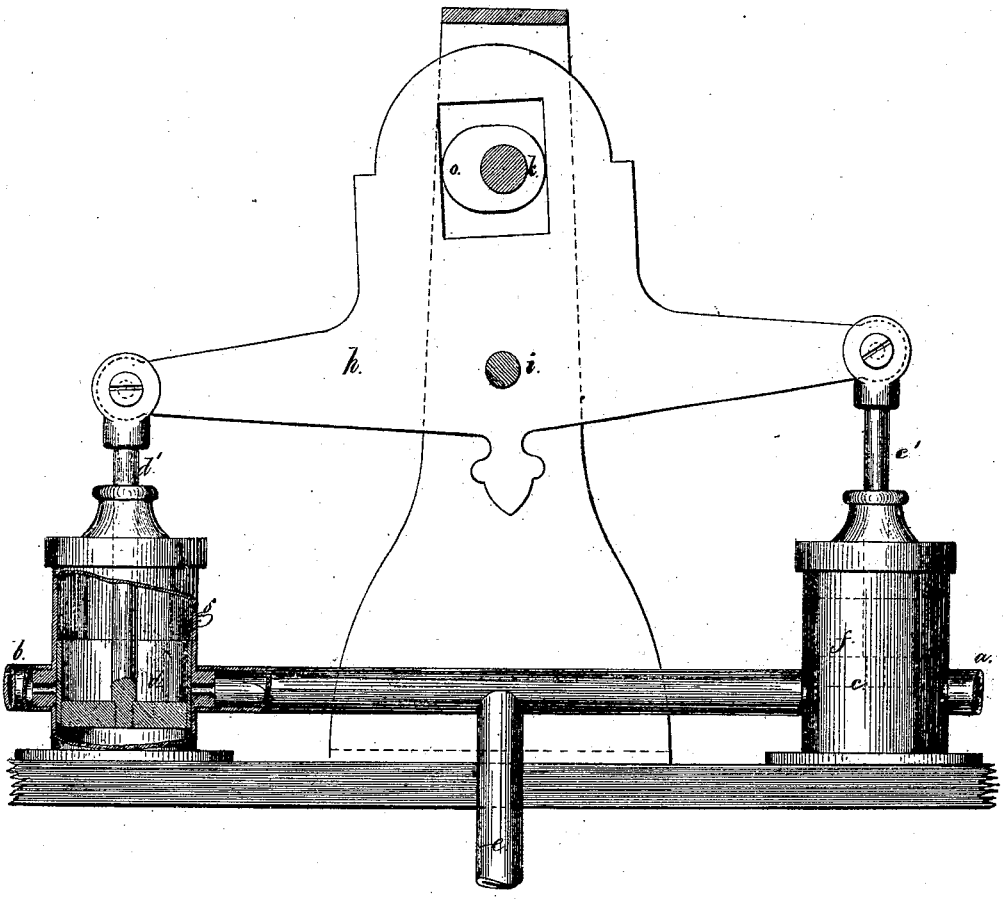
3 Sheets—Sheet 1.

CALAHAN & FIELD.

Pneumatic Telegraph.

No. 112,779. Patented Mar. 21, 1871.

FIG. 1.



