

A. C. ROEBUCK.

KINETOSCOPE SAFETY SHUTTER.

APPLICATION FILED NOV. 27, 1907. RENEWED OCT. 14, 1909.

1,006,406.

Patented Oct. 17, 1911.

4 SHEETS—SHEET 1.

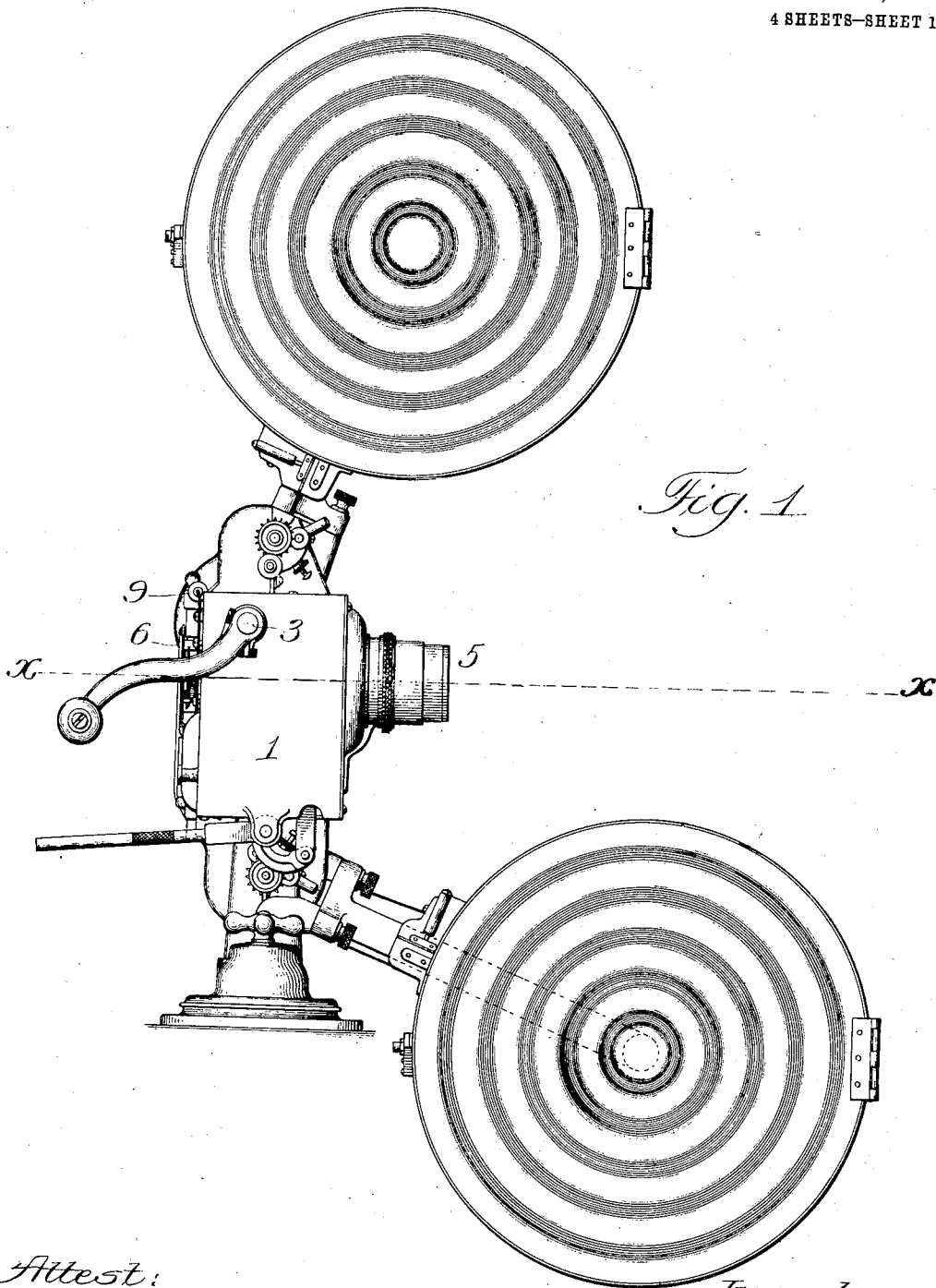


Fig. 1

Attest:
John Enders
Henry Mor.

