

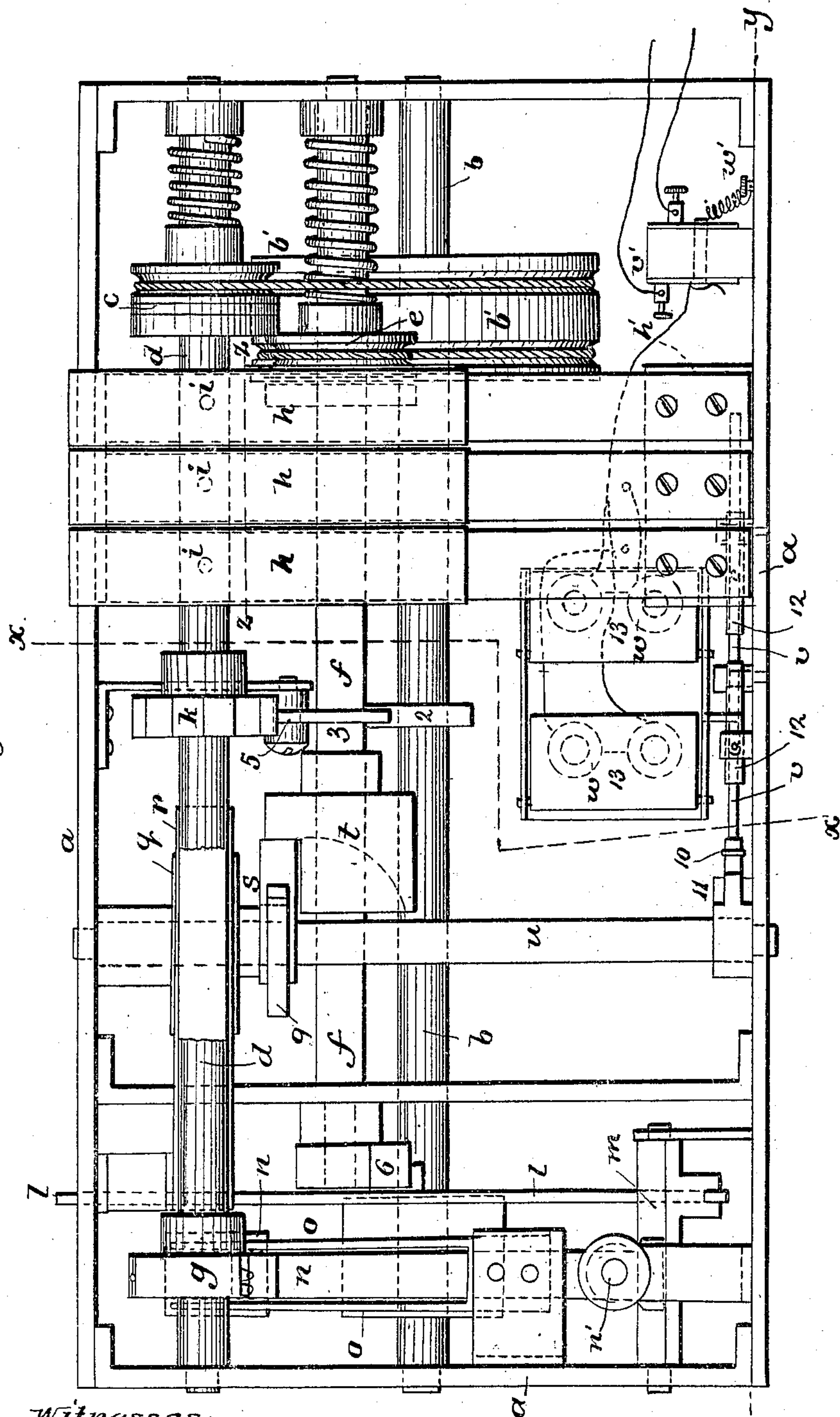
E. A. CALLAHAN.

Telegraph Punching-Apparatus.

No. 87,242.

Patented Feb. 23, 1869.

Fig. 1.



