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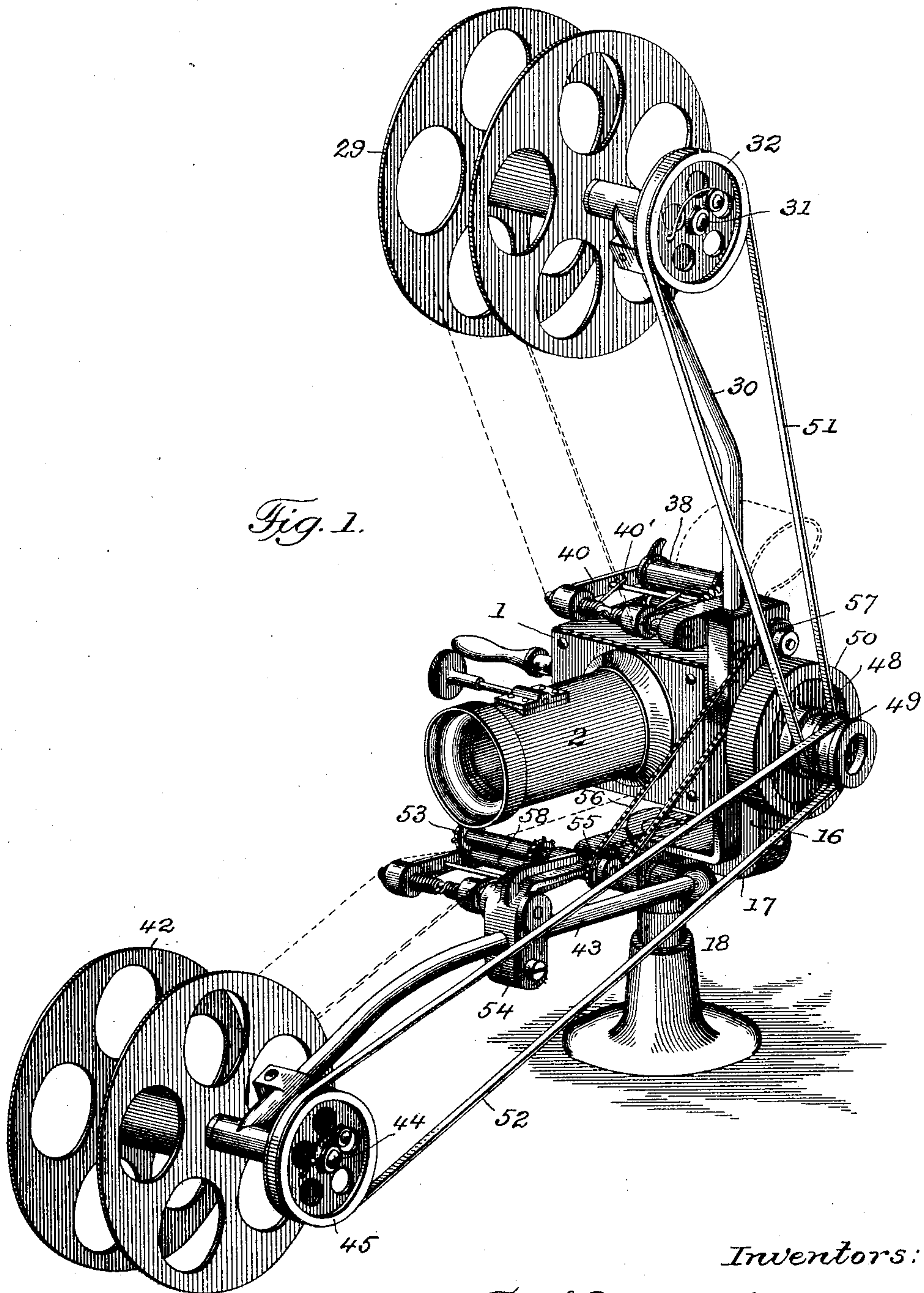
Patented Aug. 5, 1902.

A. C. ROEBUCK & F. McMILLAN.
KINETOGRAPHIC APPARATUS.

(Application filed Mar. 23, 1900.)

(No Model.)

