

(No Model.)

3 Sheets—Sheet 1.

J. ROUS.
KINETOGRAPHIC CAMERA.

No. 588,014.

Patented Aug. 10, 1897.

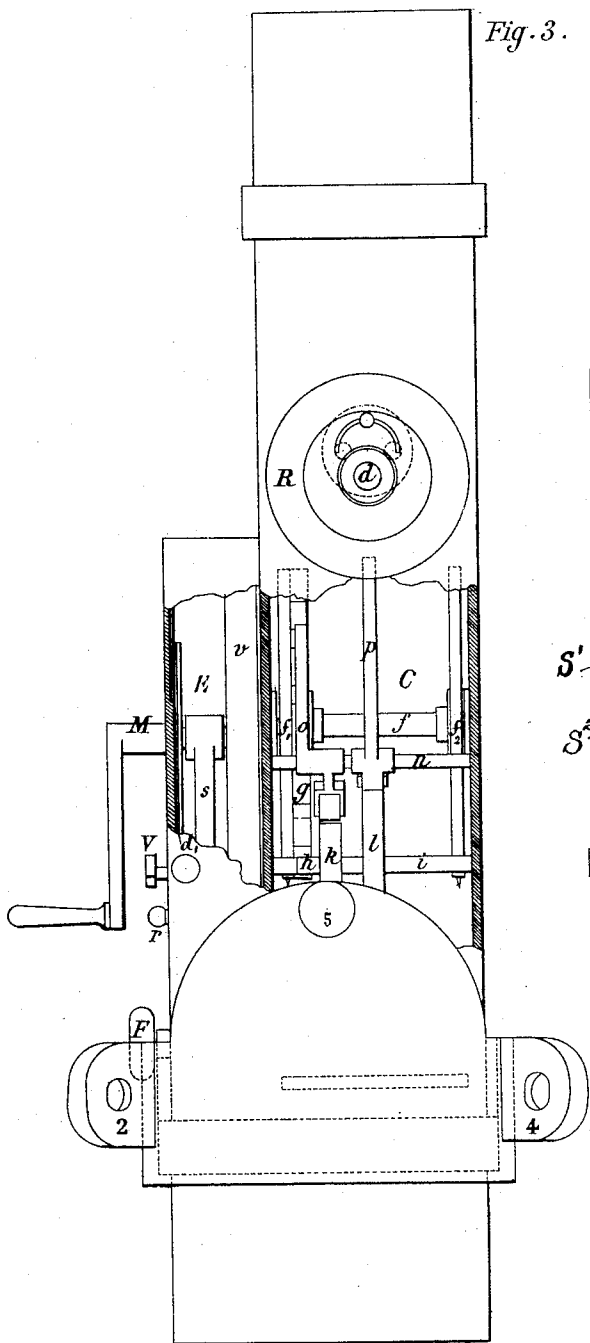


Fig. 3.

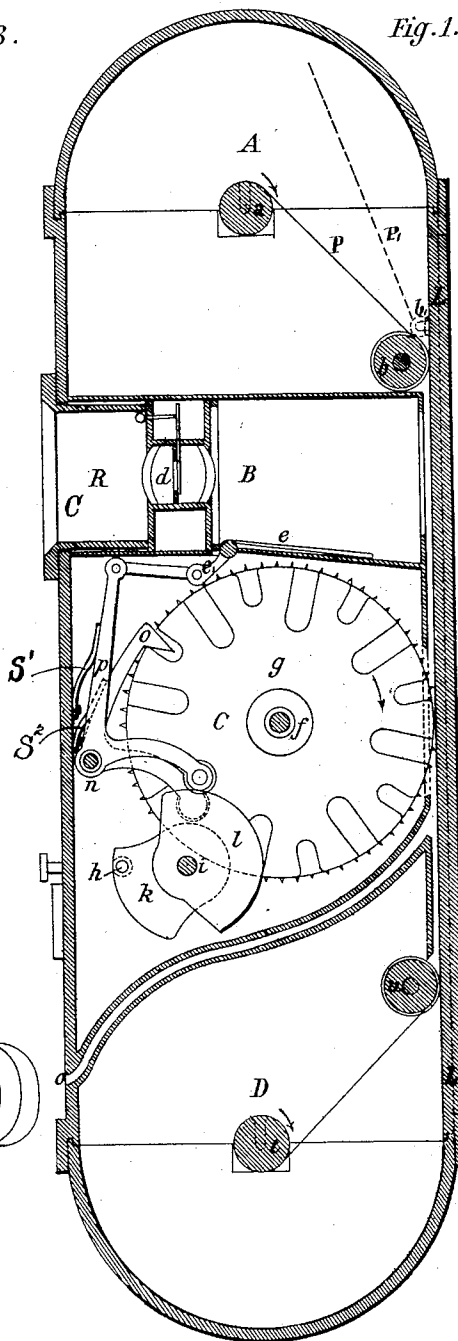


Fig. 1.

