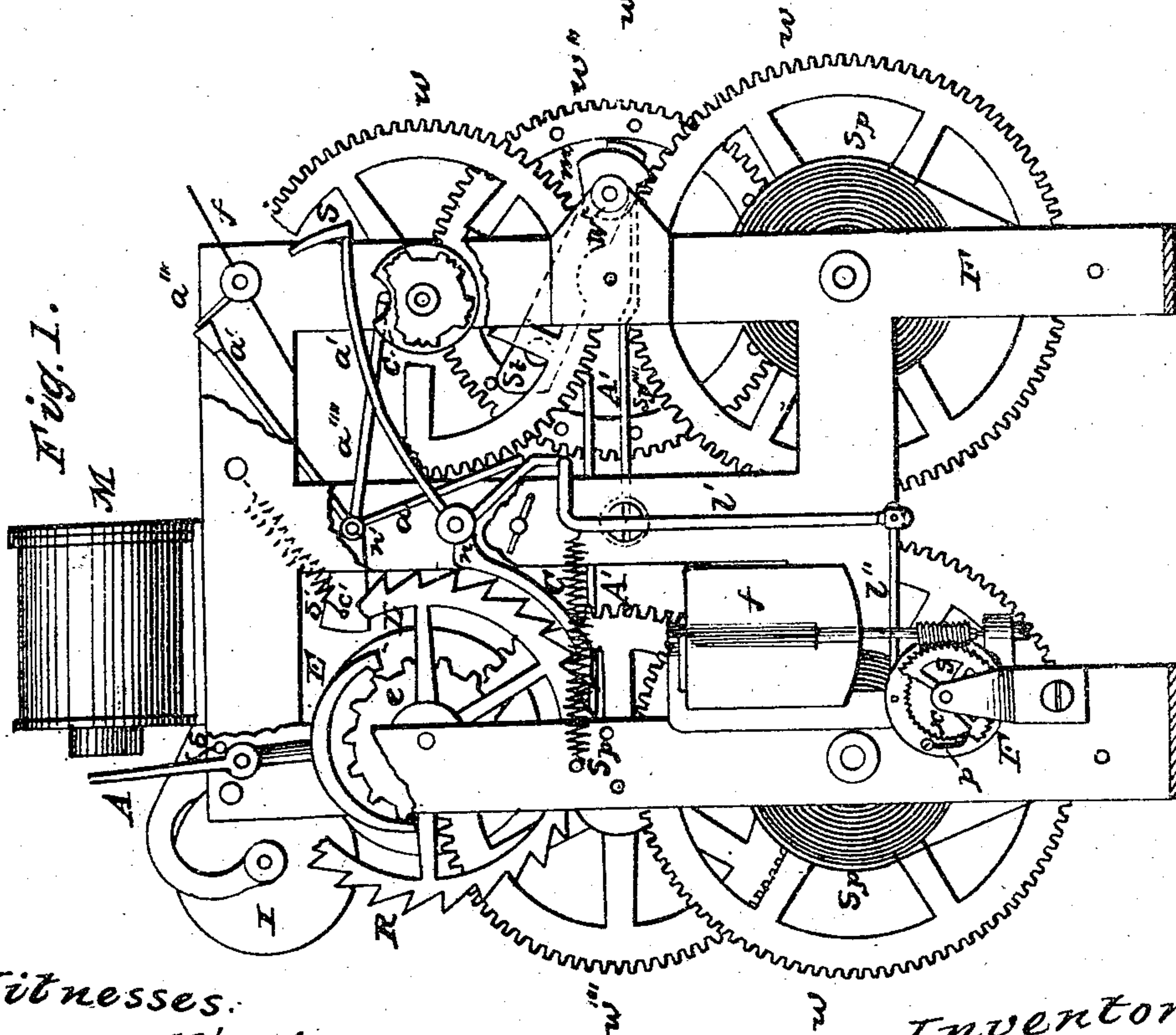
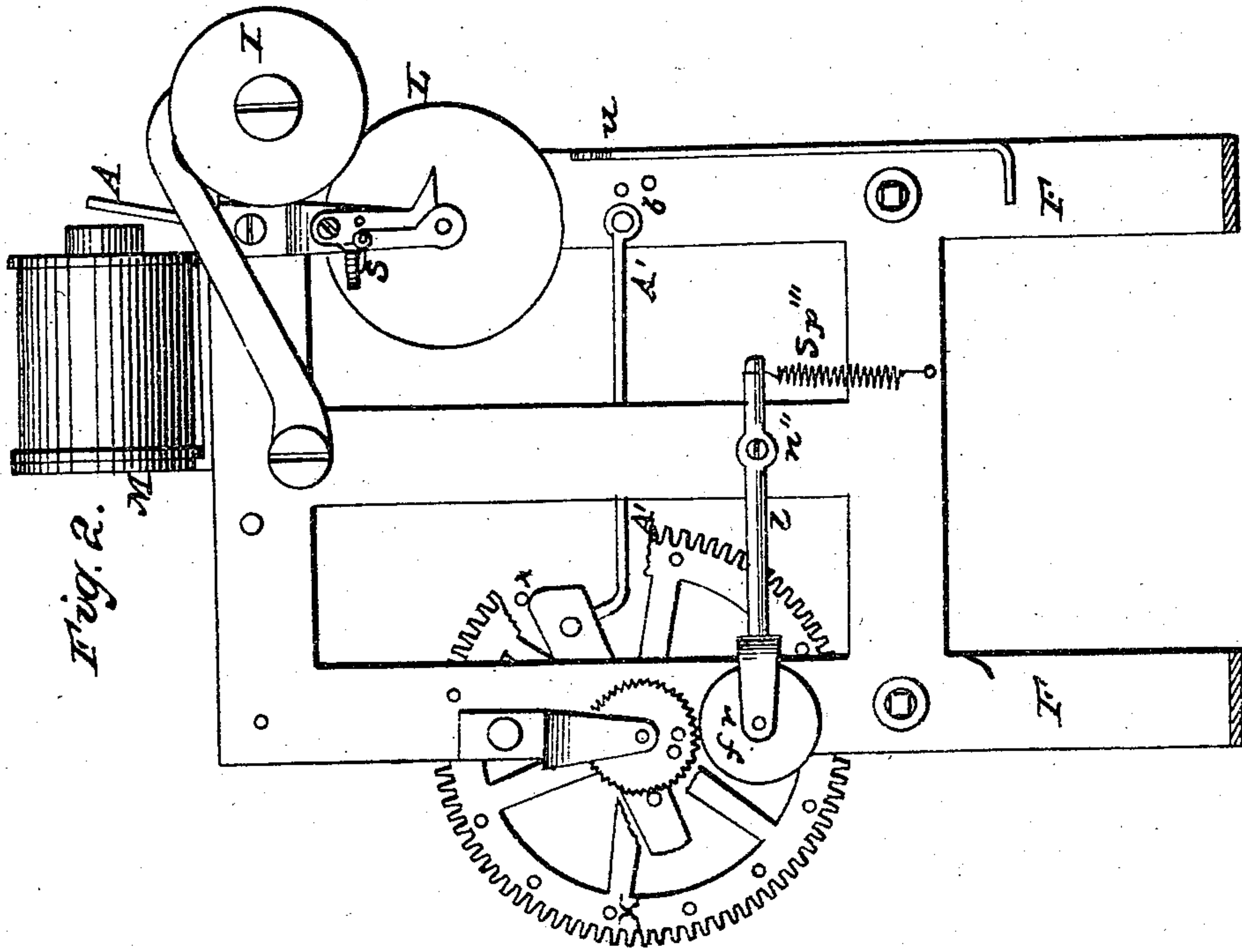


