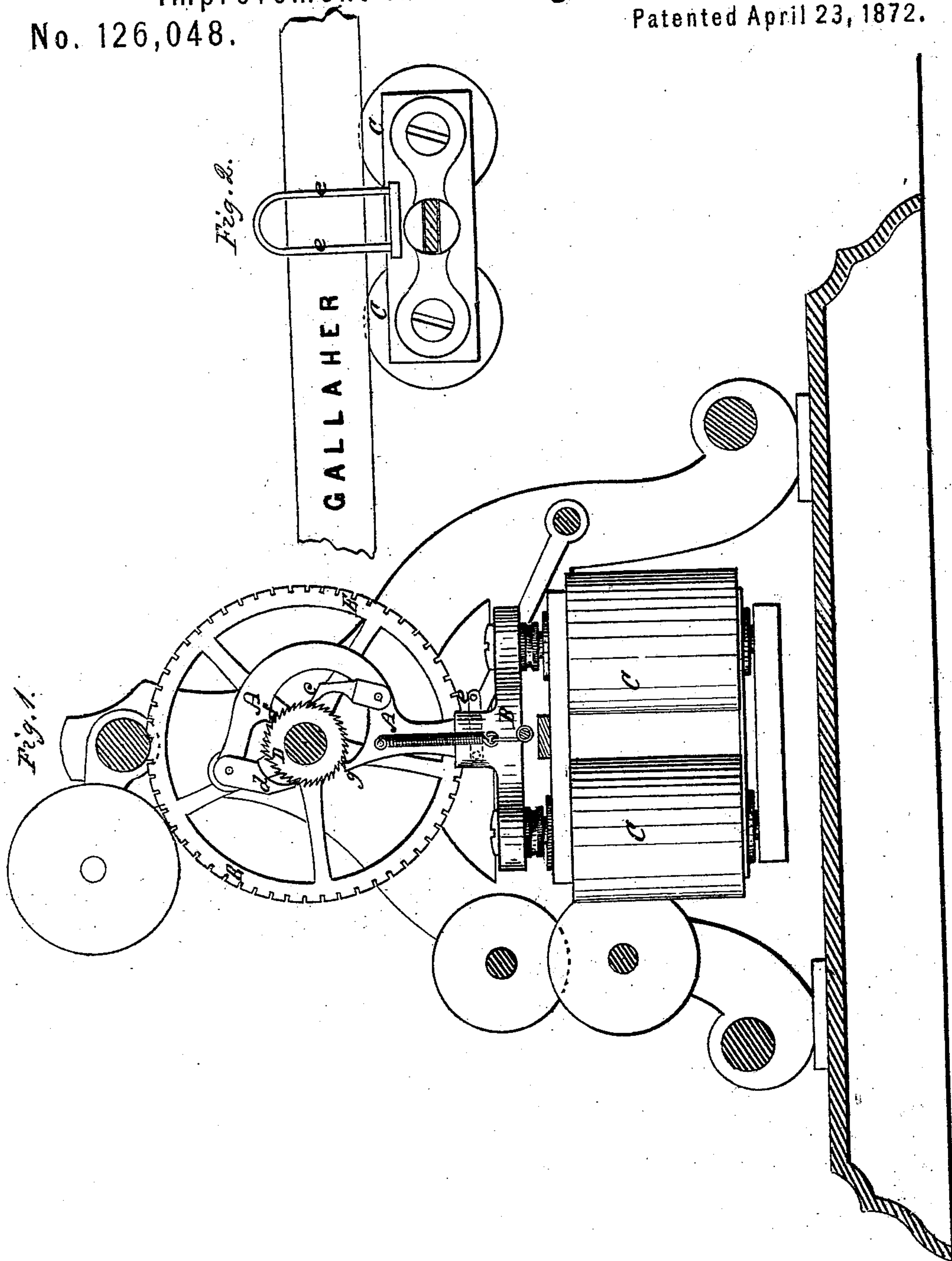


ROBERT H. GALLAHER.

Improvement in Printing-Telegraphs.

No. 126,048.

Patented April 23, 1872.