Witnesses:
Geo. D. Walter
Chas. H. Smith

Inventor:
Edw. A. Callahan

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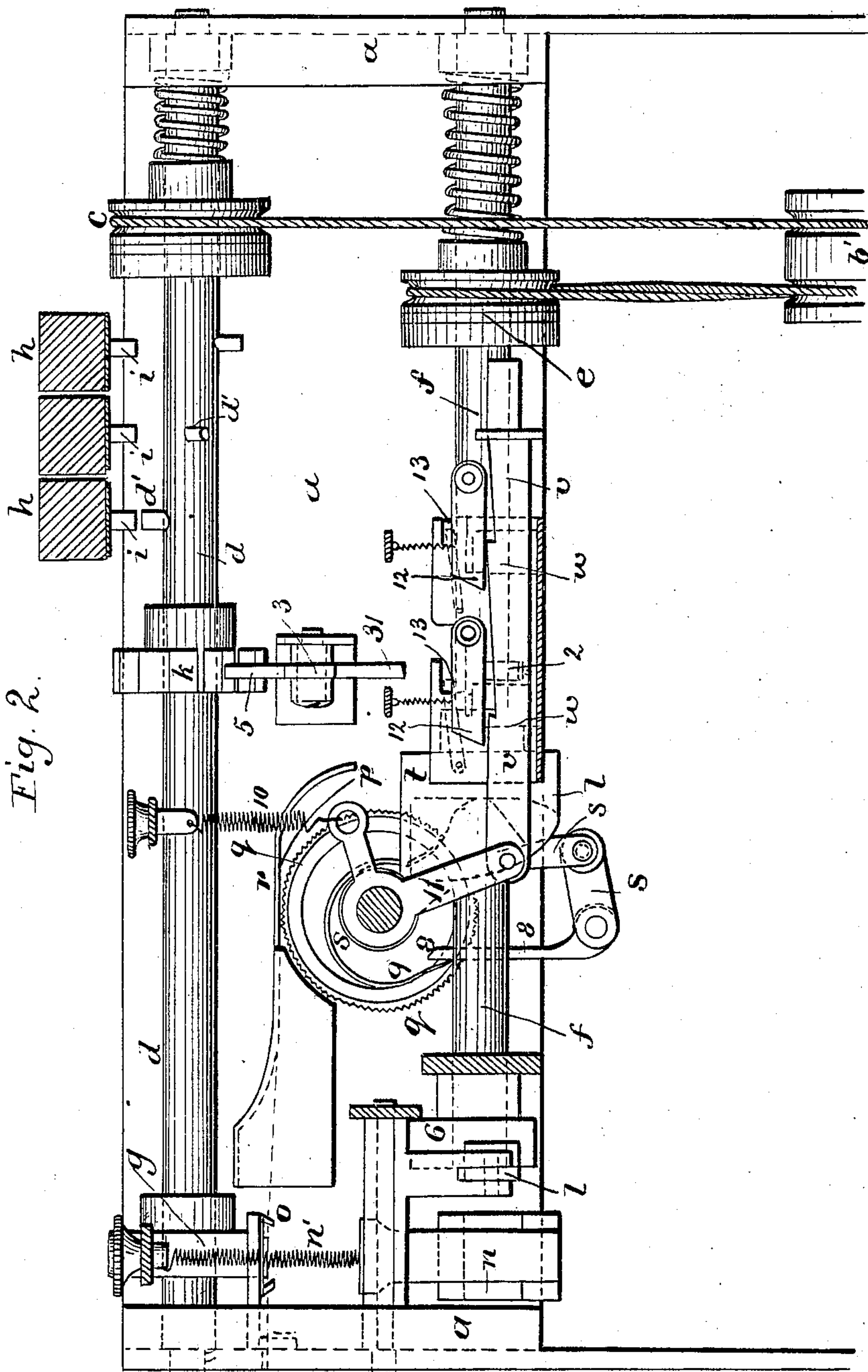


Fig. 2.