Inventor:
Alvah C. Roebuck
by Robert Burns
Attorney

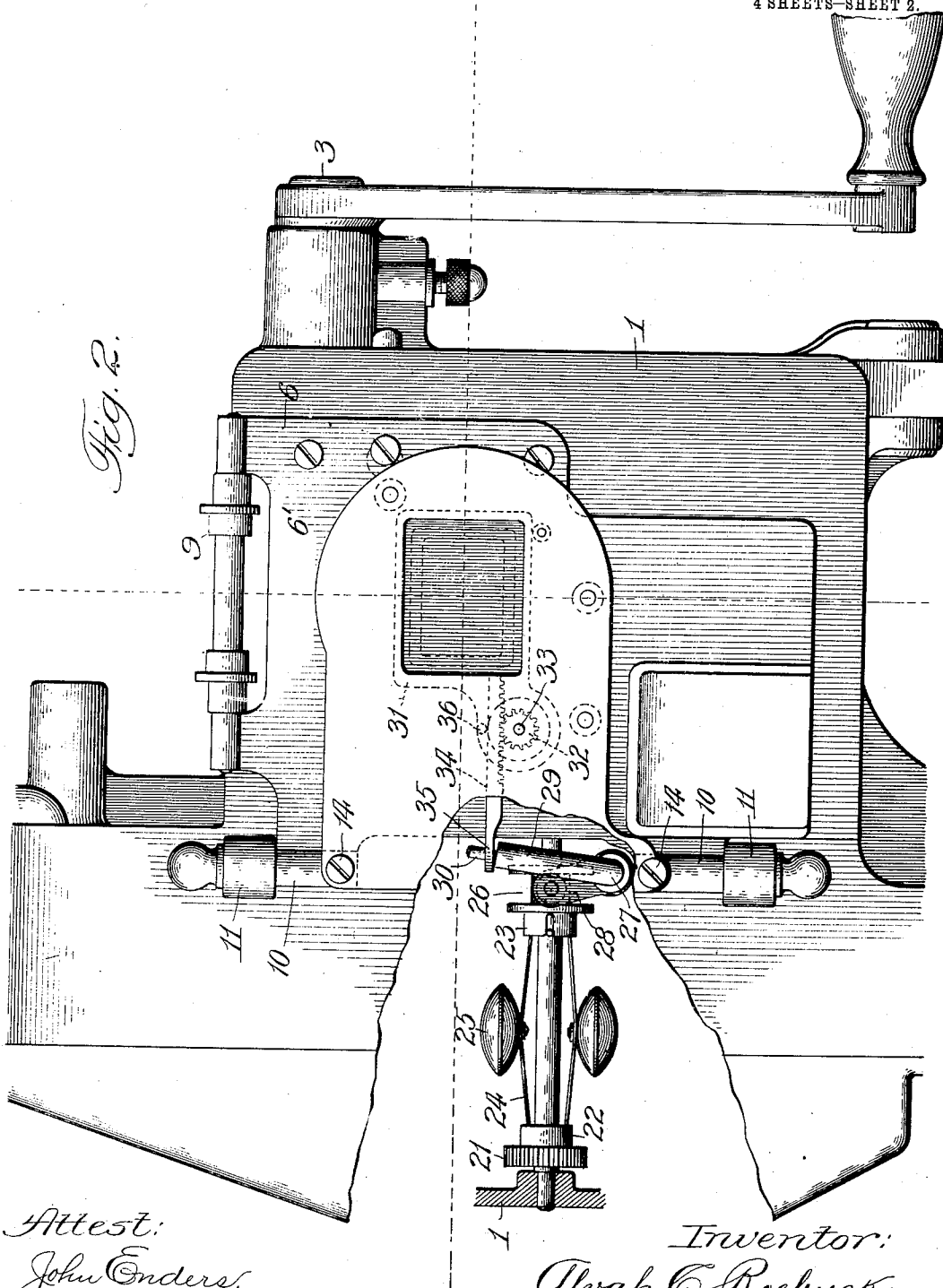
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Attest:
John Enders.
Henry Moe.

Inventor:
Alvah C. Roebuck,
by Robert Burns
Attorney.