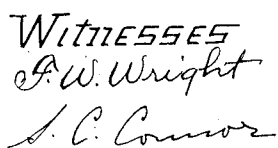
WITNESSES
F. W. Wright
J. C. Connor

INVENTOR
Joseph Rous.
BY *Horace W. W. W.*
HIS ATTORNEYS

3 Sheets—Sheet 2.

No. 588,014.

Patented Aug. 10, 1897.



INVENTOR
Joseph Rous.
By Howard Wilson
HIS ATTORNEYS

(No Model.)

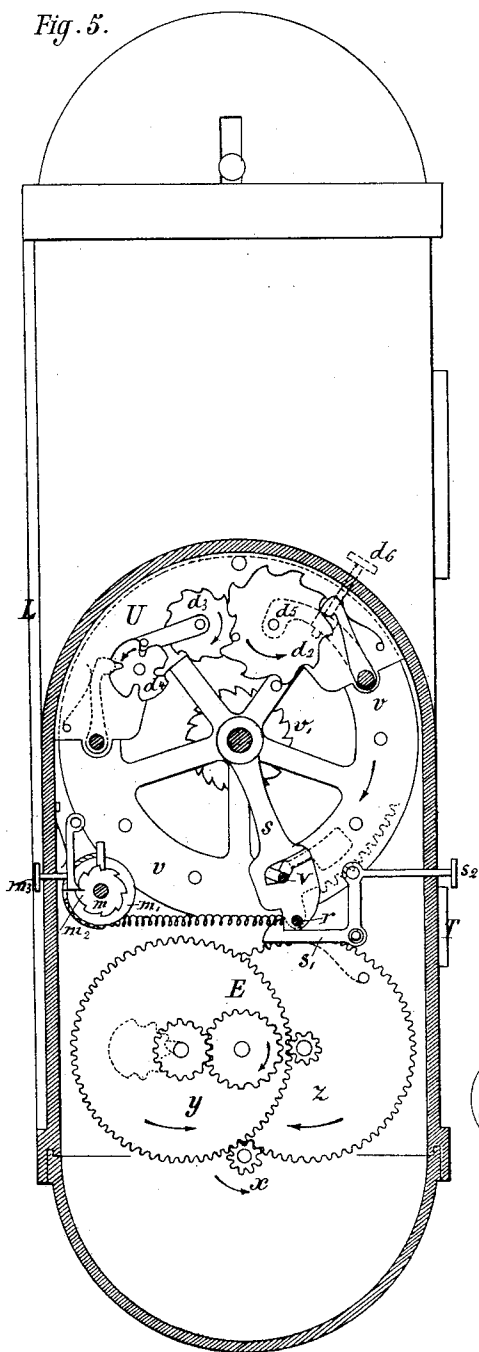
3 Sheets—Sheet 3.

J. ROUS.
KINETOGRAPHIC CAMERA.

No. 588,014.

