

(No Model.)

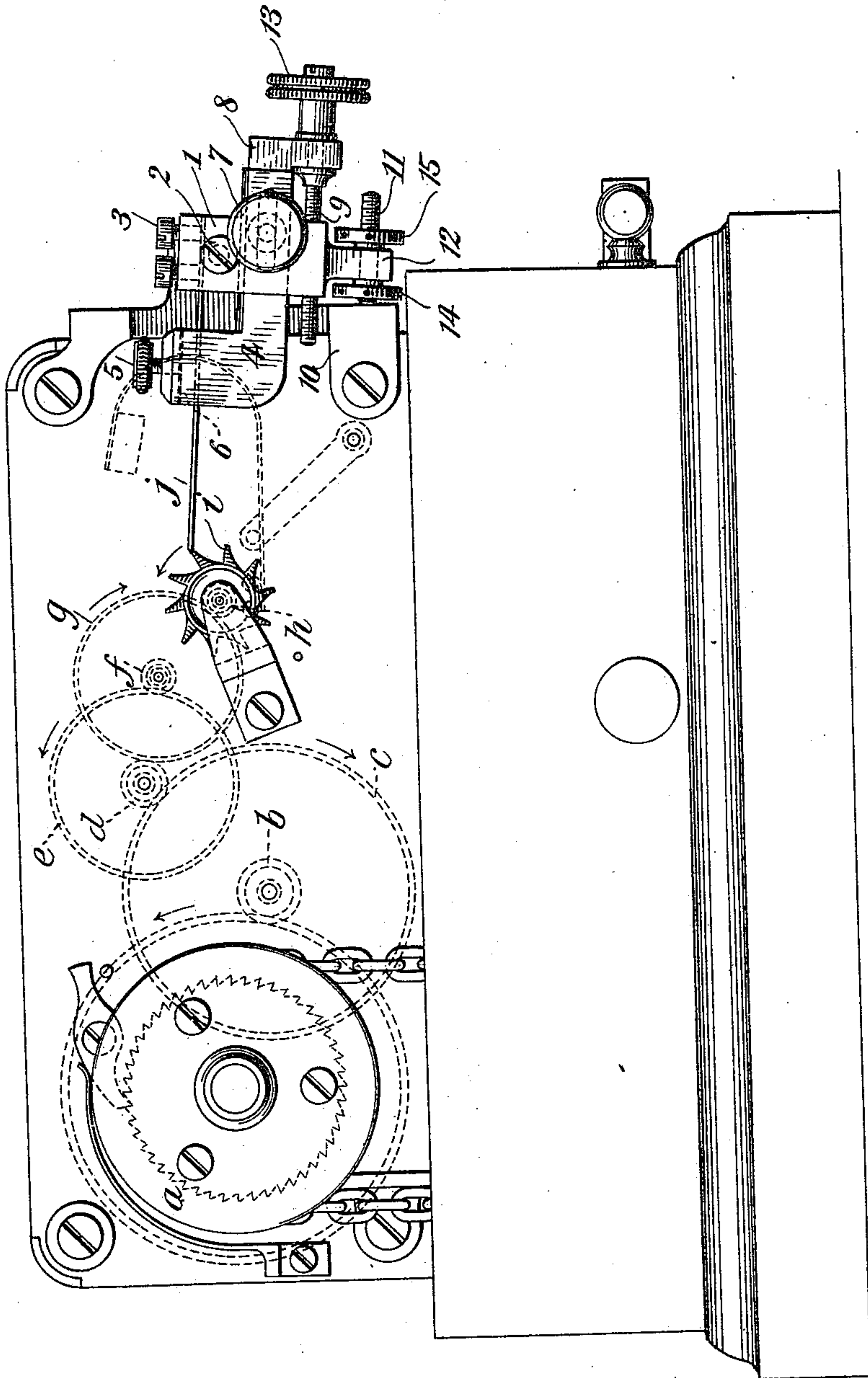
4 Sheets—Sheet 1.

C. L. BUCKINGHAM & J. GARDAM.  
TELEGRAPH TRANSMITTER.

No. 579,633.

Patented Mar. 30, 1897.

