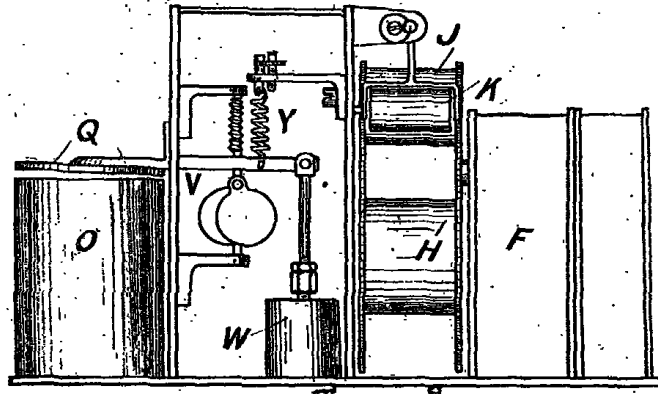


FIG. 3.

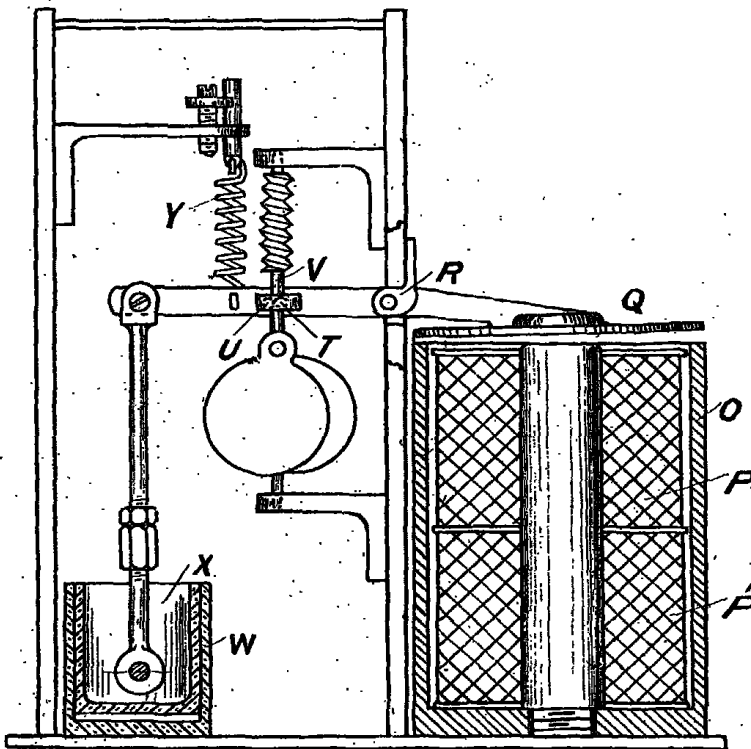


FIG. 4.

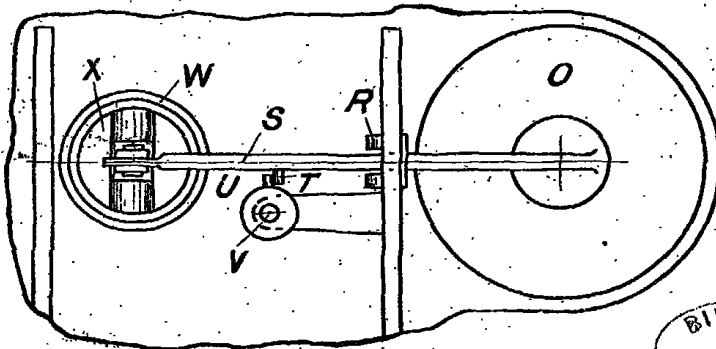


FIG. 5.

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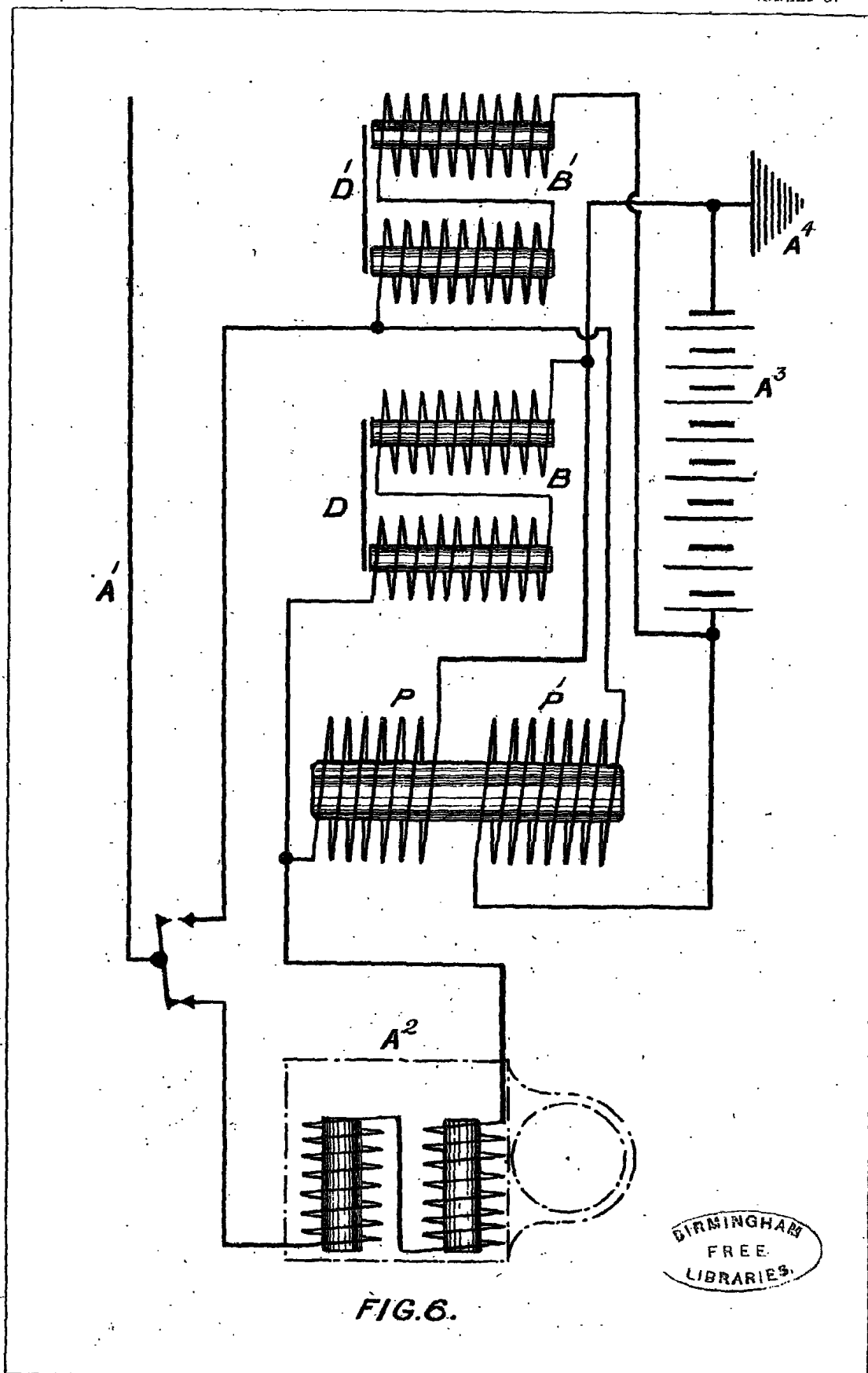


FIG. 6.

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