

No. 636,021.

Patented Oct. 31, 1899.

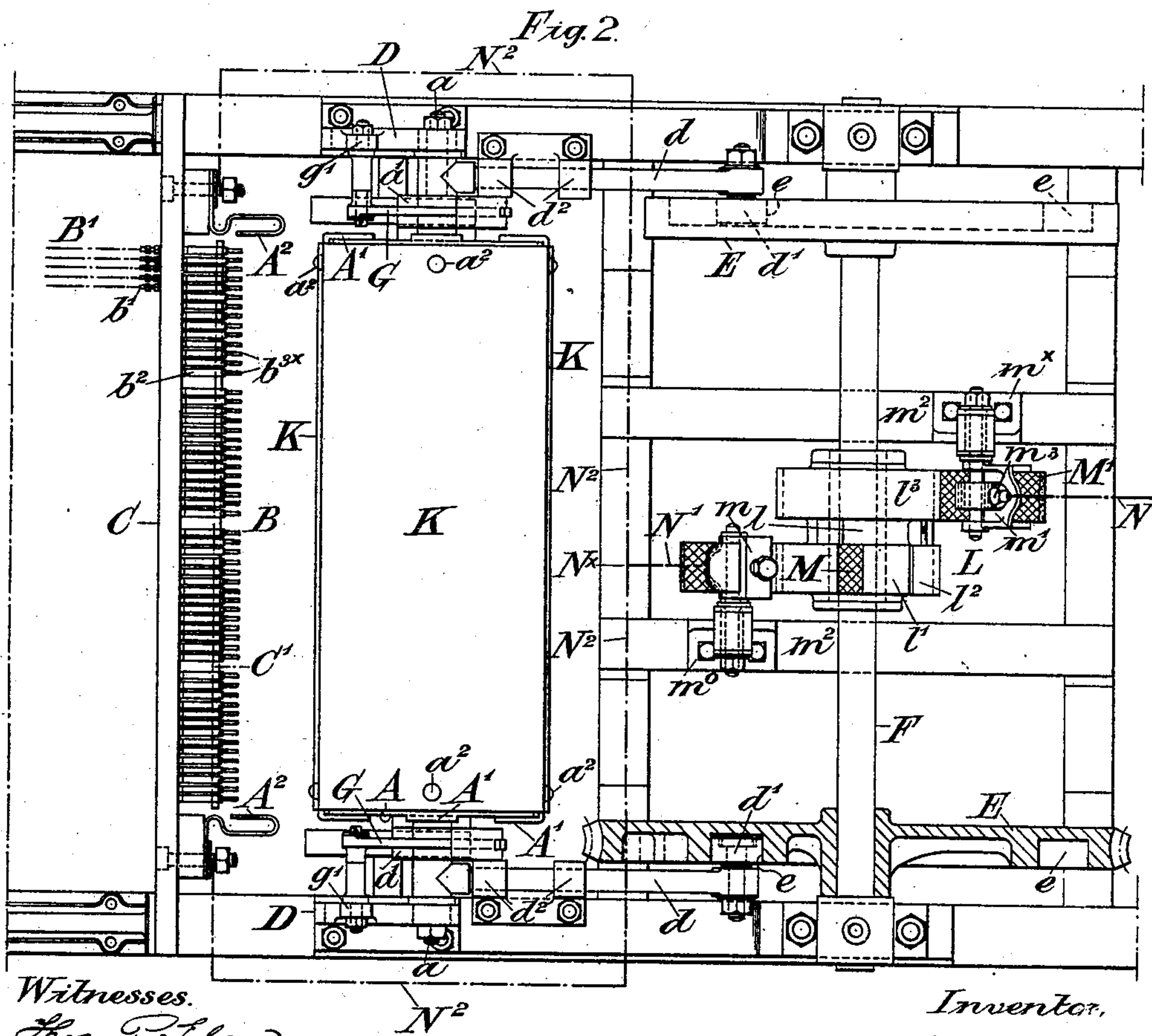
