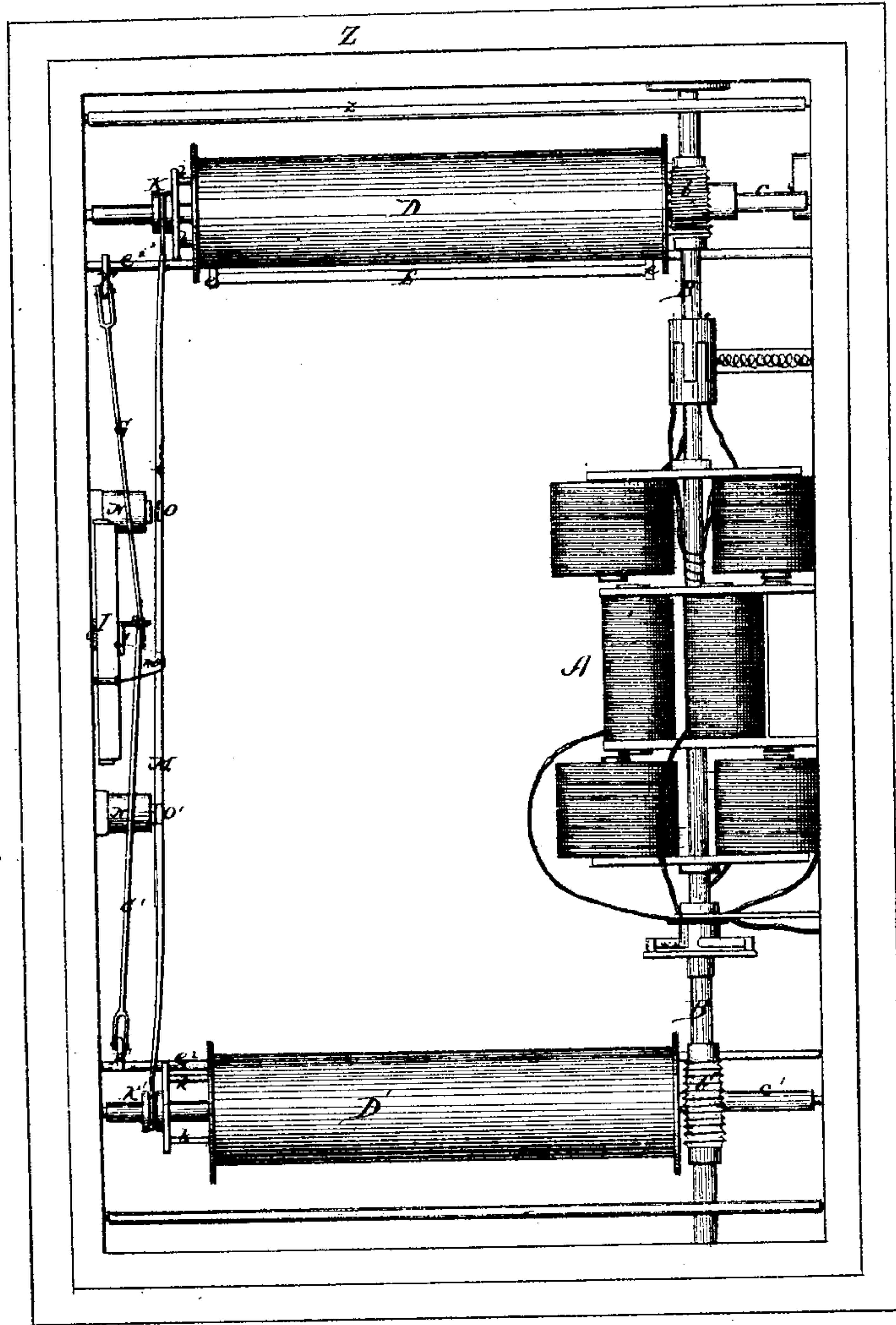


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ELECTROMAGNETIC APPARATUS FOR MOVING PANORAMAS.  
No. 105,664. Patented July 26, 1870.