3 Sheets—Sheet 1.



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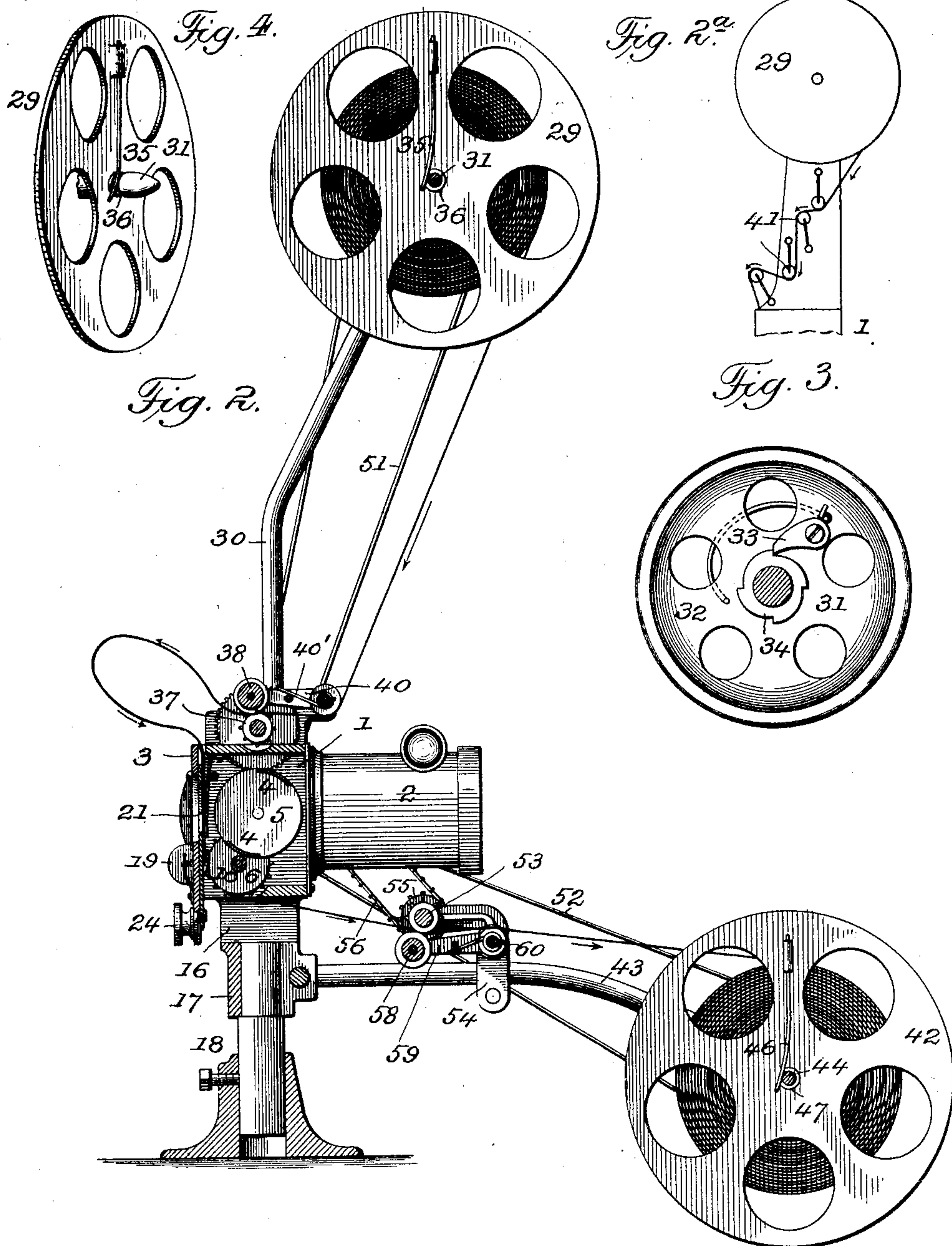