J. BLACKIE.
Printing Telegraph.

No. 94,178.

Patented Aug. 31, 1869.



Witnesses:

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JOHN BLACKIE, OF NEW YORK, N. Y.

IMPROVEMENT IN PRINTING-TELEGRAPHS.

Specification forming part of Letters Patent No. 94,178, dated August 31, 1869.

To all whom it may concern:

Be it known that I, JOHN BLACKIE, now of the city, county, and State of New York, have invented a new and useful Improvement in Printing-Telegraphs; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which the same letters refer to the same parts in each figure.

Figure 1 is a perspective view of one side, and Fig. 2 is a perspective view of the opposite side, having, however, only those parts represented which could not be exhibited in Fig. 1, from their position.

In these figures, A represents the armature to be moved by the magnet M; A' A', the arm of the striking or printing lever St; a, an arm, connecting the segment S with the nave or arbor n; a', a depending-arm attached to the nave or arbor n'; a'', an upper stop-arm attached to the same; a''', a stop-arm attached to the arbor of the fly f'; a''', the middle arm attached to the nave or arbor n', the office of which is to keep the stop-arms a'' and a''' unlocked for the period of nearly one revolution of the wheel w' by riding on the back of the cam c; b, the printing-ball, buffer, or bob; C, a clutch working into its ratchet-wheel R; E, an escapement, forming the opposite end of the arbored or pivoted armature A; e, an escapement-wheel, into which E works; F F F, the frame of the machine; f, the small fly at the bottom, and f' the larger one at the top; g, a small gear-wheel, operating the endless screw on the arbor of the fly f; I, the ink-roller, suspended by a loosely-hung arm, which permits it to drop onto and ink the face of the type-wheel; L, the letter or type wheel, having letters or other characters cut on its face; l, the lever-arm of the friction-roller fr; l', a long and crooked or angled lever attached to the nave or arbor n; l'', a short lever or connecting-rod, connecting l' with the small fly f, its ratchet r, pawl p, and gear g; n n' n'' n''' are naves, arbors, or bearings; Sp Sp, large driving-springs, for which driving-weights and cords may be preferably substituted; Sp', a spring attached to the counterbalance c of the triple-armed arbor or nave n'; Sp'', a spring attached to the long and angled lever l'; Sp''', a spring operating the lever l of the friction