Witnesses,
E. M. Gallaher.
E. M. Fear

Inventor,
Robert H. Gallaher,
By his attorney,
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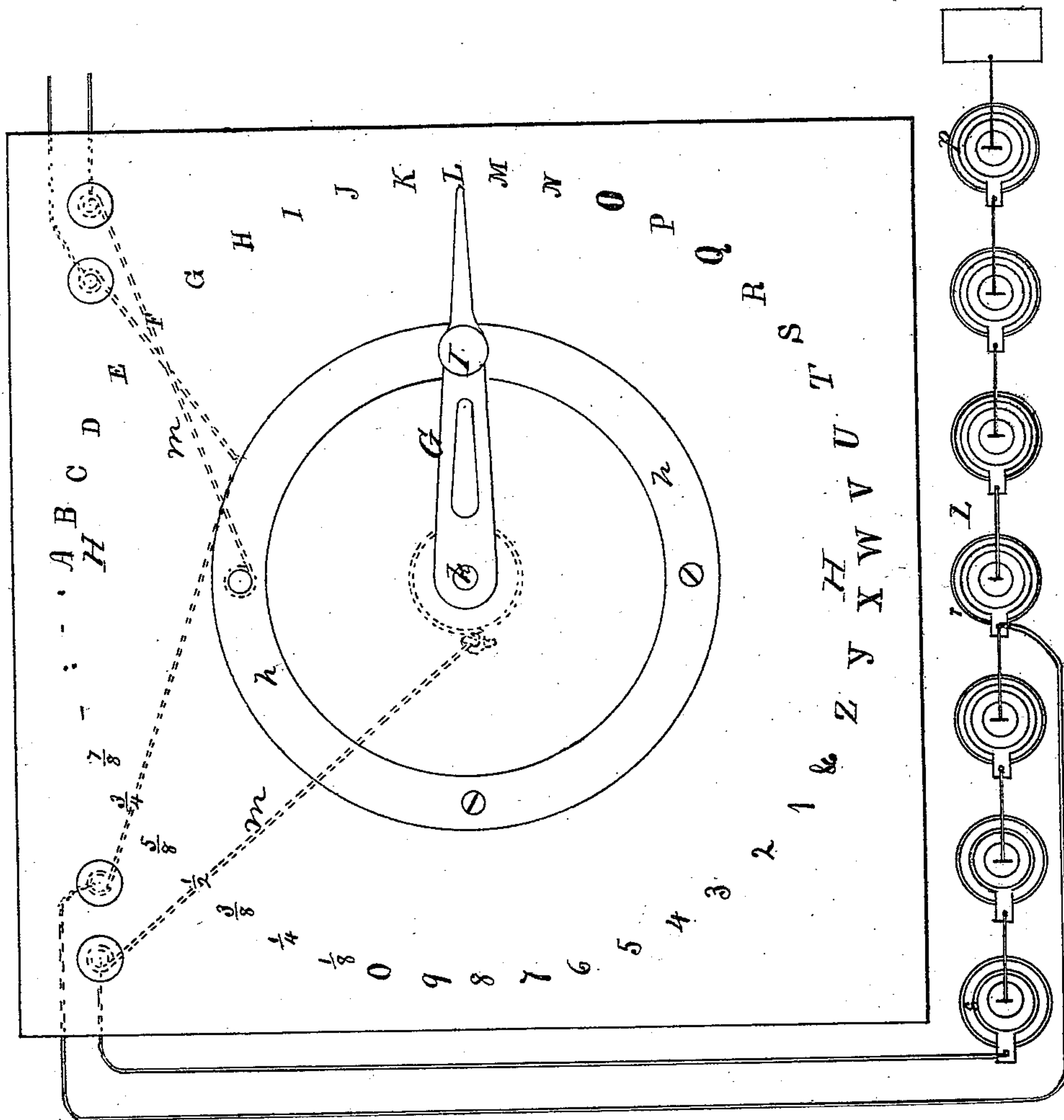
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Fig. 3.