Witnesses,

Chas. H. Smith

Geo. B. Webber

Edwd. D. Calahan

Geo. B. Field

per L. W. Serrell atty

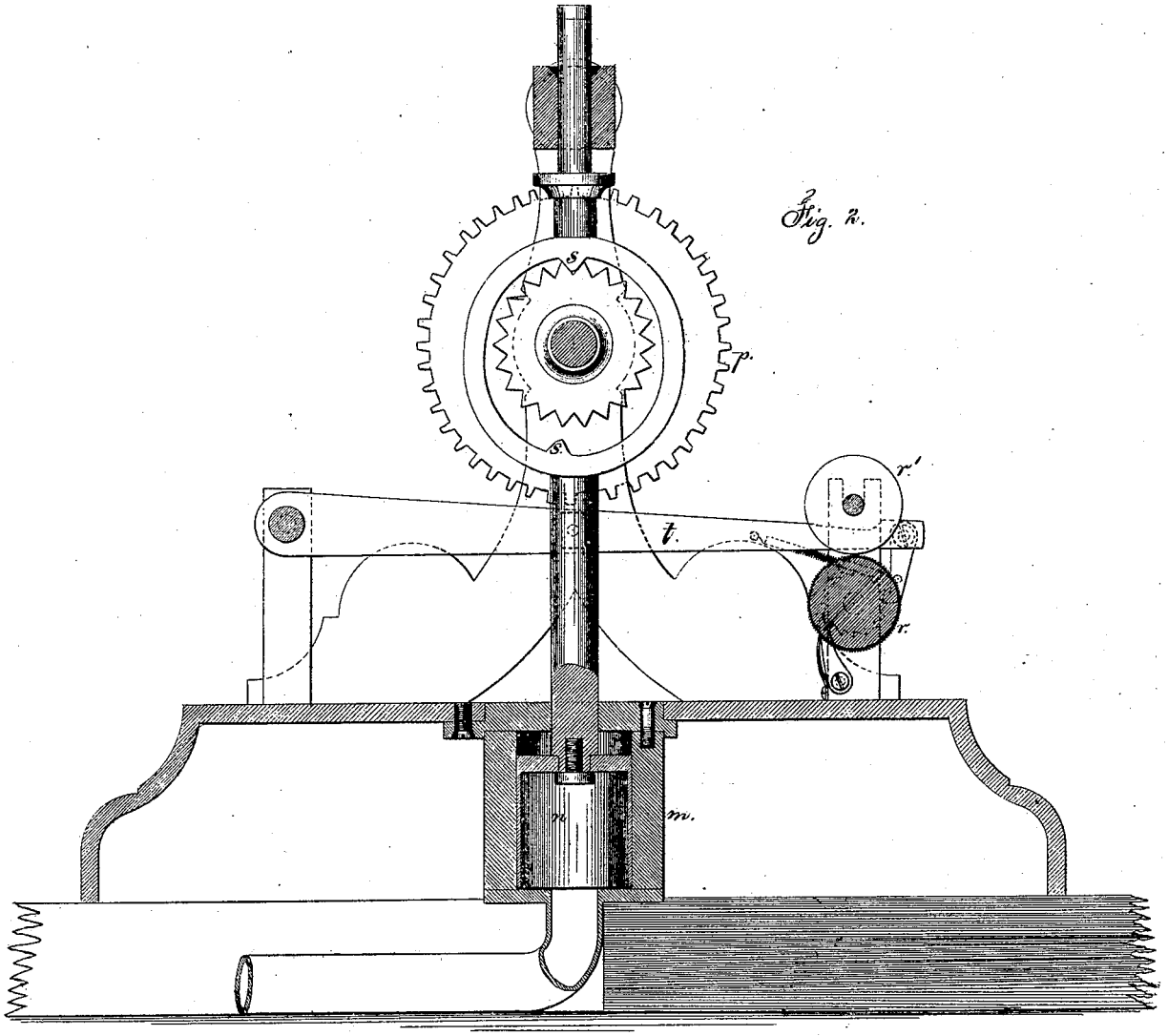
3 Sheets—Sheet 2.

CALAHAN & FIELD.

Pneumatic Telegraph.

No. 112,779. Patented Mar. 21, 1871.

Fig. 2.



Witnesses.

Chas. H. Smith

Geo. Draper

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per L. W. Serrell atty.