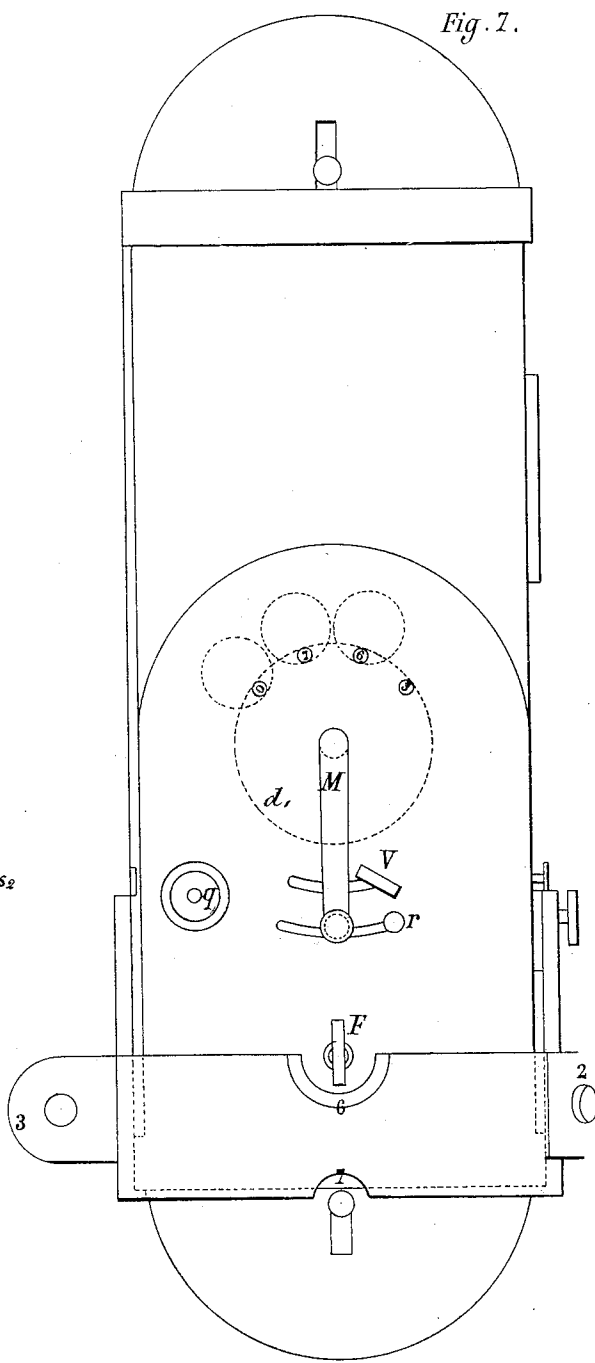
Patented Aug. 10, 1897.

Fig. 5.



WITNESSES
F. W. Wright
S. C. Connor

Fig. 7.



INVENTOR
Joseph Rous.
By Howard T. Horn
his ATTORNEYS

UNITED STATES PATENT OFFICE.

JOSEPH ROUS, OF PARIS, FRANCE.

KINETOGRAPHIC CAMERA.

SPECIFICATION forming part of Letters Patent No. 588,014, dated August 10, 1897.

Application filed August 25, 1896. Serial No. 603,924. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH ROUS, a citizen of the Republic of France, residing at Paris, France, have invented certain new and useful
5 Improvements in Photographic Cameras, of which the following is a description.

This invention has for its object an improved chronophotographic apparatus intended to illustrate the synthesis of movement. It al-
10 lows, first, of a large number of negative pictures being taken on a continuous film in a variable unit of time; second, of positive impressions being taken by contact; third, of the successive impressions obtained being pro-
15 jected on a screen, and, fourth, of the positive impressions being seen directly by means of a lamp placed behind the dark chamber.

In order to allow of the nature of my invention being understood and the manner of
20 putting it in practice, I will now describe the same with reference to the accompanying drawings, in which—

Figure 1 is a vertical section of the moto-
graph. Fig. 2 is a horizontal section taken
25 through the axis *f*. Fig. 3 is a front elevation, partly in section. Fig. 4 is a longitudinal section on a plane perpendicular to the plane of Fig. 1. Fig. 5 shows a front view of the interior of the chamber E, which contains
30 the parts for producing the movement. Fig. 6 is a transverse section showing the motive parts. Fig. 7 is an external view of the apparatus from the side of the chamber E, and Fig. 8 is a plan view of a three-branch foot
35 or base for supporting the apparatus.

The apparatus is preferably made entirely of metal and comprises two coupled boxes, (or boxes fitting together,) rounded at the ends and having the same width but differ-
40 ent heights. The larger box is divided by partitions into four compartments or chambers A B C D, which will now be respectively described.

The chamber A is the storage chamber or
45 magazine for the unexposed film P, which is wound on a movable spool *a* and which in unwinding passes between guide-rollers *b b'*. B is the photographic chamber, having an opening *c*, and which contains a movable ob-
50 jective *d*. Behind this objective is a shutter-flap *e*, pivotally hinged on an axis and provided with an arm *e'*, which is connected with

an elbow *p*, of which mention will be made hereinafter. One or two springs *S'* keep the shutter-flap normally closed. 55

In the chamber C is the mechanism which has for its object to convert into an intermittent movement the continuous movement imparted by the hand of the operator. This mechanism consists as follows: Two wheels
60 *f' f''*, provided on their periphery with points to penetrate into perforations in the continuous film in order to cause it to descend, are mounted on a revoluble spindle *f*. Another wheel *g* is also keyed on this spindle, and presents
65 on its periphery a series of notches for advancing and a series of notches for stopping.