Fig. 1.



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Fig. 2.

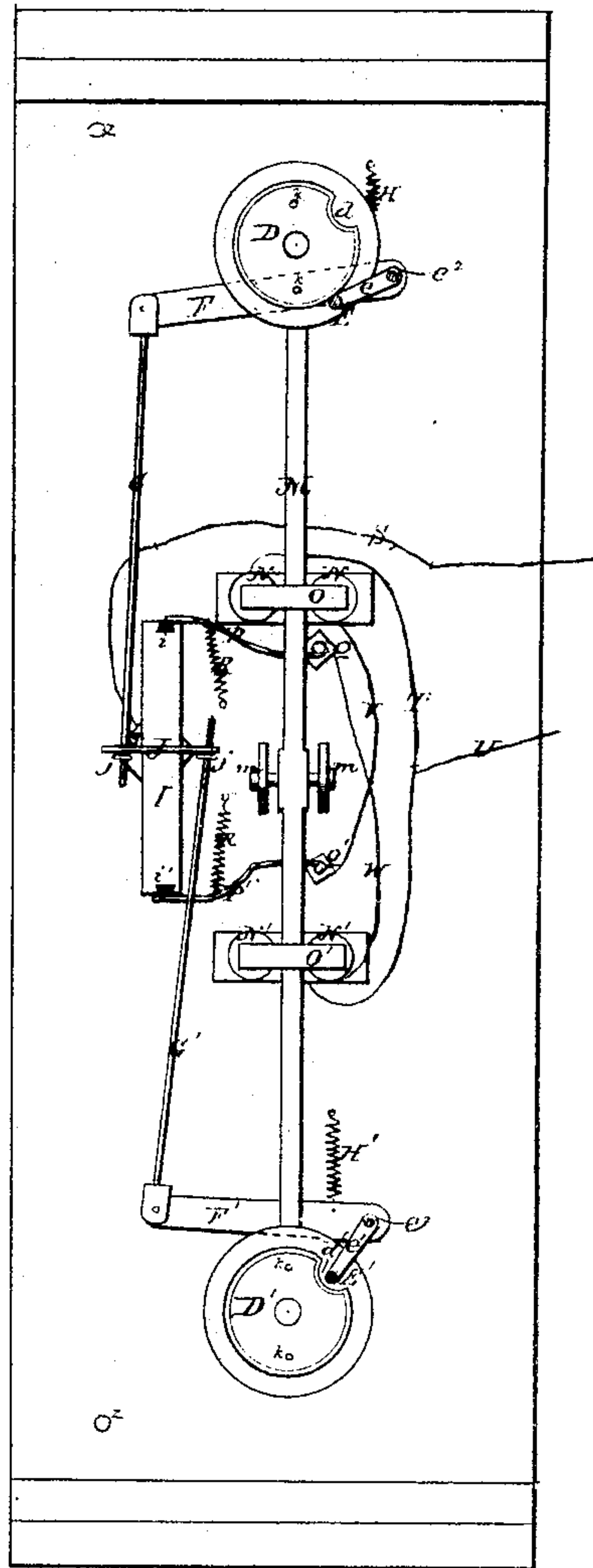


Fig. 4.

