

(No Model.)

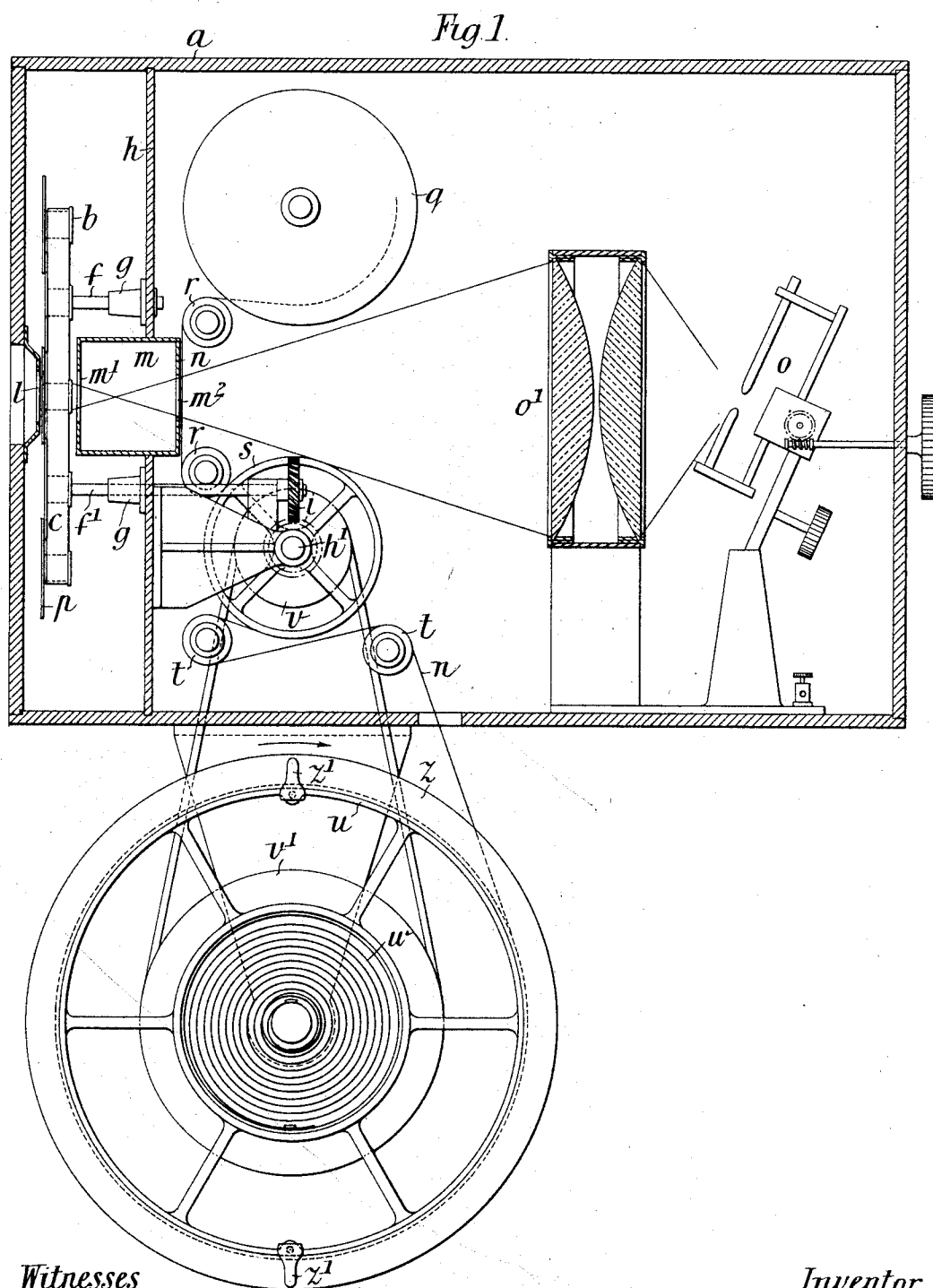
3 Sheets—Sheet 1.

