

No. 689,826.

Patented Dec. 24, 1901.

R. L. MONTAGU.

AUTOMATIC COMPENSATORY ELECTRIC REEL.

(Application filed Oct. 17, 1900.)

(No Model.)

3 Sheets—Sheet 1.

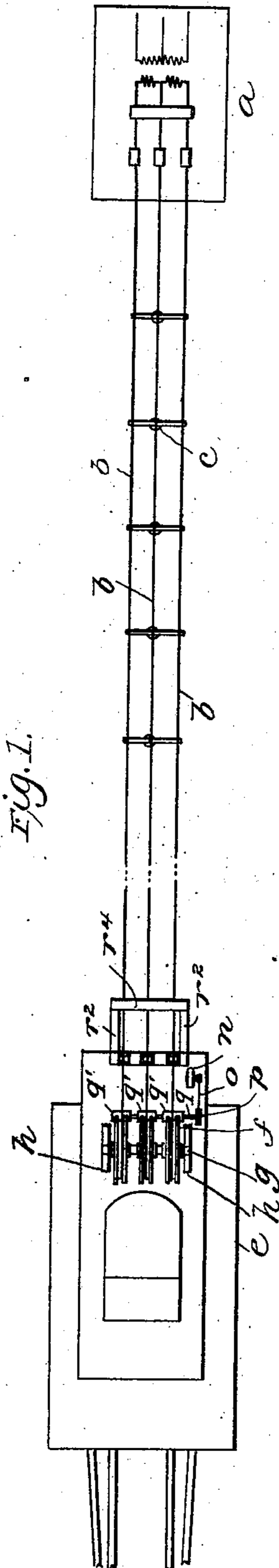


Fig. 1.