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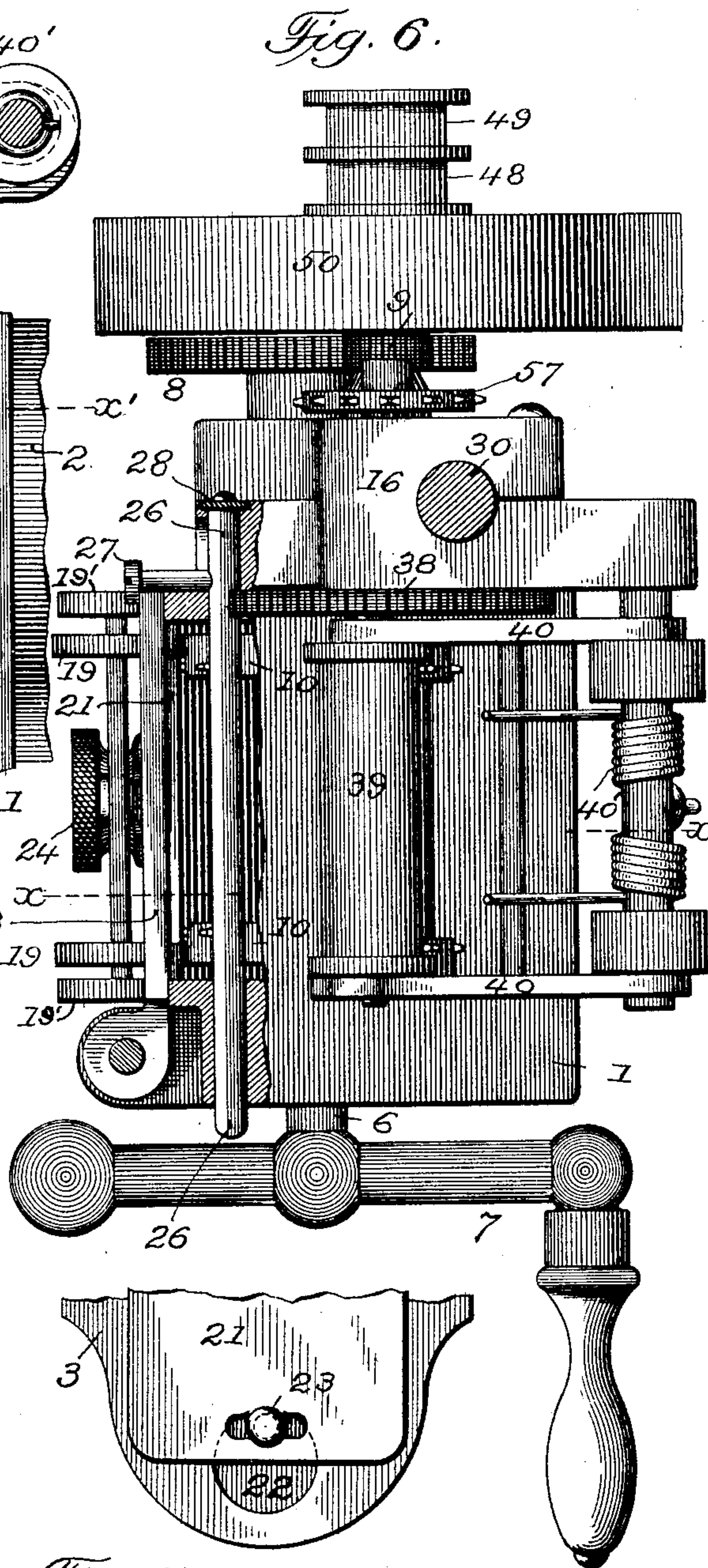