roller fr, so as to press this roller against the toothed wheel-carriers o o; S, Fig. 1, a segment or hook of the arm a; St, striker of the printing mechanism; o, Fig. 2, a zero-stop for type-wheel; o o, toothed carriers; t, pin for zero-stop to catch; S, spring of zero-stop, paper-strip holder, or guide; S, spring of armature A; w w, driving-wheels, actuated by springs Sp Sp, or weights and cords, as in clocks; w', a wheel which drives the fly f', and has attached to its arbor the cam c; w''', a cog-wheel, provided with pins x x at regular intervals, whose office is to depress the striker St and its arm A' A'; Sp''', a spring for operating the striker St when relieved from the pins x x, so as to bring the ball or buffer b suddenly against the particular type to be printed from, and yet allow the buffer b to rebound therefrom and remain free.

The operation of my invention, and so much of its construction as is not given above, may be described as follows, viz: The circuit being completed in the usual manner, the magnet M draws the armature A to itself, overcoming the small spring S and the friction of the left-hand hook of the escapement E on the corresponding tooth of the escapement-wheel e.

The left-hand escapement-hook being freed, the right-hand one drops into its notch, giving the left-hand spring Sp opportunity to act, through the cog-wheels w and w''' and the pinions on the arbor of the ratchet-wheel R, upon the ratchet-wheel R in such a way as to lift the clutch C out of the ratchet in which it happens to lie by a sliding motion, and drop it into the next ratchet to the left. In producing this effect, a, l', and C being firmly fixed on the nave or arbor n, the spring Sp'' is overcome, the lever l' pressed back, the arm a' lifted by sliding on the lever l', also the arms a''''' and a'', the small spring Sp' being overcome. By this means the stop-arms a'' and a''' are freed from each other, which, when they engage each other, prevent any motion in the right-hand system of wheels, &c., or the striking mechanism.

The stop-arm a''', being freed from the stop-arm a'', and being actuated by the right-hand spring Sp and its system, commences to revolve about its shaft. But simultaneously with the lifting of the stop-arm a'', and the consequent freeing of the stop-arm a''', the

segment S has been also lifted by its arm a' to such an extent that the stop-arm a''' is engaged by it when it has described about one-half of its circular sweep, and held. Thus only slight action of the printing-spring Sp and its system has been permitted, and preparation only allowed. Meanwhile the constant tendency of the spring Sp'' is to pull the lever l' to itself, and consequently to depress the arm a , and so free the stop-arm a''' from the segment on hook S. This tendency is, however, resisted by the fly f , through its combination of machinery, for a time, the spring Sp'' having to drive this fly against the air, and being modified in its action by this necessity.

I would here say that I contemplate the immersion of the fly f , made of suitable size, in water or other fluid, wherein, revolving, as in this case, in the air, a similar regulating result will be secured.

Supposing, now, that the letter, or type wheel were at zero, or rather presented zero to the printing-bob b before the circuit was completed, as above, and the next character upon the wheel was that of letter A, and no break or repetition of the circuit has been made, as soon as the spring Sp'' has had time to overcome the resistance of the fly f it will draw the angled lever l' to itself, the result of which will be the depression of the arm a and segment S far enough to clear or disengage the stop-arm a''' therefrom, while the clutch or pawl C is dropped into the next ratchet of the ratchet-wheel R. Simultaneously with the freeing of the stop-arms a'' and a''' the arm a''' has been lifted so as to clear its hooked end from the notch of the cam c . This is the result of the motion permitted in the stop-arm a''' from the stop of the stop-arm a'' to the hold of the segment S, the hooked end of the arm a''' being placed, as it were, on the back of the cam c , and not to be again taken into its one notch until the wheel w' , to which the cam c is secured, either directly or by its arbor, has nearly completed one revolution.

The ratchets of the ratchet-wheel R corresponding in number to the number of letters or other characters on the letter-wheel, the movement of the ratchet-wheel described has permitted the letter-wheel L to move one stage or letter, and then remain stationary, "waiting events."