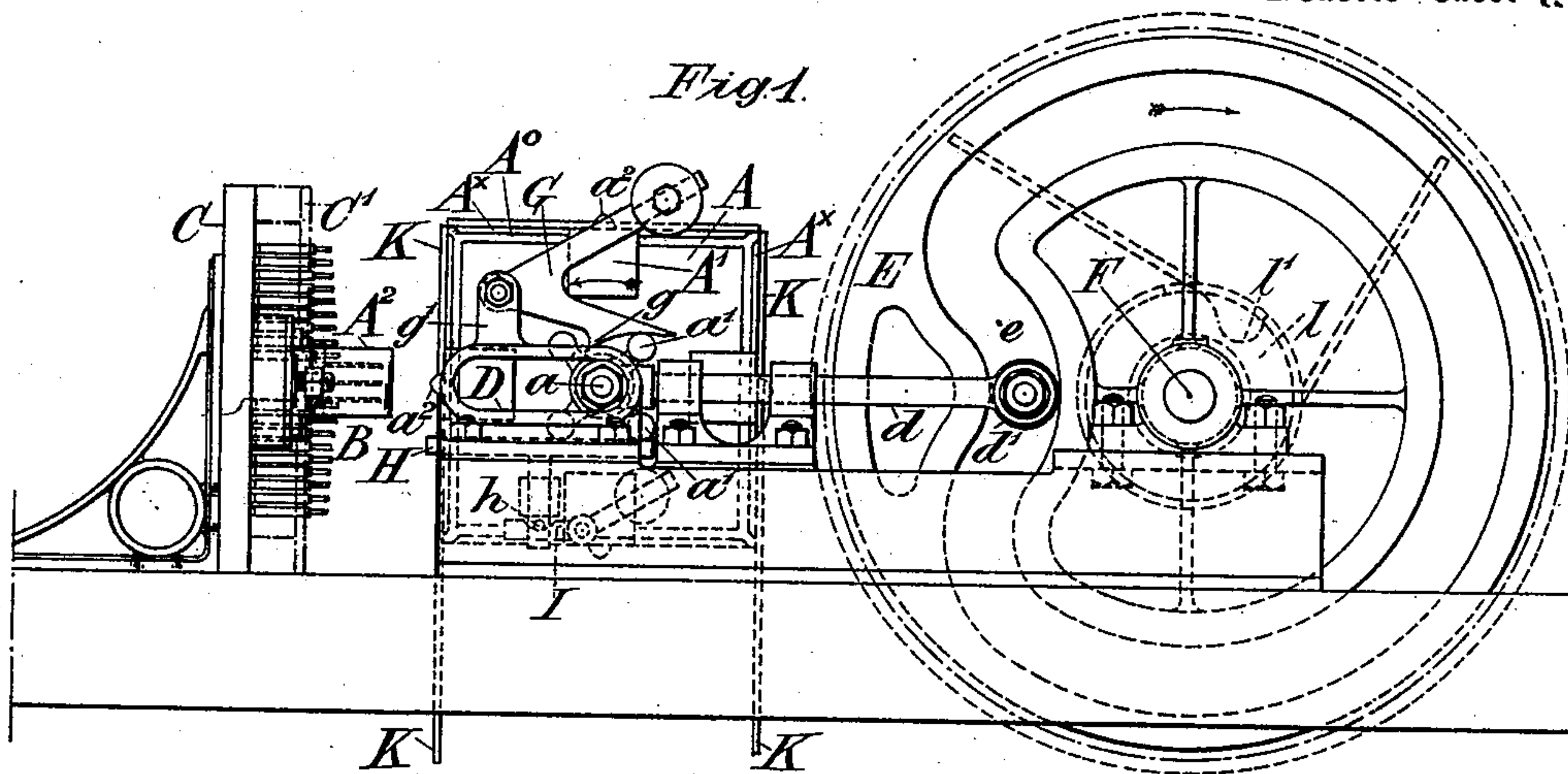
W. T. BELL.

