

(No Model.)

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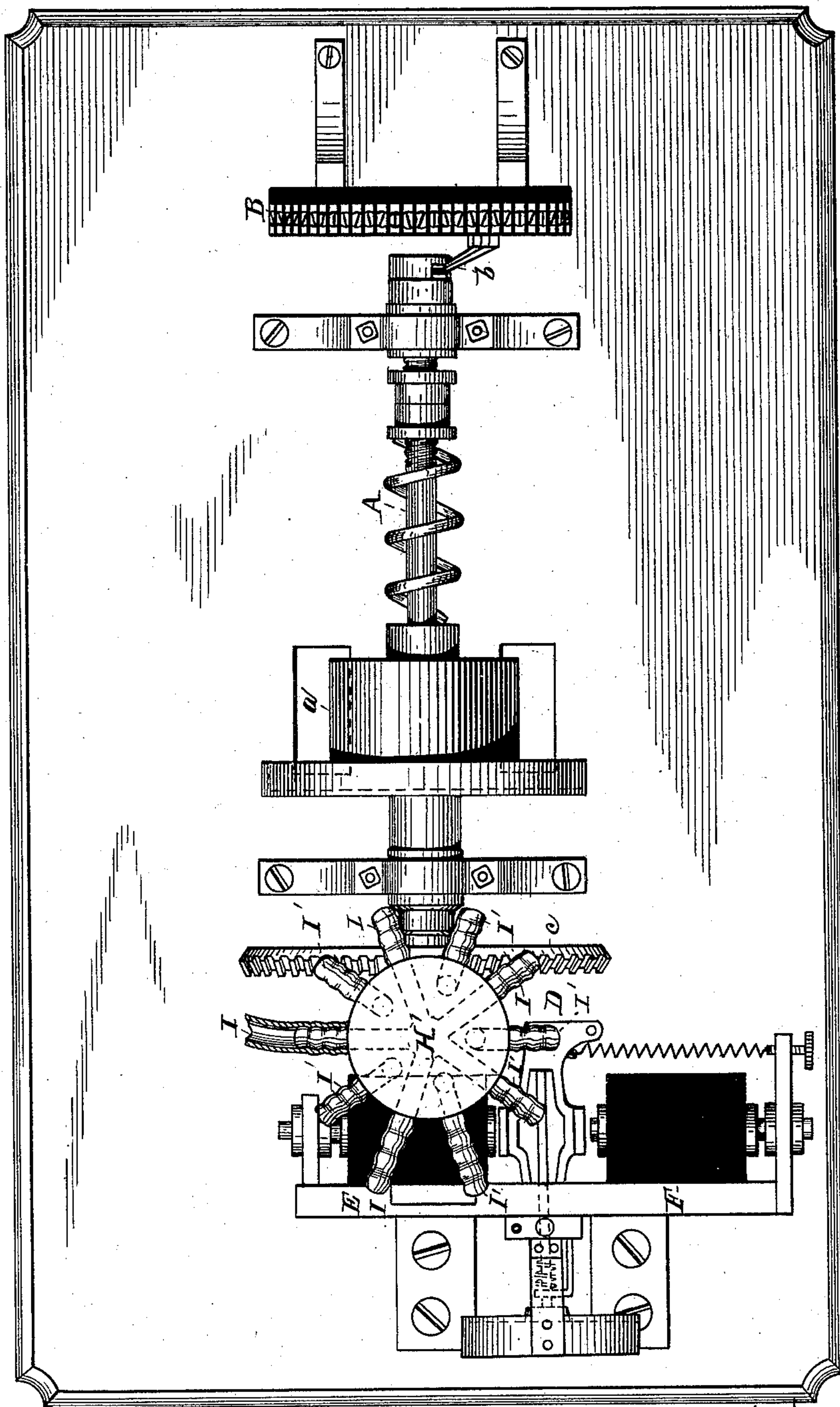
S. D. FIELD.

TRANSMITTER FOR PRINTING TELEGRAPHS.

No. 365,982.

Patented July 5, 1887.

Fig 1.



ATTEST:
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INVENTOR:
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By Dyer & Seely,
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(No Model.)