A. C. ROEBUCK.

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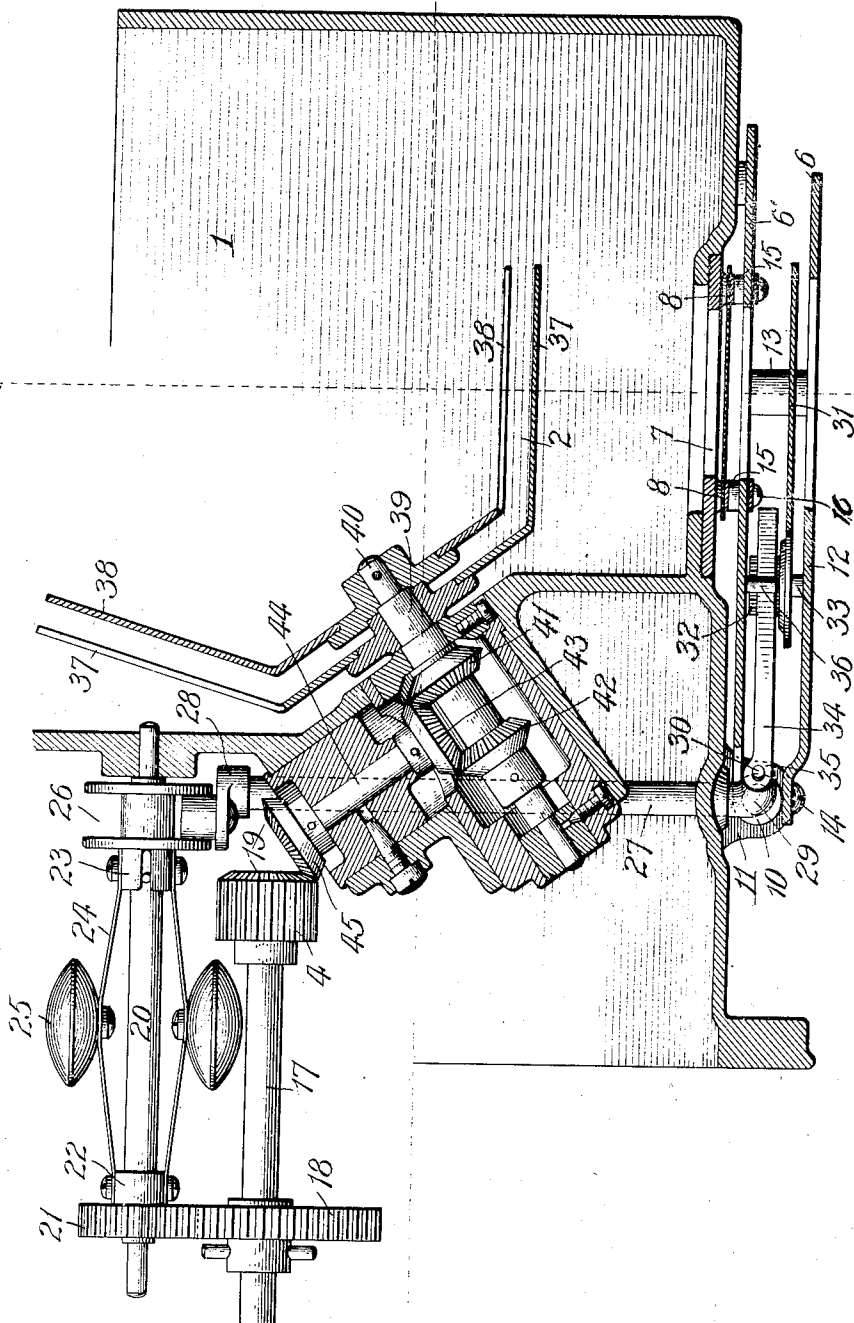
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4 SHEETS—SHEET 3.

Fig. 3.



Attest:
John Enders.
Henry Mos.

Inventor:
Alvah C. Roebuck,
by Robert Burns
Attorney.

