

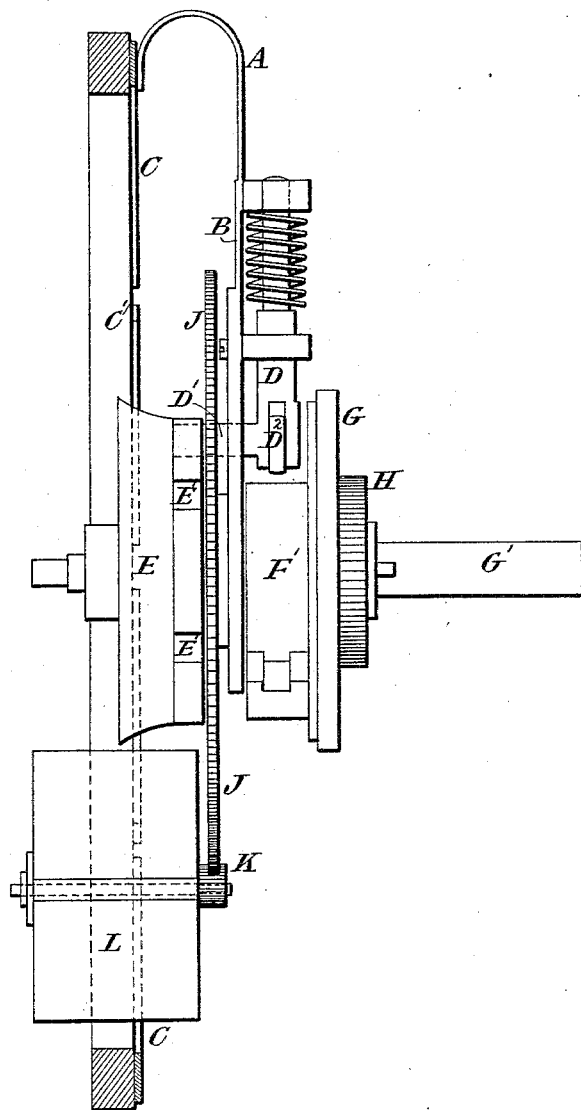
J. B. WILLIS.

TELEGRAPHIC SIGNALING APPARATUS.

No. 381,738.

Patented Apr. 24, 1888.

Fig. 1.



Witnesses.

Baltus De Long.
Allan de Lane Abert.

Inventor.

J. B. Willis.
By *Wm. H. H. H. H.*
Wm. H. H. H. H.

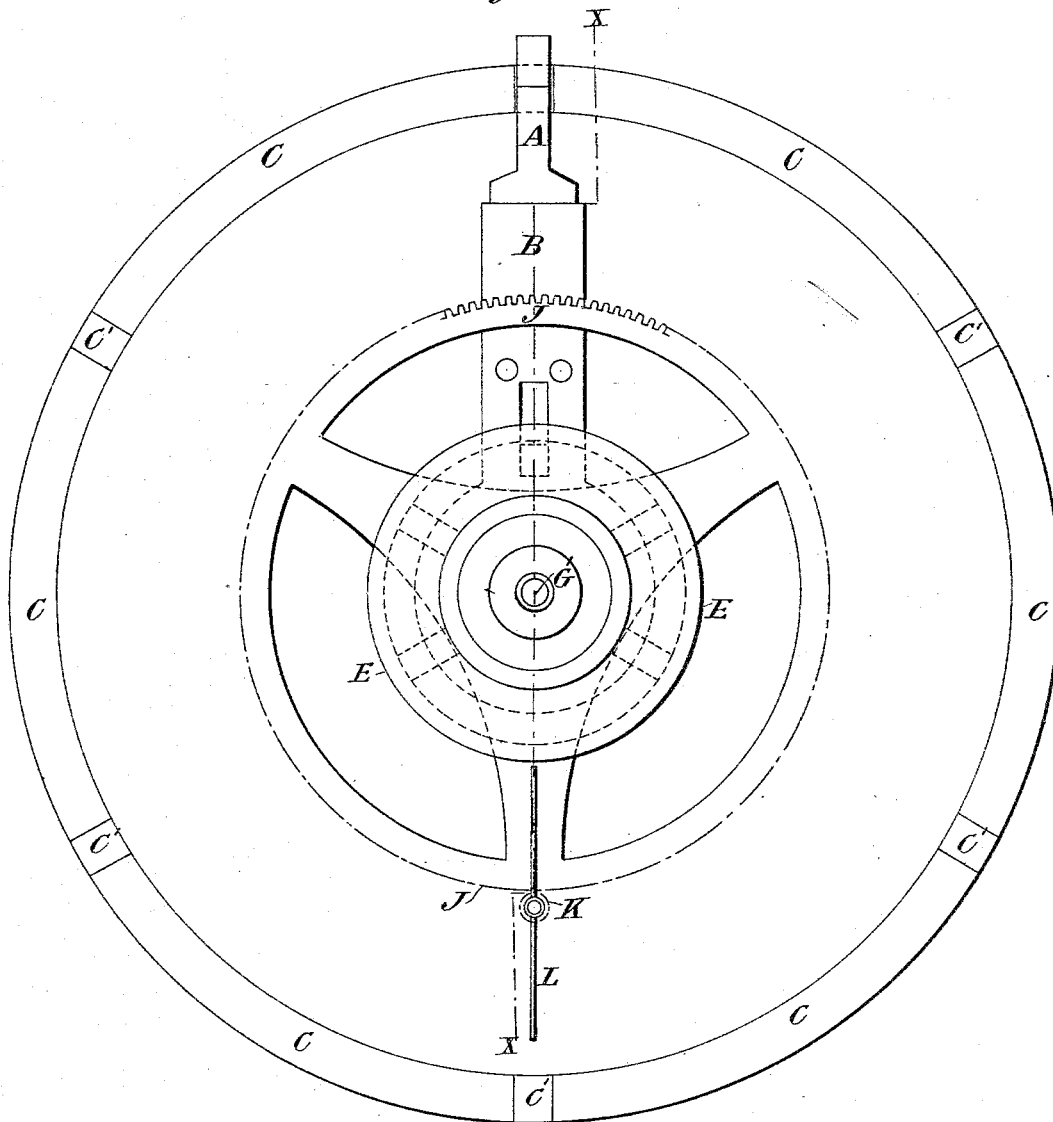
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Fig. 2.