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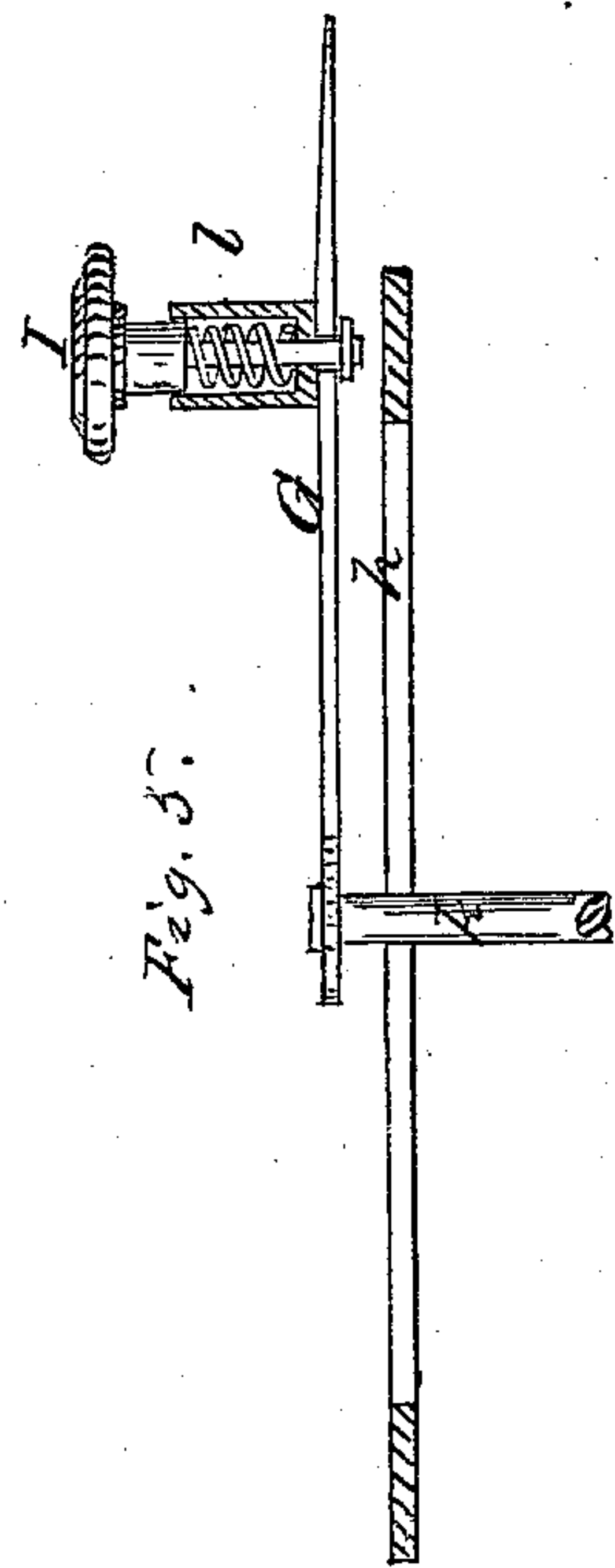
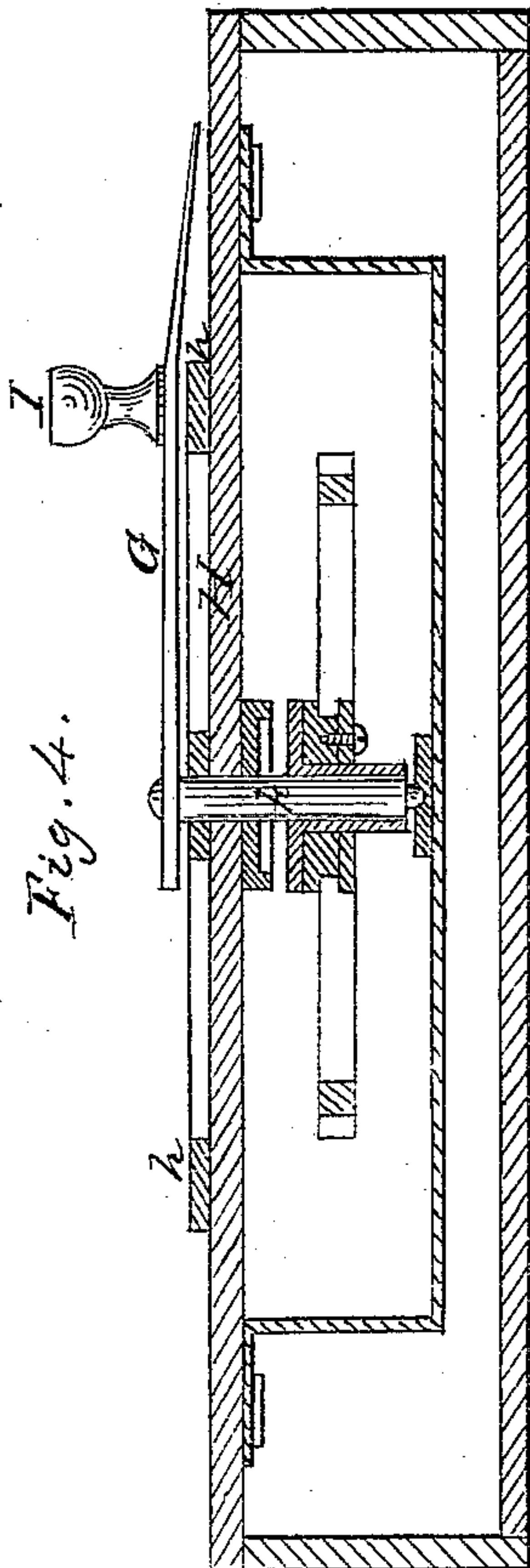
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UNITED STATES PATENT OFFICE.

