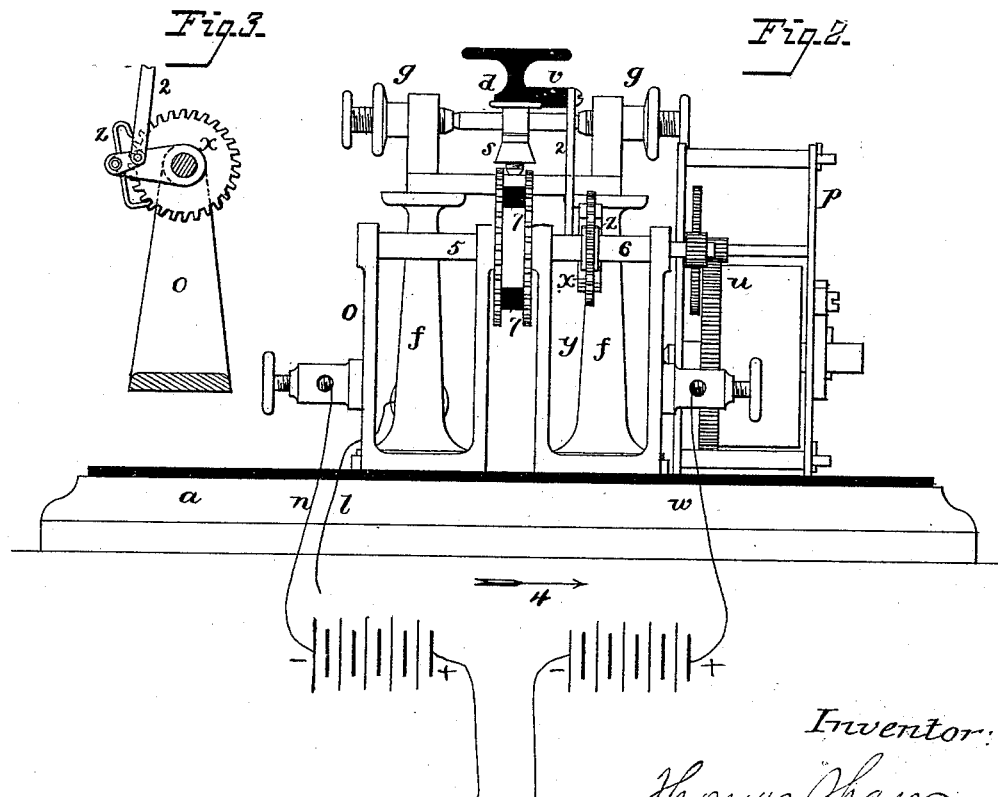
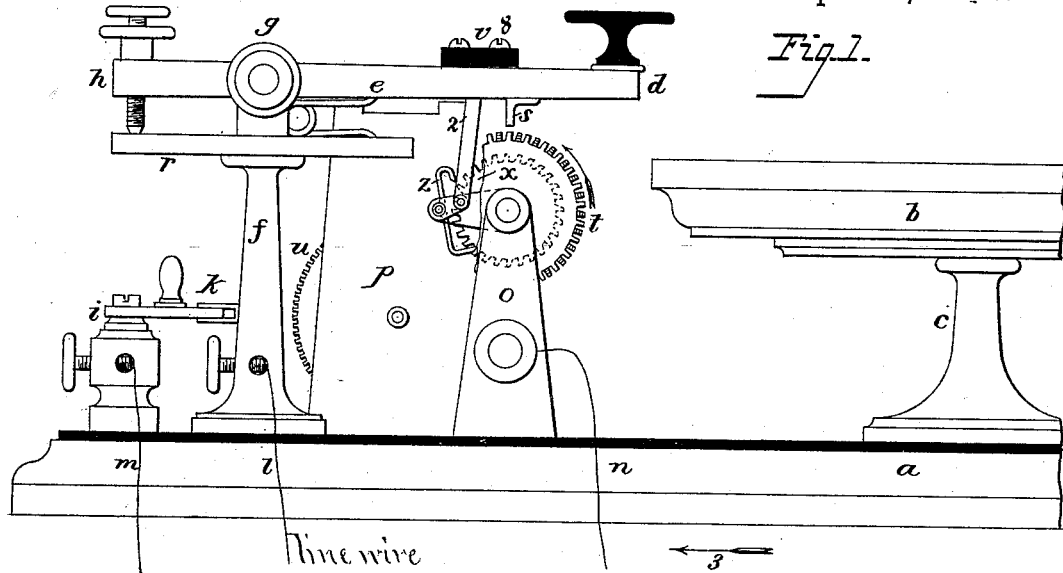


(No Model.)

T. SHAW.  
POLE CHANGING KEY.

No. 264,348.

Patented Sept. 12, 1882.



*Attest:*  
*Courtney & Cooper.*  
*William Patton*

*Inventor:*  
*Thomas Shaw*  
*By his attorney*  
*Charles E. Foster*

# UNITED STATES PATENT OFFICE.

THOMAS SHAW, OF PHILADELPHIA, PENNSYLVANIA.

## POLE-CHANGING KEY.

SPECIFICATION forming part of Letters Patent No. 264,348, dated September 12, 1882.

Application filed February 7, 1881. (No model.)