J. W. HOLST.

KINEMATOGRAPHIC LANTERN OR APPARATUS.

No. 587,527.

Patented Aug. 3, 1897.



Witnesses

John E. Dousfield.

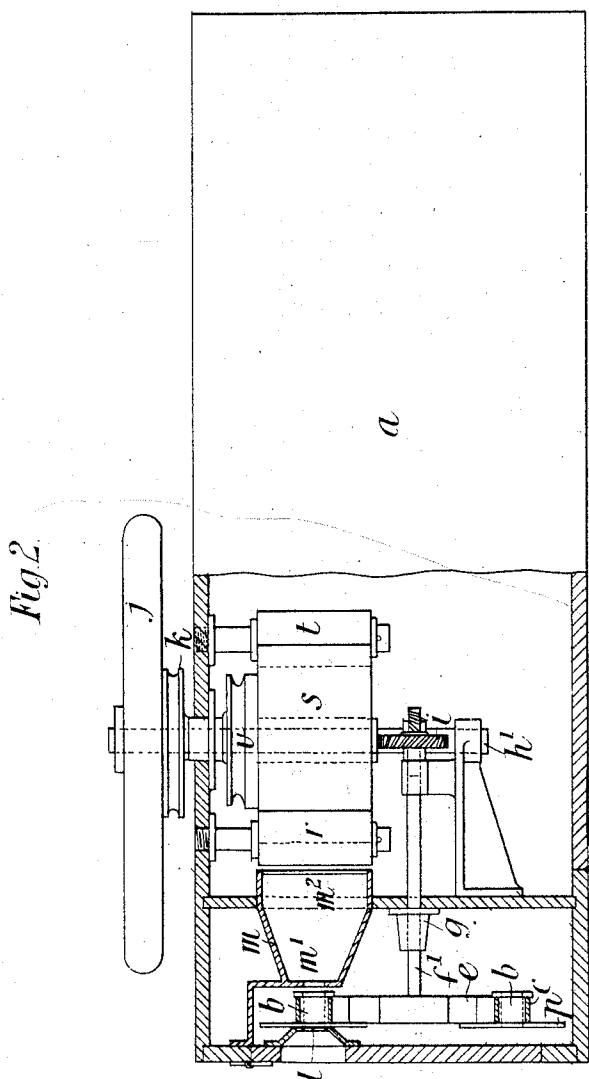
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Witnesses.

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Fig 3

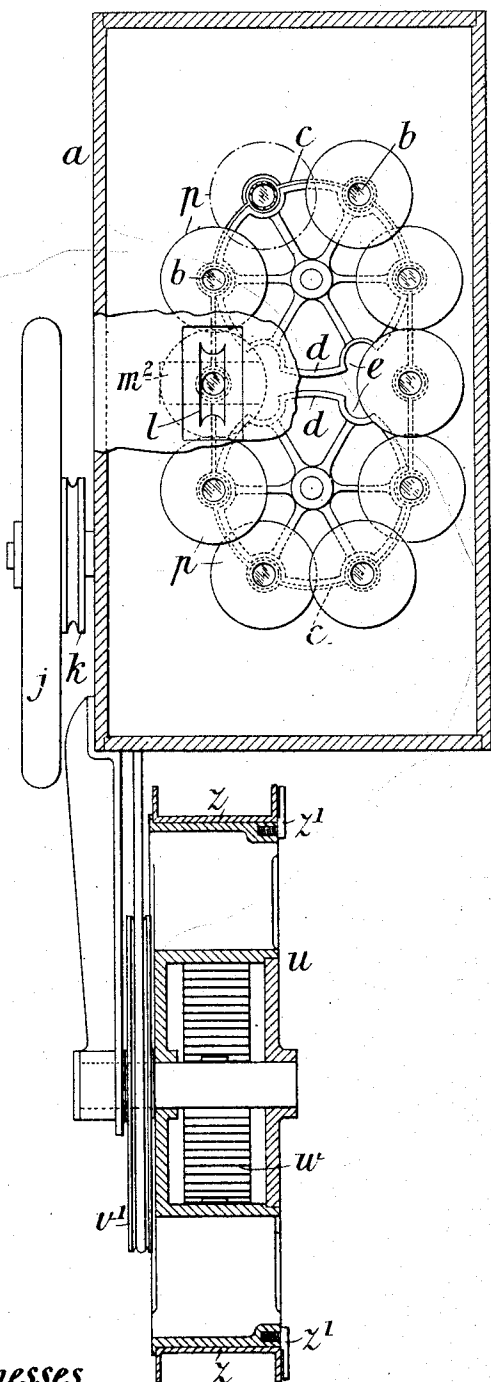
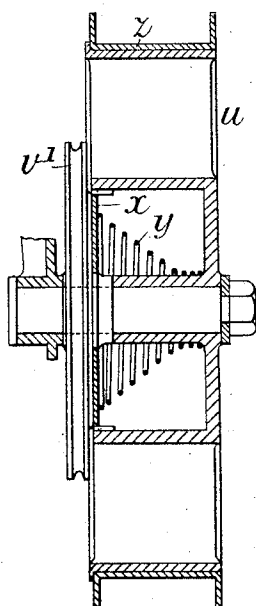