Fig. 1,



WITNESSES:

*C. E. Ashley*  
*H. W. Lloyd*

INVENTORS:

*C. L. Buckingham*  
*J. Gardam*  
By their Attorney  
*C. L. Buckingham*

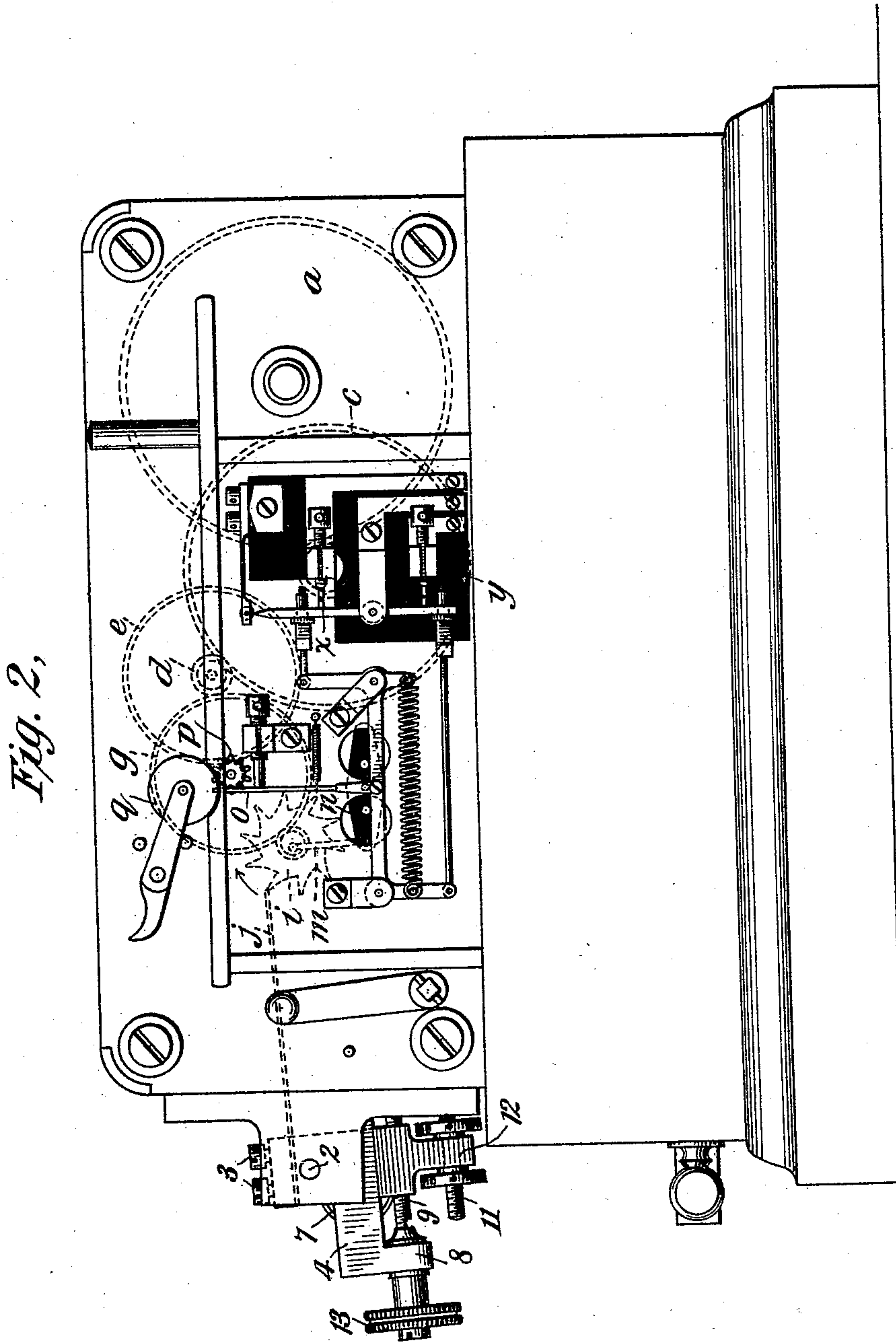
(No Model.)