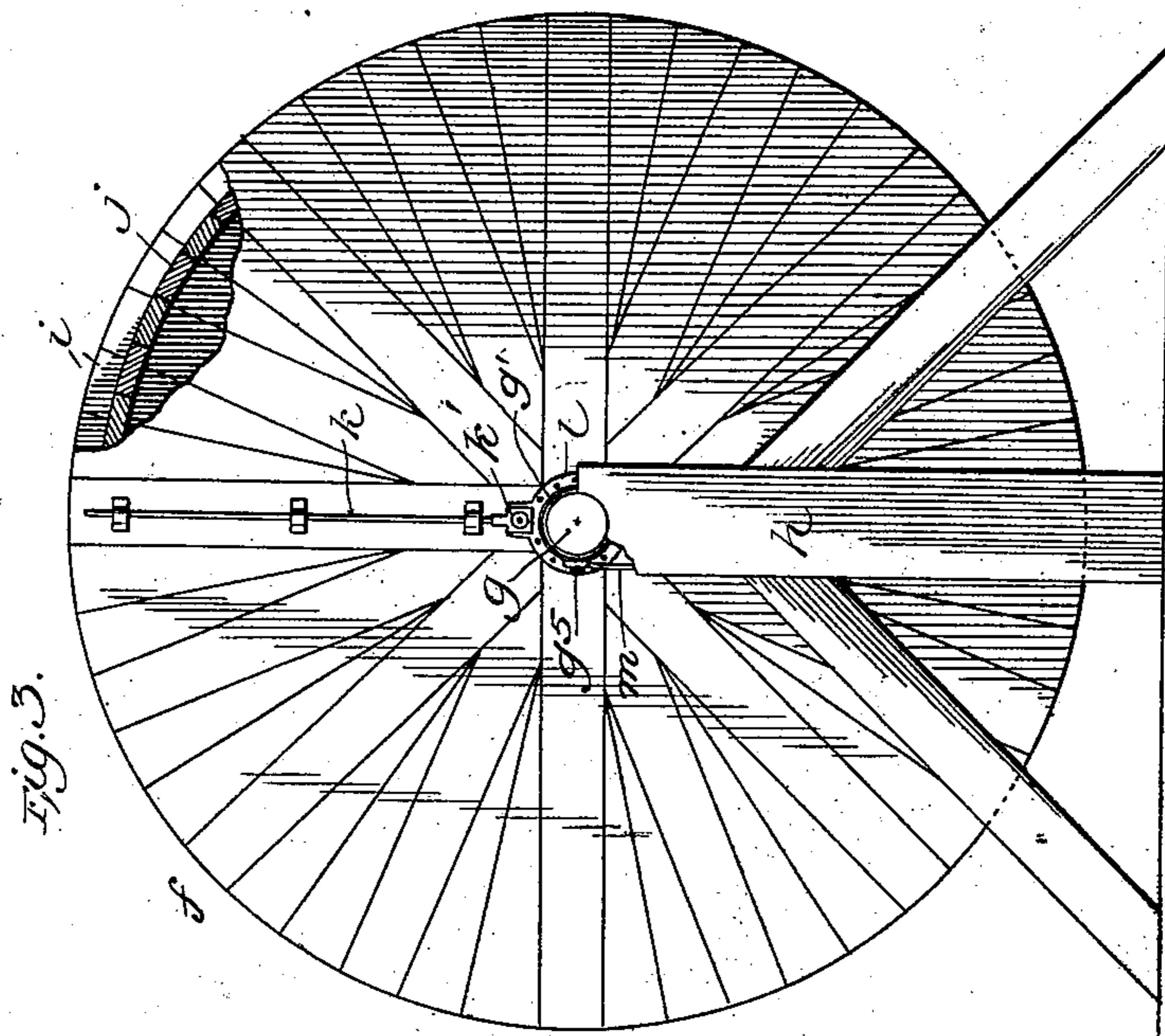


Fig. 3.

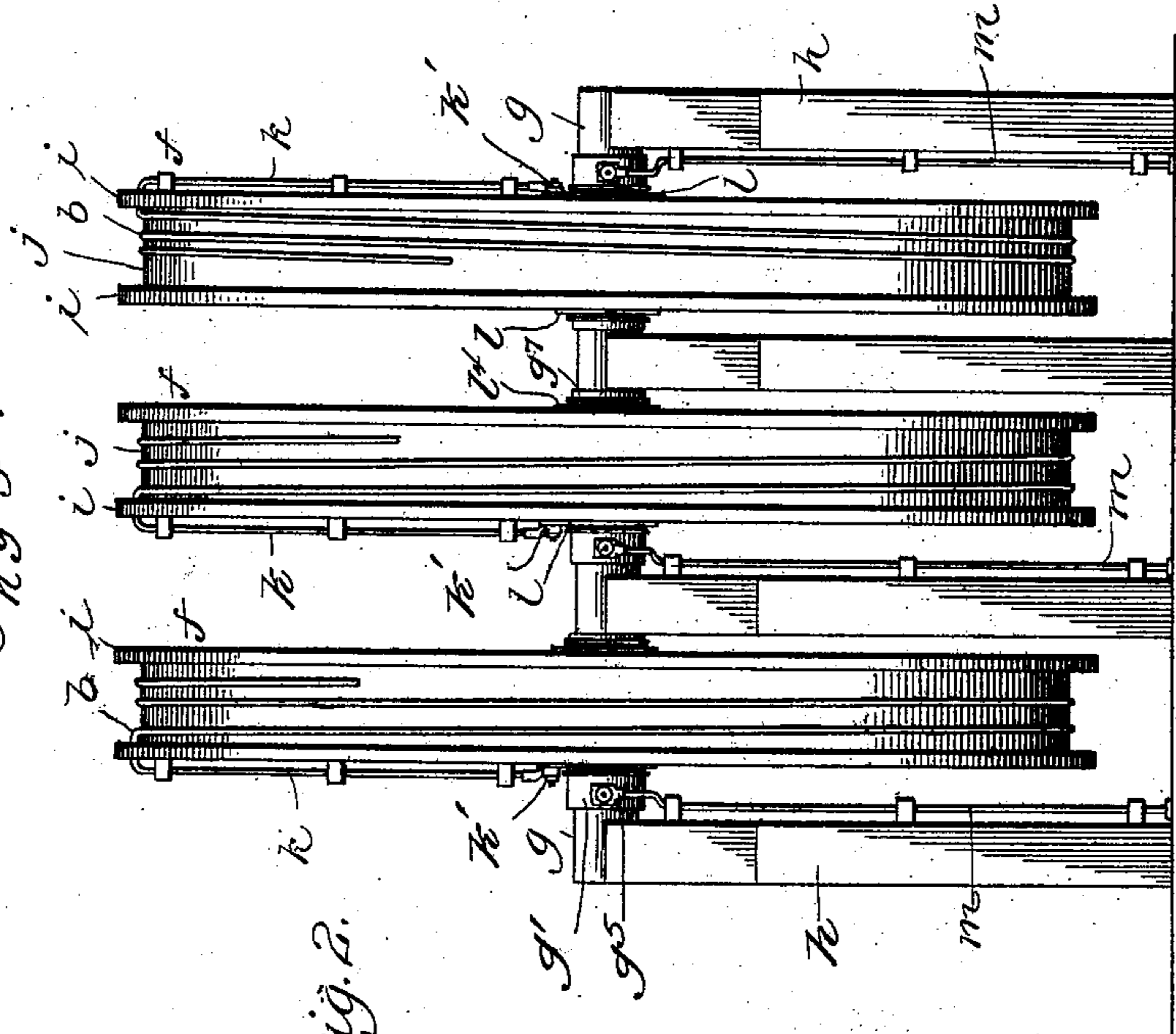


Fig. 2.