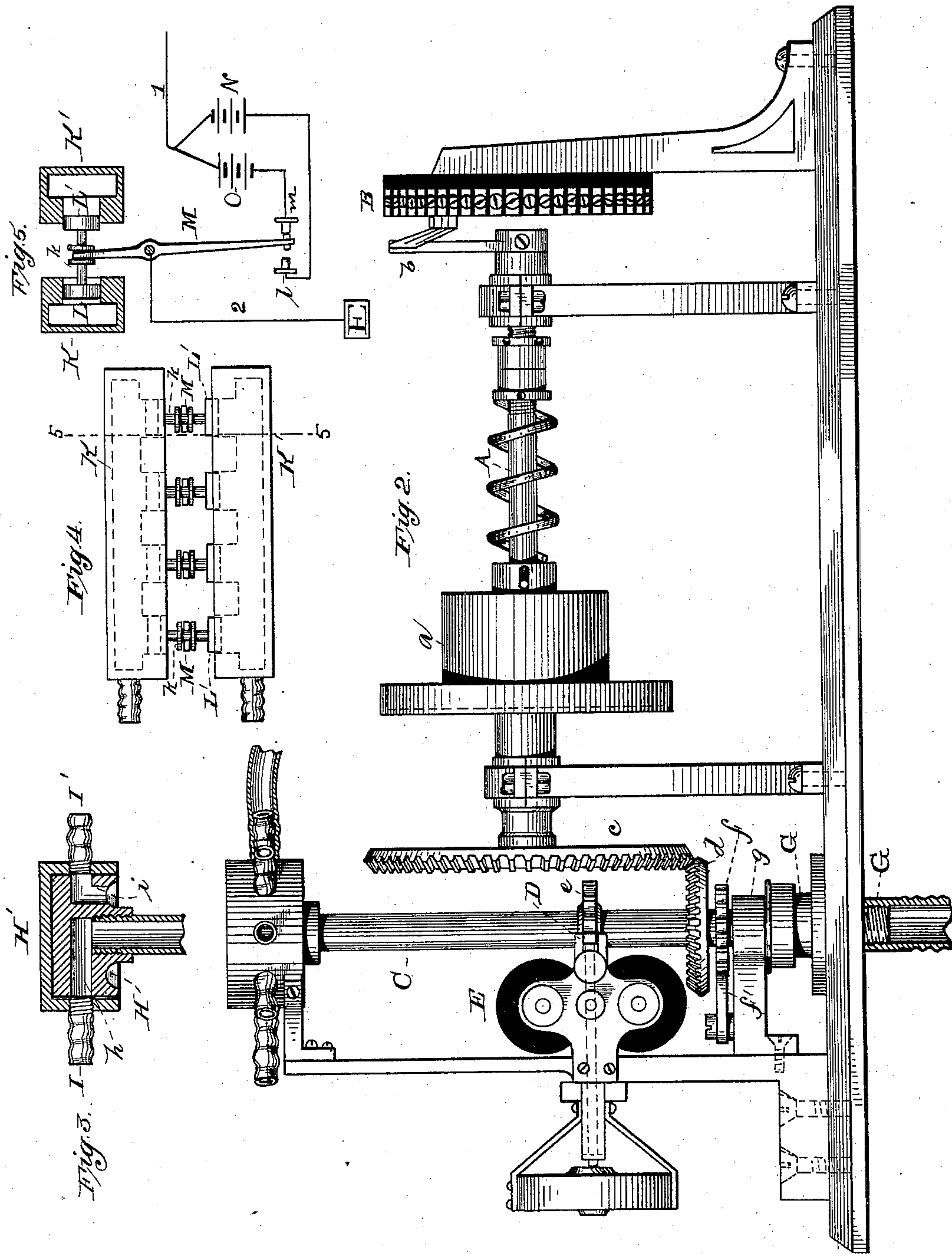
2 Sheets—Sheet 2.

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ATTEST:
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Notary Public

INVENTOR
Stephen D. Field
By *Dyer & Seely*
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UNITED STATES PATENT OFFICE.

STEPHEN DUDLEY FIELD, OF NEW YORK, N. Y., ASSIGNOR TO HIMSELF AND JOHN ANDERSON, OF SAME PLACE.

TRANSMITTER FOR PRINTING-TELEGRAPHS.

SPECIFICATION forming part of Letters Patent No. 365,982, dated July 5, 1887.

Application filed December 5, 1885. Serial No. 184,771. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN DUDLEY FIELD, of New York city, in the county and State of New York, have invented a certain new and useful Improvement in Transmitters for Printing-Telegraphs, of which the following is a specification.

Heretofore the capacity of transmitters for printing-telegraphs has been limited by the consideration that the increase in number of contacts or other devices for controlling the escapement or type wheel circuits produces such additional weight in the moving parts of the apparatus that they have great momentum, and when suddenly arrested by the stopping mechanism cause a strain upon the apparatus, which, being repeated at short intervals, soon breaks it down; and although the transmitters for printing-telegraphs heretofore have been, for the reasons given, of limited capacity, it has nevertheless been found impracticable to give them the high rate of speed necessary for the working of improved printers at their full capacity, since the principle of construction employed made necessary a considerable weight in the moving parts.