4 Sheets—Sheet 2.

C. L. BUCKINGHAM & J. GARDAM.  
TELEGRAPH TRANSMITTER.

**No. 579,633.**

Patented Mar. 30, 1897.



**WITNESSES:**

L. E. Ashley  
14. W. Lloyd

**INVENTORS;**

*C. L. Buckingham*  
*Joseph L. Carlson*  
*By their Attorney*  
*C. L. Buckingham*

(No Model.)

4 Sheets—Sheet 3.

C. L. BUCKINGHAM & J. GARDAM.  
TELEGRAPH TRANSMITTER.

No. 579,633.

Patented Mar. 30, 1897.

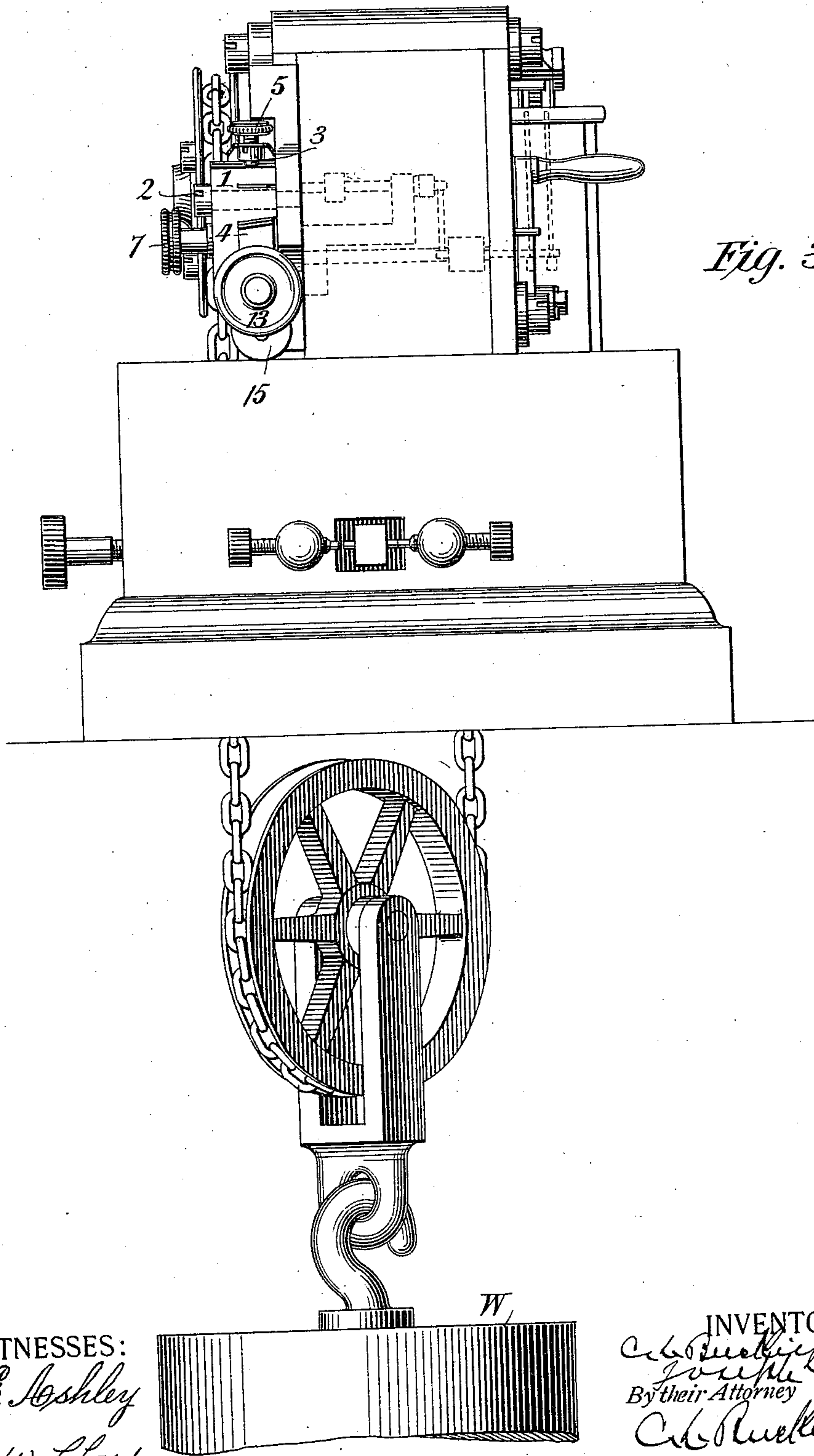


Fig. 3.

