

J. J. E. Lenoir.

Automatic Telegraph.

N^o 62,141.

Patented Feb. 19, 1867.

Fig. 4.

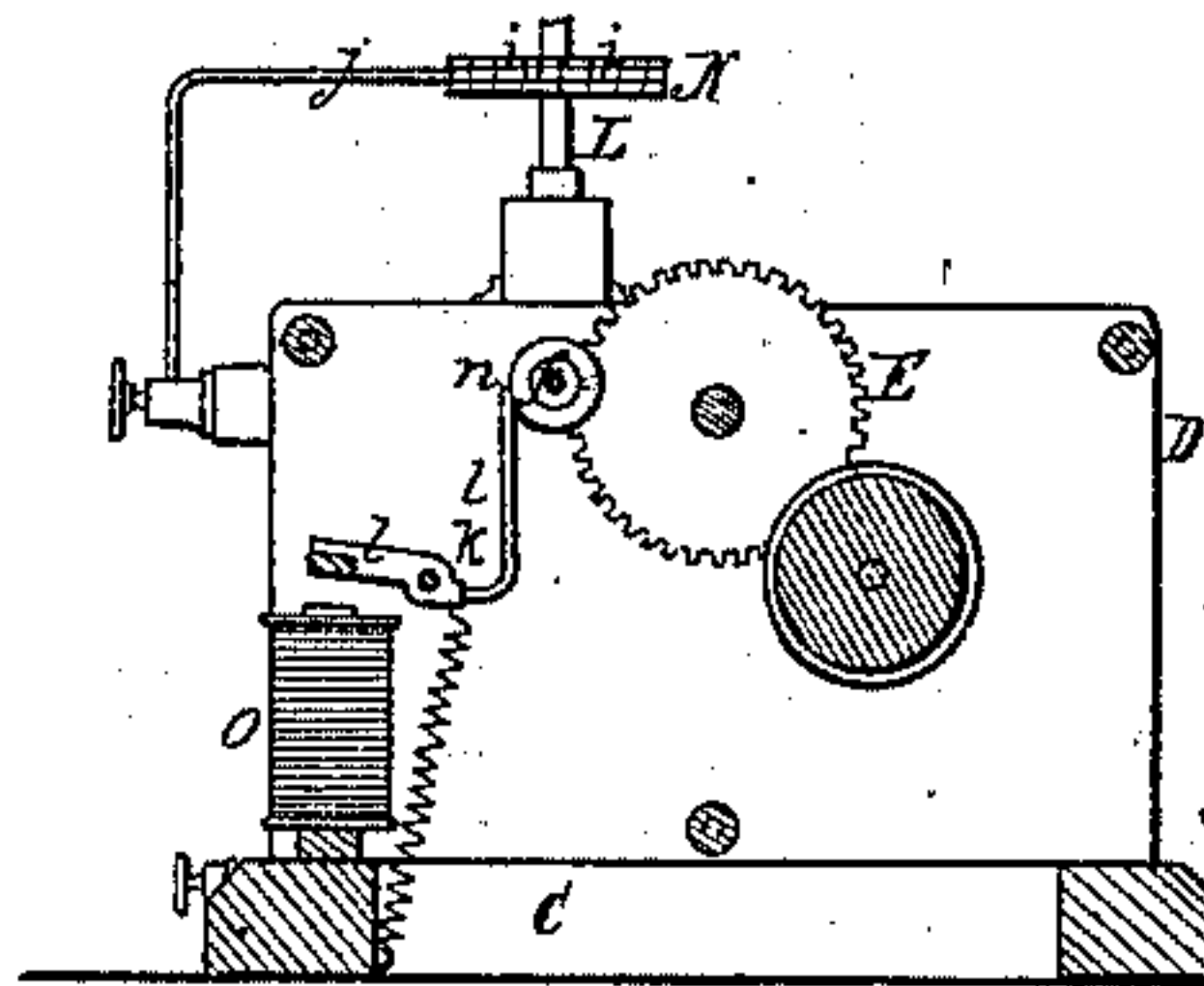


Fig. 2.