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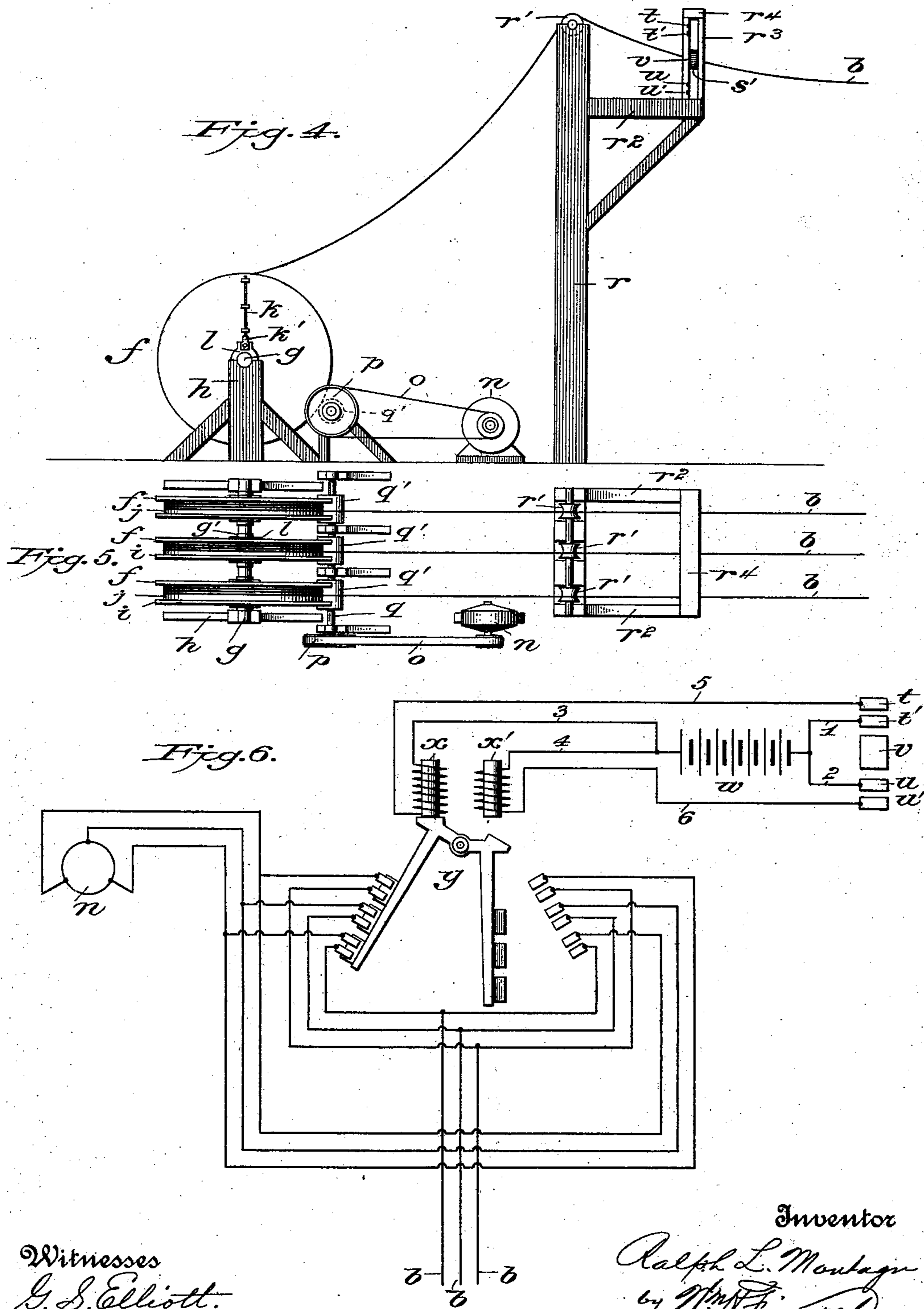