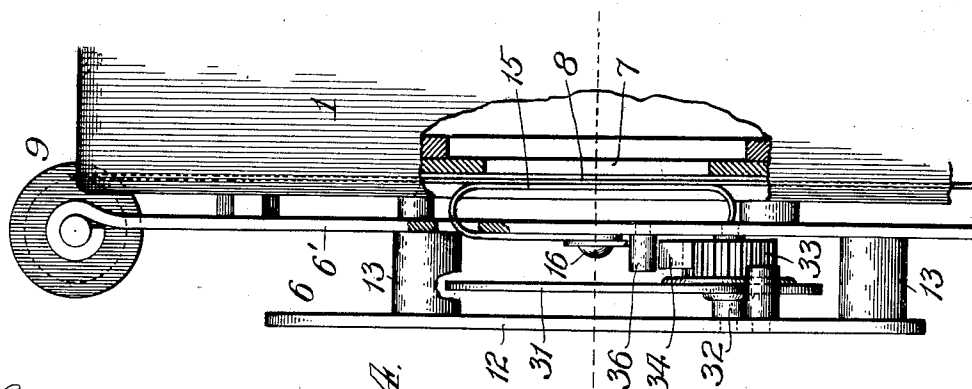
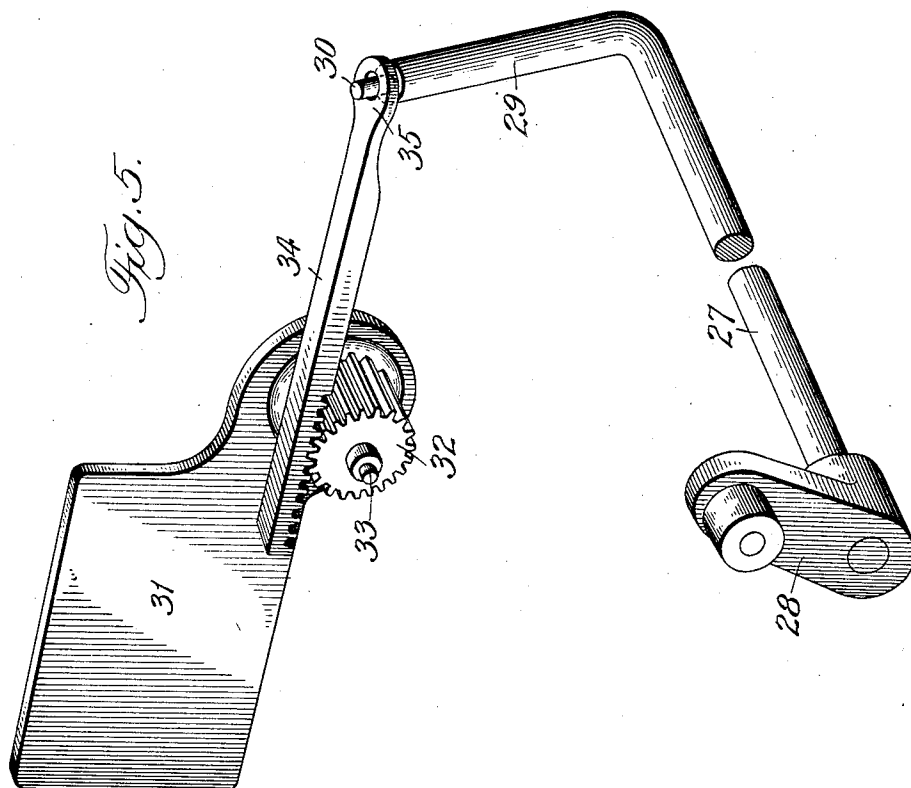
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4 SHEETS—SHEET 4.



Attest:
John Enders,
Henry Mos.

Inventor:
Alvah C. Roebuck,
by Robert Burns
Attorney.

UNITED STATES PATENT OFFICE.

ALVAH C. ROEBUCK, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE ENTERPRISE OPTICAL MFG. COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

KINETOSCOPE SAFETY-SHUTTER.

1,006,406.

Specification of Letters Patent.

Patented Oct. 17, 1911.

Application filed November 27, 1907, Serial No. 404,091. Renewed October 14, 1909. Serial No. 522,676.

To all whom it may concern:

Be it known that I, ALVAH C. ROEBUCK, a citizen of the United States of America, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Kinetoscope Safety-Shutters, of which the following is a specification.