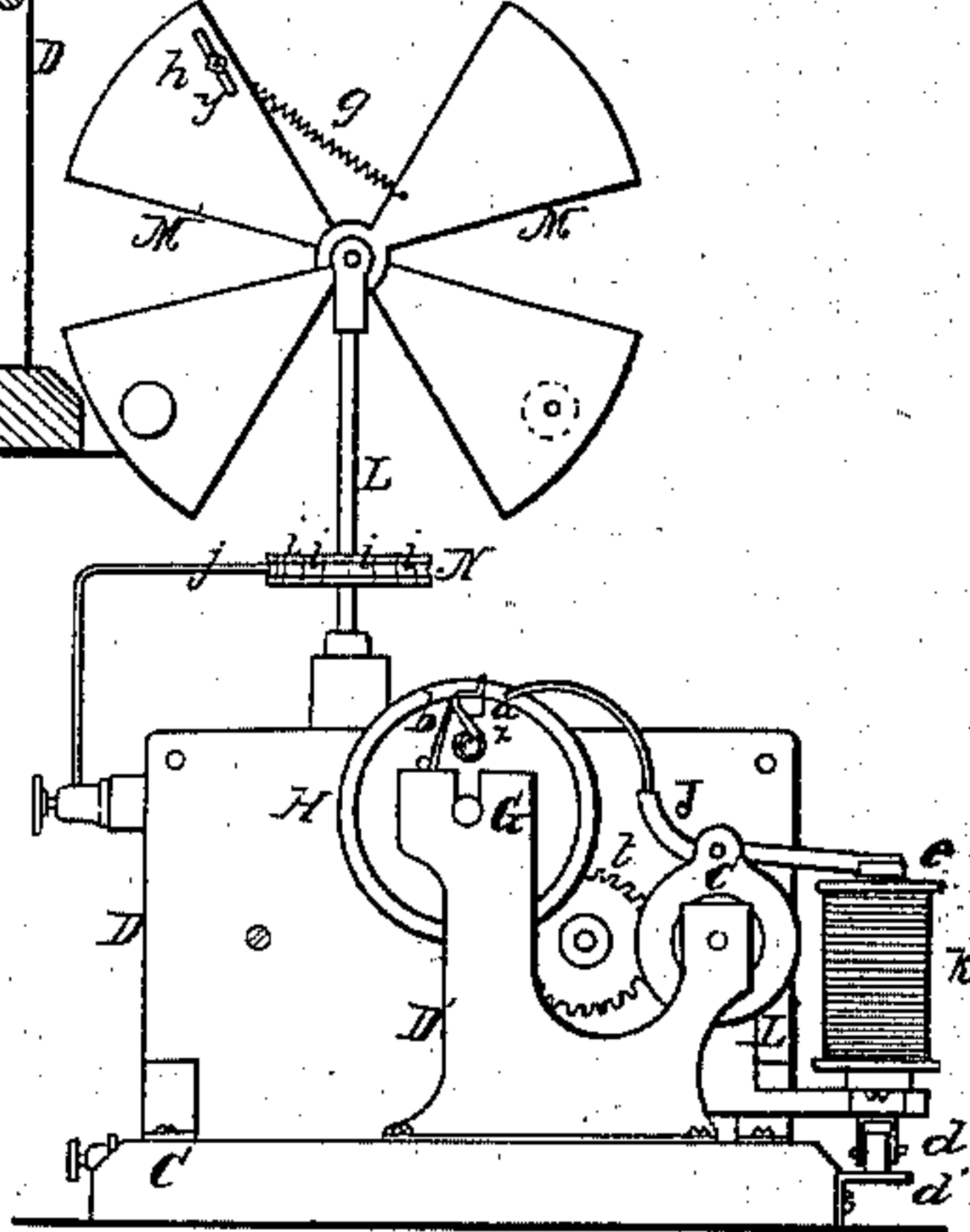


Fig. 1.