DEVICE FOR OPERATING ELECTRICALLY ILLUMINATED SIGNS.

(Application filed Oct. 19, 1898.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses.
Thos. P. Glend.
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Inventor,
William Thomson Bell

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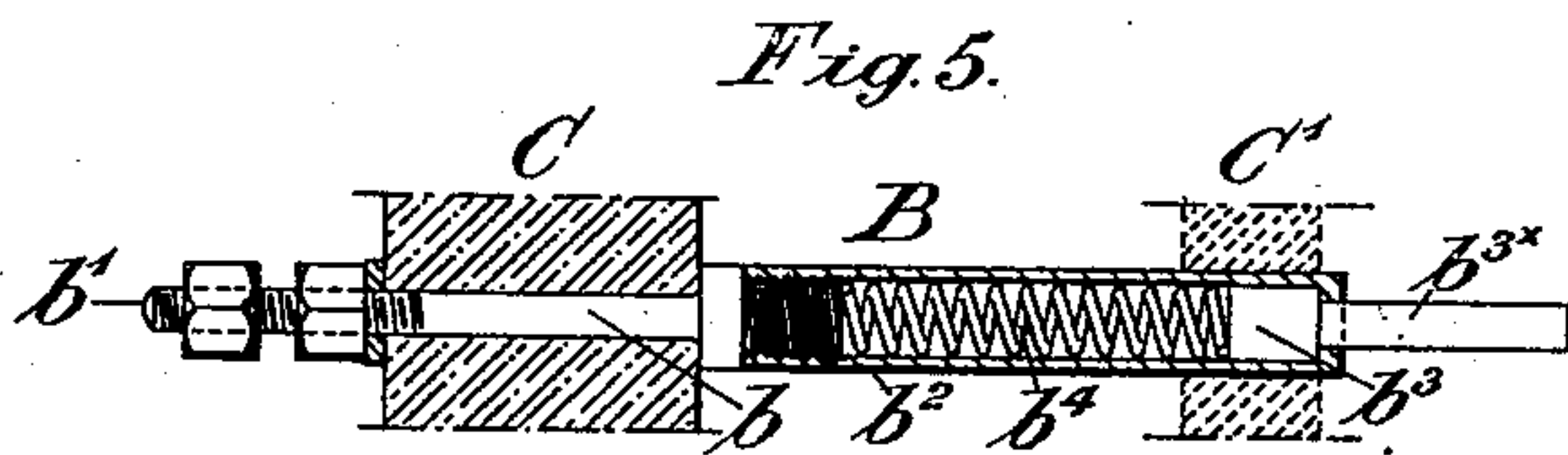
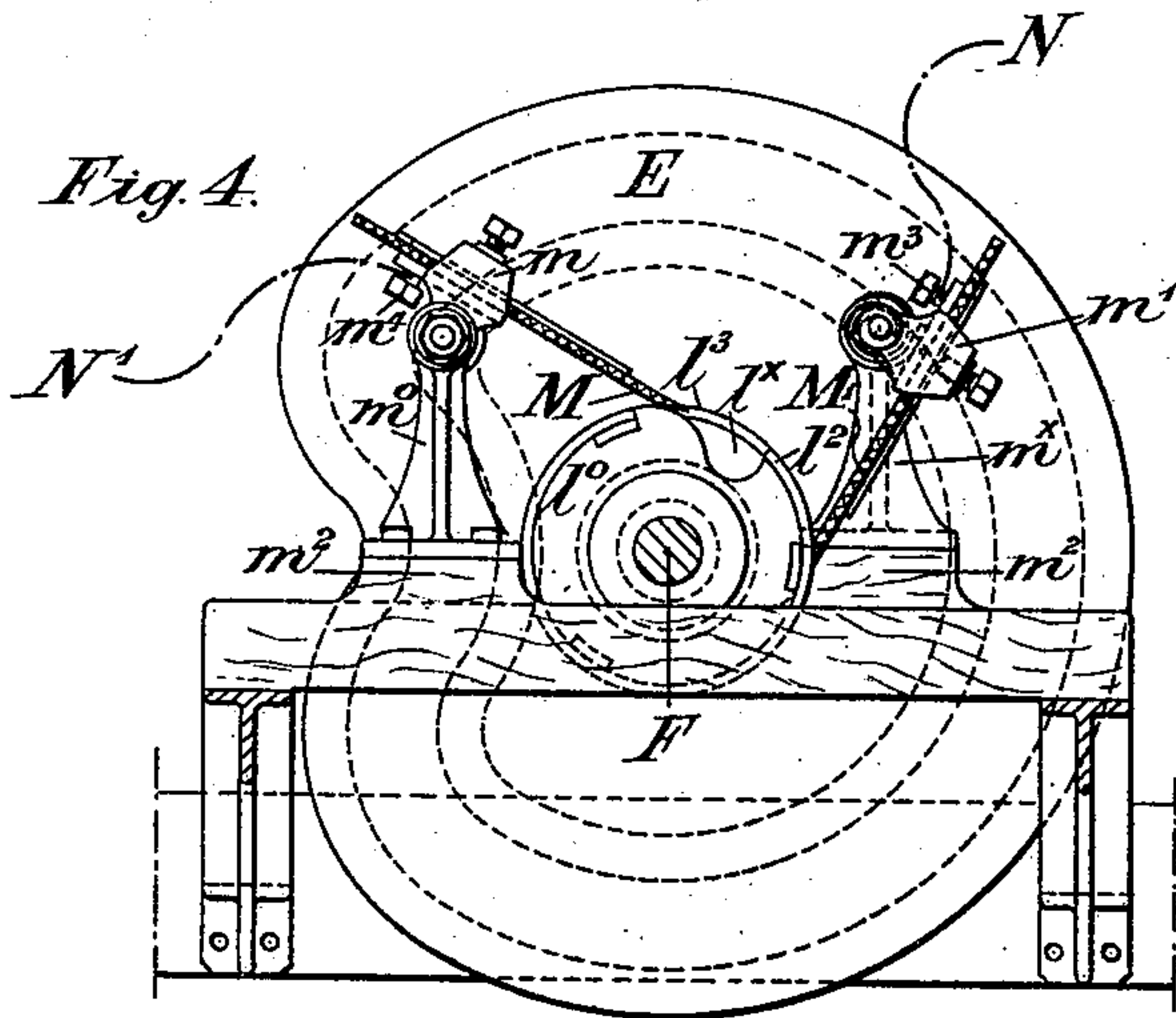
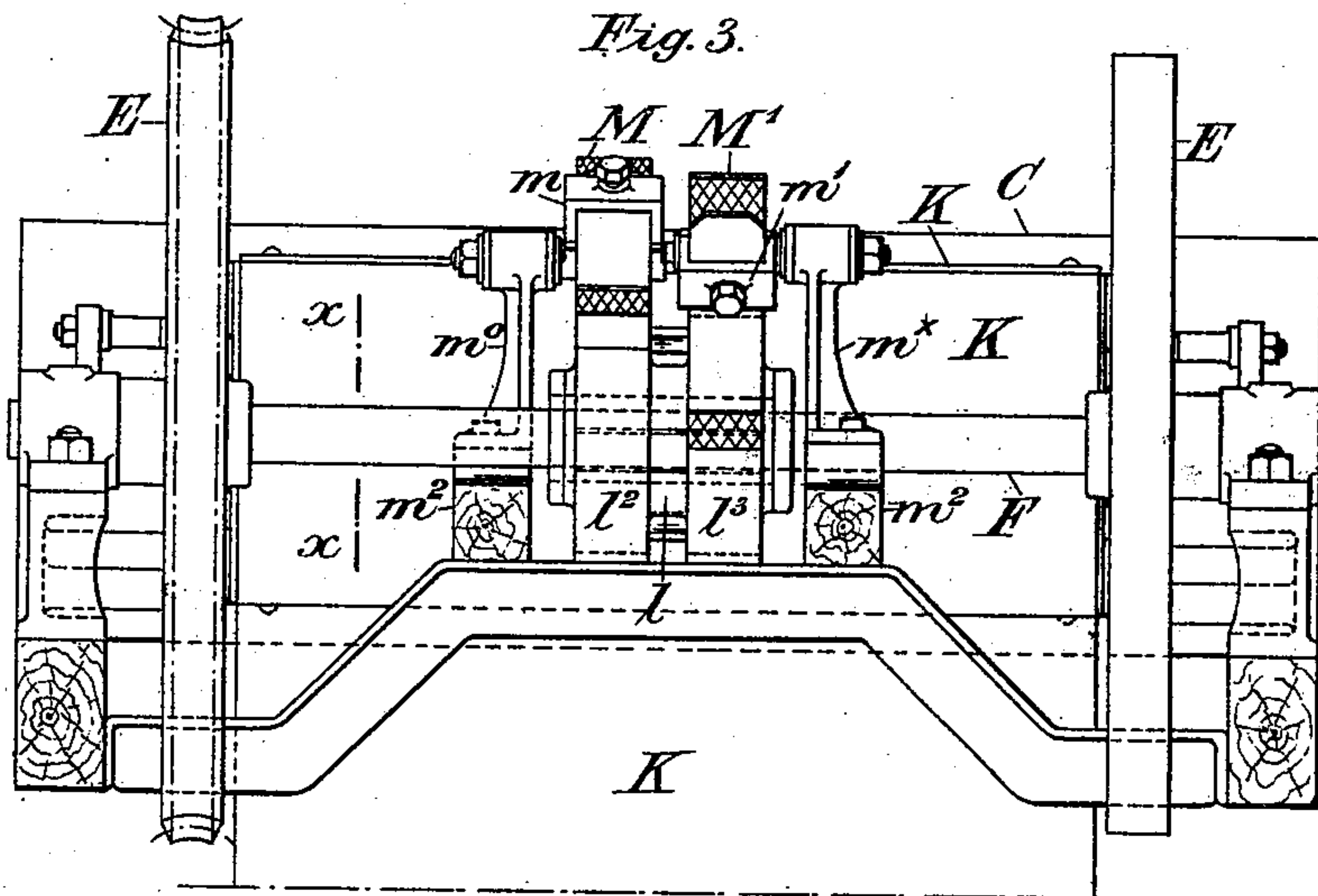
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DEVICE FOR OPERATING ELECTRICALLY ILLUMINATED SIGNS.