This invention relates to that type of safety shutter mechanisms for kinetoscopes, intended to prevent the concentration of the light rays upon the film and the ignition of the same, when at rest or in slow motion; and the present improvement has for its object to provide a simple and efficient structural arrangement and combination of parts adapted to afford a very sensitive operation of the safety shutter, and which admits of said shutter being mounted upon and moving with the vertically hinged gate which closes the rear end of the kinetoscope casing and is formed with the rear light passage of such kinetoscope, and so that the safety shutter, without any disarrangement of its operative connections, may be moved out of the way along with said gate in the operation of putting a film in place in the apparatus; or in the subsequent removal thereof, all as will hereinafter more fully appear.

In the accompanying drawings:—Figure 1 is a side elevation of a kinetoscope having the present safety shutter mechanism applied. The focal line or axis being represented by the dotted line $x-x$. Fig. 2 is a fragmentary rear elevation with portions broken away to illustrate internal parts. Fig. 3 is a detail horizontal section on the focal line $x-x$, Fig. 1. Fig. 4, is an enlarged detail end elevation partly in vertical section. Fig. 5, is a detail perspective view of the safety shutter and its operating accessories.

Similar numerals of reference indicate like parts in the different views.

Referring to the drawings, 1 represents the supporting casing or housing of the kinetoscope, preferably of the closed form shown, and within which is contained the alternately acting film feeding mechanism and light controlling shutter 2, of the kinetoscope; and preferably the type of such mechanisms which form the subject matter of my separate Patents Numbers 939,634 and 909,677, dated November 9, 1909 and January 12, 1909, respectively.

3 is the main operating shaft of the kine-

scope journaled transversely in the casing 1, and operatively connected by intermediate gear wheels (not shown) with the driven pinion 4 of the hereinafter described centrifugal mechanism or governor by which the safety or fire shutter of the present construction is operated.

5 is the projecting lens or objective at the front end of the kinetoscope casing, and 6 the horizontally swinging gate at the rear end of the same, and by which the film is confined to a vertical movement past alined light passages formed in said gate and in the rear wall of the casing.

7 is a vertical diaphragm secured in a recess in the rear face of the casing 1 and formed with one of the alined light passages above referred to, and with vertical ribs or slideways 8 at the sides of such passage upon which the film slides in its movement past such light passage.

9 is a flanged idler roll carried at the upper end of the gate 6, and over which the film passes in its movement toward the light passage aforesaid.

In the present construction the swinging gate 6 consists of a main section or plate 6' formed with one of the alined light passages above referred to, and with a pair of vertical pintle eyes 10, arranged in separated relation to leave an intermediate free space between for the purpose hereinafter stated. Such pintle eyes 10 in connection with companion pintle eyes 11 on the casing 1 are adapted to receive the pintle pins by which the gate is pivotally connected to the casing.

12 is an auxiliary plate forming a secondary member of the gate, and secured in separated relation to the main plate 6' by means of intermediate studs 13, and connecting screws 14 passing through a vertical end of said plate 12 and screwing into the pintle eyes 10 of the main plate 6'. As so arranged and connected a space is provided between said gate parts for the reception of the safety or fire shutter hereinafter described.

15 are spring shoes arranged vertically at the sides of the light passage in the main gate section 6' aforesaid; each of said shoes is formed of a single piece of spring metal of the flattened oval form shown, to provide two parallel members one of which is attached centrally to the gate section 6' by an attaching screw 16, while the other or free member is adapted to yieldingly bear

upon the film and maintain the same in contact with an adjacent vertical rib or slide 8 before described.

17 is the carrying shaft of the before mentioned driven pinion 4; such shaft is journaled in the casing 1 and carries near one end a gear wheel 18, and at the other end a bevel gear 19, as shown.