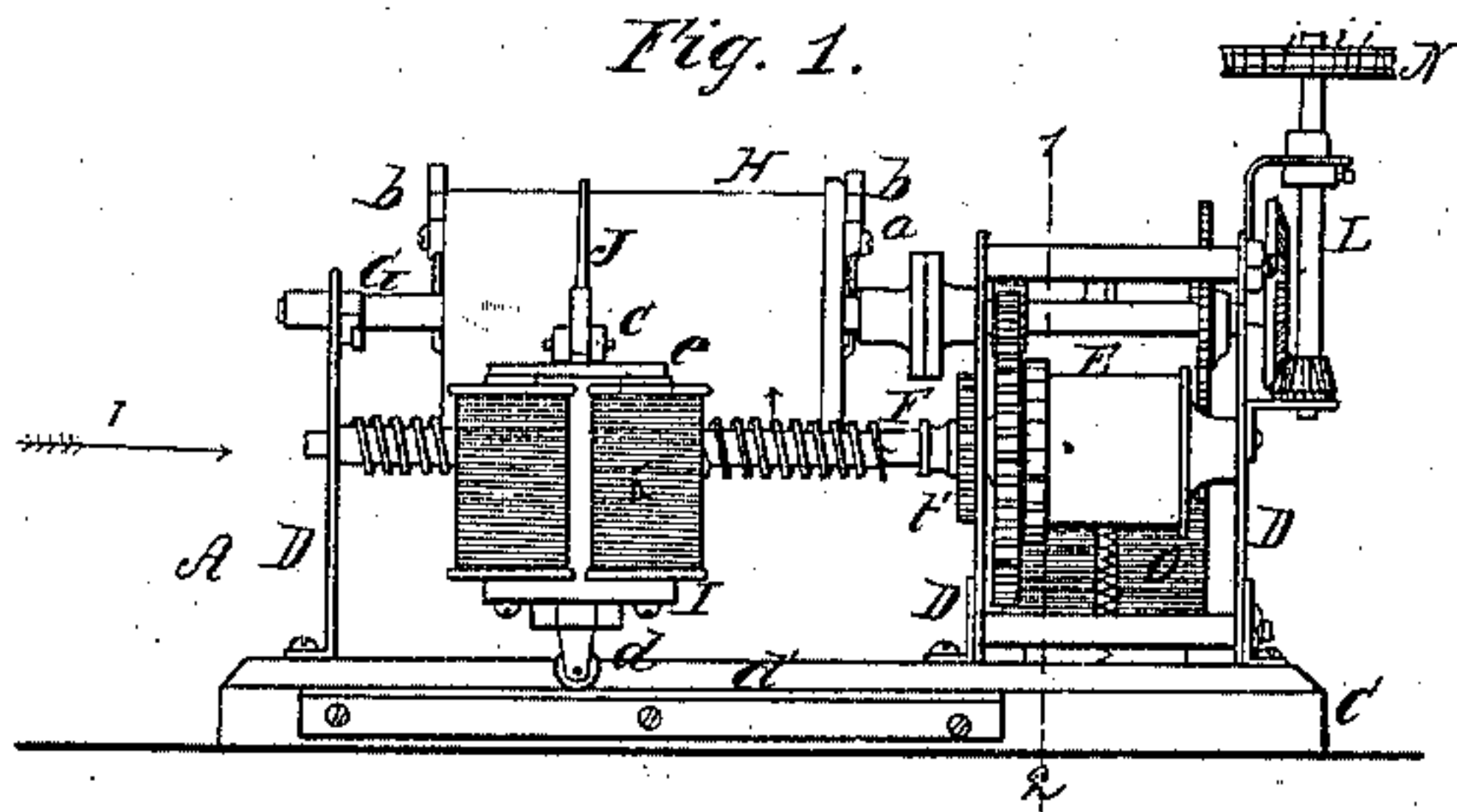


Fig. 3.