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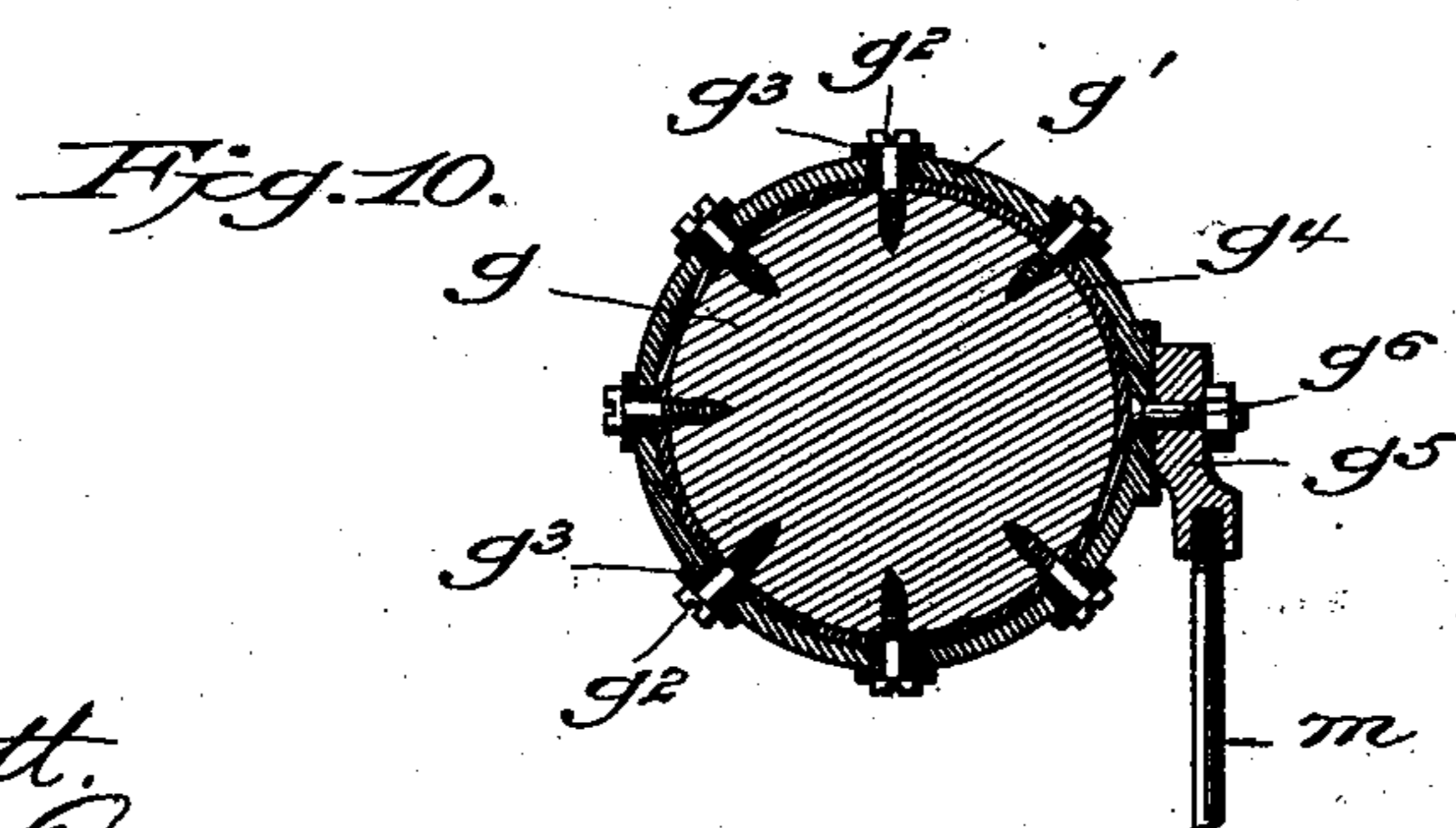
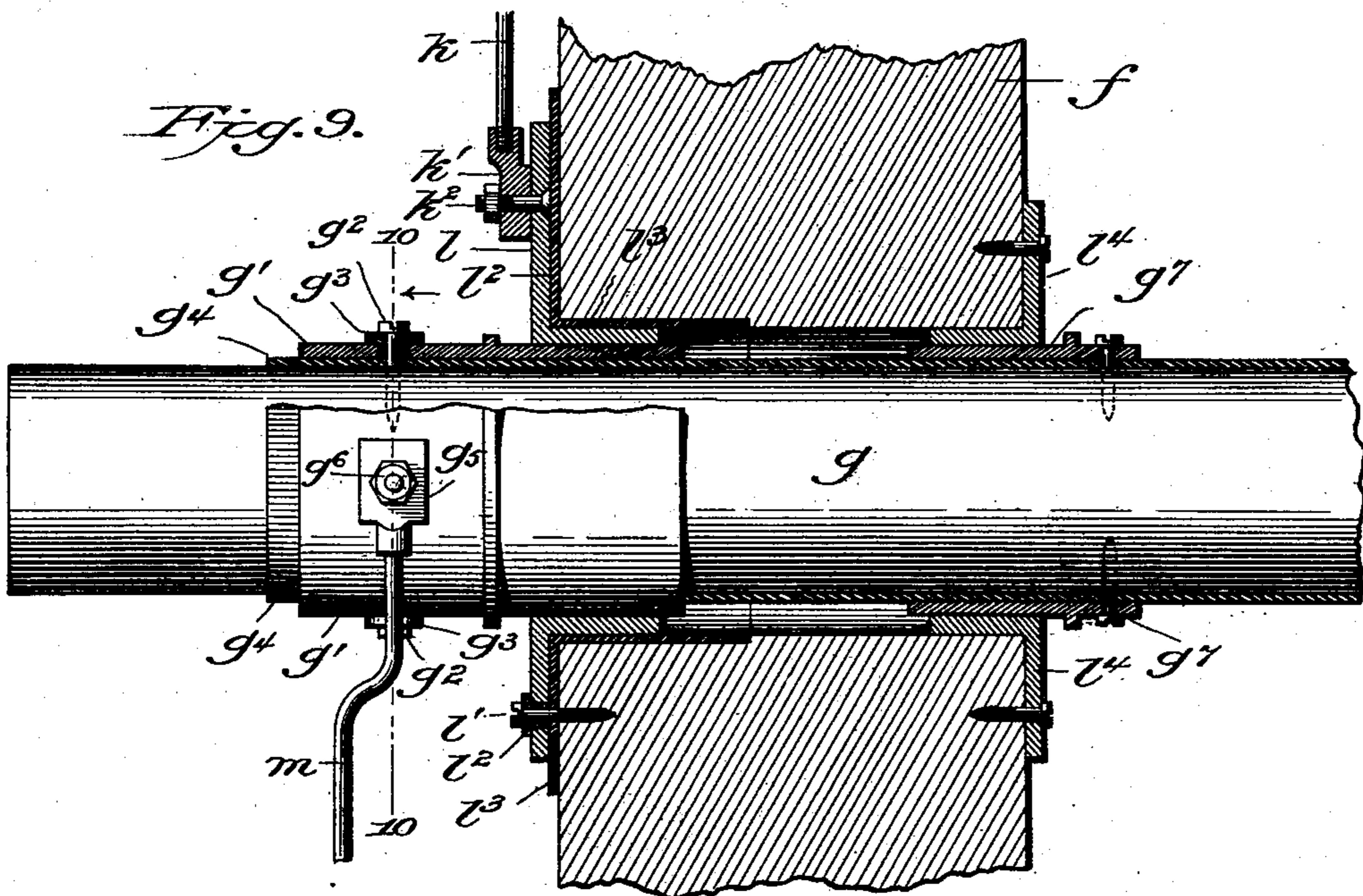