Witnesses.
Baltus De Long.
Allen McLane Abert.

Inventor,
J. B. Willis.
By Atty.
Gordon, Hopkins & Ayton.

(No Model.)

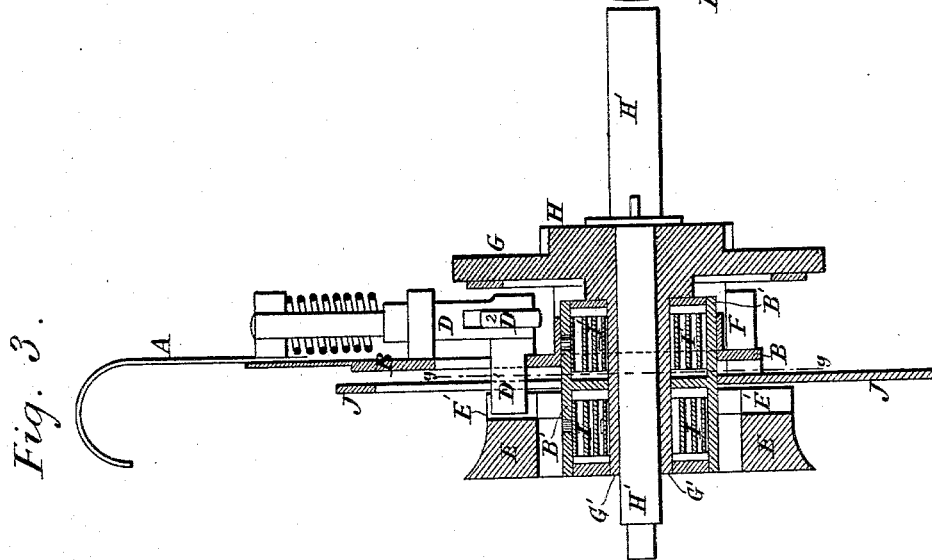
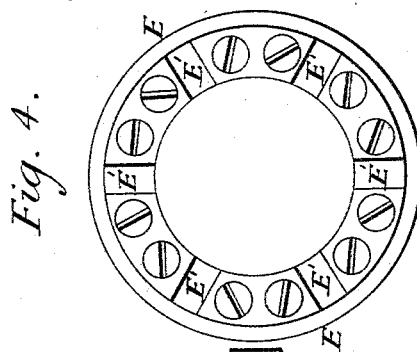
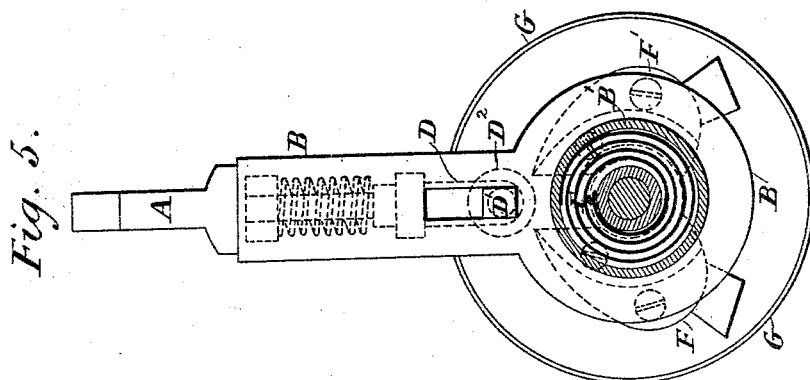
3 Sheets.—Sheet 3.