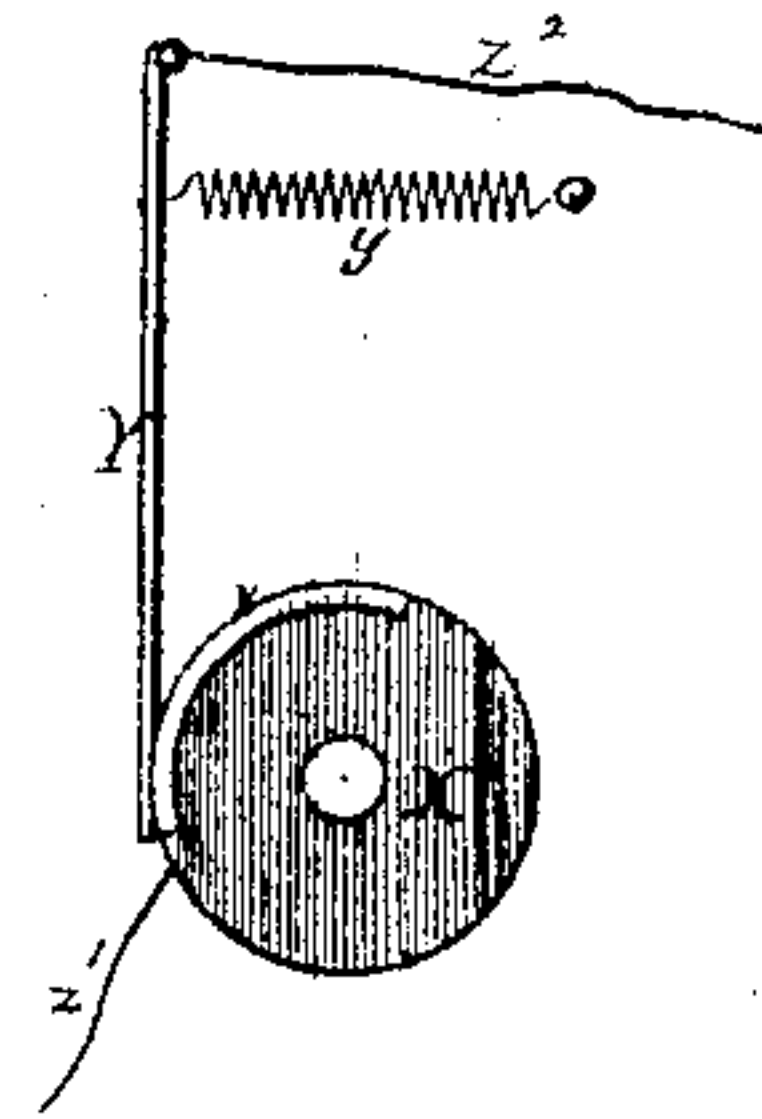
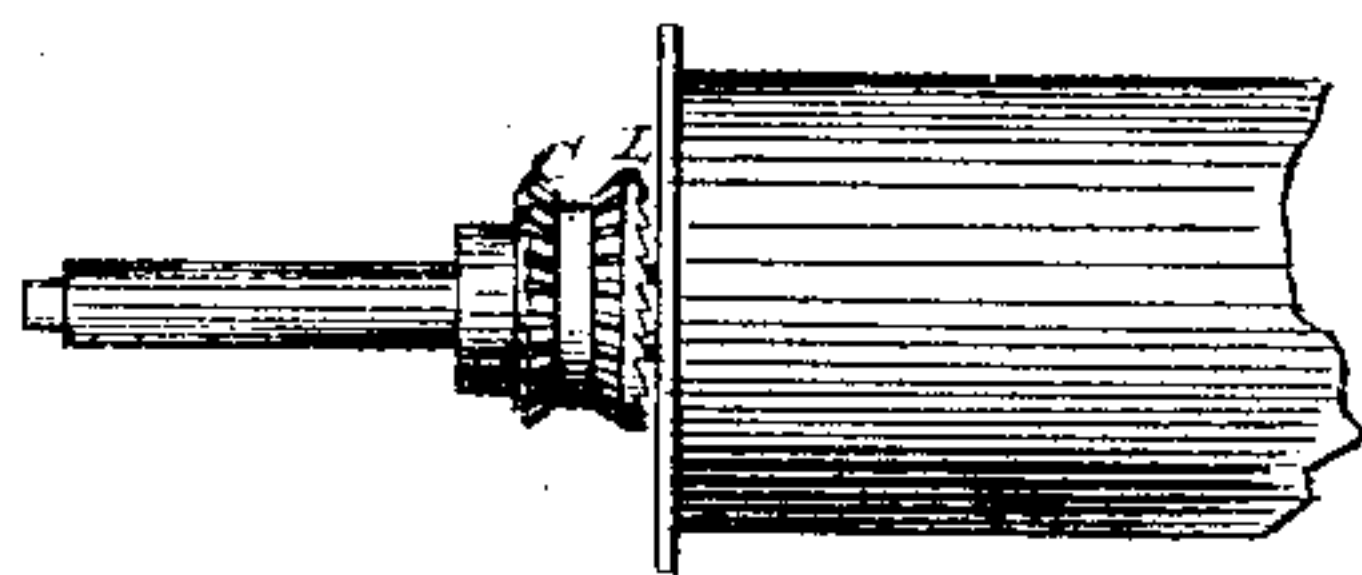