The object I have in view is to produce a transmitter for printing-telegraphs which will have none of these defects and will be capable of running at the highest desired speed and of being stopped instantly without injurious strain, and will also have a large capacity, which may be increased to any practical or desired extent without adding weight to the moving parts. This I accomplish by constructing a transmitter which does not act directly to open and close circuit or reverse currents, but serves simply to control and direct an actuating medium, which operates the circuit-controlling devices. By the preferred form of the apparatus a gas or liquid (preferably the former, which may be air) is used under pressure, and operates circuit-controlling devices by being applied alternately on opposite sides of piston mechanisms, or other suitable means, which are connected with such circuit-controlling devices. The transmitter operates a valve mechanism which directs the actuating medium under pressure, the actuating medium being delivered by the valve to as many sets of

conveying-pipes as desired and being rapidly reversed in direction through the pipes of each set by such valve. Each set of conveying-pipes supplies air under pressure to a number of the circuit-controlling piston mechanisms, the number of such mechanisms being dependent upon the degree of pressure, which may be increased without affecting the operation of the transmitter or changing the weight of its moving parts. The stopping-dog of the transmitter acts upon the spindle, which carries or actuates the directing-valve, the arresting of the valve preventing further reversals of the air-pressure in the conveying-pipes.

In the accompanying drawings, forming a part hereof, Figure 1 is a top view of the main parts of transmitter; Fig. 2, a side elevation of same; Fig. 3, a vertical section through the directing-valve of transmitter; Fig. 4, a top view of a set of circuit-controlling piston mechanisms; and Fig. 5, a section on line 5 5 in Fig. 4, with a diagram of connections for one line.

The operating-shaft A of the transmitter has a pulley, *a*, thereon, to which the power is applied by a belt, such pulley being held by friction on the shaft, as will be well understood, so adjusted that when the stopping-dog is out of action the pulley will turn the shaft positively; but when the shaft is arrested by the stopping-dog the pulley turns upon the shaft. This shaft may carry the contact-arm *b*, traveling upon the "sun-wheel" B. Shaft A is connected by speed-increasing bevel-gears *c d* with a vertical shaft, C, shaft C being driven by shaft A at an increased rate of speed. Shaft C has a heavy ratchet, *e*, with which engages the stopping-dog D, thrown into and out of engagement with the ratchet by the stopping and starting magnets E F. Shaft C may also have a ratchet, *f*, with which a pawl, *f'*, is in constant engagement to prevent the reverse movement of the shaft. Shaft C is hollow, and is stepped at its lower end in a suitable hollow box or bearing, *g*, with which is connected the supply-pipe G, for supplying the actuating medium (preferably air) under pressure. The upper end of hollow shaft C carries a circular valve, H, turning therewith, which valve is surrounded on its top and sides by the valve-case H'. The shaft C enters the

valve H air-tight to its center, from which a number of pressure-supply channels, *h*, radiate to the periphery of the valve. (Five of such channels *h* are shown in the drawings.) Between the supply-channels *h* other or exhaust channels, *i*, are formed. These extend from the periphery of the valve inwardly toward its center and turn downwardly through the under side of the valve, as shown in Fig. 3.

To the sides of valve-case H' are secured radial pipes, forming five pairs of conveying-pipes, I I'. These pipes are the same distance apart as the supply and exhaust channels in side of valve H, and since the pipes of each pair are adjoining, when one pipe of a pair is opposite a pressure-supply channel of valve the other pipe will be opposite an exhaust-channel, and this relation will be reversed rapidly as the shaft C and valve H revolve.

Each pair of conveying-pipes is extended by flexible or rigid tubing to a separate pair of air-chests, K K', which are arranged side by side, and have openings in their adjoining sides, in which work solid pistons L L', the opposite pistons being connected together by bars *k*. Each bar *k* operates by its movement a pivoted contact-arm, M, playing between contact-points *l m*. Each contact-arm M controls an escapement or type wheel line, 1, Fig. 5, which is connected, through oppositely-arranged batteries N O, with contacts *l m*, the arm M being connected with earth by wire 2.

The effect of the movement of each arm M is to reverse the current upon the line 1 controlled by it. A definite number of such reversals will be produced by one revolution of shaft C; and the proper relation will be observed between the speeds of shafts A and C, the number of pressure and exhaust channels in valve, the sun-wheel, and the stopping-ratchet, so that these several elements will operate conjointly, as will be well understood.

Each pair of air-chests K K' may have as many pairs of pistons as the pressure supplied will practically operate. Four of such pairs of pistons are shown in Fig. 4; but the number may be increased.