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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

WILLIAM THOMSON BELL, OF NOTTINGHAM, ENGLAND, ASSIGNOR TO THE
UNIVERSAL ELECTRICAL ADVERTISING SYNDICATE, LIMITED, OF SAME
PLACE.

DEVICE FOR OPERATING ELECTRICALLY-ILLUMINATED SIGNS.

SPECIFICATION forming part of Letters Patent No. 636,021, dated October 31, 1899.

Application filed October 19, 1898. Serial No. 693,949. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM THOMSON BELL, a subject of the Queen of Great Britain and Ireland, residing at 64 Loughborough road, Nottingham, England, have invented new and useful Improved Means Applicable for Use in Operating Electrically-Illuminated Signs, Advertising Media, or the Like, (in respect whereof I have applied for a patent in Great Britain to bear date March 28, 1898, No. 7,467,) of which the following is a specification.

This invention relates to apparatus for operating electrically-illuminated signs, advertising media, or the like, wherein letters, words, or other devices are depicted by means of a number of incandescent electric lamps, the objects being to simplify the construction of such apparatus, to render its action more certain, and to prevent "sparking" upon the making and breaking of the electric circuit.

Apparatus constructed according to my present invention is illustrated in the accompanying drawings, whereof—

Figure 1 is a side elevation; Fig. 2, a corresponding plan, and Fig. 3 an elevation looking from the right-hand end of Fig. 1. Fig. 4 is a partial longitudinal section on the line $x x$ in Fig. 3, showing the means for effecting the "cut-out." Fig. 5 is a longitudinal section of one of the contact-makers pertaining to the switchboard and whereby each lamp is operated.