Fig. 3.

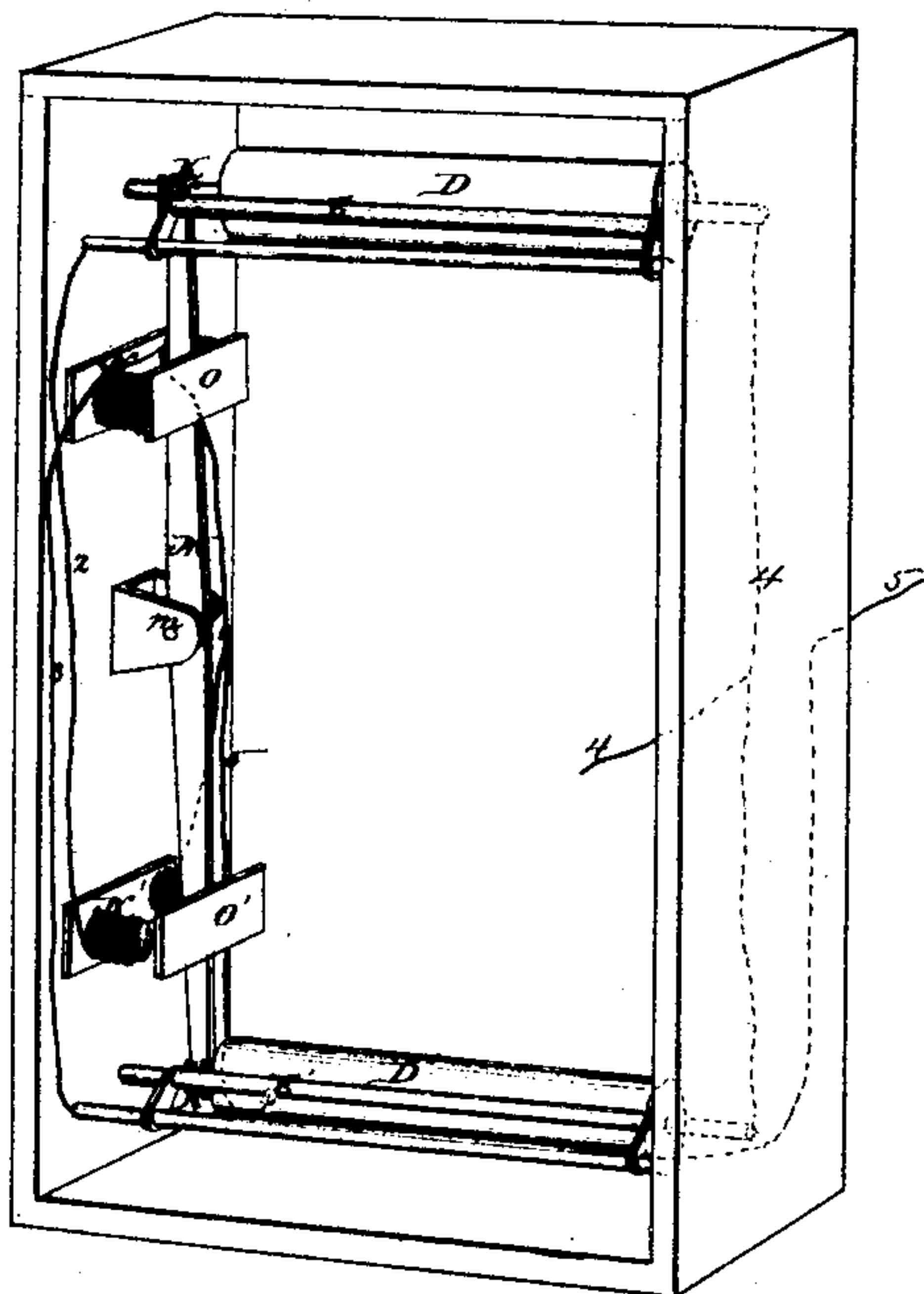


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Fig. 5



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# United States Patent Office.

LOUIS FINGER, OF CAMBRIDGE, MASSACHUSETTS.

Letters Patent No. 105,664, dated July 26, 1870.

## IMPROVEMENT IN ELECTRO-MAGNETIC APPARATUS FOR MOVING PANORAMAS.

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, LOUIS FINGER, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented an Improved Apparatus for Moving Panoramas, &c.; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawing and letters of reference marked thereon, making a part of this specification, in which—

Figure 1 is a side elevation of my invention;

Figure 2, a transverse vertical central section of the same;

Figures 3 and 4, view of parts detached; and

Figure 5, a perspective view of a modification.

The object of this invention is to produce a method whereby panoramas, advertisements, and the like, can be kept steadily in motion, or caused to move in one direction for a certain space of time, and then to reverse the motion for an equal space of time, or caused to move and remain stationary alternately; and

It consists in applying an electro-motor of my invention, which is the subject of a separate application for a patent, to a pair of revolving drums, which are operated by worm-screws on the shaft of the motor, and provided with clutch devices, which are attached to a pivoted lever between two electro-magnets, said lever being provided with armatures, which are attracted by each magnet alternately, in such manner as to throw the drums in and out of gear with the screws, as will hereinafter more fully appear.

In the drawing—

A represents the motor, which is fully described in the application referred to above, and need not be particularly referred to.