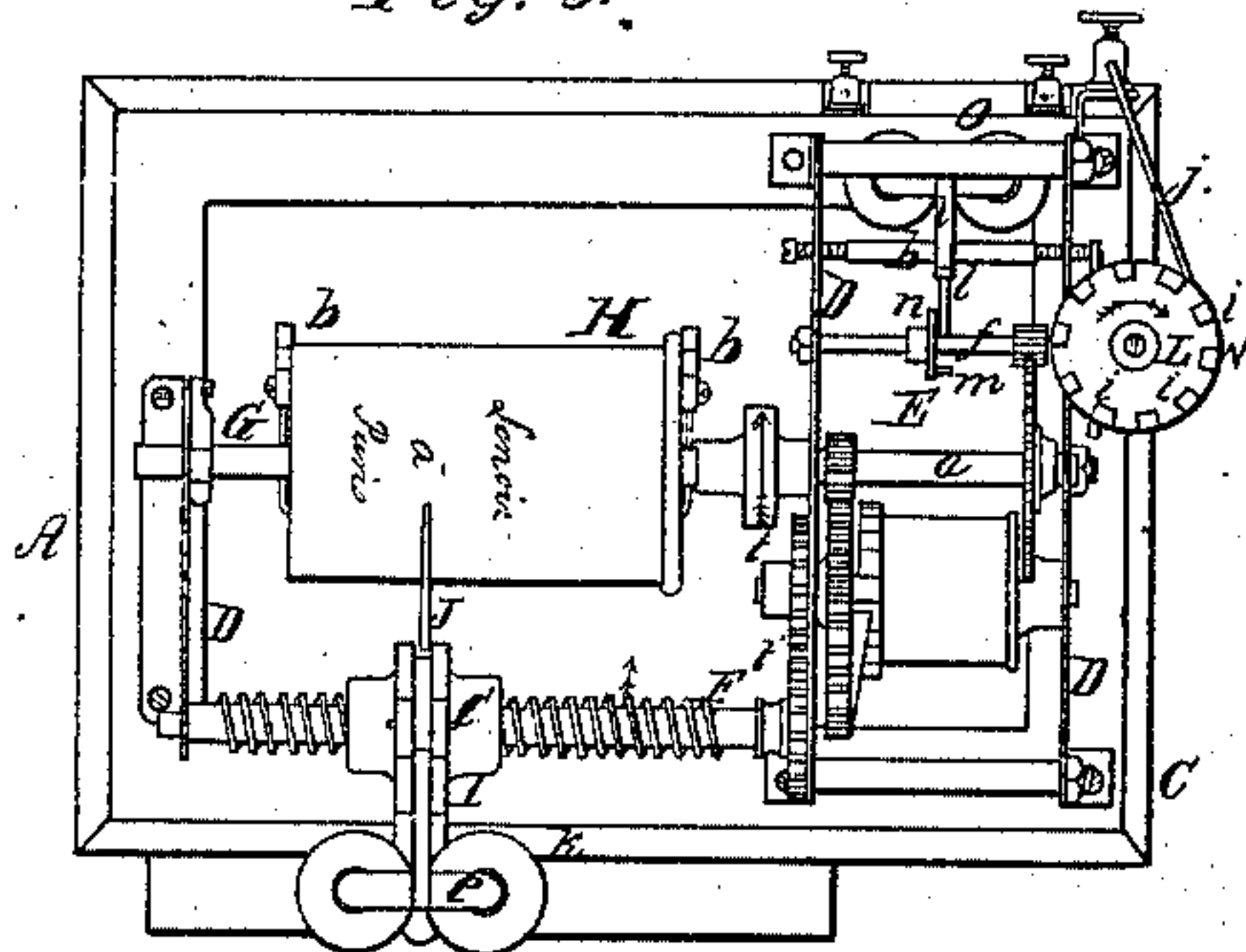


Fig. 6.