Each pair of conveying-pipes is connected with a similar set of air-chests, controlling a number of lines by means of piston mechanisms in the manner described, and it will thus be seen that the transmitter may control a large number of lines and still be very light in its moving parts, and hence be capable of high speed and of being instantly stopped without injurious strain.

What I claim is—

1. A printing-telegraph transmitter having, in combination, two or more circuit-controlling devices controlling two or more escapement or type wheel lines and operated by an actuating medium (such as air) under pressure and means operated by the movement of the transmitter for controlling and directing such actuating medium, substantially as set forth.

2. In a printing-telegraph transmitter, the combination of two or more circuit-controlling devices controlling two or more escapement or type wheel lines and operated by an actuating medium (such as air) under pressure and a revolving valve operated by the movement of the transmitter and controlling and directing the actuating medium, substantially as set forth.

3. In a printing-telegraph transmitter, the combination, with an operating-shaft to which the motive power is applied, of a valve moved by such shaft and controlling and directing an actuating medium (such as air) under pressure, two or more circuit-controlling devices operated by such actuating medium, and a dog for stopping the movement of such valve, substantially as set forth.

4. In a printing-telegraph transmitter, the combination, with an operating-shaft to which the motive power is applied, of a valve moved by such shaft and controlling and directing an actuating medium (such as air) under pressure, two or more circuit-controlling devices operated by such actuating medium, and an electrically-operated dog for stopping the movement of such valve, substantially as set forth.

5. In a printing-telegraph transmitter, the combination, with an operating-shaft to which the motive power is applied, of a valve revolved by such shaft and controlling and directing an actuating medium (such as air) under pressure, two or more circuit-controlling devices operated by such actuating medium, a contact-arm revolved by said operating-shaft and moving over a range of contacts, and an electrically-operated dog for stopping said operating-shaft, the valve, and contact-arm, substantially as set forth.

6. In a printing-telegraph transmitter, the combination, with an operating-shaft, of a directing-valve and contact-arm revolved by said shaft, the valve having a greater speed than the contact-arm, substantially as set forth.

7. In a printing-telegraph transmitter, the combination, with an operating-shaft, of a contact-arm carried directly by such operating-shaft, a valve-shaft connected with the operating-shaft by a speed-increasing gearing, and a stopping-dog engaging a ratchet on the valve-shaft, substantially as set forth.

8. In a printing-telegraph transmitter, the combination, with a moving valve, of a supply-pipe delivering an actuating medium (such as air) thereto under pressure, two or more conveying-pipes in which the actuating medium is directed and controlled by the valve, two or more circuit-controllers connected with such conveying-pipes and operated by the pressure therefrom, and two or more escapement or type wheel lines controlled by said circuit-controllers, substantially as set forth.

9. In a printing-telegraph transmitter, the combination, with two or more electric circuits, of separate circuit-controllers for said cir-

5 cuits, a separate piston mechanism for each circuit-controller, and a valve directing an actuating medium (such as air) under pressure alternately to opposite sides of such piston mechanisms, substantially as set forth.

10 10. In a printing-telegraph transmitter, the combination, with a pair of conveying-pipes, of two or more electric circuits, separate circuit-controllers for said circuits, connected
15 with such pair of pipes and operated therefrom, and a moving valve directing an actuating medium (such as air) under pressure alternately into the pipes of the pair and simultaneously opening an exhaust-outlet for the other pipe, substantially as set forth.

20 11. In a printing-telegraph transmitter, the combination, with two or more pairs of conveying-pipes, of two or more electric circuits having circuit-controllers connected with each
25 pair of pipes and operated therefrom, and a moving valve delivering an actuating medium (such as air) under pressure simultaneously to the two or more pairs of pipes and directing it alternately into the pipes of each pair

while opening an exhaust for the other pipe 25 of each pair, substantially as set forth.

12. In a printing-telegraph transmitter, the combination, with the hollow shaft, of the valve on the end of same, the radial supply and exhaust channels in valve, the valve-case, the 30 radial conveying-pipes, and circuit-controllers operated by pressure from the conveying-pipes, substantially as set forth.

13. In a printing-telegraph transmitter, the combination, with adjoining air-chests, of two 35 or more pistons in the opposite sides of each air-chest, bars joining the opposite pistons in pairs, an electric circuit having a circuit-controller connected with and moved by each pair of pistons, and pipes delivering an actuating 40 medium (such as air) under pressure to such chests alternately, substantially as set forth.

This specification signed and witnessed this 2d day of December, 1885.

STEPHEN DUDLEY FIELD.

Witnesses:

J. H. LONGSTREET,

G. M. WADSWORTH.