A pinion *j*, (placed in the chamber E,) a cam *k*, provided with a rod *h*, and another cam *l* are keyed on a rotary spindle *i*. On a
70 fixed spindle *n* there are revolubly mounted, first, an elbow-piece *o*, one of the branches of which is terminated by a wedge projection, while the other carries at its extremity a roller to travel on the cam *k*, a spring *S* being pro-
75 vided to constantly press the roller on the cam, and, secondly, an elbow-piece *p*, one of the branches of which is connected with the arm *e'* of the shutter-flap *e*, while the other branch carries at its extremity a roller to
80 travel on the cam *l*. At each revolution of the spindle *i* the rod *h* enters an advancing-notch of the wheel *g*, while the cam *k* raises the elbow-piece *o* in order to release its ex-
85 tremity from a stopping-notch of the wheel *g*, and thus leave this latter free to revolve. When the rod *h* emerges from the advancing-notch, the wheel *g* will have described one-
eighth of a revolution, (assuming that there are eight notches, as shown in the drawings,) 90 and the cam *k* will release the elbow-piece *o*, the wedge of which will enter the following stopping-notch. The cam *l* raises the elbow-piece *p*, which opens the shutter-flap *e* when the wheel *g* is stopped. The objective re-
95 mains open during a half of the time elapsed for each revolution of the spindle *i*. Thus, for instance, if twenty negatives are made in a second the exposure will be one-fortieth of a second, if forty are made the exposure will
100 be one-eightieth of a second, &c.

The chamber D receives the exposed film, which descends along the wall L, passes partly round a roller *u*, and is wound on a spool *t*.

The chamber C is separated from the chamber A by the two partitions of the photographic chamber B and from the chamber D by a double partition, forming a passage for the negative film when positive impressions are taken by contact.

In order to effect this latter operation the semicircular cap of the chamber A is removed, and this chamber is surmounted by a similar prolongation (not shown on the drawings) containing a similar spool to *a*, on which is wound the positive film P', and the whole is covered with the cap. The films P P' pass in contact with one another along the wall L, impressions are successively effected in the chamber B, the back of which is open, and the negative band then emerges at O by the double passage, while the positive band is wound off in the chamber D onto the spool *t*.

The partition or wall L is removable in order to allow of the films being put in place.

The chamber E, which incloses the motor-movement, contains a wheel *v*, Fig. 5, having internal teeth, which, with a ratchet-wheel *v'*, is mounted on a spindle having on the outside an operating-crank M. This wheel *v* engages with a pinion *j*, Fig. 4. It will be seen that by causing the crank M to revolve a continuous rotary movement is imparted to the spindle *i* and to the two cams *l* and *k*, which it carries, which movement, by means of the elbow-levers *o p*, is converted into an intermittent movement of the pointed wheels *f' f''* and of the shutter-flap *e*. The chamber E contains also a clockwork-movement, Figs. 4, 5, and 6, formed of a barrel *γ*, which operates by a train of gearing the pinion *x*, keyed at the end of the spindle of the spool *t*. The spring of the barrel receives a sufficient number of revolutions to wind the film entirely. This clockwork-movement is wound up by means of a button or thumb-piece F.

The apparatus thus constructed allows a large number of negative impressions to be taken in a given time, of taking positive impressions by contact, and of projecting these latter on a screen in such a way as to reproduce the movement; but it is also arranged for taking separate instantaneous photographs. For this object (see Figs. 2, 4, 5, and 7) a movable arm *s*, mounted freely on the spindle of the wheel *γ*, is terminated at its extremity in front by a tooth bearing a projecting stud *r* and in the rear by an attachment on which is hinged the end of a spiral spring *r'*. A key V passes through this arm *s* and penetrates into one of ten holes formed in the rim of the motor-wheel *γ*. This key is provided with a projection capable of turning in a recess in the arm *s* and with a spiral spring which pushes it forward. The wheel *v* is released by drawing outward the key V and causing it to describe a quarter of a revolution, Fig. 5.

