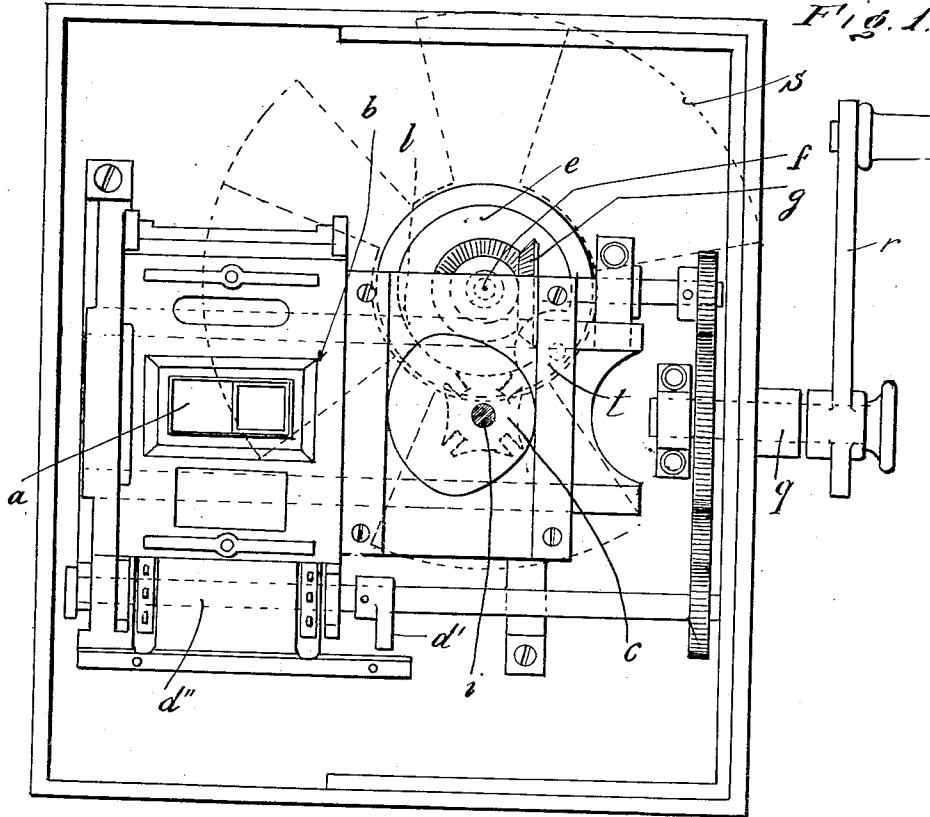
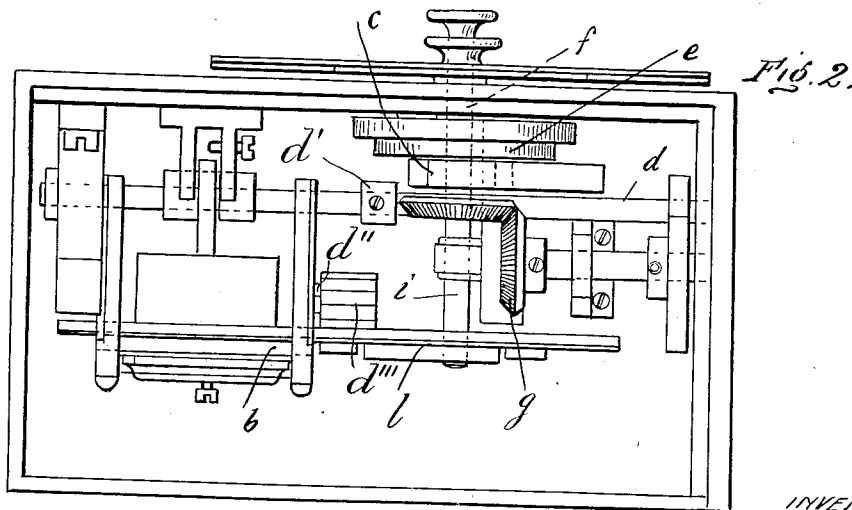


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E. PLUDERI.
CINEMATOGRAPHIC MACHINE.
APPLICATION FILED APR. 4, 1918.

Patented Oct. 25, 1921.

