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PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Slide Projector

We, FRANKE & HEIDECHE G.M.B.H. A German body corporate, trading as ROLLEI-WERKE FRANKE & HEIDECHE, of 196 Salzdh-lumerstrasse, Brunschweig, Germany, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 This invention relates to a slide-change drive in slide projectors, more especially magazine-type projectors, said drive including a driven shaft which makes one revolution for each slide-changing operation.

15 It is possible to arrange on the shaft a cam disc which, on each complete cycle, opens a contact which, for example, connects an electromagnetic coupling for the shaft to a constantly running driving motor. For a fresh start, this contact only has to be closed temporarily. With such an arrangement, the motor can also be used for driving a cooling fan. It is also possible to provide a separate motor for the slide-changing drive, which motor is switched on and off by the said contact.

25 The switching on and off of an electromagnetic coupling or clutch does in fact take place practically without any delay, so that there is no obstacle in this respect to considerably accelerating the changing of the slides; however, the inertia of the parts of the drive mechanism which are to be accelerated and retarded becomes more prohibitive as the speed of the slide-changing operation is increased. When using a motor which can be switched on and off, the centrifugal moment of the armature is a factor such that the point at which the drive mechanism stops, more especially at relatively high changing speeds, cannot be exactly defined unless additional engageable and disengageable stops are also provided. An additional factor is that if the release contact is unintentionally actuated for a long time, several slide-changing operations take place.

45 It is an object of the invention to provide, [Price 4s. 6d.]

in a simple constructional manner, a slide change drive in which:

1) an exactly defined stopping point of the drive is produced;

2) continued rotation, e.g. continuous slide changing, is prevented, even when the release member is permanently actuated, so that in every case only one forward step can occur with each actuation; and

3) both of these conditions are achieved even at high slide-changing speeds.

According to the invention there is provided a slide projector, having a slide change drive including a driven shaft which makes one revolution with each slide-changing operation, comprising a ratchet wheel fixed on a driving shaft, a driving pawl mounted on the driven shaft, said pawl being urged by spring action into engagement with the ratchet wheel, and a disengageable stop disposed in its rest position in the path of movement of a tail on the pawl so that the latter is disengaged from the ratchet wheel when the stop is abutted by the pawl tail.

Preferably a second stop is provided which is connected to the first stop and in its operative position, is disposed in the path of the pawl tail in the direction of rotation of the pawl. The disengagement and engagement of these stops can be effected mechanically by direct manual actuation or electrically by means of an electromagnet.

As well as achieving the objects set forth above, the drive according to the invention has the advantage that coupling of the two shafts is maintained throughout the entire slide-changing cycle if, for example, the current fails during the slide-changing operation.

One embodiment of the invention is illustrated by way of example in the accompanying drawing;

Figure 1 showing the arrangement in the rest position, and

Figure 2 the arrangement in the slide-changing position, while

Figure 3 is an end view of the pawl stop.

Fixed on a driving shaft 1, which is constantly rotating, is a driver ratchet wheel 2. A hollow driven shaft 5 is fitted concentrically on the shaft 1 and carries at one of its ends a gear-wheel 3, which drives the slide changer proper (not shown). The other end of the shaft 5 carries a flange 4 on which is a stud 6 carrying a pawl 7. The pawl is urged towards engagement with the ratchet wheel 2 by a spring 13 loaded by contact with a pin 8 on the flange 4 which also serves to limit pivotal movement of the pawl. A tail 18 on the pawl projects beyond the contour of the flange 4. Disposed in the path of pivotal movement of the pivotal movement of the pawl tail 18 is a pallet 11 which is rockable about a fixed spindle 15 arranged with its axis perpendicular to the axis of stud 6 and which is pulled against a stop 17 by the action of a tension spring 16. The pallet is formed with teeth 9 and 10, the tooth 10 being offset from the plane of the pallet and the tooth 9, as shown in Figure 3.

In the rest position of the pallet 11 (Figure 1) the tooth 9 is disposed in the plane of movement of the pawl 7, so that the pawl is held disengaged from the teeth of the ratchet wheel 2 when its tail 18 abuts against the tooth 9 and the shaft 5 remains stationary. When the pallet 11 is rocked in the clockwise direction to the position of Figure 2, the tooth 9 slides forwardly off the pawl tail 18. As a result, the spring 13 urges the pawl 7 into engagement with the ratchet wheel 2, so that now the pawl, the flange 4 and the shaft 5 are coupled to the shaft 1. With this pivotal movement of the pallet 11, the tooth 10 is now located in the path of rotation of the pawl tail 18. After almost one revolution, the tail 18 strikes against the tooth 10, whereby the pawl 7 is disengaged and the coupling from the shaft 1 is broken. When, thereafter, the pallet is released and returns to the position of Figure 1 under the action of spring 16, the tooth 10 slides off the pawl tail 18 while simultaneously the tooth 9 moves into the path of said tail, so that the shaft 5 is further rotated until it is again in the position according to Figure 1.