In carrying out my invention I arrange in the electric circuit a horizontally-reciprocating and intermittently-rotating drum or cylinder A, which at each forward movement operates a number of contact-makers B, carried by a suitably-constructed switchboard C. The drum A is preferably of rectangular cross-section and is carried at each end by trunnions $a a$, which are mounted in horizontal guides D D. To each trunnion is connected a thrust-bar d , furnished at its opposite extremity with a roller d' , which works in the groove e of the face-cam E, keyed on the main shaft F, these bars being carried in guides $d^2 d^2$, or the rollers d' may each be caused to bear against a circumferential cam mounted on the main shaft, springs being em-

ployed to effect their return movement. The cams E E are so formed as to advance the drum A toward the switchboard C, and thus to operate the contacts B, the drum being then held in that position, so as to maintain the electric circuit for the desired length of time. The cams ultimately cause or permit the drum to retreat, thus breaking the electric circuit upon the predetermined limit of time for such exposure being reached. The drum is provided at each end with arms or projections $a' a' a' a'$, which engage with a tooth g on one arm of a weighted bell-crank lever G, the latter being pivoted in a support g' , mounted upon the guides D D or upon a pin secured in the frame of the machine. Thus during the outward movement of the drum the extremity of one of the arms a' glides beneath the tooth g of the bell-crank lever G and passes the same, while during the retreat of the drum the said arm is held captive by the tooth and the drum is rotated a quarter of a revolution. The overturning of the drum is prevented by horizontal plates H H, arranged at each end of the drum and maintained in contact with the lower arms $a' a'$ by counterweighted levers I I, pivoted to the side frames, a pendent tailpiece h on each plate entering a slot in the unweighted arm of each lever.

It is preferable that only one face of the drum be in the electric circuit at one time, and to this end the drum is constructed in the following manner: Upon a foundation A^0 of insulating material are secured the contact-plates $A^x A^x A^x A^x$, whence depend the contact-pieces $A' A' A' A'$, hereinafter more particularly referred to. By these means the contact-plates A^x are entirely insulated from the other parts of the machine. The drum is furnished with cards K of the jacquard type, provided with perforations arranged to accord with the particular contacts in the switchboard it is necessary to operate in order to bring into operation the group of lamps which pertain to the particular device to be illuminated. The unperforated portions of the cards serve as insulation for those contacts which for the time being are required to be inoperative. The cards are preferably

arranged upon a flexible carrier, and in order to accurately "register" each card upon the face of the drum the latter is furnished with projections a^2 , which engage with perforations near the ends of the cards. The contact-plates of the drum may be constructed of any suitable conducting material, such as brass, copper, platinum, or silver.

The switchboard is preferably arranged in a vertical plane and is furnished with as many contacts as there are lamps on the lamp-board. The contacts B are each constructed as follows: In the face of the switchboard C is inserted a stud b , preferably formed of brass. The end b' of this stud which protrudes through the back of the board is formed as a terminal for the lamp-wire. The other end of the stud carries a tubular casing or barrel b^2 , in which works a plunger b^3 , the latter being maintained at the outer end of the tube by means of a coiled spring b^4 . The rod or tail b^{3x} of the plunger protrudes through the outer or fore end of the tube b^2 and serves to make contact with the surface of the drum or card-cylinder A wherever a perforation occurs in the card K, carried by such cylinder. If the switchboard C be constructed of metal, the studs must be suitably insulated. In the construction illustrated the switchboard is made of slate. The plunger may be made of brass, copper, platinum, or silver. The outer or fore end of the tube b^2 may be supported by a perforated plate C' of suitable insulating material.

With a view to prevent sparking upon the breaking of the electric circuit owing to the retreat of the drum or card cylinder A from the contacts B on the switchboard C, I arrange upon the cam or actuating shaft F a cut-out L, same being timed to slightly anticipate the breaking of the circuit caused by the drum retreating from the contact-makers B. This cut-out may comprise a disk or cam l , arranged in the main circuit and mounted upon the before-mentioned cam-shaft, the said cam being formed with a gap or depression l' in its periphery, furnished with a piece of non-conducting material. In the construction illustrated the disk or cam is formed of wood or other suitable non-conducting material and comprises two flanges $l^0 l^x$, upon which are respectively secured the metal rings $l^2 l^3$. The ring l^2 is formed with an opening or gap, the material of the disk being cut away to correspond. Working against rings $l^2 l^3$ on the periphery of each of the flanges $l^0 l^x$ is a spring contact or brush M M', arranged in the main circuit. These brushes are mounted in carriers $m m'$, supported in the standard $m^0 m^x$. The latter are mounted on insulating material m^2 , the carriers being also insulated from their standards. When the gap l' arrives at the brush M, the electric circuit is interrupted, the brush or contact resting for a time on the non-conducting material of which the main portion of the cam is composed.