2 SHEETS—SHEET 1.

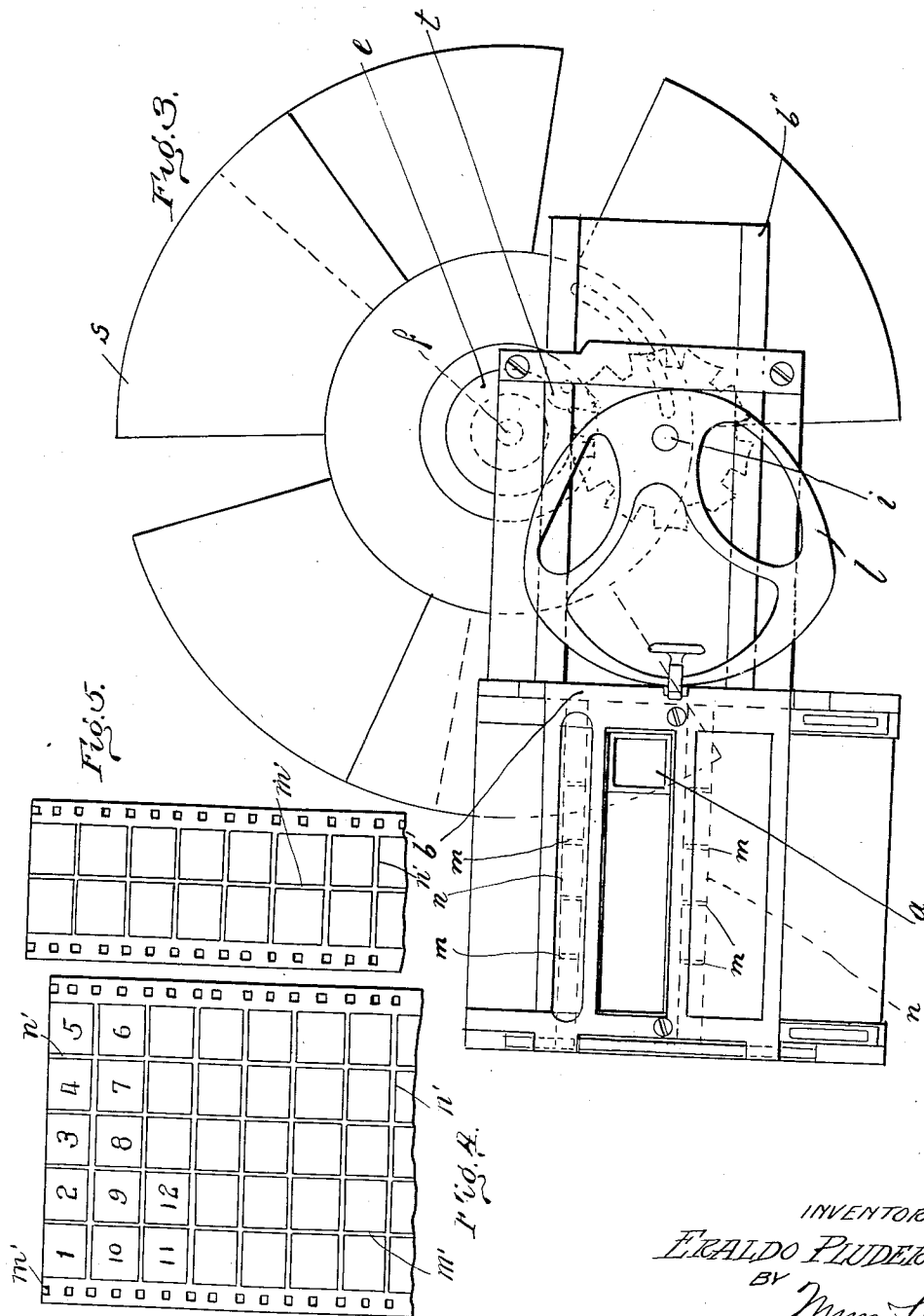


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UNITED STATES PATENT OFFICE.

ERALDO PLUDERI, OF TURRO MILANESE, ITALY, ASSIGNOR TO ETTORE SCHIERONI AND ROBERTO FRIGERIO, BOTH OF MILAN, ITALY.

CINEMATOGRAPHIC MACHINE.

1,395,137.

Specification of Letters Patent.

Patented Oct. 25, 1921.

Application filed April 4, 1918. Serial No. 226,695.

To all whom it may concern:

Be it known that I, ERALDO PLUDERI, subject of the King of Italy, resident of Turro Milanese, in the Kingdom of Italy, have invented new and useful Improvements in and Relating to Cinematographic Machines, of which the following is a specification.

The object of the present invention relates to cinematographic machines and especially to machines for films having several photographs on horizontal sets and provides the means for a step by step horizontal displacement of the car or slide, said means serving also as a guide during the displacement of the car.

The machine comprising the said improvement serves both to obtain the photographs on the films and to project the film photographs on a screen.

These novel features are represented, only by way of example, in the annexed drawings, in which:—

Figure 1 shows the inside of the cinematographic machine as seen from the front.

Fig. 2 shows the same as seen from above,

Fig. 3 shows the car on a larger scale as seen from the front,

Figs. 4 and 5 show respectively a film with sets of five and two photographs, with the partition lines between the adjacent photographs.