If the pallet were freed again immediately after the pawl release operation, only the tooth 9 would be in the path of the pawl tail 18, so that the pawl, after one cycle of the shaft 5, would directly reach the end position according to Figure 1. The pallet 11 can be actuated mechanically or by an electromagnet 14 as illustrated in the drawing. The tooth 10 is thus only effective when the pallet 11 is permanently released; if the pallet 11 is freed again each time immediately after release of the pawl, then it is only the tooth 9 which is effective as a stop at the rest position and the release member.

WHAT WE CLAIM IS:—

1. A slide projector, having a slide change drive including a driven shaft which makes one revolution with each slide-changing operation, comprising a ratchet wheel fixed on a driving shaft, a driving pawl mounted on the driven shaft, said pawl being urged by spring action into engagement with the ratchet wheel, and a disengageable stop disposed in its rest position in the path of movement of a tail on the pawl so that the latter is disengaged from the ratchet wheel when the stop is abutted by the pawl tail.
2. A slide projector as claimed in Claim 1, wherein the stop is movable perpendicularly to the plane of rotation of the pawl.
3. A slide projector as claimed in Claim 1 or 2, wherein a second stop is connected to the first stop and in its operative position, is located in the path of the pawl tail in the direction of rotation of the pawl.
4. A slide projector as claimed in Claim 3, wherein the two stops are formed as teeth on a pallet or on the armature of an electromagnet.
5. A slide projector as claimed in Claim 1 substantially as described with reference to and as illustrated in the accompanying drawings.

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Fixed on a driving shaft 1, which is constantly rotating, is a driver ratchet wheel 2. A hollow driven shaft 5 is fitted concentrically on the shaft 1 and carries at one of its ends a gear-wheel 3, which drives the slide changer proper (not shown). The other end of the shaft 5 carries a flange 4 on which is a stud 6 carrying a pawl 7. The pawl is urged towards engagement with the ratchet wheel 2 by a spring 13 loaded by contact with a pin 8 on the flange 4 which also serves to limit pivotal movement of the pawl. A tail 18 on the pawl projects beyond the contour of the flange 4. Disposed in the path of pivotal movement of the pivotal movement of the pawl tail 18 is a pallet 11 which is rockable about a fixed spindle 15 arranged with its axis perpendicular to the axis of stud 6 and which is pulled against a stop 17 by the action of a tension spring 16. The pallet is formed with teeth 9 and 10, the tooth 10 being offset from the plane of the pallet and the tooth 9, as shown in Figure 3.

In the rest position of the pallet 11 (Figure 1) the tooth 9 is disposed in the plane of movement of the pawl 7, so that the pawl is held disengaged from the teeth of the ratchet wheel 2 when its tail 18 abuts against the tooth 9 and the shaft 5 remains stationary. When the pallet 11 is rocked in the clockwise direction to the position of Figure 2, the tooth 9 slides forwardly off the pawl tail 18. As a result, the spring 13 urges the pawl 7 into engagement with the ratchet wheel 2, so that now the pawl, the flange 4 and the shaft 5 are coupled to the shaft 1. With this pivotal movement of the pallet 11, the tooth 10 is now located in the path of rotation of the pawl tail 18. After almost one revolution, the tail 18 strikes against the tooth 10, whereby the pawl 7 is disengaged and the coupling from the shaft 1 is broken. When, thereafter, the pallet is released and returns to the position of Figure 1 under the action of spring 16, the tooth 10 slides off the pawl tail 18 while simultaneously the tooth 9 moves into the path of said tail, so that the shaft 5 is further rotated until it is again in the position according to Figure 1.

If the pallet were freed again immediately after the pawl release operation, only the tooth 9 would be in the path of the pawl tail 18, so that the pawl, after one cycle of the shaft 5, would directly reach the end position according to Figure 1. The pallet 11 can be actuated mechanically or by an electromagnet 14 as illustrated in the drawing. The tooth 10 is thus only effective when the pallet 11 is permanently released; if the pallet 11 is freed again each time immediately after release of the pawl, then it is only the tooth 9 which is effective as a stop at the rest position and the release member.

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1. A slide projector, having a slide change drive including a driven shaft which makes one revolution with each slide-changing operation, comprising a ratchet wheel fixed on a driving shaft, a driving pawl mounted on the driven shaft, said pawl being urged by spring action into engagement with the ratchet wheel, and a disengageable stop disposed in its rest position in the path of movement of a tail on the pawl so that the latter is disengaged from the ratchet wheel when the stop is abutted by the pawl tail.
2. A slide projector as claimed in Claim 1, wherein the stop is movable perpendicularly to the plane of rotation of the pawl.
3. A slide projector as claimed in Claim 1 or 2, wherein a second stop is connected to the first stop and in its operative position, is located in the path of the pawl tail in the direction of rotation of the pawl.
4. A slide projector as claimed in Claim 3, wherein the two stops are formed as teeth on a pallet or on the armature of an electromagnet.
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