20 is a governor shaft journaled in the casing 1 and receiving motion from the shaft 17 through the aforesaid gear wheel 18 and a pinion 21 on said governor shaft. Such governor shaft carries a centrifugal governor of any usual type, preferably one of the following construction:—22 is a fixed collar, and 23 a movable collar on the governor shaft 20, connected together by a pair of spring plates 24 upon which are centrally mounted the governor balls 25, which under centrifugal stress are adapted to move away from the governor shaft and impart longitudinal movement to the collar 23, which is provided with the usual peripheral groove 26 preferably formed by separated disks on said collar 23, as shown, and adapted for operative engagement with the rock shaft mechanism now to be described. 27 is a rock shaft journaled in the casing 1 and provided at one end with a rock arm 28 adapted for operative engagement with the peripheral groove 26 of the movable governor collar aforesaid, and at its other end with a vertical rock arm 29 which in the present improvement is in substantially vertical alinement with the axis of the pivot pintle of the gate 6, before described, and is provided at its upper end with a cylindrical extension 30 for engagement with an end of the rack bar of the safety shutter hereinafter described. 31 is the safety or fire shutter of a substantially rectangular plate form, and of a size greater than the light passages heretofore referred to; such shutter is provided at one corner with a pivot extension carrying a pinion 32 and a pivot shaft 33 by which it is pivotally mounted in and between the gate members 6' and 12 aforesaid. 34 is a rack bar engaging the pinion 32 aforesaid, and provided at one end with an eye 35 by which it is operatively connected with the cylindrical extension 30 of the rock arm 29 before described. 36 is a guide stud or projection on the main shutter section 6' adapted to confine the rack bar 34 in operative engagement with the pinion 32 aforesaid.

With the above described construction, the fire shutter is adapted to swing bodily out of the way, along with the gate 6 in the operation of introducing or removing a film, and without any disarrangement of the operative mechanism between said fire shutter and its operating governor. With the present construction neither the opening or closing movement of the fire shutter is de-

pendent on gravity or friction as in previous shutters used for the same purpose, and which cannot be depended upon at all times to perform their functions.

37 and 38 are the duplex shutter members of the light controlling shutter 2 before mentioned by which the passage of light through the apparatus is intermittently intercepted. Such shutters constitute the subject matter of my separate Patent No. 909,677, dated January 12, 1909, and is described in detail therein.

In the construction shown: 39 is a tubular shaft carrying the shutter 37, while 40 is a central shaft arranged in the bore of the tubular shaft 39 and carrying the other shutter 38. 41 and 42 are bevel gears carried by the shafts 39 and 40 respectively. 43 is a bevel gear meshing with and driving the bevel gears 41 and 42 in opposite directions. 44 is a shaft carrying the aforesaid bevel gear 43 at one end, and at the other end a secondary bevel gear 45 which meshes with and is driven by the bevel gear 19 before described. As so arranged connected the light controlling and safety shutter mechanisms are positively connected together to operate in unison.

Having thus fully described my said invention what I claim as new and desire to secure by Letters Patent, is:—

1. In a safety shutter mechanism for kinetoscopes, the combination of a gate confining the film in place and provided with a light passage, a safety shutter hinged to such gate at the margin of the light passage, a centrifugal governor operatively connected to the driving mechanism of the kinetoscope, a rock shaft journaled in the kinetoscope casing and operatively connected to the governor, a rock arm carried by said rock shaft and arranged in alinement with the pivot axis of said gate, and operative connections between said rock arm and the shutter, substantially as set forth.

2. In a safety shutter mechanism for kinetoscopes, the combination of a gate confining the film in place and provided with a light passage, a safety shutter hinged to such gate at the margin of the light passage, a centrifugal governor operatively connected to the driving mechanism of the kinetoscope, a rock shaft journaled in the kinetoscope casing and operatively connected to the governor, a rock arm carried by said rock shaft and arranged in alinement with the pivot axis of said gate, and operative connections between said rock arm and the shutter, the same comprising a pinion carried by the shutter at its pivot axis and a rack bar engaging said pinion and operatively connected to the free end of said rock arm, substantially as set forth.

3. In a safety shutter mechanism for kinetoscopes, the combination of a gate con-

fining the film in place and provided with a light passage, a safety shutter hinged to such gate at the margin of the light passage, a centrifugal governor operatively connected to the driving mechanism of the kinetoscope, and provided with a moving part having a peripheral groove, a rock shaft journaled in the kinetoscope casing and connected to the governor by a rock arm engaging said groove, a rock arm carried by said rock shaft and arranged in alinement with the pivot axis of said gate, and operative connections between said rock arm and the shutter, substantially as set forth.