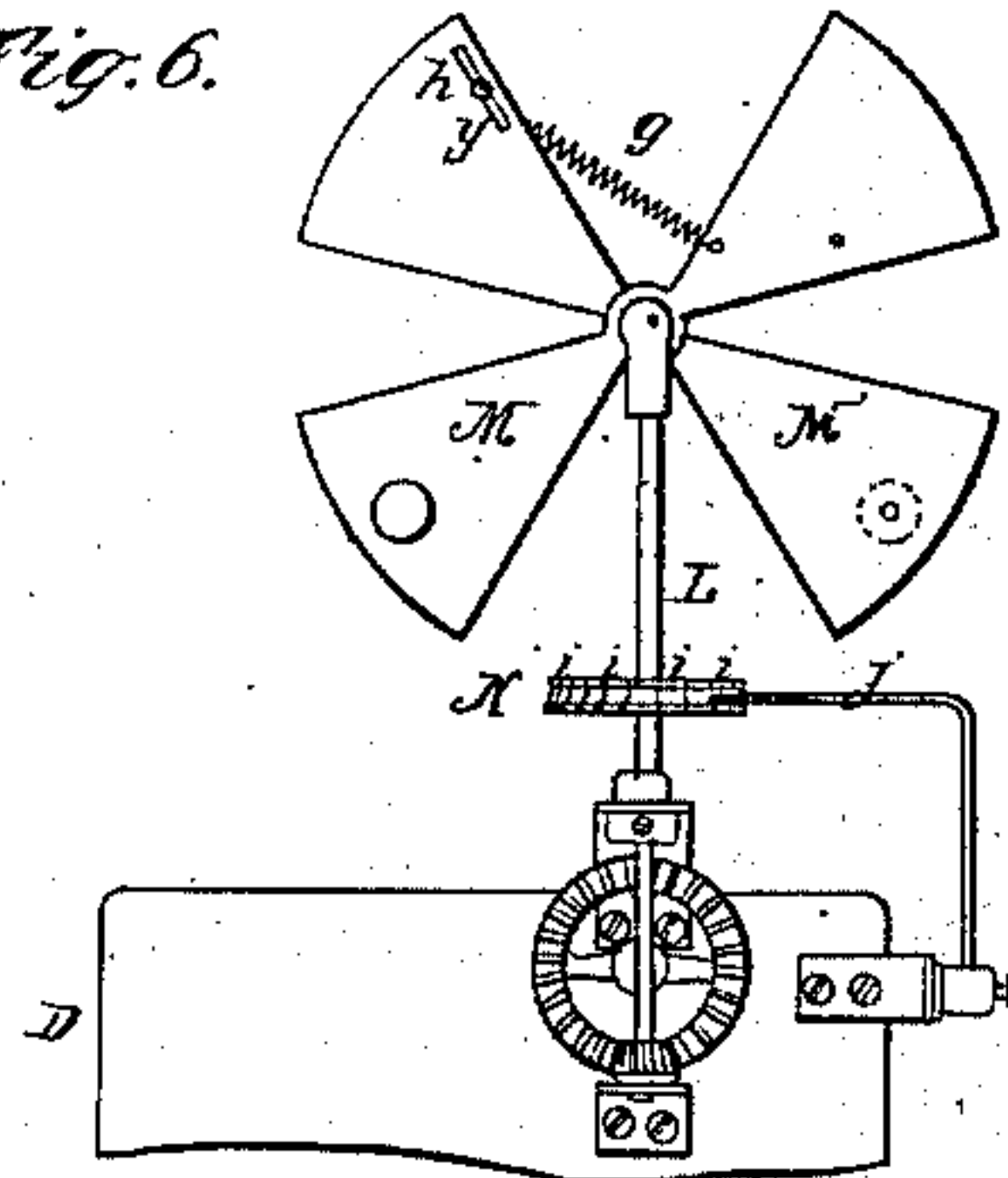


Fig. 5.