Witnesses:
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Inventor:
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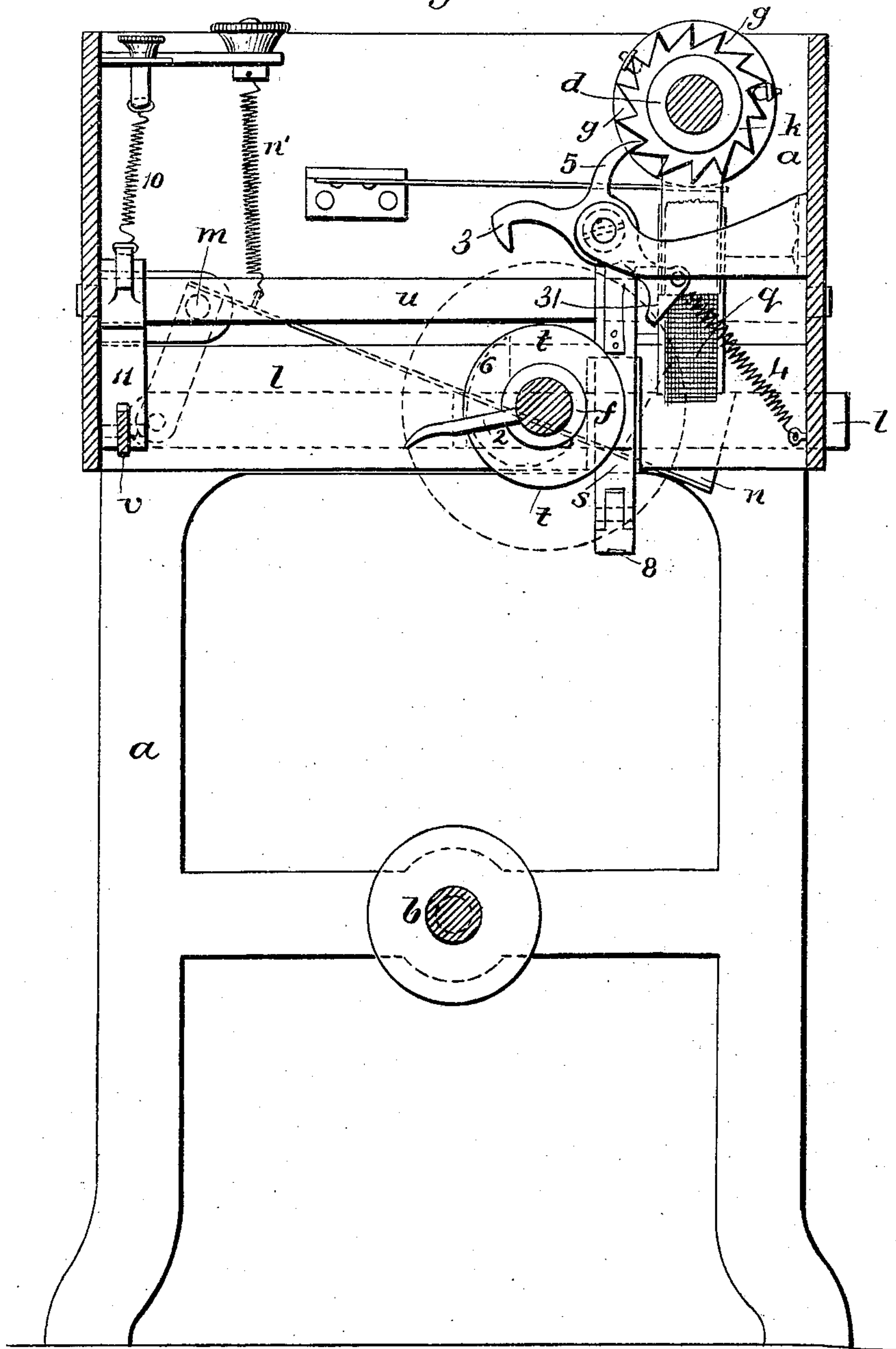
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Fig. 3.



Witnesses:

Geo. D. Walker
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UNITED STATES PATENT OFFICE.

EDWARD A. CALAHAN, OF BROOKLYN, NEW YORK, ASSIGNOR TO HIMSELF
AND MARSHALL LEFFERTS, OF NEW YORK CITY.

IMPROVEMENT IN TELEGRAPH PUNCHING APPARATUS.

Specification forming part of Letters Patent No. 87,242, dated February 23, 1869.

To all whom it may concern:

Be it known that I, EDWARD A. CALAHAN, of Brooklyn, in the county of Kings and State of New York, have invented and made a new and useful Improvement in Means for Punching Paper for Telegraphic Purposes; and I do hereby declare the following to be a full, clear, and exact description of the said invention, reference being had to the annexed drawing, making part of this specification, wherein—

Figure 1 is a plan of the machine; only a few of the keys, however, are represented. Fig. 2 is a longitudinal section at the line *y y*, showing the machine from the back, so as to represent the magnets and regulating-slide, with the exception that the section through the finger-keys is at the line *z z*. Fig. 3 is a cross-section at the line *x x*.