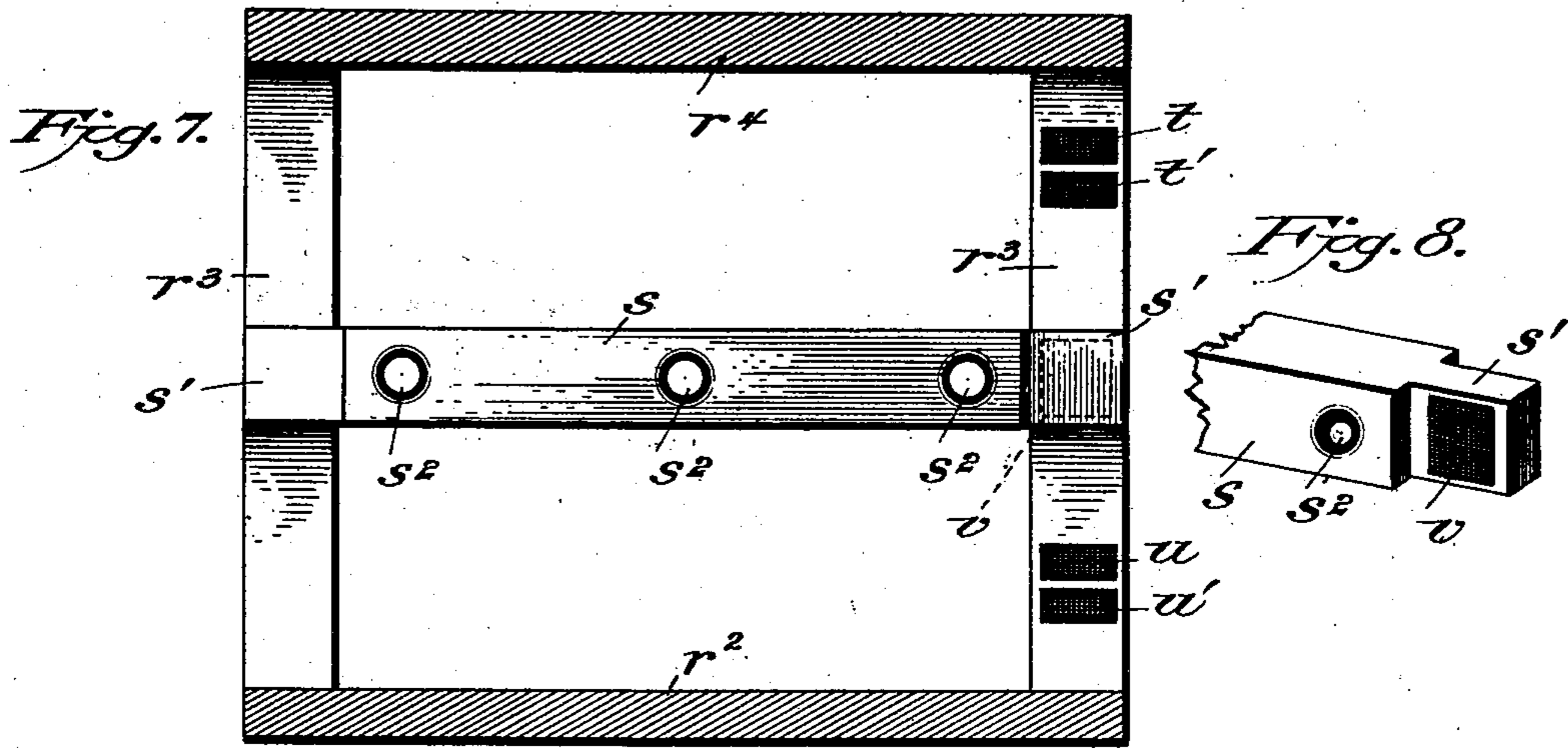
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(Application filed Oct. 17, 1900.)