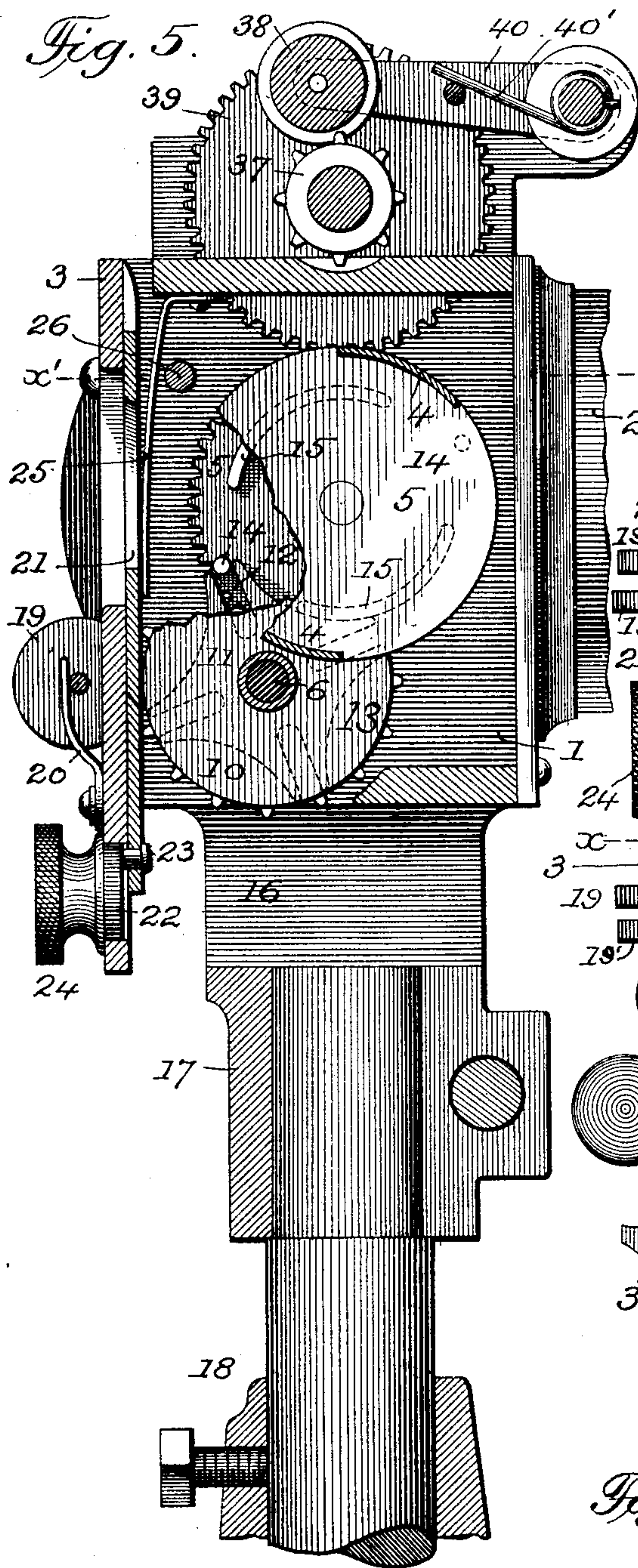
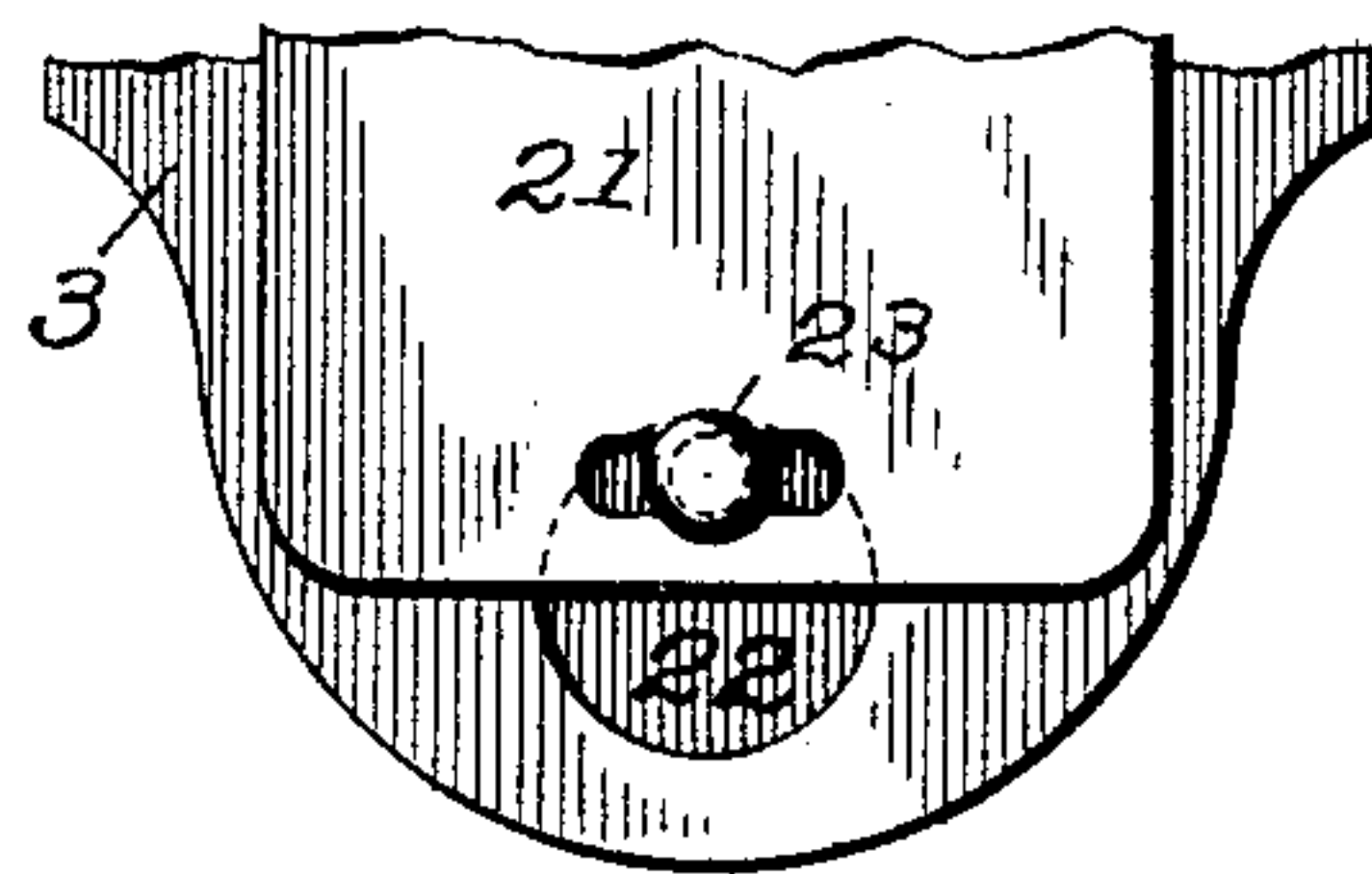