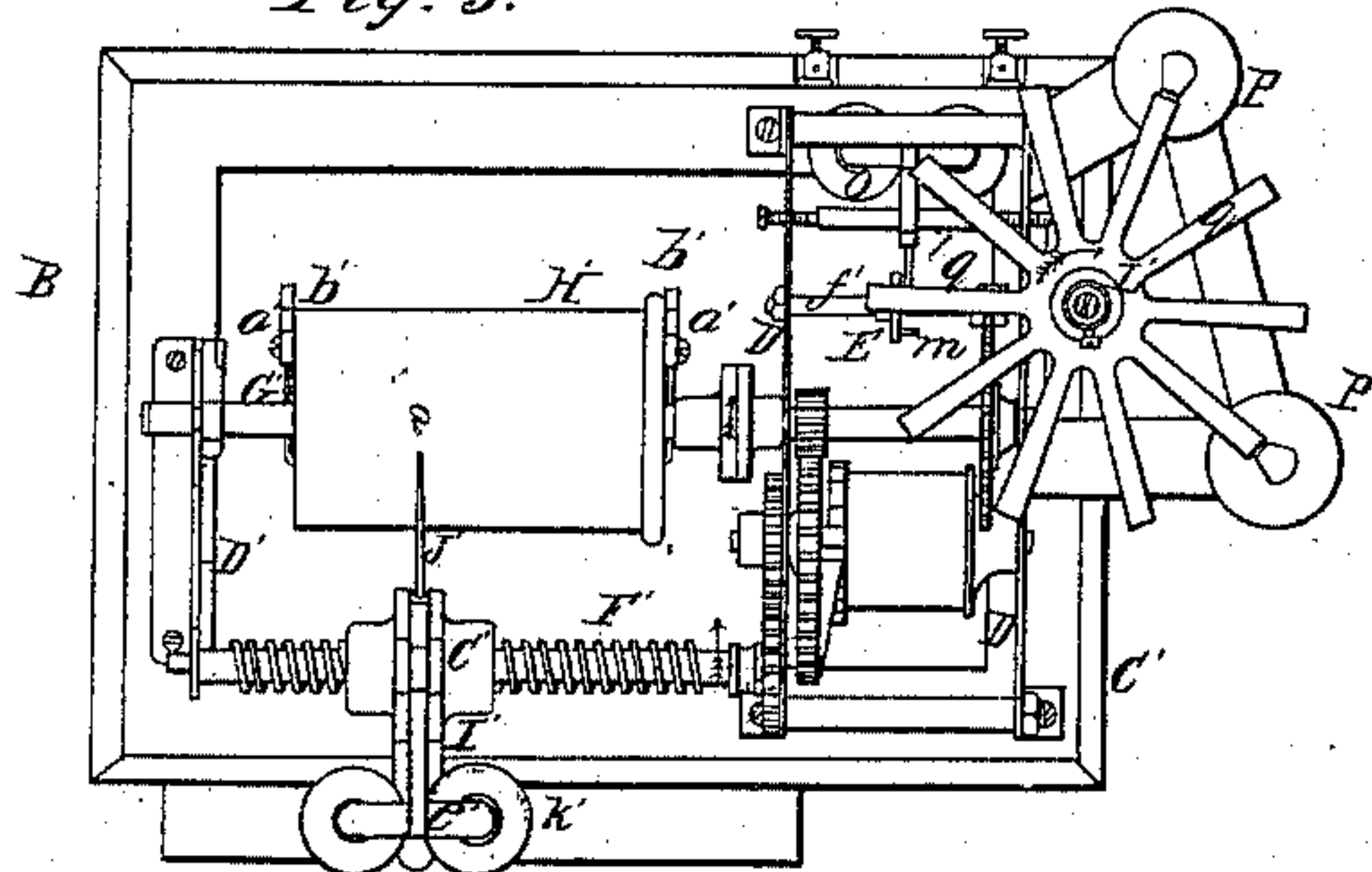
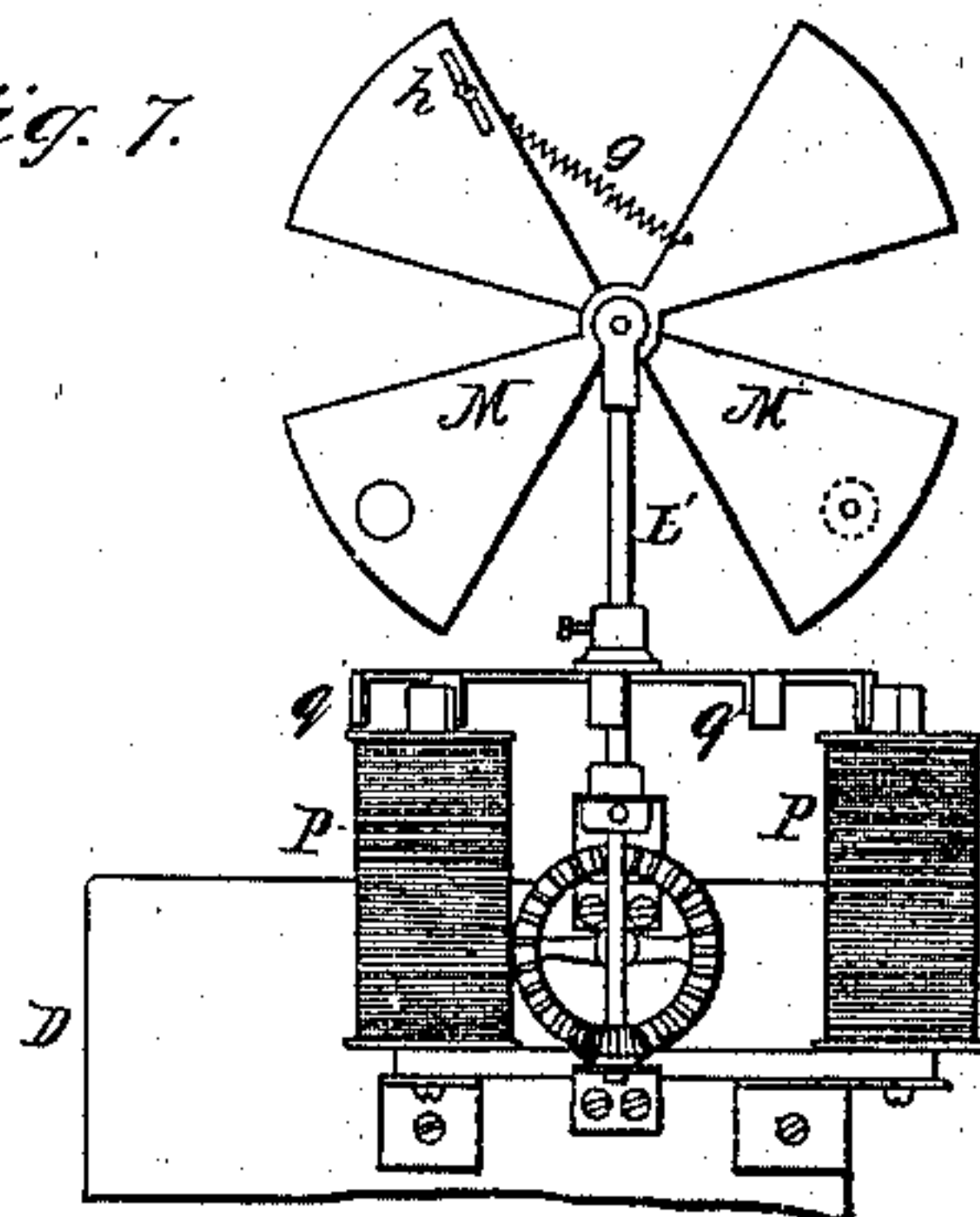


Fig. 7.



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J. J. E. LENOIR, OF PARIS, FRANCE.

Letters Patent No. 62,141, dated February 19, 1867.

IMPROVEMENT IN TELEGRAPHING APPARATUS.

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

TO ALL WHOM IT MAY CONCERN:

Be it known that I, J. J. E. LENOIR, of Paris, France, have invented an Improved Telegraphing Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing and to the letters of reference marked thereon.

My invention consists of certain devices, constructed and operating as fully described hereafter, whereby *fac simile* copies of written or printed messages or diagrams may be transmitted from one extremity of a telegraph line to the other.

In order to enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation, reference being had to the accompanying drawing, which forms a part of this specification, and in which—

Figure 1 is a side elevation of one of the instruments used in my improved telegraphing apparatus.