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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC COMPENSATORY ELECTRIC REEL.

SPECIFICATION forming part of Letters Patent No. 689,826, dated December 24, 1901.

Application filed October 17, 1900. Serial No. 33,390. (No model.)

To all whom it may concern:

Be it known that I, RALPH L. MONTAGU, a citizen of the United States, residing at Oroville, in the county of Butte and State of California, have invented a certain new and useful Improvement in Automatic Compensatory Electric Reels, of which the following is a full, clear, and exact description.

The object of this invention is to utilize an electric current generated at a distance for furnishing power on a periodically removed or removable body containing machinery or other apparatus in or by which the electric current may be utilized.

In placer, alluvial, or river mining where floating or otherwise - movable dredges are utilized the introduction of the electric current upon such dredges for power purposes when such current is supplied from a distant power-station is attended with mechanical difficulties, such as the sagging and consequent dragging of the conductors, owing to the distance that the dredge may have to be anchored from the shore of the stream.

My invention is designed to afford a simple and efficient means for supplying the electric current to such a dredge from a pole-line running from a distant power-station; and my invention comprises a compensatory reel or drum-like body to be erected upon the dredge and means to operate said reel to take up and pay out the conductors as the dredge is moved from place to place and within the breaking strain of the conductors, all as I will proceed now more particularly to set forth and finally claim.

In the accompanying drawings, illustrating my invention, in the several figures of which like parts are similarly designated, Figure 1 is a diagram showing one available installation. Fig. 2 is a front elevation of a gang of my compensatory reels. Fig. 3 is a side elevation of the reel with a portion of one of its sides broken away to show the rim. Fig. 4 is an elevation, and Fig. 5 a plan, of a gang of such reels and their operating mechanism. Fig. 6 is a diagram of an electrical system for controlling or regulating the supply of current to the reel-operating motor. Fig. 7 is an enlarged detail of the sliding guide and its frame and attached contacts. Fig. 8 is a per-

spective view of one end of the sliding guide, showing its attached contact. Fig. 9 is a sectional detail, on an enlarged scale, showing the electrical connection between the reel and its shaft; and Fig. 10 is a cross-section taken in the plane of line 10 10, Fig. 9.

Referring to Fig. 1, *a* may represent a power-station of any approved construction for generating electricity, and from which line-wires *b* of any number may be led over poles *c* to any distance. *e* may represent a mining-dredge of any approved construction and movable by power carried on it and having its machinery operated by power. In order to supply electric power for operating this dredge or its machinery, or both, I erect upon the deck or any suitable portion of this dredge any number of reels *f*. In the illustration here given I have shown three line-wires connected up in a three-phase three-wire circuit and as many reels, and these reels may be mounted to revolve upon a stationary shaft *g*, common to all, or each reel may have a separate shaft. This shaft or these shafts is or are mounted in suitable stands or frames *h*. Each reel may be built up in the form of a drum of planking, substantially as indicated in the drawings, Fig. 3, with side flanges *i* and a rim *j*, or they may be constructed in any other suitable manner and are preferably coated or painted with an insulating substance. Each reel is supplied with a permanent or applied electric conductor *k*, which may be and preferably is a continuation of the line-wire *b* and which may terminate in some metallic portion connected to and movable with the reel and which in turn contacts with a metallic portion on the shaft, from which extends the service-conductor *m*, which may lead to the machinery or apparatus to be supplied with electric current. The line-wires *b* are connected with the conductors *k* in such a manner that they may be wound upon or unwound from the reels to take up slack or to let out the line-wires within their breaking strain as the dredge is moved.

