(No Model.) 2 Sheets—Sheet 1.

G. M. STEVENS.

BELL STRIKING MECHANISM.

No. 585,718. Patented July 6, 1897.

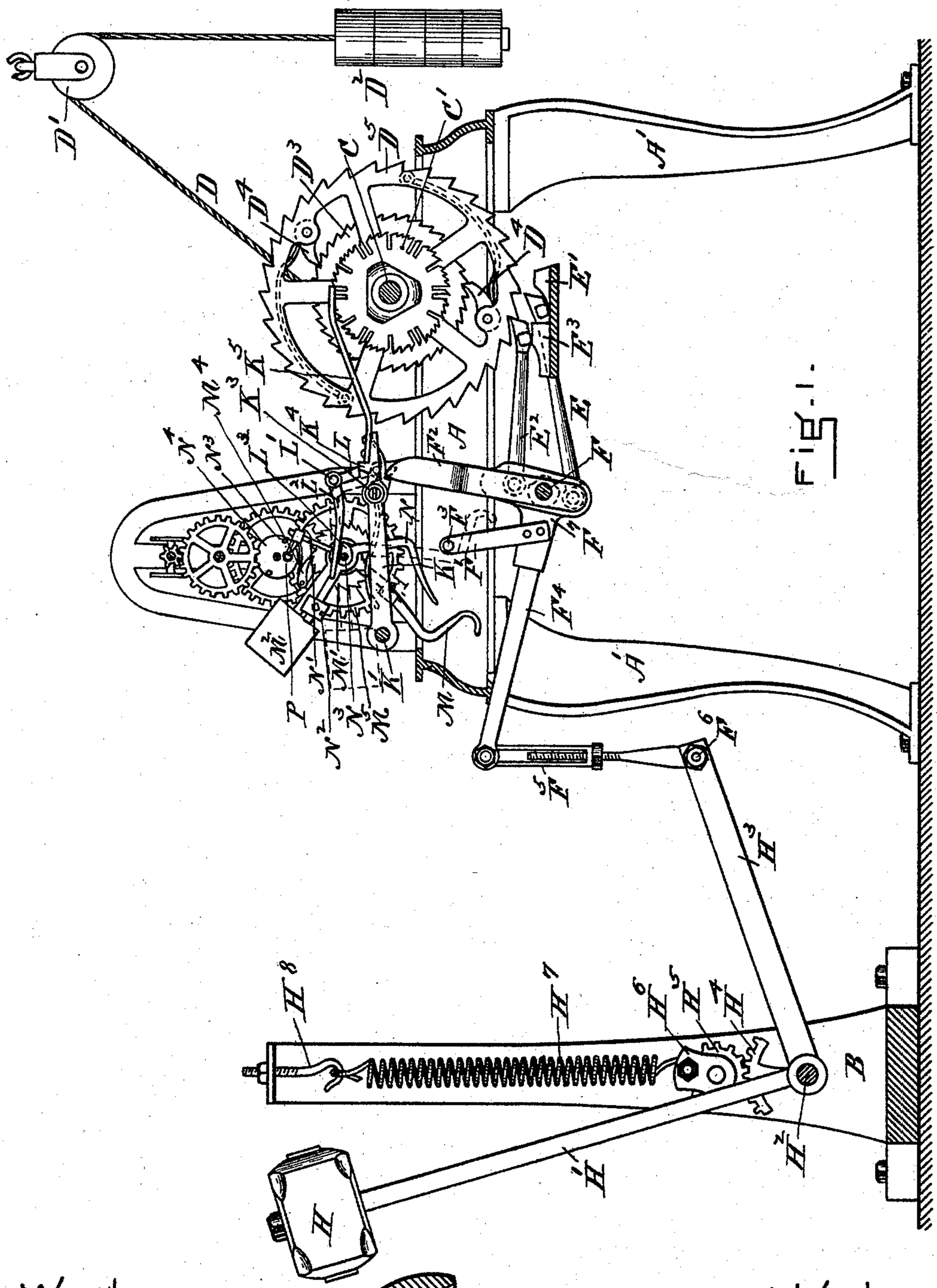

Fig. 1.

WITNESSES

Frank G. Parker

William H. Parry

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(No Model.) 2 Sheets—Sheet 2.