To all whom it may concern:

Be it known that I, THOMAS SHAW, of the city and county of Philadelphia, Pennsylvania, have invented a new and Improved Pole-  
5 Changing Transmitter; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

10 My invention consists in a device for reversing the negative and positive electric currents alternately, in the manner and for the purpose hereinafter described.

On reference to the accompanying drawings, 15 which form part of this specification, Figure 1 is a side view of an apparatus embodying my invention; Fig. 2, an end view of same in the direction of the arrow 3', and Fig. 3 a section in the direction of the arrow 4.

20 Similar letters refer to similar parts throughout the several views, in which *a* is a wood base supporting a pillar, *C*, and hand-rest *b*.

*ff* are two pillars, secured to the base *a*, and supporting an ordinary Morse key, *v*, provided 25 with the usual pivot-screw support, *g*, spring *e*, and adjusting-screw *h*, but modified in having a contact-point, *s*, of the broad shape shown, and also the connecting-arm 2, for the purpose hereinafter described.

30 *o* and *y* are two metal bearing-supports for the axles 5 6 of tooth-wheels *t*, one of which is connected with axle 5 and the other with the axle 6. Said axle 6 has an escapement ratchet-wheel, *x*, (shown in Fig. 3,) with the pawl-escapement *z*, which limits the rotation of said 35 wheels to the space of one tooth of wheel *x* at a movement. The axles of wheels *t* are rotated in the direction of the arrow shown in Fig. 1 by ordinary spring clock-gear, *u*, which gears 40 into cog-wheel on axle of wheels *t*, as shown in Fig. 2. Said clock-gear is supported in a framing, *p*. The cog-wheels *t* are caused to rotate together by two connecting crank-pins, 77, (shown in Fig. 2,) of any non-conducting substance. The connecting-arm 2, Fig. 2, has a 45 non-conducting pivotal connection with the key-arm *d* by a small screw, 8, connecting the same with a piece of hard rubber, *v*. The lower end of said connecting-arm 2 is pivoted to a 50 short crank-arm on the axle of the vibrating pallets *z*, Fig. 3. The effect of this connection is to cause the lever-key *d*, when vibrated, to

impart similar motion to the pallets *z*, allowing the wheel *x* to rotate to the extent of one tooth of the wheel for each vibration. The 55 wheels *t* are arranged with their teeth alternating opposite each other—i. e., one tooth of one wheel will stand directly opposite one space of the opposite wheel—so that when the key-lever arm *d* is pressed down the metal contact- 60 piece *s* will come in contact with only one cog of one wheel, and will rest between the spaces of the teeth in the opposite wheel; but on raising and lowering the lever *d* it will strike first on the top of the cog-tooth of one wheel and 65 the next stroke on the top of the tooth of the opposite wheel *t*, all for the purpose hereinafter explained.

*w* is a wire connected to a screw-post, (shown in Fig. 2,) said wire leading from positive pole 70 of one galvanic battery, the other pole of battery being suitably grounded for earth-connection; and *n* is another wire connected with the negative pole of another distinct battery, the positive pole of which is suitably grounded. 75

*l* is the main-line wire, connected with the key-pillar *f*. Any ordinary relay or other telegraphic instrument can be connected in the circuit of the main-line wire *l*.

A switch-post, *i*, is arranged to connect a 80 ground-wire, *m*, with main-line wire *l* by an ordinary switch-lever, *k*, connecting with the post *f*. (Shown in Fig. 1.)

The instrument is operated in this wise: The two toothed wheels *t* being connected by in- 85 sulating material, there is no electric current flowing, except when the lever *d* is pressed down by the operator, bringing the contact-piece *s* in contact with the top of one of the cogs on said wheel *t*. The effect of this is to 90 send a current over the main-line wire *l* from one of the batteries aforementioned, which will continue as long as the lever is depressed, and, presuming this to be the positive current flowing from one of said wheels *t*, on making another stroke of lever *d* the wheel *x* will rotate 95 one tooth and the contact will be brought upon the tooth of the opposite wheel, when a negative current will be caused to flow over the main line *l*, and so on the currents will be al- 100 ternately positive and negative.

The appliance can be modified to adapt it to the various telegraphic apparatus now existing, in order to derive the advantage of the

new process of telegraphing with alternate positive and negative currents, to neutralize and utilize the effect of induced currents in telegraphing where many wires are assembled  
5 in close proximity.

The spring clock-gearing is arranged with sufficient spring-power to propel the wheels *t* and the connecting-axles, so that no labor is required of the operator in this respect; but  
10 the required motive power is so slight that an escapement might be arranged to be operated by the key, and so dispense with said clock-gearing.

What I claim, and desire to secure by Letters Patent, is—  
15

1. In a pole-changing transmitter, the key having extended contact-point and the spaced wheels separately mounted and secured together

by rods of insulating material, and arranged with the teeth of one opposite the spaces of  
20 the other, in combination with a scape-wheel secured to the axis of the spaced wheels, and pallets operated by the vibrations of the key, substantially as described.

2. The key having contact-points and forming a part of the line-circuit, the wheels *t*, rods  
25 7, axles 5 6, and the metallic supports *o y*, provided with binding-posts adapted to receive battery-wires of opposite polarity, in combination with clock-gear and an escapement op-  
30 erated by the vibrations of the transmitting-key, substantially as shown and described.

THOMAS SHAW.

Witnesses:

F. FRANK MILLER,  
WM. GARWOOD.