Fig. 7.



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UNITED STATES PATENT OFFICE.

ALVAH C. ROEBUCK AND FRANK McMILLAN, OF CHICAGO, ILLINOIS.

KINETOGRAPHIC APPARATUS.

SPECIFICATION forming part of Letters Patent No. 706,113, dated August 5, 1902.

Application filed March 23, 1900. Serial No. 9,947. (No model.)

To all whom it may concern:

Be it known that we, ALVAH C. ROEBUCK and FRANK McMILLAN, citizens of the United States, and residents of Chicago, in the county
5 of Cook and State of Illinois, have invented certain new and useful Improvements in Kinetographic Apparatus, of which the following is a specification.

The present invention relates to that class
10 of kinetoscopic apparatus in which a transparent film carrying a series of pictures receives an intermittent progressive movement through the apparatus to produce upon a
suitable screen the appearance of objects in
15 motion, and more especially to that type of apparatus which constitutes the subject-matter of our prior Letters Patent, No. 628,413, dated July 4, 1899; and the objects of the
present improvement are to provide a simple,
20 efficient, and convenient construction of the film carrying and guiding parts, whereby the film is capable of ready removal and replacement from the apparatus with but little waste
of time, and with the positioning of the film
25 is readily effected, all as will hereinafter more fully appear, and be more particularly pointed out in the claims.

We attain such objects by the construction and arrangement of parts illustrated in the
30 accompanying drawings, in which—

Figure 1 is a perspective view of a kinetoscopic apparatus embodying the present improvements; Fig. 2, a side elevation of the same with parts in sectional elevation at line
35 $x x$, Fig. 6; Fig. 2^a, a diagrammatic view of a modification; Fig. 3, a detail sectional elevation illustrating the spring-dog and ratchet-wheel engagement of the carrying-shaft of the film-reel with the driving-pulley of the
40 same; Fig. 4, a detail perspective view illustrating the connection between the film-carrying reel and its carrying-arbor; Fig. 5, an enlarged longitudinal sectional elevation at line $x x$, Fig. 6, illustrating the automatic
45 shutter, the main intermittent film mechanism, and other accessories of the main portion of the apparatus; Fig. 6, an enlarged plan view of the main portion of the apparatus, partly in horizontal section, at line $x' x'$, Fig.
50 5; Fig. 7, a fragmentary detail elevation illustrating the means for effecting the vertical

adjustment of the light-opening slide of the present improvement.

Similar numerals of reference indicate like parts in the several views. 55

Referring to the drawings, 1 represents the casing of the main portion of the present apparatus, such casing being of a rectangular box shape, its front being closed by a removable plate carrying the objective mount 2 and
60 its rear by a swinging door or frame 3, hereinafter more particularly described.