ROBERT H. GALLAHER, OF NEW YORK, N. Y.

IMPROVEMENT IN PRINTING-TELEGRAPHS.

Specification forming part of Letters Patent No. 126,048, dated April 23, 1872.

To all whom it may concern:

Be it known that I, ROBERT H. GALLAHER, of the city, county, and State of New York, have invented certain Improvements in Printing-Telegraph Instruments; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawing making part of this specification—

Figure 1 being a vertical section of a telegraphic-printing instrument constructed in my improved manner; Fig. 2, a view of a part of the instrument detached; Fig. 3, a top view of a telegraphic-transmitter as improved by me; Fig. 4, a central vertical section of the same; Fig. 5, a view, showing a modification of a part of the transmitter.

Like letters designate corresponding parts in all of the figures.

The first feature of my invention is an improvement on the invention described in Letters Patent granted to me August 15, 1871. In the specification accompanying the said Letters Patent is described a means of turning the type-wheel step by step by the direct up-and-down motions of the armature of the printing-magnet, consisting of swinging pawls and a ratchet-wheel, like the escapement of a clock, but acting reversely.

My present device produces the motions of the type-wheel in a more direct and certain manner.

A single rigid arm, A, is secured to and projects upward from the cross-head B of the armature-rods, which extend upward through the cores of the magnet C; or, it may project upward directly from the armature itself. This arm bends around the ratchet-wheel D on the shaft of the type-wheel, and has pawls *c* *d* in diametrically opposite positions in relation to the said ratchet-wheel, as represented, or forming simple rigid projections or dogs on the same, so that the upward motion of the arm as the magnet-armature is raised, moves the ratchet-wheel a notch by the pawl *c*, and the return downward motion of the arm also moves the ratchet-wheel one notch by means of the pawl *d*. This device is the simplest possible in construction, sure in action, and has no liability to become disarranged. Another feature of this device consists in the sharp projections *f* *g* on the inner curve or edge of the bent arm