When it is desired to set the apparatus in order to take a separate instantaneous impression, it is sufficient to bring the arm *s*

from left to right by means of the stud *r*, Fig. 7, until the key V, encountering a catch, falls back into the next hole of the wheel *v*. At this moment the tooth of the arm *s* engages with the hooked end of an elbow-lever *s'* and the spring *r'* is stretched. By pressing on the stud *s''* the disengagement is produced and the arm *s* (returned by the spring *r'*) moves the motor-wheel a tenth of a revolution. A movable spindle *m*, operated by a button *q*, Figs. 2 and 5, carries a pulley *m'*, on which the spiral spring *r* is attached, and a ratchet-wheel *m''* for graduating the tension of the spring. A pin *m'''* serves to stop the rotation. Finally, the apparatus is completed by a counting device U, composed of three spindles, each bearing a cog-wheel and a numbered disk, Fig. 5.

The spindle of the motor-wheel *γ* has in front a disk *d'*, Figs. 4 and 7, on which disk the units are inscribed. A revolution of this wheel equals ten negatives. A saw-toothed wheel *d''*, Fig. 5, springs one tooth at each revolution of the motor-wheel and its disk indicates, therefore, tens. The wheel *d'''* springs one tooth at each revolution of *d''* and its disk indicates, therefore, hundreds. Finally, the wheel *d''''* springs one tooth at each revolution of *d'''* and its disk therefore indicates thousands. The form of this latter wheel *d''''* varies according to the extent of the number which it is desired that the indicating or counting device should attain. Thus for a counting device indicating from "0" to "1,999" this wheel has four teeth, and on the disk there are engraved two "0's" and two "1's." The wheel *d''* is carried by a movable piece *d''''*, operated by an external screw *d'''''*, which allows of its being set out of action—that is to say, to render the use of the counting device optional.

In order to support the apparatus either in a vertical or horizontal direction so as to take at will high or broad views, I employ a support formed of a metallic rectangular frame, Figs. 7 and 8, having inside the base projecting fillets 1, serving as stays or supports for the lower beading of the apparatus. A tightening-screw 5 solidly unites the support with the motograph. Lugs 2, 3, and 4 receive the three legs of the foot-piece or tripod. Finally, grooves 6 and 7 allow free passage to the key F and to the button of the lower cap.

The apparatus may be made of various sizes and may be more or less complete—that is to say, with the counting device or with the system of disengaging mechanism providing for separate instantaneous exposures, or both together may be dispensed with.

I claim as my invention—

1. In a chronophotographic apparatus, the combination of wheels adapted to draw along a continuous film, a shaft on which the wheels are mounted, a notched wheel on the same shaft, and an elbow-lever adapted to engage with the notched wheel, with a rotary spindle provided with a cam to actuate the said elbow-

lever and a projection to engage the notched wheel, whereby the rotary motion of the said spindle imparts an intermittent motion of the said wheel, substantially as set forth.

5 2. In a chronophotographic apparatus, the combination of wheels adapted to draw along a continuous film, a shaft on which the wheels are mounted, a notched wheel on the said shaft and an elbow-lever adapted to engage
10 with the notched wheel, with a spindle, a crank, and gearing between the crank and spindle, the said spindle being provided with a cam to actuate the elbow-lever and a projection to engage the notched wheel, substantially
15 as and for the purpose set forth.

3. In a chronophotographic apparatus, the combination of wheels to draw along a continuous film, a shutter, and levers connected thereto, with a rotary spindle provided with
20 two cams, one to intermittently move the said wheels, and the other to act on the said levers to open and close the shutters, substantially as and for the purpose set forth.

4. In a chronophotographic apparatus, the
25 combination of wheels adapted to draw along

a continuous film, a shaft on which the wheels are mounted, a notched wheel on the same shaft, a shutter and levers connected thereto and an elbow-lever adapted to engage with the said notched wheel, with a rotary shaft
30 provided with a cam to actuate the shutter-levers and shutter, and a cam to act on the elbow-lever and a projection to engage with the notched wheel whereby an intermittent motion of the film and the synchronous opera-
35 tion of the shutter are obtained.

5. In a chronophotographic apparatus, the combination of the motor-wheel, an oscillating arm mounted freely on the shaft of the motor-wheel and provided with a stud and an
40 adjustable spring with a disengaging-lever and a spring-key, all substantially as and for the purposes set forth.

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

JOSEPH ROUS.

Witnesses:

JOSEPH DELAGE,
EDWARD P. MACLEAN.