Within the casing 1 is arranged, as in our prior patented construction, a revolving shutter, the axis of rotation of which is arranged
65 horizontally and at right angles to the axis of the objective 2. In the construction shown such shutter comprises a pair of concentrically-arranged segmental blades, 4 that are secured at one end to a carrying-disk 5, which is
70 preferably a gear-wheel, as shown, and which is journaled by means of a carrying-arbor in the end wall of the casing 1. A continuous rotary motion is imparted to said shutter by means of a main driving-shaft 6, carrying at
75 one end the operating-handle 7 and at the other end a gear-wheel 8, meshing with and driving a gear-pinion 9 on the journal-arbor of the shutter.

10 is the main film-feeding roller, provided
80 with the usual peripheral spurs adapted to engage in the usual series of spaced orifices in the margin of the pictured film to effect a positive feed of the same. In the present improvement the film-feeding roller 10 is
85 mounted loosely on the main driving-shaft 6, so as to be supported thereby, but capable of a movement of rotation independent of the rotation of the shaft 6.

The film-feeding roller 10 carries at one end
90 an intermittent gear-wheel 11, the periphery of which is formed with alternating radial recesses 12 and marginal convex depressions 13, usually four in number of each. Said gear-wheel 11 has operative connection with
95 a pair of studs 14 on the side of the shutter-carrying disk 5, and which studs are adapted in turn to engage in the radial recesses 12 of said gear-wheel 11 and impart thereto an intermittent one-quarter revolution. In the
100 interval between such intermittent actuations of the gear-wheel 11 and the film-feed-

ing roller 10 the same are positively held in a stationary condition by the engagement of one of the concentrically-arranged rim-sections 15 on the side of the shutter-carrying disk 5 in an adjacent convex marginal recess 13 of the gear-wheel 11.

As in our former patented construction the above-described interdependent mechanism will be so assembled that the shutter will shut off the passage of light through the apparatus during the interval of time in which the feeding movement of the film-feeding mechanism is being effected and will admit the passage of light through the apparatus during the interval of time in which the film and film-feeding mechanism are at rest.

In the present improvement the main casing 1 is secured at one of its sides to the vertical member 16 of an angular bracket-piece, the horizontal member 17 of which has attachment to the supporting foot or base 18 of the apparatus, all as clearly illustrated in Fig. 1 of the drawings. With the above-described construction a ready insertion or removal of the film can be attained in a very convenient and rapid manner from the operator's side of the apparatus.

The swinging door or frame 3 of the casing 1 is hinged in a vertical direction at near edge of the casing 1 by means of a vertical pintle passing through pintle-lugs on the swinging door and on the edge of the casing, as shown in Fig. 6.

19 is a bearing-roller loosely mounted in guides 19' on the swinging door 4 and adapted to hold the film in operative engagement with the film-feeding roller 10.

20 is a spring tending to force the bearing-roller 19 toward the film-feeding roller 10.

21 is a vertically-adjustable frame or sash arranged to slide in side guides upon the inner face of the swinging door 4 and provided with a light-opening of the proper size to constitute a framing for the pictures of the film.

22 is a crank-disk journaled in the lower end of the swinging door 4, with its crank-pin 23 engaging in a horizontal slot in the frame or sash 21 and adapted to impart a vertical adjustment to said frame or sash in effecting a centering or framing of said picture in the initial adjustment of the parts to suit the film.

24 is a milled head on the crank-disk to afford convenient means for effecting the before-described adjustment of the parts.

25 is a spring-finger arranged within the casing 1 and adapted to guide the film in a proper direction toward the film-feeding roller 10 and its accessories.

26 is a horizontal sliding rod that extends transversely through the casing 1 and is provided at its far or rear end with a headed screw or catch 27, adapted to engage the free end of the swinging door 4 to lock the same in a closed condition, the near end of such sliding rod projecting through the casing to afford a convenient means for operating the

mechanism at the operator's side of the apparatus.

28 is a spring tending to force the rod 26 toward the operator's side of the apparatus and maintain the locking engagement of the mechanism with the edge of the swinging door 4.