Similar marks of reference denote the same parts.

This machine is for punching holes in a strip of paper, said holes representing telegraphic characters, so as to be used in the transmission of messages by telegraph in place of using the finger-key.

My invention relates, first, to a series of punches upon a wheel that is continually revolving, except when stopped by the depression of a key, which brings the punch (for the character corresponding to the key struck) into the position to be operated upon by a hammer of wood, or similar material, that strikes the strip of paper against the punch, and perforates the same with the given character; second, to a feeding-wheel, that acts to draw the paper along the proper amount, the same being operated by a secondary shaft after the paper has been perforated by the blow of the hammer against the punch; third, to a means for determining the amount of movement of the feeding mechanism, so that the strip of paper is drawn along after each perforation a distance sufficient to cause the next perforation to be in the proper place. This regulation is effected by the action of stops moved by magnetism.

In the drawing, *a* represents the frame of the machine; *b*, the main shaft, rotated by competent mechanism. *b'* is a pulley thereon, from which belts pass to the pulley *c* on the type-wheel shaft *d*, and to the pulley *e* on the

cam-shaft *f*, and these pulleys *c* and *e* are each provided with a spring-friction sufficient for rotating the respective shafts, when not stopped by the mechanism provided for that purpose, and when the shaft is stopped its pulley can continue to revolve.

Upon the shaft *d* is the type-wheel *g*, in the periphery of which I place cutting-punches, formed to make perforations of the shapes desired for telegraphic signals or characters, that are by them cut in a strip of paper or other material, to compose the message. The punches in this wheel *g* are hollow punches, with cutting-edges, that cut out from the strip of paper disks, so as to leave holes, through which the wire brush may close the circuit in sending telegraph-messages. These punches are grouped together so as to form the various telegraphic characters, and they are arranged around the periphery of the wheel *g*, with the groups running parallel, or nearly so, with the axis of the wheel, in order that the cutting-edges of each group may be in a straight line, and hence cut out the entire corresponding group of perforations in the paper when the punch is pressed upon the paper or the paper driven upon the punch.

It will be understood that the strip of paper to be perforated is drawn along parallel to the axis of the wheel *g*, and that the groups of perforations formed in the strip of paper, and the punches that produce them, are to be distinguished from letters to be printed or impressed in the surface of a strip of paper, or indentations or punctures, with or without the use of ink upon the types or points, my wheel being constructed with the desired telegraphic characters in cutting-punches, so as to produce a complete perforated character in the paper when pressed thereon.

The keys *h* are fitted upon springs secured to a strip of non-conducting material, *h'*, and the keys themselves may be of non-conducting material. The keys *h* correspond in number to the characters and spaces of the type-wheel, and the keys are to be marked with the same letters or characters as those of the type-wheel; and upon the shaft *d* are stops *d'*, arranged spirally or otherwise, and *i* are the stops upon the keys, so that when one key, *h*, is depressed, the stops *i* and *d'* will arrest the

type-wheel, with the character-punch corresponding to the key, in the position to operate on the paper.

Upon the secondary or cam shaft *f* is an arm, 2, that is held by a hook or escapement, 3; and 4 is a spring that draws the escapement 3 off the end of the arm 2, when that movement is permitted by the stopping of the rotation of the type-wheel shaft *d* and ratchet-wheel *h*, allowing the arm 5 of the escapement to pass into one of the teeth on this wheel *h*. The shaft *f* is then revolved, and the arm 2 stops against the escapement-arm 31 until the shaft *d* and escapement again move, and the hook 3 becomes the stop for the arm 2. As soon as the arm 2 is liberated the shaft *f* revolves, and a cam, 6, on its end acts upon the slide *l*, rock-shaft *m*, and hammer *n* to throw the same down, and the cam, clearing a stud on the slide *l*, allows the spring *n'* to throw the hammer *n* up against the under side of the strip of paper *p*, and strike that upon the punch of the type-wheel, and thereby perforate the paper with the character corresponding to the key that is struck.

Spring-fingers *o* relieve the paper from the punch after the blow of the hammer, and the hammer does not remain in contact with the paper or with the type-wheel, as the cam 6 moves it away by its rotation.