When setting up the machine for working, the main conductor N from the source of electric energy is brought to the terminal m^3 of the brush M', a similar conductor N' being led from the terminal m^4 of the brush M. This latter wire is divided at N^x, the two branches N² N² being led to the spring-contact makers A² A². Each wire B' from the contacts B is led to a lamp on the lamp-board, the several lamps being connected to a common return. It will thus be seen that the electric current upon entering the machine at M' passes to the brush M, then through the branch wires N² N², contact-makers A² A², and one of the plates A to the contacts or pushes B, the current thereupon operating those lamps on the lamp-board whereof the corresponding pushes or contacts B have been depressed by the forward thrust of the drum A and are in contact therewith.

It is proper to explain that the object in making the contacts B yielding to pressure is to insure good contact with the conducting-plate on the drum and in order that they may accommodate themselves to inequalities in the surface of said plate and that produced by the perforated card. There is no make and break of the circuit produced by or due to this yielding of the contacts.

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

1. In a device for automatically operating electrically-illuminated signs and the like, the combination with an intermittently-rotating and horizontally-reciprocating drum having on each of its several faces an insulated contact-plate of conducting material, and a vertically-disposed stationary switchboard carrying a series of yielding contact makers or terminals connected respectively with the lamps on the lamp-board, the said terminals in position to touch a contact-plate on the drum when the latter moves up thereto, of a series of jacquard-cards of insulating material about said drum and adapted to cover the respective contact-plates thereof and interpose between them and the contact-terminals, means for closing the lamp-circuit through the operating contact-plate, and means for automatically breaking the lamp-circuit a moment before the contact-plate moves out of touch with said contact-terminals.

2. In a device for automatically operating electrically-illuminated signs and the like, the combination with the stationary switchboard C, provided with yielding contact-terminals B, and the rotatively-mounted drum A, having on its respective faces imperforate contact-plates A^x, of conducting material, of the slotted guides D, in which said drum is mounted, the operating-cams E, the thrust-bars d , connecting the cams with the respective journals of said drum, and means for imparting an intermittent rotation to said drum as it is moved to and fro in its guides, substantially as set forth.

3. In a device for automatically operating

electrically-illuminated signs, the combination with the horizontally-reciprocating and intermittently-rotating drum having imperforate contact-plates on its respective faces, and the stationary switchboard provided with a series of yielding contact-terminals, of means for preventing sparking upon the breaking of contact between the contact-plate on the drum and the said contact-terminals, said means comprising a rotating circuit-breaker which breaks the lamp-circuit at the moment before the said drum recedes, substantially as set forth.

4. In a device for automatically operating electrically-illuminated signs and the like, the combination with the reciprocating and intermittently-rotating drum, having on its faces insulated contact-plates each having on it a contact-piece, as A', the fixed contact-piece A², adapted to contact electrically with the piece A' when the drum is moved into operative positions, the switchboard C, provided with contact-terminals as described, and an electric circuit including the said terminals, and the contact-pieces A' and A², whereby, when operating, only the operative

contact-plate on the drum shall be included in the circuit.

5. In a device for the purpose specified, the combination with the stationary switchboard C, provided with contact-terminals of the respective lamp-circuits, and the rotatably and slidably mounted drum A, provided on each of its several faces with an insulated contact-plate adapted to be put in contact with said terminals, of the rotating shaft F, means between said shaft and drum for converting the rotary motion of the former into reciprocating motion of the latter, an electric circuit having the terminals on the switchboard C for one terminal, and the operative contact-plate on the drum for the other terminal, and a rotary breaker for said circuit at the shaft F, said breaker comprising a disk on the said shaft and two brushes in the circuit bearing thereon, said disk having a recess which breaks the circuit when it passes under the brush, substantially as set forth.

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Witnesses:

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