Fig 4



Witnesses

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UNITED STATES PATENT OFFICE.

JOHAN WILHELM HOLST, OF AMSTERDAM, NETHERLANDS.

KINEMATOGRAPHIC LANTERN OR APPARATUS.

SPECIFICATION forming part of Letters Patent No. 587,527, dated August 3, 1897.

Application filed December 23, 1896. Serial No. 616,783. (No model.)

To all whom it may concern:

Be it known that I, JOHAN WILHELM HOLST, a subject of the Queen of the Netherlands, residing at Amsterdam, Netherlands, have invented new and useful Improvements in Kinematographic Lanterns or Apparatus, of which the following is a specification.

My invention relates to lanterns for projecting kinematographic pictures onto a screen. In apparatus of this class as heretofore constructed there is a considerable amount of vibration set up, owing to the rapid intermittent motion of some of the parts. The object of my invention is to overcome this vibration, and to this end I provide the improvements hereinafter described.

In carrying out my invention I advantageously provide the following arrangement of mechanism: I fix the series of lenses in an endless band (hereinafter referred to as the "lens-carrier") mounted upon two wheels or drums having peripheral recesses to receive the said lenses, and I provide driving mechanism for moving this lens-carrier at a predetermined speed. The film-band is drawn from a suitable drum over guide-rollers and a feed-roller, which latter is connected with the lens-carrying drums—for instance, by screw-gearing—so that the lens-carrier and picture-band will move at the proper speed. The feed-roller may move the picture-band either by friction or by means of pins or points engaging with the edges of the band. The picture-band after passing the feed-roller is wound onto a drum driven positively but capable of an independent motion—such, for instance, as is provided for by connecting the said drum to its axle by means of a volute spring or by a friction-coupling.

To enable my invention to be fully understood, I will describe the same by reference to the accompanying drawings, in which—

Figure 1 is a sectional side elevation of my improved apparatus. Fig. 2 is a sectional plan view of the same. Fig. 3 is a sectional front elevation. Fig. 4 is a sectional view illustrating a modification.

Similar letters of reference indicate similar or corresponding parts throughout the drawings.

a is the box or body of the lantern.

b b are the projecting lenses, and *c* is the

lens-carrier, which carrier is advantageously made of two strips of thin spring-steel, bent at suitable points to receive the lenses between them and riveted together between the said lenses.

d d are the two wheels or drums carrying the series of lenses and having recesses *e e* in their peripheries to receive the projections caused by the lenses on one side of the lens-carrier. The wheels *d d* are mounted on two shafts *f f'*, carried in bearings *g g*, fixed to a partition *h* in the box *a*, the shaft *f'* being extended through the said partition, so that motion may be imparted to it and consequently also to the lens-carrier through the medium of a shaft *h'* and suitable gear-wheels *i i*. As shown in the drawings, screw gear-wheels are shown for transmitting the motion of the shaft *h'* to the shaft *f'*, but any other suitable form of gearing may, however, be used for the purpose.