The punches in the type-wheel are hollow, with sharp cutting-edges of the shape of the characters, and a space is left in the wheel behind the punches for the pieces of paper to pass out, which they will do freely in consequence of the concussion by the hammer, thus preventing the cutters becoming clogged.

The strip of paper is drawn along a sufficient distance to place it properly for the next punch, and this is effected by a wheel, *q*, roughened on its surface, and a spring or presser, *r*, that keeps the paper in contact with said wheel.

The punches on the type-wheel are applied so that the first part of every character is in the same plane, at right angles to the shaft *d*. Hence, after each perforation of the strip of paper, said strip has to be fed along a distance proportioned to the space occupied by the character, so that the paper will be in the correct position for the next perforation.

The feed-wheel *q* has a rim or circular flange on one side, receiving a notched clamping-bar, 8, linked at its lower end to the arm *s*, which clamping-bar 8 rotates the wheel *q* when moved one way, and is relieved of its hold thereon and slipped upon said rim by the spring 9 when moved the other way, like a sewing-machine feed.

The cam *t* upon the shaft *f* gives the positive feeding motion in one direction, (and operates after the cam 6 has allowed the hammer to strike;) and the depth of this cam is such that the feed, if uncontrolled, would be the amount necessary for the largest character of type-wheel.

In order, therefore, to lessen the feed, it is

only necessary to regulate the distance to which the arm *s* can come back when relieved from the cam *t*, which is effected as follows: The arm *s* is attached to the shaft *u*, (the feed-wheel being loose thereon,) and a spring, 10, is employed to turn this shaft for drawing the feed back, and an arm, 11, connects the shaft *u* with the regulating-slide *v*, that moves at the sides of the magnets *w*, and has notches that take the spring-pawls 12, which are operated upon by the armatures 13.

The characters on the type-wheel are generally such that only about seven or eight different lengths of feed movement of the paper are required in the machine. I therefore provide as many magnets as there are different lengths of feed, and I make the notches in the regulating-slide *v* of proportionate lengths, so that when one magnet is charged and its armature and pawl depressed, the pawl becomes a stop in the notch of the regulating-bar, to determine the backward movement of the arm and clamp of the feed-wheel, and hence the cam *t* will only give to the feed-wheel such a motion as is necessary to draw the paper along the required distance.

The respective magnets are connected by wires with the various keys that require a given movement of paper for the particular character or letter of the key, and all the wires from the magnet connect with one insulated plate, *v'*, that receives one of the battery-wires.

The other battery-wire is connected to the frame of the machine at *w'*. Hence when a key is depressed the stops *d'* and *i* close the circuit, and the electricity passes through the particular magnet to which that key is connected, and the induced magnetism, acting upon the armature, draws that and its pawl down, presenting the end of that pawl as a stop to the regulating-bar, for determining the back movement of the feeding arm and clamp, and, consequently, the feed of the paper as the cam comes around.

I am aware that a type-wheel has been used in printing-telegraphs, and, also, that a wheel with characters thereon has been used in connection with slides that perforate the paper; and magnetism has been employed as a means for giving motion to the paper.

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

1. A series of hollow cutting-punches grouped together for the letters or characters, and arranged to form a wheel, with the groups of punches running parallel, or nearly so, with the axis of said wheel, in combination with mechanism for pressing the paper upon such punches to perforate the same, substantially as set forth.

2. A series of keys, *h*, with stops that act upon the shaft of the cutter-wheel, in combination with said perforating cutters and hammer, substantially as set forth.

3. The escapement 3, for controlling the ro-

tation of the secondary shaft, in combination with the cam 6, for operating the hammer, and the cam *t*, for operating the feed.

4. In a perforating machine, the employment of magnetism to regulate the action of the mechanism moving the paper, so as to effect a greater or less movement of the paper, according to the character perforated in the same, substantially as specified.

5. The regulating-bar *v*, armatures 13, and

pawls 12, in combination with mechanism, substantially as set forth, for feeding the paper along after the perforation of the respective letters or characters in the strip of paper.

In witness whereof I have hereunto set my signature this 17th day of April, 1868.

EDWD. A. CALAHAN.

Witnesses:

CHAS. H. SMITH,

GEO. T. PINCKNEY.