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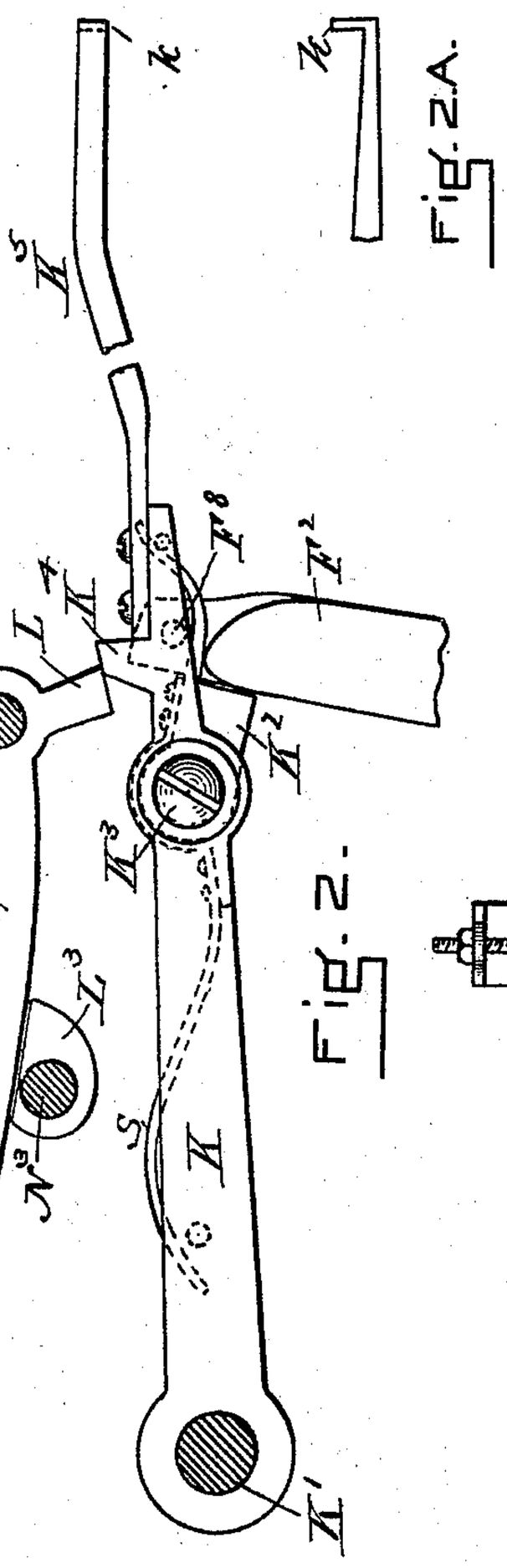

Fig. 2.

Fig. 2A.

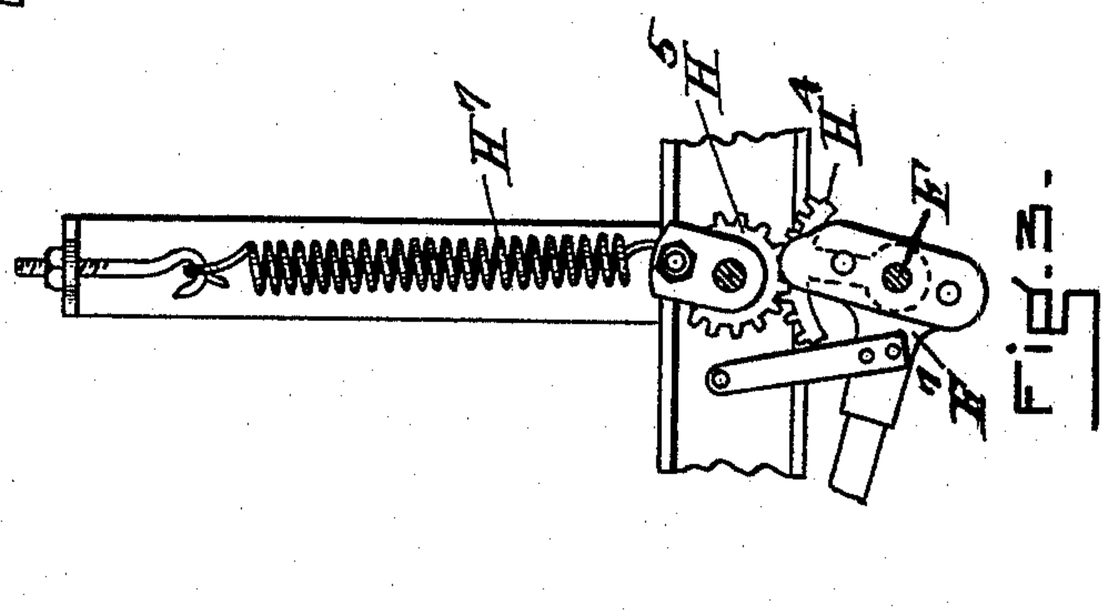

Fig. 3.