A, one, *f*, being nearly over the center of the ratchet-wheel, and the other, *g*, being nearly under the same, so that, when the arm descends, the upper projection *f* takes into one of the notches of the ratchet-wheel and holds it from turning around, and the lower projection *g* takes into a notch of the ratchet-wheel when the arm ascends. Thus, both act as sure detents to hold the ratchet-wheel in position. Centrally under the type-wheel E, a transverse wire or wires, *e*, is fixedly secured, being bent or formed double like a loop or bow, as shown, the two arms being separated far enough to allow the printing-hammer to ascend between them and move the paper up to the type-wheel. This wire, or equivalent piece of similar form, holds the strip of paper down away from contact with all the types of the type-wheel, except the one at the lowest point which produces the impression. This wire also assists to keep the paper-strip in place. I am aware that movable paper-holders have been used, and that loops through which the paper-strip passes have been attached to a fixed paper-guide; but, my invention differs from both in furnishing an open guide to keep the paper-strip away from the type-wheel, and at the same time offering little or no obstruction to the movement of the paper or to the view. The type-wheel magnet and printing-magnet are connected by different wires with the transmitter; and each wire has a galvanic-battery or part of a battery to operate its magnet. The type-wheel magnet is or may be actuated by means of an ordinary transmitting-index, G, and dial H, on which the various letters, figures, fractions, monograms, and other characters are arranged in proper order corresponding with the arrangement of like characters on the type-wheel. The printing-key or circuit-closer I is either one with the index or key G of the type-wheel, as shown in Figs. 3 and 4, or it is mounted upon or in the same, as shown in Fig. 5. As in Figs. 3 and 4, the printing-circuit is through the index or key G and the metallic ring *h*, or its equivalent, one part of the circuit-wire *m* being connected with the pivot *k* of the index, and the other part with the said ring, which is insulated from the index-pivot. Ordinarily the index keeps itself raised above and out of contact with the ring by its own rigidity, or by a lifting spring; but, when a letter or char-

acter is to be printed, the index itself is depressed and brought into contact with the ring, and thus closes the circuit. In the modification represented in Fig. 5, the index itself is kept insulated from, or always out of contact with the ring, and the printing-key I mounted upon or in it, is kept raised from the ring *h* by a spring, *l*, or its equivalent. On depressing the key it is brought into contact with the ring, and closes the circuit. In either case the manipulation of both magnets is very easy, requiring no change in the position of the hand to go from one to the other. By means of this union of the type-wheel and printing-keys, I am also enabled to join the forces of the two batteries, or part of a battery, into one circuit for printing, so that not so many separate cups may be required for the printing. The circuit-closing and breaking-wheel of the transmitter serves to disconnect the type-wheel battery, or part of a battery from its own magnet-wire, and bring it into the printing-circuit with the other battery. Thus, as indicated in Fig. 3, let the cup *p* of the battery L be connected with the ground-wire; the middle cup *r* be connected by a wire with the transmitting-wheel, or its equivalent, for breaking and closing the type-wheel circuit; and the cup *s* at the other end of the battery be connected with the printing-key I, all as indicated in the drawing. Hence, when the printing-key is disconnected from the ring *h*, and the printing-circuit broken, only that part of the battery extending from the cup *p* to the cup *r* inclusive, is in action; but when the printing-circuit is closed by the printing-key, the whole battery being in the circuit is brought into action; and, if at the time while the type-wheel circuit is broken, the whole force of the battery is concentrated on the printing-circuit, or, if the type-wheel circuit is closed, then with equal length and con-

ducting power in the two circuits, the printing-circuit gets the force of half the cups from *p* to *r* inclusive, and all of the remainder of the battery; or, if the printing-circuit is shorter or better than the other, it gets the greater part of the current of the part from *p* to *r* of the battery.

I disclaim the lever-escapement described in Letters Patent No. 103,035, granted May 17, 1870.

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

1. The arm A, attached to and moving directly with the magnet-armature or its cross-head B, and provided with the pawls or dogs *c d* for operating the ratchet-wheel D on the type-wheel shaft, substantially as herein specified.

2. In combination with the above, the detent projections *f g* on the inner curve or bend of the arm A, substantially as and for the purpose herein specified.

3. The stationary paper-holder *e* formed of a bent wire, or as an open bow, arranged in combination with the type-wheel E and the printing-hammer, substantially as herein specified.

4. The mode of bringing the type-wheel battery or part of battery into the printing magnet-circuit in conjunction with the printing-battery or part of battery, by means of the printing-key, substantially as herein specified.

5. The arrangement of the printing-key or circuit-closer upon the type-wheel index or key of the transmitter, or the union of the two in one, substantially as and for the purpose herein specified.

R. H. GALLAHER.

Witnesses:

J. A. BROWN,

R. E. GALLAHER.