WITNESSES:

*C. E. Ashley*

*W. W. Lloyd*

INVENTORS:

*C. L. Buckingham*  
*Joseph Gardam*  
By their Attorney

*C. L. Buckingham*



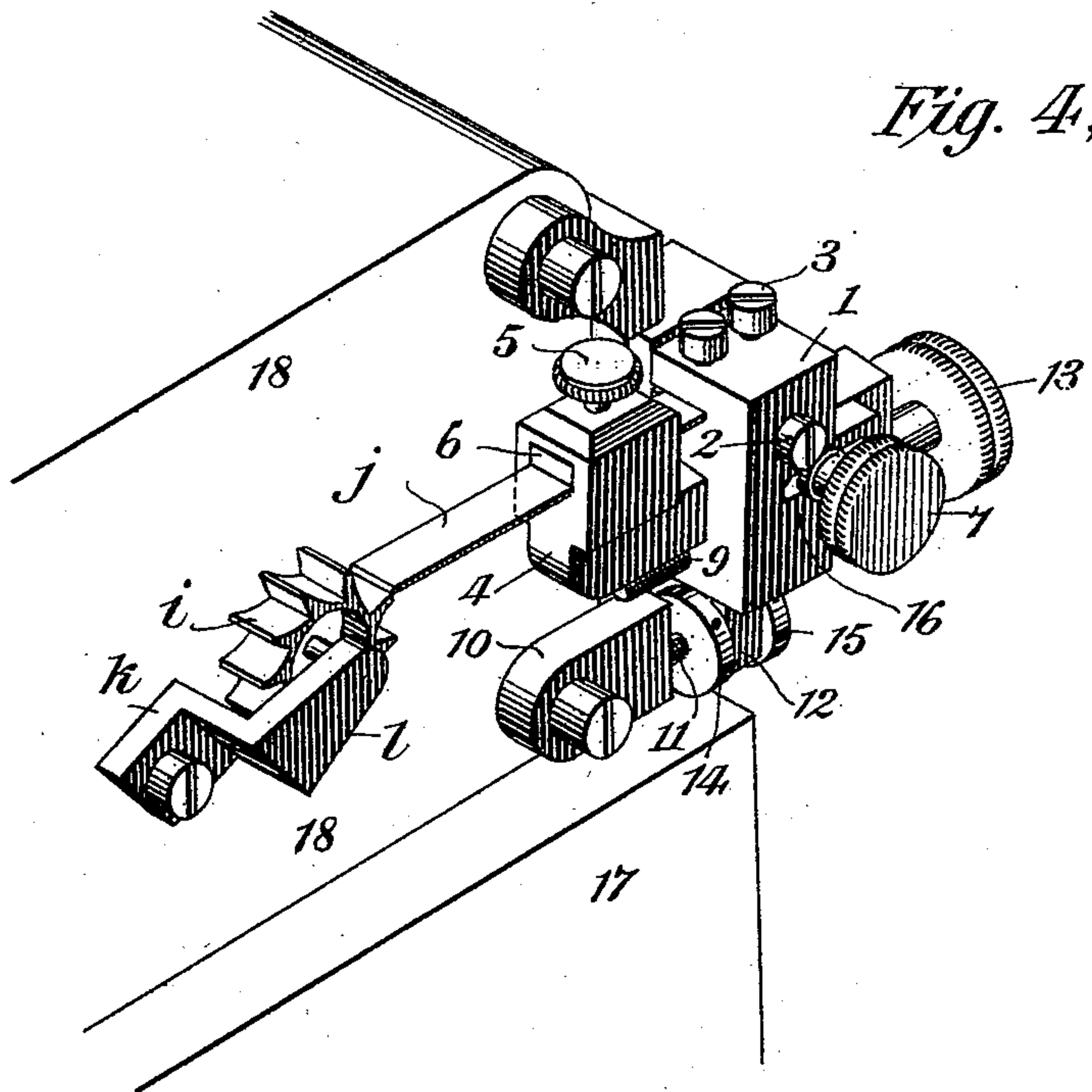
(No Model.)