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GEORGE M. STEVENS, OF CAMBRIDGE, MASSACHUSETTS.

BELL-STRIKING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 585,718, dated July 6, 1897.

Application filed November 2, 1896. Serial No. 610,879. (No model.)

To all whom it may concern:

Be it known that I, GEORGE M. STEVENS, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Signal Apparatus, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to that class of signal apparatus in which the signal is given by a single number or by indicating the number of a station, or any numerical indication, by giving each digit of which the number is composed, then allowing a rest, after which the next digit is given, and so on until all the digits are notated, and then after a longer rest repeating, so that the hearer or observer may know the whole number, the object being to insure ease and certainty of action of the apparatus. This object I attain by the mechanism shown in the accompanying drawings, in which—

Figure 1 is a view partly in elevation and partly in vertical section. Fig. 2 shows certain details in elevation. Fig. 2^A shows in plan one part that is shown in elevation in Fig. 2. Fig. 3 illustrates a slight modification.

In the drawings, Fig. 1, the frame of the actuating and regulating gear is indicated by A A′ A′. The main shaft C is suitably mounted upon this frame and has upon it a drum (not shown) to which a rope D is attached. This rope D passes over the pulley D′ and has connected to it a weight D^2, the object of which is to cause the said drum and its connected parts to rotate. A ratchet-wheel D^3 is connected to the drum and, acting through the pawls D^4 D^4, communicates motion to the hammer-driving wheel D^5.

The mechanism for transmitting motion from the wheel D^5 to the hammer is not new and needs but a brief mention. A rocker F^7 is hung upon the pin F to an arm extending downward from the frame. This rocker F^7 has an arm F^4, the end of which is pivoted to the upper end of an adjustable link F^5. The lower end of the said link is connected by a pivot F^6 to an arm H^8 of the hammer-lever H′. The hammer-lever H′ H^8 is pivoted on the shaft H^2. A balancing segment-gear H^4 is connected to the hammer-lever H′ H^3, so that any movement of the hammer H is transmitted to the said segment-gear H^4 and thence to the pinion H^5 and to the arm H^6, which is rigidly attached to the pinion H^5. A spring H^7 is connected to the pin H^6 at its lower end and to a hook H^8 at its upper end, which is attached to the standard B. The bell is indicated by H^9. The novelty of this part of my apparatus consists in the arrangement of the segment-gear H^4, pinion H^5, and spring H^7 in connection with the hammer. It will be observed that the segment-gear H^4 is of a radius about twice that of the pinion H^5, so that the spring H^7 has considerable leverage in its strain on the hammer—that is, the spring can exert a great force in drawing the hammer back from its inclined position and yet exert but little opposition to the starting of the hammer from its resting-place. The two pawls E^2 and E are connected to the rocker F^7 and are kept in working position by the fixed guide E^3 E′ and operate in the usual manner.

In the bell-hammer the segment-gear H^4, pinion H^5, and spring H^7 form an important part of my invention.

When the hammer is inclined at an angle toward the bell, as shown in Fig. 1, the spring attached to the pinion is tending to pull the hammer from the bell. As the mechanism is released and the hammer swings back from the bell, the spring, by the action of the pinion which is rotated by the segment, is thrown back to perpendicular and rapidly to the other side of the hammer, thus checking the hammer's tendency to drop backward after it has left the perpendicular balance position. The hammer thus becomes a balanced or oscillating hammer. When the hammer by the operation of the machine strikes the bell, the spring H^7 assists to bring it away quickly from the bell, thus giving freedom for its full vibration, while, on the other hand, when the hammer falls back on its back stroke this spring being thrown to the other side helps to give a quick forward movement. Thus the hammer, with the aid of the segment-wheel and pinion, changes the tension of the spring from one side to the other, making the motion of the hammer rapid and easy.