The shaft B of motor A is provided with the screws *b b'*, one near each end, which screws mesh with the double bevel-pinions C on the shafts *c c'* of the drums D D', which latter are provided with the longitudinal depressions or concavities *d d'*.

E E' represent rollers, which are journaled in the arms *e e'* of shafts *e e'*, and bear upon the periphery of drums D D'. Said rods are nearly the same length as drums D D'.

F F' represent arms, pivoted at one end to shafts *e e'*, and their other ends to the rods G G'.

The arms F F' are supported by springs H H I.

I represents a commutator or current-changer, which consists of a flat strip of conducting-metal, pivoted in the center, and provided at each end with the insulating-pieces *i i'*.

The commutator I is also provided with the transverse strip J, the ends of which project on each side, and have holes through which the ends of rods G G' pass.

Both rods G G' have nuts *j*, which bear upward on the lower side of strip J.

K K' represent sliding collars on the ends of shafts *c c'*, opposite pinions C, to which collars are attached the rods *k k'*, which run through drums D D' and engage with the teeth of clutches L on the double pinions C.

M represents a lever, pivoted at the center to standards *m*, and bifurcated at the ends, which bifurcations rest in the grooves of collars K K'.

N N' are electro-magnets, situated above and below standards *m*, and at an equal distance from the same.

O O' are armatures on the lever M, which are opposite magnets N N'.

P P' are curved strips of conducting metal attached to bolts *o o'*, their outer ends resting on the ends of commutator I, being caused to bear against the same by the spiral springs R R.

S represents a wire, which is attached to plate *s*, under commutator I, and is connected to one pole of the battery.