3 Sheets—Sheet 3.

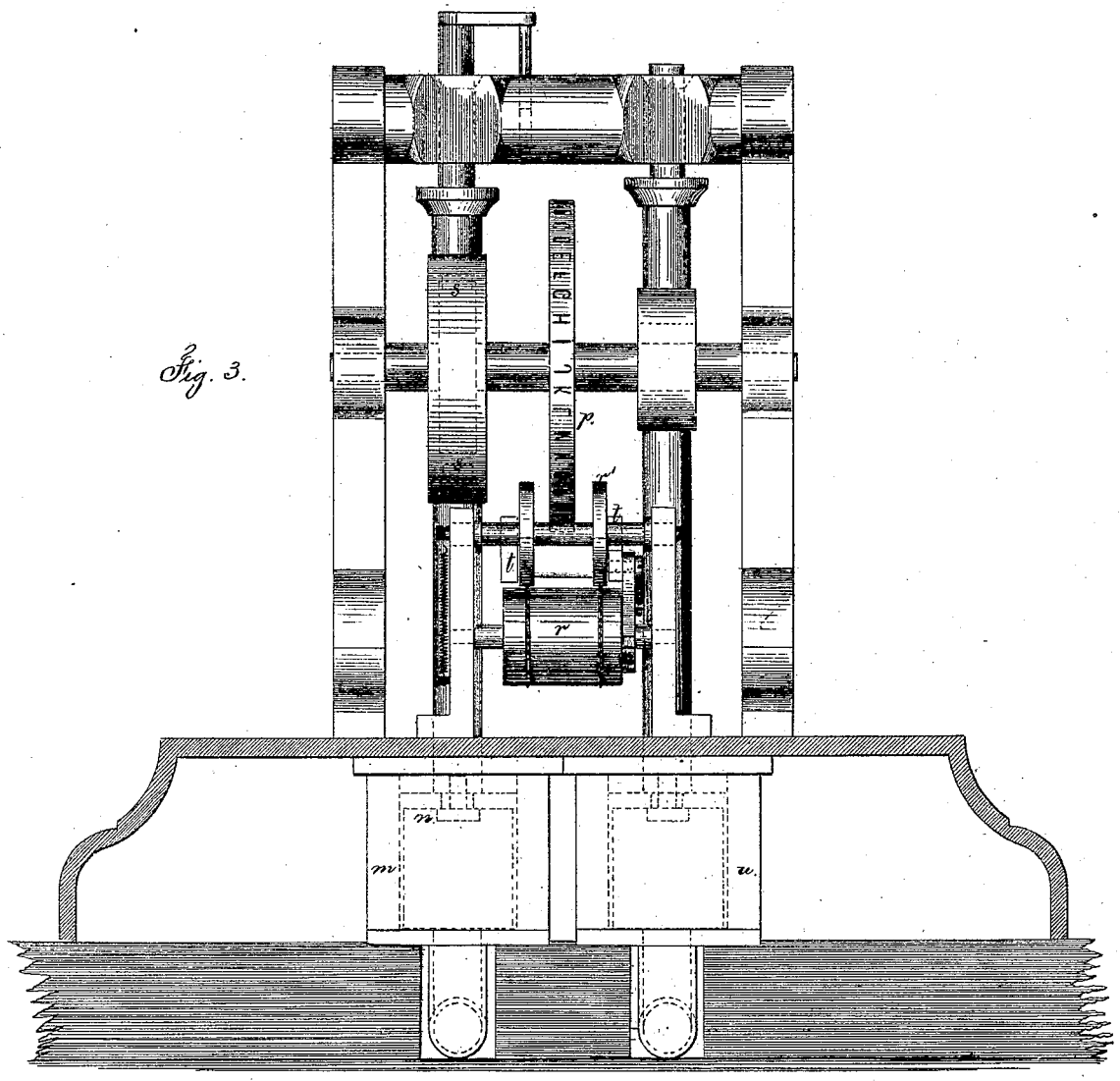
CALAHAN & FIELD.

Pneumatic Telegraph.

No. 112,779.

Patented Mar. 21, 1871.

Fig. 3.



Witnesses,

Chas. H. Smith

Geo. D. Wales

Edw'd V. Calahan

Geo. D. Field

per L. W. Serrell atty.

United States Patent Office.

EDWARD A. CALAHAN, OF BROOKLYN, AND GEORGE B. FIELD, OF NEW YORK, N. Y.

Letters Patent No. 112,779, dated March 21, 1871.

IMPROVEMENT IN PNEUMATIC TELEGRAPHS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that we, EDWARD A. CALAHAN, of Brooklyn, in the county of Kings, and State of New York, and GEORGE B. FIELD, of the city and State of New York, have invented an Improvement in Telegraphs; and the following is declared to be a correct description of the same.

This invention is adapted to short distances, especially in cities, for denoting the rise and fall of gold or stocks, or for communicating other items of intelligence from one central station to two or more distant points within the range of the capacity of the apparatus.