In order to maintain the circuit between the conductors *k* and *m*, and in the preferred construction, the hub of each reel is provided upon one side with a metallic bushing *l*, se-

cured in place by means of fastening devices l' , insulated from the bushing by the sleeves or collars l^2 , of any suitable insulating material, a suitable insulating material l^3 being interposed between the reel and bushing, and to the bushing l the conductor k is connected by a connector k' and bolt k^2 , Figs. 9 and 10, or in any other suitable manner. The shaft g is stationary, and mounted thereupon to receive the metallic bushing l is a metallic sleeve g' , secured to said shaft by suitable fastenings g^2 , insulated from said sleeve by the insulation g^3 , a suitable insulation g^4 being interposed between the said shaft and sleeve, and to the sleeve g' the conductor m is connected by a connector g^5 and bolt g^6 , Figs. 9 and 10, or in any other suitable manner. A complementary bushing l^4 and sleeve g^7 are arranged upon the opposite side of the reel to facilitate rotation. From this construction it will be observed that during the rotation of the reels the circuit between the conductors k and m will not be interrupted, the bushing l and the sleeve g' always remaining in contact during rotation, thereby maintaining the circuit between said conductors.

Mounted upon the dredge is an electric motor n , the armature of which, through a belt or other suitable gearing, transmits its motion to a pulley p , mounted upon a shaft q , arranged in suitable bearings parallel to the shaft g and in close proximity to the reels f . Upon the shaft q are mounted and engaging the peripheries of the reels a series of friction-pulleys q' , by which the reels are adapted to be rotated in either direction, for a purpose presently appearing. Also mounted upon the dredge in any suitable manner and extending above the reels to a suitable height is a stand r , and suitably supported in the upper end of said stand is a series of pulleys or sheaves r' , equal in number to the number of line-wires and upon which the line-wires are supported and travel in the movement of the dredge. Extending from near the upper end of the stand r are suitable arms or brackets r^2 , and rising from the outer ends thereof are slotted uprights r^3 , connected at their upper ends by a cross-piece r^4 . Arranged in said slotted uprights and adapted to slide therein is a sliding guide s , constructed as a bar, having reduced ends s' , adapted to engage and slide in the slotted uprights r^3 and also provided between its ends with a series of holes or perforations s^2 equal in number to the number of line-wires and through which perforations the line-wires pass. The perforations s^2 are slightly tapered from the opposite sides of the bar toward the center to permit the free passage of the wires and to prevent the wires from binding therein in the movement of the bar or guide from one position to another. Upon the inner face of one of the slotted uprights r^3 and at a suitable distance apart are arranged two sets of contact-plates $t t'$ and $u u'$,

Fig. 7, and upon the reduced end s' of the sliding guide s , adjacent to the slotted upright to which the contact-plates $t t'$ and $u u'$ are affixed, is a contact-plate v of sufficient width to contact with both or either of the sets of contact-plates $t t'$ or $u u'$ when brought adjacent thereto to complete a local circuit for a purpose presently appearing. (See details, Figs. 7 and 8.)

For the purpose of automatically controlling or regulating the direction of rotation of the reels in taking up and letting out the line-wires in the movement of the dredge I use a three-pole switch apparatus, substantially such as I have shown in diagram in Fig. 6. At any suitable place upon the dredge I arrange a battery w and connect one pole thereof by wires 1 2 with the contact-plates t' and u , and the other pole of said battery is connected by the wires 3 4 with one of the terminals of two electromagnets $x x'$, respectively, while the other terminals of said magnets are connected by the wires 5 6 with the contact-plates t and u' . Suitably arranged with relation to the electromagnets $x x'$ and to be operated thereby is a three-pole switch y , having suitable connections, as indicated in the drawings, with the line-wires b and with the motor n , whereby upon the operation of the switch the power-current to the motor may be reversed, and consequently the rotation of the reels reversed.

I wish to be understood as not limiting my invention to the particular apparatus herein described for reversing the rotation of the reels, as any other well-known mechanical means may be used for accomplishing this purpose, nor do I limit my invention to other details of construction and arrangement herein shown and described.