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Witnesses.

Baltus D & Long.
 Allan Mc Lane Abt.

Inventor.

A. B. Willis.
By Atty -
William H. H. H. H. H.

UNITED STATES PATENT OFFICE.

JAMES BONELLE WILLIS, OF PORTSMOUTH, COUNTY OF HANTS, ENGLAND.

TELEGRAPHIC SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 381,738, dated April 24, 1888.

Application filed February 7, 1888. Serial No. 263,357. (No model.)

To all whom it may concern:

Be it known that I, JAMES BONELLE WILLIS, a subject of the Queen of Great Britain, residing at 1 Mill Lane, Mile End, Portsmouth, in the county of Hants, England, draftsman and engineer, have invented certain new and useful Improvements in Telegraphic Signaling Apparatus, of which the following is a specification.

10 The apparatus is a step-by-step telegraphic instrument which dwells on each step and travels rapidly between them. The contacts are made by a spring contact-maker fixed to a radial arm, which, as it revolves, carries the
15 contact-maker over a ring of alternate conducting and insulating surfaces, and thereby makes or breaks the circuit by which the signals are repeated on a suitable receiving-instrument having a similar step-by-step
20 movement. Concentric with this ring there is a fixed cylindrical surface, against which a spring-bolt on the radial arm bears. In the cylindrical surface there are holes or notches, one for each conducting or insulating surface.
25 When the bolt comes to one of these holes, it is forced into it by its spring, and the radial arm cannot be moved farther until the bolt is withdrawn. For this purpose the bolt carries a friction-roller, which bears upon
30 a double-cam surface connected to the handle or other part whose movement is to be signaled, so that it is caused to revolve as the handle or other part whose movement is to be
35 signaled is turned. When the cam has revolved through a certain angle the bolt is raised by it out of the hole. The radial arm and the cams are connected together by two
40 spiral springs wound in opposite directions, so that the radial arm always tends to turn with the cams; but when it is prevented from so doing by reason of its bolt being in a hole one of the spiral springs is wound up while the other is unwound. Immediately
45 the radial arm is again free to do so on the bolt being raised it is rapidly turned by the spring and tends to resume its normal position between the cams. A fly is connected to it to prevent its moving too fast and causing undue shocks when arrested on the bolt dropping into a hole.
50 In the drawings, Figure 1 is a side eleva-

tion of the apparatus. Fig. 2 is an end elevation. Fig. 3 is a section on the line $x x$, Fig. 2. Fig. 4 is a separate view of the ring E. Fig. 5 is a section on the line $y y$, Fig. 3. 55

A is the spring contact-maker, which is fixed to the radial arm B.

C C' are alternate conducting and insulating surfaces.

D is a spring-bolt. Its nose D' enters 60 notches E' E' in the ring E. The bolt D carries a friction-roller, D², which bears upon the double cam F F'. (See Fig. 5.) These cams are fixed to one face of the disk G, the other face having upon it the pinion H, which is 65 driven by a wheel actuated by the handle or other part whose movement is to be signaled. The wheel and handle are omitted from the drawings.

The disk G carries the tube G', which is free 70 to turn on the fixed axis H'. The tube G' is connected to the barrel B' by the two spiral springs I I', which are wound in opposite directions.

J is a toothed wheel fixed to the barrel B', 75 so that it revolves with the radial arm B and contact-maker A. It gears with the pinion K, to which the fly L is fixed. This fly prevents the contact-maker A from revolving too fast.

Having now particularly described and as- 80 certain the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. The combination of a revolving contact-maker with a pair of spiral springs coiled in 85 opposite directions and connecting the contact-maker to the part whose movement is to be signaled.

2. The combination of the radial arm B with its contact-maker A, the spring-bolt D D', the 90 ring E, the cams F F', the tube G', and the springs I I', substantially as described.

3. The combination of the radial arm B with its contact-maker A, the spring-bolt D D', the 95 notched ring E, the cams F F', the tube G', the springs I I', the toothed wheel J, the pinion K, and fly L, substantially as described.

JAMES BONELLE WILLIS.

Witnesses:

THOMAS WRIGHT ALDERTON,
HENRY G. TEMPLETON.