29 is a carrying or supply reel for the roll of pictured film and arranged in a superimposed position above the apparatus upon a suitable support that comprises as follows:

30 is a vertical standard secured at its lower end to the vertical member 16 of the bracket, while its upper end is transversely bored to form a journal or bearing in which the horizontally-arranged shaft or arbor 31 is supported in a revoluble manner. In the present construction the shaft 31 projects at both sides of such bearing, and one portion forms a laterally-projecting arbor adapted to support the film-carrying or supply reel 29 by passing through a central bore in the hub portion of such reel, while the other projecting portion of such shaft 31 carries a driving-pulley 32, adapted to impart positive rotation to the arbor 31 in one direction only by the engagement of the spring dog or detent 33 on said pulley engaging a ratchet formation 34 on said arbor, as shown in Fig. 3.

35 is a spring on the side of the reel 29, adapted to engage in a circumferential recess 36 in the arbor 31 to hold the reel against lateral disengagement and at the same time afford a frictional engagement between the reel and the arbor, so that in the operation of rewinding the film upon said reel, by means of a positive rotation of the arbor, an undue strain cannot be given the film, in view of the fact that said frictional engagement, above set forth, will permit of the slipping of the reel upon the arbor.

37 is a film-feeding roller supported at one end in a journal-bearing in the vertical member 16 of the bracket that supports the main casing 1 and receiving constant rotation by means of a gear-wheel 39 on its carrying-shaft meshing with the geared rim 5 of the light-shutter, as represented in Figs. 2 and 5. The operation of this initial and constant film-feeding roller 37 is to form in the film, in manner indicated in Figs. 1 and 2, a series of succeeding loops, which are taken up in a like succeeding manner by the main intermittent film-feeding mechanism without any undue strain upon the film.

38 is an idler-roller bearing upon the film and adapted to hold the same in operative engagement with the feeding-roller 37.

40 is a carrying-frame for the idler-roller 38, journaled at one side to the vertical member 16 of the casing-supporting bracket, and for a similar purpose to that of the end support of the film-feeding roller 37—to wit, to permit of a ready and convenient insertion and removal of the film from its engagement with such feeding mechanism.

40' is a spring tending to force the carry-

ing-frame downward and hold the idler-roller 38 in contact with the film-feeding roller 37.

In a simpler type of the present apparatus in which the initial film-feeding mechanism above described is not desired the same may be dispensed with, and as a substitute therefor the film may be carried around a series of yielding rollers 41, carried by elastic arms secured to the main frame, as illustrated in Fig. 2^a, and adapted to afford the required degree of tension upon the film in its passage to the main intermittent feeding mechanism.

42 is the receiving or winding reel for the pictured film as it comes from the apparatus. 43 is a horizontal support for said reel, secured at one end to the main supporting-bracket of the apparatus, and at its other end provided with a journal-bearing for the horizontal arbor 44, that supports at one end the winding-reel 42 and on the other end carries a driving-pulley 45, adapted to impart positive rotation to the arbor 44, in one direction only, by a ratchet-and-pawl mechanism similar in construction and arrangement to that heretofore described in connection with the carrying or supply reel and mechanism for the roll of pictured film.

46 is a spring on the side of the reel 42, and 47 is a circumferential recess in the arbor 44, for a purpose similar to that heretofore described in connection with the like mechanism of the carrying or supply mechanism for the roll of pictured film.

48 and 49 are pulleys on the shutter-carrying arbor next adjacent to the fly-wheel 50 thereof and having belt connections 51 and 52 with the driving-pulleys 32 and 45 of the film carrying and receiving reels heretofore described.

53 is a film-feeding roller supported at one end in a journal-bearing in a bracket-frame 54, secured to the horizontal reel-support 43 and receiving constant rotation by means of a sprocket-wheel 55 on its carrying-shaft, a sprocket-chain 56, and a sprocket-wheel 57 on the carrying-shaft of the film-feeding roller 37, heretofore described. The purpose of this auxiliary film-feeding roller is to take up in a constant manner the film as it leaves the apparatus in a series of recurring loops due to the action of the main intermittent feeding mechanisms, and in this manner relieve the winding mechanism from undue strain in winding the film into a roll.

58 is an idler-roller bearing against the film and adapted to hold the same in operative engagement with the feeding-roller 53.

59 is a carrying-frame for the idler-roller 58, journaled at one side to bracket-frame 54 and provided with a spring 60, tending to hold the idler-roller 58 against the film, as illustrated in Figs. 1 and 2.