The wheel w w'' w' , being free to move, as described, when the spring Sp'' has completed its work, proceed in their motion, whereby the next succeeding pin X of the wheel w'' is pressed upon the rounded corner of the striking-lever St sliding thereon, and depressing said striker until it reaches a certain point, when it is suddenly freed. Thereupon a spring, Sp''', (in the drawing represented as secured to the middle bar of the frame, as shown in the drawing, Fig. 1, and as indicated by dotted lines,) passing on till it reaches a point of contact with a cam, m , secured on the striker-shaft near its bearing n'' , takes

this striker in charge, and, it having been depressed, as above, sudden reaction is given by this spring, whereby the bob b is brought in contact with the under side of the paper strip passing between it and the letter-wheel, pressing the same suddenly and concussively against the type or character A, which becomes printed on said strip, the type being constantly inked by the ink-roller I, against which the letter-wheel rotates. Printing may thus be accomplished while the carriers o o and the paper strip are in motion, for the rebound of the bob b is instantaneous; and, further, the next pin x engages the striker, and begins to prepare it for a repetition of the blow. If, however, it be desired to print the letter C instead of A, or the third letter in the alphabet, three completions and breaks together must be made, as the teeth on the escapement-wheel e are just half in number of the characters on the type or letter wheel, whereby the letter C will be presented and printed.

I now come to the description of the method whereby false printing is prevented while passing the intermediate letters. As I have stated, the fly f gives time, during which the stop-arm a''' engages the segment S, while the arm a''' and cam c relieve the angled lever l' from the pressure of the arm a' . If, now, the circuit first above completed be broken, the armature A will be relieved, its spring S will act, the right-hand tooth or hook of the escapement E will be freed, and the left-hand one will drop into the next notch, the clutch C will strike on the point of the next ratchet only in passing the segment S, not freeing the stop-arm a''' , and consequently all action of the striking or printing system being prevented still. The break and completion of the circuit must, however, be done with proper rhythmic relation to the strength of springs or forces used in the printing-machine, and must be continuous, and any number of letters may thus be passed without their being printed. Each break and completion of the circuit will drive the segment S up so as to perfect its hold on the stop-arm a''' . Meantime the fly f' is rapidly revolving and steadying the action of the parts; but when the wheel w' has nearly completed its revolution, the hook end of the arm a''' dropping into the notch of the cam c , as it may do, because the clutch C has dropped into a ratchet, the long lever l' has followed it, and so relieved the arm a' , the stop-arm a'' again drops far enough to engage the stop-arm a''' , and prevent further action of the machinery controlled thereby.

While the stop-arm a'' may be used, as described, to perform this stop function, it is not absolutely essential to the perfect working of the machine. For, omitting it altogether, the arm a''' and cam c may be used to effect the same result by simply making the cam c hook-formed, instead of having an incline, as in the drawing, up which the bent end of the arm a''' easily slides.

The same mechanism which lifts a'' lifts a''' , and at the same time; hence I do not confine myself to the use of the stop a'' . So, also, may the fly f be otherwise connected with and operate upon the arm a , as say directly, without the use of the long arm l' , and even with the clutch C. So might the arm a' be made to perform its function, perhaps, if rested on the arm a or the clutch C.

These and other possibilities of this sort I contemplate, and some of them have I employed in the course of experimental construction indeed.

A co-ordinate function of the wheel w'' , or its shaft or arbor, is to operate the carrier-wheels $o o$, whereby the printing-strip is carried along far enough to secure the requisite succession and spacing of the letters printed thereon.

The zero-stop o is for regulating the letter-wheel or disk. By pressing the thumb on the thumb-piece, the disk will revolve until engaged by the pin t , when the disk will present zero to the printing-roller or bob.

This printing-telegraph may be operated by one wire at long distances and with very small battery-power.

A convenient instrument for controlling and regulating the break and completion of circuit is the ordinary dial, with characters on its face corresponding to those on the die or

type-wheel, a movable pointer, with knob for thumb and finger, together with the suitable and usual means for breaking and completing circuit at the characters in succession.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The segmental-formed detent S upon the arm a , operating in the manner and for the purpose as set forth.

2. The stop-arm a''' upon the arbor of the fly f' , in combination with the segmental hook or detent S, as and for the purposes set forth.

3. The combination of the segmental-formed detent S, arm a , detaining-stop C, and fly f , operating substantially as set forth.

4. The combination of the arms a' and a''' , pivoted at the point n' , and operating as and for the purposes described.

5. In combination with the printing-surface, the striking apparatus consisting of the lever St, arm A' , and hammer b .

6. In combination with the striking apparatus, the cam m , or its equivalent, and the spring Sp''' , operating as and for the purposes set forth.

7. The stop-arm a'' , pivoted at n' , so as to act in the manner and for the purposes named.

JOHN BLACKIE.

Witnesses:

RICHD. L'H. FINCH,
C. H. WIGHT.