4. In a safety shutter mechanism for kinetoscopes, the combination of a gate confining the film in place and provided with a light passage, a safety shutter hinged to such gate at the margin of the light passage, a centrifugal governor operatively connected to the driving mechanism of the kinetoscope, and provided with a moving part having a peripheral groove, a rock shaft journaled in the kinetoscope casing and connected to the governor by a rock arm engaging said groove, a rock arm carried by said rock shaft, and operative connections between said rock arm and the shutter the same comprising a pinion carried by the shutter at its pivot axis and a rack bar carried by the film confining gate engaging said pinion and operatively connected to the free end of said rock arm, substantially as set forth.

5. In a safety shutter mechanism for kinetoscopes, the combination of a gate confining the film in place and provided with a light passage, said gate consisting of two plates secured together in separated relation, a safety shutter pivoted between such plates, a centrifugal governor operatively connected to the driving mechanism of the kinetoscope, a rock shaft journaled in the kinetoscope casing and operatively connected to the governor, a rock arm carried by said rock shaft and arranged in alinement with the pivot axis of said gate, and operative connections between said rock arm and the shutter, substantially as set forth.

6. In a safety shutter mechanism for kinetoscopes, the combination of a gate confining the film in place and provided with a light passage, said gate consisting of two plates secured together in separated relation, a safety shutter pivoted between such plates, a centrifugal governor operatively connected to the driving mechanism of the kinetoscope, a rock shaft journaled in the kinetoscope casing and operatively connected to the governor, a rock arm carried by said rock shaft and arranged in alinement with the pivot axis of said gate, and operative connections between said rock arm and the shutter, the same comprising a pinion carried by the shutter at its pivot axis and a rack bar engaging said pinion and operatively con-

nected to the free end of said rock arm, substantially as set forth.

7. In a safety shutter mechanism for kinetoscopes, the combination of a gate confining the film in place and provided with a light passage, said gate consisting of two plates secured together in separated relation, a safety shutter pivoted between such plates, a centrifugal governor operatively connected to the driving mechanism of the kinetoscope, and provided with a moving part having a peripheral groove, a rock shaft journaled in the kinetoscope casing and connected to the governor by a rock arm engaging said groove, a rock arm carried by said rock shaft and arranged in alinement with the pivot axis of said gate, and operative connections between said rock arm and the shutter, substantially as set forth.

8. In a safety shutter mechanism for kinetoscopes, the combination of a gate confining the film in place and provided with a light passage, said gate consisting of two plates secured together in separated relation, a safety shutter pivoted between such plates, a centrifugal governor operatively connected to the driving mechanism of the kinetoscope, and provided with a moving part having a peripheral groove, a rock shaft journaled in the kinetoscope casing and connected to the governor by a rock arm engaging said groove, a rock arm carried by said rock shaft and arranged in alinement with the pivot axis of said gate, and operative connections between said rock arm and the shutter, the same comprising a pinion carried by the shutter at its pivot axis and a rack bar engaging said pinion and operatively connected to the free end of said rock arm, substantially as set forth.

9. In a safety shutter mechanism for kinetoscopes, the combination of a gate confining the film in place and provided with a light passage, a safety shutter hinged to such gate at the margin of the light passage, a centrifugal governor operatively connected to the driving mechanism of the kinetoscope, a rock shaft journaled in the kinetoscope casing and operatively connected to the governor, a rock arm carried by said rock shaft and arranged in alinement with the pivot axis of said gate, operative connections between said rock arm and the fire shutter, a light controlling shutter, and a shaft operatively connected in common to the operating mechanism of the fire and light controlling shutters, substantially as set forth.

10. In a kinetoscope, the combination of a main frame provided with film moving mechanism, a door hinged thereto, a movable screen on said door, and mechanical means for moving said screen controlled by the film moving mechanism and located partly on the frame and partly on the door, said parts being coupled together to maintain

their operative connection unbroken during the opening and closing movements of the door, substantially as set forth.

11. In a kinetoscope, the combination of
5 a main frame provided with mechanism for moving the film along one side thereof, a door hinged to the frame and adapted to cooperate with the frame to provide a pas-
sage for the film, a movable screen on said
10 door adapted to normally cut off the projecting light from said film, a mechanical actuating means for said screen located

partly on the frame and partly on the door, said parts being coupled together to maintain their operative connection unbroken 15 during the opening and closing movements of the door, substantially as set forth.

Signed at Chicago, Illinois, this 25th day of November 1907.

ALVAH C. ROEBUCK.

Witnesses:

ROBERT BURNS,
HENRY MOE.