Figure 2, an end elevation, looking in the direction of the arrow 1, fig. 1.

Figure 3, a plan view.

Figure 4, a sectional elevation on the line 1-2, fig. 1, looking in the direction of the arrow.

Figure 5, a plan view of another instrument used in the apparatus; and

Figures 6 and 7, detached views of parts of the apparatus.

Similar letters refer to similar parts throughout the several views.

The apparatus consists of a dispatching instrument, A, and a "receiver," B, (figs. 1, 3, and 5,) each instrument being situated at one of the extremities of the line or wire through which messages are to be sent and being connected with the usual galvanic batteries by suitable wires. To the base-plate, C, of the "dispatcher," A, are secured a framework, D, and a frame, D', the former containing a train of wheels, E, to which motion is imparted by a spring or weight, and on the projecting end of one of the shafts of this train is a cog-wheel, *t*, the teeth of which are adapted to those of a similar wheel, *t'*, on a screw spindle, F, the journals of the latter turning in the frames D and D'. In the frame D' turns one end of a shaft, G, the opposite end of which is so connected to the end of one of the shafts, *u*, of the train E that it may be readily detached from or (after a slight lateral adjustment) may be turned independently of the said shaft, *u*. To the shaft G is secured a roller, H, within a recess, *x*, in which fits a bar, *a*, the latter being secured in its place by spring-catches *b b*, fig. 2, which are hung to the ends of the roller and extend over the projecting ends of the bar. On the screw F travels a nut, *c*, which is attached to or forms a part of a frame, I, a roller, *d*, at the under side of the latter resting on a plate, *d'*, secured to the edge of the base-plate C. To the nut *c*, or to the frame I, is hung a lever, J, the forward pointed end of which projects over the roller H; and to the rear end of the lever is secured an armature, *e*, which is directly above the ends of an electro-magnet, K, secured to the frame I. In suitable bearings, at the side of the frame D, turns a vertical shaft, L, a bevel pinion on which gears with a bevel-wheel on the projecting end of one of the shafts *f* of the train E, and to the upper end of the shaft L are hung two double vanes or wings M M', each of which is weighted at its lower end. To the vane M' is secured a spiral spring, *g*, and the opposite end of the latter is connected to a pin, *h*, which is adjustable in a slot, *y*, in the vane M. To the shaft L is secured a metal disk, N, in the edge of which, at equal distances from each other, are ten blocks *i i* of ivory or other insulating material; and against the edge of this disk bears a wire or spring, *j*. To a shaft, *k*, turning in bearings in the frame D, is secured an arm, *l*, an armature at one end of which is directly above the ends of an electro-magnet, O, the opposite end of the arm *l* (when in the position shown in fig. 4) being in contact with a pin, *m*, on a disk, *n*, secured to the shaft *k*, thereby preventing the revolution of the shaft and the movement of the train. The receiving instrument B is precisely like the dispatcher A, excepting that the vertical shaft L', instead of having a disk N, is provided with a hub of soft iron, from which project ten radial arms or spokes, *q q*. To brackets secured to the frame D is attached an electro-magnet, P, the ends of which are almost within range of the ends of the arms *q q*, the wire which surrounds the magnet P being connected with the arm *j*, which bears against the disk N of the dispatcher. A message is written with a non-conducting ink upon a sheet of foil, or paper having a metallic or conducting surface; this sheet is then lapped round the roller of the dispatcher, its ends being secured in the recess *x* by the bar *a*. A sheet of white paper is wrapped round the roller H' of the receiver, and on this sheet is

placed a sheet of transfer paper, the ends of both sheets being secured in the recess x by the bar a' . The frame I in each instrument is brought close to the frame D' , and the operator starts both machines simultaneously by establishing a circuit, which magnetizes the electro-magnet O , draws down its armature and thus removes each arm l from contact with the pin m on the adjacent shaft f . As the screws $F F'$ and the shafts $G G'$ and $L L'$ revolve in the direction of their arrows, the rollers $H H'$ will revolve quickly, and the frames $I I'$ and their levers $J J'$ will be carried slowly towards the frames D . So long as the point of the lever J of the dispatcher is in contact with the metallic surface of the paper on the roller H an electric current is communicated to the electro-magnet K' of the receiver, the armature e' is held in contact with the magnet, and the point of the lever J' is free from contact with the surface of the paper on the roller H' . As soon, however, as the point of the lever J passes from contact with the metallic surface on to an ink mark, the electric current is broken, the magnet K' no longer attracts the armature e' , and the point of the lever J is brought against the transfer paper, from which a mark is thus transferred to the plain paper beneath, this mark being equal in length to the extent of the rotation of the cylinder while the lever is in contact with the latter. As soon as the ink mark is removed from contact with the lever J and the point of the latter is again brought against the metallic surface, the electric current will be again established and the lever J' will be raised from contact with the roller H' . As the roller H continues its revolution, and as the frame I travels slowly towards the frame D , nearly every portion of the surface of the roller H will be brought in contact with the point of the lever J , and currents will be alternately established and interrupted, as before described, the lever J' rising and falling as the lever J passes from or into contact with the ink marks on the roller H , and producing lines or dots on the paper wrapped on the roller H' , corresponding in length, form, and position to those on the roller H ; a *fac simile* copy of the dispatch on the latter roller being thus obtained.