4 Sheets—Sheet 4.

C. L. BUCKINGHAM & J. GARDAM.  
TELEGRAPH TRANSMITTER.

No. 579,633.

Patented Mar. 30, 1897.



WITNESSES:

*C. E. Ashley*  
*W. W. Lloyd*

INVENTORS:

*C. L. Buckingham*  
*Joseph Gardam*  
By their Attorney  
*C. L. Buckingham*

# UNITED STATES PATENT OFFICE.

CHARLES L. BUCKINGHAM, OF NEW YORK, AND JOSEPH GARDAM, OF BROOKLYN, NEW YORK; SAID GARDAM ASSIGNOR TO SAID BUCKINGHAM.

## TELEGRAPH-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 579,633, dated March 30, 1897.

Application filed September 2, 1896. Serial No. 604,614. (No model.)

*To all whom it may concern:*

Be it known that we, CHARLES L. BUCKINGHAM, of the city and county of New York, and JOSEPH GARDAM, of Brooklyn, county of Kings, State of New York, citizens of the United States of America, have made a new and useful Improvement in Telegraph-Transmitters, of which the following is a specification.

10 Wheatstone transmitters heretofore employed in printing-telegraph systems have been subject to irregularities in speed of transmission, and to overcome this difficulty we have reorganized the instrument by removing its well-known form of regulator and substituting therefor one of great simplicity, which is automatic in action and capable of maintaining within wide limits any required rate of transmission.

20 Our invention is fully described by reference to the accompanying drawings, in which—

Figure 1 represents a side view of a Wheatstone transmitter, together with a side view of the outlines of the motor-train and of our improved regulator. Fig. 2 is an opposite view of the transmitter shown in Fig. 1, and also shows other parts of the internal apparatus. Fig. 3 represents an end view of the transmitter and a weight and chain serving as a motor therefor. Fig. 4 represents a perspective view of the governor with such details of construction as are necessary for securing the various speeds of transmission.

35 In Figs. 1 and 2 is shown a train of gearing *a b c d e f g h* such as is usually employed in Wheatstone transmitters for feeding a fillet of paper and actuating the circuit-controlling apparatus. The paper strip is fed by a wheel *p*, having spur-teeth engaging the central row of perforations, and is placed upon the shaft of wheel *f*, while above the feed-wheel is a wheel *q* for guiding the tape over the teeth of the feed-wheel. There is also employed the usual organization which characterizes the Wheatstone transmitter, consisting of a crank-arm *m*, placed upon the shaft of wheel *h*, which with the rotation of said shaft causes a rocking motion of a walking-beam or arm *n*, through which, as the

needles *o* (one only of which is shown) enter the holes of the tape, the contacts *x* and *y* are alternately opened and closed. Connecting with the train of gearing and upon the shaft *h* is also placed a regulator-wheel *i*, having teeth, substantially as shown in Figs. 1, 2, and 4, the points of which during rotation pass rapidly under the point of a tuning-fork spring *j*, which when set in vibration maintains a speed of oscillation depending upon its length and cross-section. As wheel *i* rotates, its teeth may or may not come in contact with the point of the spring. If the speed of the wheel were such that one tooth should pass for each vibration of the spring, there might be no contact, but if the wheel were rotated under the action of a strong motor and with a tendency sufficient to move the teeth of *i* at a greater rate than the vibrations of the spring, then at each passage of a tooth the point of the spring would be hit and rotation of the wheel would be retarded. For the purposes of Wheatstone transmission we have found that this regulator, with proportions of apparatus shown in the drawings, may readily be adjusted to a speed of from fifty to two hundred words a minute. Adjustments of the regulator are effected as follows:

In Figs. 1, 2, 3, and 4 are shown different views of the various parts, which consist of a bracket carrying the heel of spring *j*, mounted upon the outer frame of the transmitter by a pivot or bolt 2, passing through a large heel-piece 1. Sliding within the lower part of heel-piece 1 is an L part 4, in which is a horizontal aperture near the top of its vertical arm, permitting it to be slid over spring *j* near the latter's central part. Above the spring *j*, within the aperture, is a clamping-shoe 6, which, by means of screw 5, serves to rigidly fix spring *j* within the L-support. Projecting from the lower side of the heel-piece 1 is an arm 12, and through this projection passes screw 11, which is rigidly fixed in a bracket 10. By means of screw-heads 14 and 15 arm 12 may be thrown to the right or left around the supporting-bolt 2, thus raising or lowering the free end of *j* with reference to the teeth of *i*. The spring *j* may



also be given a lengthwise adjustment by loosening the screws 3 and 5. The adjustments above noted are wholly for the purpose of fixing the free end of the spring *j* with reference to the teeth of wheel *i*. An adjustment, however, which is necessary for securing any required speed of transmission is obtained by loosening spring *j* from the L-piece 4 and moving it from right to left. To this end a clamping-screw 7, as well as screw 5, is loosened, and the L-piece 4, under the action of screw 13, is moved to the left if it is desired to quicken transmission or to the right to make transmission slower. When, however, the L-piece 4 has been moved to proper position, set-screws 5 and 7 will be tightened to fix part 4 in position and to clamp spring *j* tightly thereto. The L-piece 4 and the clamping-piece 6 constitute a large metallic body of comparatively solid construction, so that when they are set the vibrating portion of spring *j* will be found almost wholly between its point and the support 4.

What we claim, and desire to secure by Letters Patent, is—

1. The combination, in a telegraph-transmitter, of a motor, a train of gear, circuit-controlling apparatus for directing suitable signals to line, a phonic governor consisting of a toothed wheel, *i*, connected to and driven by said train of gear, and a tuning-fork spring, *j*, whose vibration is maintained by the teeth of said wheel, as and for the purpose set forth.

2. The combination, in a telegraph-transmitter, of a motor, a train of gear, circuit-controlling apparatus for directing signaling-currents to line, a phonic governor consisting of a regulating-wheel, *i*, connected with said train, a tuning-fork spring, *j*, whose vibration is maintained by and which in turn controls the rotation of said wheel, and an adjusting apparatus for varying the vibrating length of said spring.

3. In a telegraph-transmitter, the combination of a motor, a train of gear, circuit-controlling apparatus for directing signaling-cur-

rents to line, a harmonic regulator consisting of a toothed wheel connected with said train of gear, spring *j*, means for limiting the vibrating length of said spring, and means of adjustment for setting the point of said spring with relation to the teeth of said regulating-spring.

4. In a telegraph-transmitter, the combination of a motor, a train of gear, circuit-controlling apparatus for directing signaling-currents to line, a toothed regulating-wheel *i* connected with said train, a vibrating spring *j*, a heel-support, 1, for said spring, and a clamping-arm for the purpose of limiting the vibrating length of said spring.

5. In a telegraph-transmitter, the combination of a motor, a train of gear, circuit-controlling devices for directing signaling-currents to line, a toothed regulating-wheel *i* connected with said train, a vibrating spring *j*, a heel-piece, 1, a clamping-arm, 4, for limiting the vibrating length of said spring, a clamping-screw, 5, a shoe, 6, and a set-screw, 13, for moving or adjusting said clamping-arm.

6. In a telegraph-transmitter, the combination of a motor, a train of gear, circuit-controlling devices for directing signaling-currents to line, a toothed regulating-wheel *i* connected with said gear, a spring *j*, a heel-piece, 1, pivoted at 2, a bracket, 10, a set-screw 11, as and for the purpose set forth.

7. In a telegraph-transmitter, the combination of a motor, a train of gear, circuit-controlling apparatus for directing signaling-currents to line, a toothed regulating-wheel connected with said gear, a spring *j*, a heel-piece, 1, pivoted at 2, a clamping-arm 4, clamping devices 5 and 6, a clamping-screw 7, an adjusting-screw 13, a bracket 10, and a screw 11, as and for the purpose set forth.

CHARLES L. BUCKINGHAM.  
JOSEPH GARDAM.

Witnesses:

J. NOBLE CURLEY,  
PETER C. LENZ.