In the said figures:

a is the fixed window formed in the casing of the machine, and *a'* is a movable window having a length of so many times the length of window *a* as is the number of photographs on each horizontal row in the film, so that in any displaced position of the car the projection of the images can be made on the screen through windows *a* and *a'*.

b is the step-by-step horizontally moving car carrying the film and having a side projection *b'* in shape of a frame, the whole after each complete journey in either horizontal direction is advanced by a step in the sense of its own length in order to bring before the window *a* in succession all the horizontal photograph sets.

c is a gear in shape of a four-teeth Malta cross operating the cross motion of the film for the case of films having horizontal sets of two photographs; when the film has for instance five photograph sets, this gear is fitted with ten teeth, (Fig. 3) and generally

has the number of teeth double the number of photographs of each horizontal set.

e is a disk keyed on a shaft *f* actuated through bevel gears *g* by the countershaft *p*, which in its turn is driven from the main shaft *q* through spur gear, *q* being actuated by means of a crank *r*; a pin *t* fitted to the disk *e*, engages the four pointed Malta cross or gear *c* and causes the latter to advance one step at each revolution of the disk *e*. *s* is the obturator.

On the spindle *i* of the Malta cross *c* a cam or eccentric *l* is keyed, the cam profile being designed to suit the machine type concerned. The cam periphery bears against the sides *b' b''* of the car *b* pushing it backward and forward and accompanying it throughout its stroke so as to prevent the vibrations and small displacements of the car.

Two opposite portions of the eccentric *c* are in shape of arcs of circles having their center at *i*, so that the car *b* may stand still for a time during which the longitudinal advancement of the film takes place; namely: the outline of the cam is such that, during a quarter revolution the car is moved a full step in one direction and during the following quarter revolution owing to the circular outline of the concerned portion of the cam, the car is not moved transversely and in the meantime the film is moved longitudinally one step.

m m are vertical and *n n* horizontal flat ribs (Fig. 3) projecting from the surface of the car *b* and correspond to the partition lines *m' n'* (Figs. 4 and 5) of the various photographs of the film for the purpose of holding the film away from the car surface during the horizontal and vertical displacement of the film.

d is a shaft operating to cause the longitudinal motion of the film and in any known manner, for instance as shown, by means of a finger *d'* which intermittently rotates a shaft *d''* fitted on the moving car and having a toothed wheel *d'''* on it, a tooth of which is actuated at each revolution of finger *d'* to permit of the shaft *d''* being actuated whatever may be the position of the car; the toothed wheel is of a width corresponding to the displacement of the car; the finger *d'* is placed on the shaft *d* in such a position and the ratio between the speed of the main shaft *p* and of the shaft *d* is such

that the rotary movement of the shaft α'' takes place while the quarter revolution of the Malta cross does produce no cross displacement of the car.

5 Having now described my invention and how the same is to be carried out, what I claim as my invention, is:

1. In a cinematographic machine for films having horizontal sets of photograms and a car transversely sliding relatively to a window formed in the machine, a driving shaft actuated by crank handle, a shaft operating the longitudinal displacement of the film and a shaft operating the transverse displacement of the car and the rotation of the obturator, both shafts being driven by said driving shaft, a disk keyed on the second named operating shaft fitted with a projecting pin, a gear in shape of a Malta cross co-
10 operating with said pin, an eccentric fast with the Malta cross and revolving within a frame forming an extension of the car and leaning with its periphery in succession against either of two opposed sides of the
15 frame, projecting ribs on the surface of the car to afford a support to the film in correspondence to the separation lines between the photograms, an obturator fitted on the said second named shaft, substantially as and to
20 the purposes set forth.

2. In a cinematographic machine for films carrying horizontal sets of photograms and including a casing having a window therein; a car mounted to slide transversely relatively to the window, a manually actuated driving shaft, a shaft for causing longitudinal displacement of the film, a shaft for causing transverse displacement of the film and the obturator, an obturator on the second named shaft both of said shafts being
35 driven by the said driving shaft, a disk secured on the second named operating shaft and a pin projecting therefrom, a Malta cross gear cooperating with said pin; an ec-

centric rigidly mounted on said Malta gear, 45 a frame extension on the car, said eccentric revolving within said frame extension and contacting with its periphery successively either of two opposed sides of the frame, ribs projecting from the surface of the car, 50 said ribs providing a support to the film corresponding to lines of separation between the photograms.

3. A cinematographic machine for films having horizontal sets of photographs comprising in combination a car sliding transversely relatively to a window formed in the machine; a driving shaft actuated by a crank handle; a wheel gear actuating a shaft for the transverse displacement of the film 60 and for rotating the obturator and a shaft for the longitudinal displacement of the film; a set of bevel gears connected to the shaft operating the cross displacement of the film; a shaft driven by the said bevel gears 65 and having thereon the obturator and a disk fitted with a projecting pin; a gear in shape of a Malta cross having a number of teeth double as the number of photographs of each horizontal set of the film and actuated by the said projecting pin at each revolution of the disk; an eccentric rigid with the Malta cross and adapted to revolve in a frame formed of an extension of the car to displace the car transversely and having two opposite portions of its periphery concentric with its pivot so as to maintain the car at rest during the actuation of two opposite teeth of the Malta cross; projecting ribs on the surface of the car over which the film may pass arranged in corresponding relation to the partition lines of the photographs; and a finger carried on the shaft operating the longitudinal displacement of the film, to longitudinally displace the film while the car remains 85 at rest.

In testimony whereof I affix my signature.
ERALDO PLUDERI.