As it is of the utmost importance that the rollers $H H'$ and the frames $I I'$ of the two instruments shall move at precisely the same speed, the speed of the operating mechanism in both instruments is regulated by the devices connected to the shafts $L L'$ in the following manner: So long as the arm j is in contact with the metallic portion of the disk N , an electric current will be established between the arm j and the electro-magnet P , this current being interrupted and the magnet becoming passive when the arm j is in contact with one of the insulated blocks i of the disk. The regulator of the receiver B is so adjusted that two of the arms $q q$ (when both machines move at the same speed) will be exactly opposite the ends of the magnet P when a metallic portion of the disk N is in contact with the arm j , that is, when the magnet P is active. Should the shaft L acquire a greater speed than the shaft L' , a metallic portion of the disk N will be brought against the arm j before any of the arms q are opposite the ends of the magnet P ; the latter, therefore, being magnetized, (before the arms are in their positions,) will attract the arms approaching it, and thus accelerate the motion of the shaft L' . In like manner, should the shaft L revolve at a less speed than the shaft L' , the arms $q q$ of the latter will arrive opposite to and will pass or almost pass the ends of the magnet P before the latter becomes magnetized. When this change is effected, however, the arms nearest to, but passing from, the ends of the magnet will be attracted, and their motion from the magnet, and consequently the revolution of the shaft, will be retarded.

The transfer paper used in this apparatus may be covered with a mixture of any suitable coloring material and glycerine, the latter preserving the color moist so that it may be easily transferred from one paper to the other. A copy of the dispatch may also be transferred to another sheet of paper by placing the two sheets in contact and subjecting them to the action of a press.

A secret message may be forwarded by writing the message with a non-conducting ink corresponding in color with the paper it is written upon. A dispatch also may be preserved from the knowledge of the operator who receives it by securing together the edges of the transfer and receiving sheets before they are placed on the roller H' . Instead of using transfer paper, the surface of the roller H' may be inked, and a transparent paper may be used, on to the inner side of which the ink from the roller is transferred by the pressure of the lever J' , the dispatch being read through the paper. To give additional security to the dispatch, stamps containing private seals or signs, printed on metallic surfaces with non-conducting ink, may be secured to the paper containing the message to be forwarded.

Magnetized steel may be substituted for soft iron in the construction of the electric gearing and for the electro-magnet of the receiver, this substitution obviating the necessity of employing two wires.

Flat or curved vibrating plates may be substituted for the revolving rollers $H H'$ for holding the sheets on which the messages are written or to which they are transferred; or a suitable lever or pencil may be caused to traverse rapidly from one end of the holder to the other, the holder being turned or adjusted to a slight extent after the passage of the pencil or lever in either direction, so that the points of the lever may be brought into contact with every portion of the surface of the paper beneath it.

Without confining myself to the precise construction and operation of the devices herein described, I claim as my invention, and desire to secure by Letters Patent—

1. The revolving rollers H and H' in combination with the revolving screws $F F'$, traversing frames $I I'$, their magnets $K K'$, levers $J J'$, and armatures $e e'$; the whole being constructed, arranged, and operating as described.

2. The shafts $G G'$ and their rollers $H H'$, screws $F F'$, frames $I I'$, magnets $K K'$, and levers $J J'$, in combination with the trains of wheels $E E$ or the equivalent to the same; the whole being arranged and operating substantially as and for the purpose set forth.

3. A sheet of transfer paper and a sheet of plain paper, combined with the roller H , and arranged to be operated on substantially as and for the purpose specified.

4. The combination of a receiving roller or holder H' , having an inked surface, a lever or pencil J' , and a sheet of transparent paper, or its equivalent, for the purpose described.

5. The magnets $O O'$, connected electrically with each other, and the arms $l l$, in combination with two instruments $A B$ when the latter are constructed and operate together as described.

6. The shaft L with its disk N , and the shaft L' with its arms $q q$, in combination with the driving mechanism of two instruments A and B , and with the arm j and the electro-magnet P , the whole being constructed and operating substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

ET. LENOIR.

Witnesses:

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G. REINARD.