j is a fly-wheel attached to the shaft *h'* for obtaining regularity of movement, and *k* is a pulley by means of which the power of a motor—say, for instance, a small electric motor—may be applied to the apparatus through the medium of a belt for operating the same.

l is an opening in the front of the lantern past which the lenses are successively moved, and *m* is a small box mounted in the partition *h* and having in it openings *m' m''*, past the latter of which the picture-band *n* is moved at the same speed as the lenses.

o is an electric lamp or lighting apparatus, and *o'* is a condenser.

In practice the lenses are arranged at such distances apart that the marginal rays projected through one lens will not intersect those projected through the preceding lens.

In order to prevent light from reaching the screen except through the lenses, the said lenses have in connection with them disks *p p*, which overlap each other and form a shutter, as shown in Figs. 1 and 3.

The picture-band *n* is drawn from the drum *q* (hereinafter referred to as the "store-drum") over the guide-rollers *r r*, around the feed-wheel *s*, and over the guide-rollers *t t* onto the winding-drum *u*. The motion of the band is effected through the medium of the feed-wheel *s*, which is mounted upon the shaft *h'*, and the diameter of which is such that it

moves the band n at precisely the same speed as that at which the lenses move. As hereinbefore stated, if the friction of the film-band upon the surface of the feed-wheel s is not deemed sufficient to cause the proper feeding of the said band pins or points adapted to engage with the edges of the band may be employed.

A brake of any suitable construction is applied to the store-drum to prevent it from unwinding too fast and to maintain the tension of the band.

The drum u , onto which the band is wound after illumination, is driven from the shaft h' through the medium of the pulleys v v' , which are so proportioned to each other that the peripheral speed of the said drum will correspond with that of the feed-wheels. As, owing to the winding of the band upon the said drum, the diameter of the winding-surface will increase and so tend to move the band forward faster than it is moved by the feed-wheel, I provide that the peripheral speed of the surface onto which the film-band is wound shall remain uniform—that is to say, I arrange a volute spring w between the axle of the said drum and the drum itself, as will be clearly understood by reference to Figs. 1 and 2. With this arrangement the excess of speed which the said axle has beyond that of the drum will be absorbed by the said spring, which will be more or less coiled up. The said spring must in all cases be applied so that its tendency to uncoil serves to maintain the band taut.

Before attaching the end of the picture-band to the drum u it is advisable to give the drum one or two turns in order to put the spring under sufficient tension to maintain the band taut.

Instead of transmitting the motion to the drum u through the spring w , I may arrange in conjunction with the said drum a disk x ,

which rotates with the drum, but which is pressed into frictional contact with a friction-surface on the pulley v' by a spring y in a manner which will be clearly understood by reference to Fig. 4.

The friction between the disk x and the surface of the pulley v' must at all times be sufficient to rotate the drum, but at the same time permit of the pulley v' moving forward independently of the drum should the latter be retarded, the slip taking place between the said disk x and the surface of the pulley against which it bears.

It will be noticed in the drawings that the drum u is represented as provided with a false rim z , onto which the picture-band is wound and which is capable of being removed from the drum with the band upon it. Any means may be employed for fixing the false rim upon the drum u . As shown in the drawings, I have represented small turnbuckles z' as being used for the purpose.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

In a cinematographic lantern, the combination with the endless carrier, a pair of rotary supporting devices therefor, the portions of said carrier between the supporting devices being maintained in a straight line, a series of lenses carried by said carrier, means for supporting a film in line with the path of said lenses, intermediate said supporting devices, an illuminating device in rear of said film and means for moving said film and carrier uniformly at the same speed and in the same direction, substantially as described.

JOHAN WILHELM HOLST.

Witnesses:

G. F. REDFERN,

JOHN E. BOUSFIELD.