The arms F′ and F^2 are connected to the rocker F^7 and are adapted to work in connection with the controlling mechanism, which will be explained.

The wheel C′ has its periphery divided by

a series of notches some of which are much deeper than the others. These notches are adapted to receive the bent end *k* (see Figs. 2 and 2A) of the lever K K^5. When the end *k* of the lever engages with one of the teeth of the wheel C′, it holds it until the said lever is raised so that the end *k* is taken up out of engagement with the notch or tooth.

The lever K K^5 is pivoted at K′ and has a projection K^4, which at times is engaged with the drop L on the lever L^2. (Said lever L^2 is pivoted on the pin L′.) The lever K K^5 has a dropping latch K^2, pivoted to it at K^3. S is a spring which has a tendency to force the end of the latch K^2 down. The locking-lever L^2 is operated by the cam L^3, loosely mounted on the shaft N^3. The shaft N^3 is connected with the clock-train, as shown, the action of which will now be explained.

The gear-wheel M^5 is made fast to the shaft N^3 and is one of the set of wheels that together make up the clock-train. A pawl M^4 is attached to the wheel M^5 and serves to communicate motion from the ratchet M′ to the gear M^5 and thence to the train. Motion is communicated to the ratchet M′ by the weight M^2, which is connected to it by a bar, as shown. An arm M is also attached to the ratchet M′, and this arm M is caused to move by the pin F^3 on the arm F′—that is, as the rocker F^7 swings the pin F^3 will come in contact with the arm M and (pushing it back from the position indicated by dotted lines) cause the ratchet M′ to turn, thereby lifting the weight M^2 upward. The downward motion of the weight will cause the ratchet M′ to turn, and thus operating through the pawl M^4 will give motion to the whole train. The wheel N^4 is in the train and will of course rotate when the train is in motion. This wheel has upon it pins N^3, the action of which is to throw off from the fixed pin P the locking-latch at the upper end of the lever N′ and allow the weight N^2 to fall, and as this weight is connected to the cam L^3 it will lift the said cam and thus throw up the end of the locking-lever L^2 and turn the drop L away from the projection K^4 on the lever K K^5 and thus allow the said lever to be forced upward so as to raise the hook *k* out of engagement with the teeth of the stroke-regulating wheel C′. The cam L^3 is restored to its resting-place by the movement of the arm F^2, which has a pin F^8. The said pin coming in contact with the lever N forces it back and thus puts the cam L^3 and its weight N back to its position as shown in Fig. 1.

The modification shown in Fig. 3 consists in applying the segment-gear H^4, the pinion H^5, the spring H^7, and their adjuncts, as shown in Fig. 1, directly to the rocker F^7 and shaft F instead of connecting them to the hammer-lever H H^3. The notches on the stroke-regulating wheel C′ may be arranged so as to give any desired number. By removing the extension K^5 of the lever K K^5 the apparatus will strike single blows at intervals, in which case the wheel C′ is not used.

It is obvious that instead of a hammer and bell, as shown in the illustration, a whistle or a light may be substituted.

The operation of my apparatus is so similar to the devices of this class that it is not necessary to set it forth at length.

I claim—

1. In a signal apparatus, a stroke-regulating lever having a projection adapted to engage with a locking and let-off mechanism, a drop-latch attached to the said lever and adapted to engage with an oscillating arm connected to the stroke mechanism, and operating with the same, and the said oscillating arm substantially as and for the purpose set forth.

2. In a signal apparatus, a stroke-regulating lever having a projection adapted to engage with a locking and let-off mechanism, and an extension having a hook adapted to engage with a stroke-number-regulating mechanism, a drop-latch attached to said lever and adapted to engage with an oscillating arm connected to the stroke mechanism and operating with the same, and the said oscillating arm, substantially as and for the purpose set forth.

3. In a signal apparatus, a mechanism for giving motion to a signal-emitter, a swinging weighted arm, a segment-gear swinging with said arm, a pinion engaging with said segment-gear and a spring adapted to control said weighted arm substantially as and for the purpose set forth.

4. In a signal apparatus, the combination of a bell-hammer; with a segment-gear connected to said hammer, a pinion engaging with said segment-gear and a spring adapted to control said pinion, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 30th day of October, A. D. 1896.

GEORGE M. STEVENS.

Witnesses:

FRANK G. PARKER,

WILLIAM EDSON.