The operation is as follows: The dredge being located at a suitable distance from the shore for carrying on its operation and its operation being completed at that location and it being desired to change the location of the dredge—say to a distance farther away from the shore—the dredge-propelling machinery is set into operation, it deriving its current over the line-wires b . The movement of the dredge will cause the line-wires to be drawn taut, and consequently the sliding guide s will be caused to rise, and as soon as its contact-plate v (so designated also in Fig. 6) comes in contact with the contacts $t t'$ the local circuit through the wires 1 3 5 and electromagnet x is completed and energizes the magnet x , which in turn shifts the three-pole switch y to the position shown in Fig. 6 and starts the motor n , and through its connections with the reels rotates the reels in a direction to unwind the line-wires b and without interruption of the circuit to the propelling machinery. When the desired location is reached and the dredge is stopped, the line-wires are slackened and permit the sliding guide s to drop, thereby breaking the circuit to magnet x and releasing the switch,

thereby cutting out the circuit to and stopping the reel-operating motor *n*. When the dredge is not in motion and its operation is being carried on, its dredging machinery being operated by the current over the line-wires, the sliding guide *s* normally remains in a position between and out of contact with the contacts *t t'* and *u u'*, and the switch *y* hangs in its normal inactive position, and hence there is no current passing to the reel-operating motor *n*. If the line-wires should in any way become too slack, the sliding guide will drop, and its contact *v* coming into contact with the contacts *u u'* will complete the local circuit through the wires 2 4 6 and magnet *x'*, thus energizing magnet *x'* and shifting the switch *y* to the right, Fig. 6, thereby diverting the power-current to the motor in a direction to rotate the reels to take up the undue slack in the line-wires. This last-described operation is also effected when it is desired to move the dredge nearer to the shore, it only being necessary to start the propelling machinery to propel the dredge in that direction, the reels taking up and winding the line-wires as the dredge is moved along.

If for any reason the dredge is to be located at such a distance from the shore as to exceed the breaking-strain capacity of the conductors, pontoons having poles to support the line-wires may be arranged at intervals between the dredge and shore or last pole.

The number and character of reels will be appropriate to the weight and character of the conductors and of the current supplied.

I do not limit my invention to the use of a reel on a dredge, since obviously it is applicable to other floating or movable bodies upon which electrical power is to be introduced for lighting purposes, running generators, motors, or any other class or kind of machinery, and so, also, the location of the reels is a matter largely of convenience or choice with the user, it being assumed that the best location of the reel is that where the minimum amount of haul of wires or other conductors will take place.

What I claim is—

1. A compensatory electric reel, adapted to receive and support the end of an electric conductor, and having a service-conductor for leading off the current to the machinery or apparatus to be supplied with such current, and adapted to take up and let out said electric conductor, a metallic bushing inserted in the hub of the reel and adapted to be connected with said electric conductor, and a metallic sleeve arranged upon the shaft of said reel and about which the metallic bushing and

reel rotate and to which the said service-conductor is adapted to be connected, substantially as and for the purpose described.

2. A compensatory electric reel, adapted to receive and support the end of an electric conductor, and having a service-conductor for leading off the current to the machinery or apparatus to be supplied with such current, and adapted to take up and let out said electric conductor, a metallic bushing inserted in the hub of the reel and insulated therefrom and adapted to be connected with said electric conductor, and a metallic sleeve arranged upon the shaft of said reel and insulated therefrom and about which the metallic bushing and reel rotate and to which the said service-conductor is adapted to be connected, substantially as and for the purpose described.

3. The combination of a dredge or other floating or movable body of machinery, a distant electric power-station, line-wires leading from said power-station to said dredge or other floating or movable body, compensatory reels mounted upon such dredge or other floating or movable body and receiving the ends of said line-wires, electric connections between said reels and line-wires adapted to serve the power to the machinery, an electric motor for rotating said reels included in the line-circuit, and means for automatically reversing said motor, whereby the line-wires may be taken up or let out, substantially as described.

4. The combination of a dredge or other floating or movable body of machinery, a distant electric power-station, line-wires leading from said power-station to said dredge or other floating or movable body, compensatory reels mounted upon such dredge or other floating or movable body and receiving the ends of said line-wires, electric connections between said reels and line-wires adapted to serve the power to the machinery, an electric motor for rotating said reels and a switch included in the line-circuit, a local circuit including electromagnets for operating said switch, a supporting-stand for said line-wires, stationary contacts on said stand, and a sliding guide for the line-wires in said stand and provided with a contact-plate adapted to engage said stationary contacts, whereby the local circuit is automatically completed to operate the switch and thereby control the direction of rotation of the motor and the reels operated thereby, substantially as described.

In testimony whereof I have hereunto set my hand this 10th day of October, A. D. 1900.

RALPH L. MONTAGU.

Witnesses:

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J. R. CALLAHAN.