We make use of an air-tube extending from one station to the next, and the message is communicated by alternate compression and exhaustion of the air or gas in such pipe acting at the distant station upon a type-wheel to set the same to the letter or character to be indicated or printed.

In the drawing—

Figure 1 is a vertical longitudinal section of the transmitting apparatus;

Figure 2 is an elevation and partial section of the receiving instrument; and

Figure 3 is an elevation of said receiving instrument at right angles to fig. 2. The bed is represented in section.

We make use of an air-pump that is operated by suitable mechanism to exhaust a receiver of capacity adapted to the length of line, and a second receiver of proper capacity to contain air pumped by the same or any suitable pump into such receiver.

The pipe *a* is to be connected with the vacuum-receiver and the pipe *b* with the pressure-receiver.

The valves *c* and *d* are of suitable character to open and close the communications between the tubes *a* or *b* and the tube *e* that is connected with the tube passing to the distant station.

We have shown the valves *c d* as cup-shaped piston-valves within cylinders *f g*, and the valves *c d* are provided with rods or stems *c' d'* to the rocking-lever *h* on the fulcrum *i*.

This lever *h* is reciprocated to open the valve *c* after the valve *d* is closed, and the reverse.

To give this movement to the lever *h* the same may be acted upon by an eccentric, *o*, upon a shaft, *k*, said eccentric acting in a slot in the lever *h*, or by a connection to the same, and wedge-acting pallets and a wheel turned by a crank might be substituted, so as to give to the lever *h* a rocking movement and open and close the valves *c d* alternately as such wheel is revolved.

A dial or index should be provided at the transmitting-station, having divisions corresponding to those of the type-wheel, and this index is to be moved progressively with each vibration of the lever *h* by any suitable means.

The receiving-instrument is provided with a cylinder, *m*, and piston, *n*, that acts upon the escapement-pallets *s s*, and give a step-by-step movement to the type-wheel *p*.

This type or character-wheel is provided with any desired letters, figures, or characters, and the divisions or spaces are of any number, but should correspond with those of the dial at the transmitting-station.

It will now be understood that the shaft *k* is to be turned by a crank or other convenient means, and operates to send a pulsation of compressed air through the tube *e* to the distant station, and follow the same with a vacuum or exhaustion, to clear the tube of atmosphere, and produce, by the alternations, a rise and fall of the piston *m*, and consequent motion of the type-wheel at the distant station.

The parts may be so proportioned that the pressure of atmosphere shall, by the mechanism, move the type-wheel one character, and then the exhaust shall move it another character.

The instrument at the receiving-station may have an indicating-dial and a hand on the shaft of the wheel *p*.

At the receiving-station the mechanism connected with the type-wheel may be of any character similar to that employed in a printing-telegraph, for inking the types and feeding the paper along.

I have shown the lever *t*, for printing, and the roller *r r'*, for drawing the paper along, similar to those employed in printing-telegraphs.

The impression is to be given by the pressure of atmospheric air or gas, or the exhaust action.

I have shown the cylinder *u* as connected to a second main air-tube, and valves and a key are to be moved after the type-wheel has been set, so as to give the impression by atmospheric pressure and relieve it by exhaust action.

The second cylinder might be fitted so that the exhaust may act to move the impression-pad, said cylinder being connected to the main line by a small hole passing through the piston *n* and cylinder. In this case there must be a sufficient pause to give the necessary time for the vacuum to act in the cylinder that gives the impression.

In cases where the line is of considerable length the pulsations of air may be made to operate a relay-instrument, the valves of which allow the air to act from a second exhaust and compression-reservoir to the distant station.

What we claim as our invention, is—

1. The mode herein specified of operating a print-

ing-telegraph instrument by alternate compression and exhaust pulsations of air or gas, substantially as set forth.

2. The valves *c d*, operated alternately by a rocking-lever, combined with the pressure and exhaust-pipes and the tube connecting to the distant instrument, substantially as set forth.

3. The cylinder *m*, piston *n*, and escapement *s*, for moving the type-wheel *p* by the alternate pressure and exhaust pulsations, substantially as specified.

Signed by us this 7th day of June, 1870.

EDWD. A. CALAHAN.
GEO. B. FIELD.

Witnesses:

CHAS. H. SMITH,
GEO. D. WALKER.