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

1. In a kinetographic apparatus, the com-

bination of a closed casing provided with an objective at one side and with passages at top and bottom for the passage of a pictured film, a film-feeding mechanism arranged within said casing, a door forming the opposite side of the casing and adapted to maintain the film at the proper focal plane, a vertical pivot-pintle securing the door to the casing, a supporting-standard having connection with said casing at the side at which the door is hinged, and adapted to provide an open-sided passage beneath the casing, substantially as set forth.

2. In a kinetographic apparatus, the combination of a closed casing provided with an objective at one side and with passages at top and bottom for the passage of a pictured film, a film-feeding mechanism arranged within said casing, a door forming the opposite side of the casing and adapted to maintain the film at the proper focal plane, a vertical pivot-pintle securing the door to the casing, a vertically-adjustable sash arranged upon said door and provided with a framing-opening, a supporting-standard having connection with said casing at the side at which the door is hinged and adapted to provide an open-sided passage beneath the casing, substantially as set forth.

3. In a kinetographic apparatus of the character herein described, the combination of a main casing, a door adapted to maintain the picture-frame at the focal plane, a vertically-sliding sash arranged to move in guides on said door and provided with a picture-framing opening, and a crank-disk journaled in the door and provided with a crank-pin having operative engagement with the sash, substantially as set forth.

4. In a kinetographic apparatus, the combination of a closed casing provided with an objective at one side and with passages at top and bottom for the passage of a pictured film, a film-feeding mechanism arranged within said casing, a door forming the opposite side of the casing and adapted to maintain the film at the proper focal plane, a vertical pivot-pintle securing the door to the casing, a bearing-roller journaled on said door and adapted to hold the film in engagement with the feeding mechanism, and a spring tending to force said roller toward such film-feeding mechanism, substantially as set forth.

5. In a kinetographic apparatus, the combination of a closed casing provided with passages at top and bottom for the passage of a pictured film, a film-feeding mechanism arranged within said casing, a door hinged at one side of said casing on a vertical pivot-axis and forming one side of the casing, and adapted to maintain the film at the proper focal plane, a supporting-standard having connection with said casing at the side at which the door is hinged, an initial film-feeding mechanism journaled wholly at one end to such supporting-standard, and adapted in

connection with said door to admit of a ready removal and replacement of the film in the film-changing operation, substantially as set forth.

5 6. In a kinetographic apparatus, the combination of a closed casing provided with passages at top and bottom for the passage of a
10 pictured film, a film-feeding mechanism arranged within said casing, a door hinged at
one side of said casing on a vertical pivot-
axis and forming one side of the casing and
adapted to maintain the film at the proper
focal plane, a supporting-standard having
15 connection with said casing at the side at
which the door is hinged, an initial film-feeding
mechanism journaled wholly at one end
to such supporting-standard, a horizontal arm
secured to said standard, and an auxiliary
20 film-feeding mechanism journaled wholly at
one end on said horizontal arm, substantially
as set forth.

7. In a kinetographic apparatus of the character herein described, the combination with
the film-carrying reel, of a supporting-arbor
25 for such reel, and a combined attaching means
and frictional connection between such reel
and arbor, the same comprising a spring-finger
carried by the reel, and a circumferential

groove in said arbor adapted to receive said
spring-finger, substantially as set forth. 30

8. In a kinetographic apparatus of the character herein described, the combination with
the main casing, of a swinging door for the
same, and a horizontal rod extending trans-
versely across the casing and provided with a
35 catch to engage the free end of the door, substantially
as set forth.

9. In a kinetographic apparatus of the character herein described, the combination with
the main casing, film-feeding roller and a re-
volving shutter, of a driving-shaft forming a
journal for the feeding-roller and revoluble
independent of such roller, a gear-wheel on
the driving-shaft, a gear-wheel on the shutter-
shaft gearing with said gear-wheel, and gear-
45 ing connection between the shutter and the
film-feeding roller, adapted to impart inter-
mittent motion to said roller, substantially
as set forth.

In testimony whereof witness our hands 50
this 19th day of March, 1900.

ALVAH C. ROEBUCK.

FRANK McMILLAN.

In presence of—

ROBERT BURNS,

M. H. HOLMES.