T is a wire, which connects magnets N N', to which is also attached the wire U, which connects with the opposite pole of the battery.

V is a wire, which connects magnet N with strip P'.

X represents a disk of rubber, or other insulating material, having a segment of conducting material, *x*, upon its periphery, and is in contact with the strip Y, which is kept in place by the spring *y*.

Z represents a case, in which the whole is held, and *z z* are rollers near the front of the same.

The disk X is suitably connected with an eight-day or other clock mechanism, and is connected with the battery by the wire *z*<sup>1</sup>, and with the motor by the wire *z*<sup>2</sup>.

### Operation.

A suitable length of material, which it is desired to exhibit, such as painted canvas, paper, &c., being wound upon the drum D', and one end passed over rollers *z z*, and attached to drum D, the drum D' is thrown out of gear by the armature O', being attracted to magnet N', which throws the collar K and rods *k k'* into gear with clutch L on shaft *c*, as shown in fig. 1.

The connections being formed, the motor A causes the shaft B to revolve, and impart motion to screws *b* and drum D. The material is thus wound around drum D, while drum D', being out of gear, revolves freely.

This operation goes on until all the material is unwound from drum D', and the concavity *d'* left exposed, into which the roller E' drops, when it comes in contact therewith, being rigidly attached to arm F', and drawn upward by spring H'. This motion causes rod



G' to bear upward upon the inner end of piece J, and give a slight motion to commutator I, which causes the end of strip P to bear on insulator i, which breaks the connection with wire W and magnet N', while the end of strip p bears on the end of commutator, and completes the circuit through wire V to magnet N, which latter instantly attracts armature O, and reverses the position of the same, throwing the drum D out of gear, and the drum D' into gear. The winding operation is thus reversed, and the material wound upon drum D', while drum D revolves freely.

When it is desired to run the apparatus for a portion of the time, during the day, for instance, the disk X is employed, which is revolved by clock-work.

When the strip Y bears upon the periphery of the insulator, there is no connection, and, consequently, no operation of the motor; but as soon as it touches the segment the connection is formed, and operation ensues, which continues as long as the strip is in contact with segment x, and ceases when said contact is broken. The segment may be of any desired length, the time of operation being regulated thereby.

A portion of the mechanism may be omitted, if desired, as shown in fig. 5, in which I connect the roller E with the magnet N' by wire 2, and roller E' with magnet N by wire 3, while the drums D D' are connected together and with one pole of the battery by wire 4, as shown in dotted lines, and the magnets O O' are connected with the opposite pole by wire 5.

In this construction the direction of the revolution of drums D D' is changed by the contact of the rollers E E' with the drums, by the unwinding of the paper or other insulating material wound thereon; for instance, when the paper is so nearly removed from drum D that roller E comes in contact with the bare surface thereof, a current will be formed through wire 2 to magnet N', which immediately attracts armature O', and throws clutch K into gear.

It will be seen, that, in either case, the effect is the same, the advantage of the latter being in its simplicity.

Having thus fully described my invention,

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

1. The motor A, in combination with screws b b', pinions C, and drums D D', substantially as described.

2. The rollers E E', rods F F' and G G', in combination with drums D D' and their concavities d d', as and for the purpose set forth.

3. The commutator I and strip J, in combination with rods G G', as described.

4. The commutator I, in combination with strips P P' and magnets N N', as described.

5. The lever M and armatures O O', in combination with magnets N N' and sliding collars K K', with their rods k k'.

6. The combination of the above combination with commutator I, strips P P', rods G G' and F F', arranged and operating as described.

7. The disk X, with its segment x, in combination with the motor A.

8. The drums D D' and rollers E E', in combination with the wires 2 and 3, magnets N N' armatures O O', lever M, and clutches K K', substantially as described and shown in fig. 5.

9. Reversing the motion of drums D D' by breaking and connecting the current between the same, and the magnets N N', by the means substantially as set forth and shown in fig. 5.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LOUIS FINGER

Witnesses:

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