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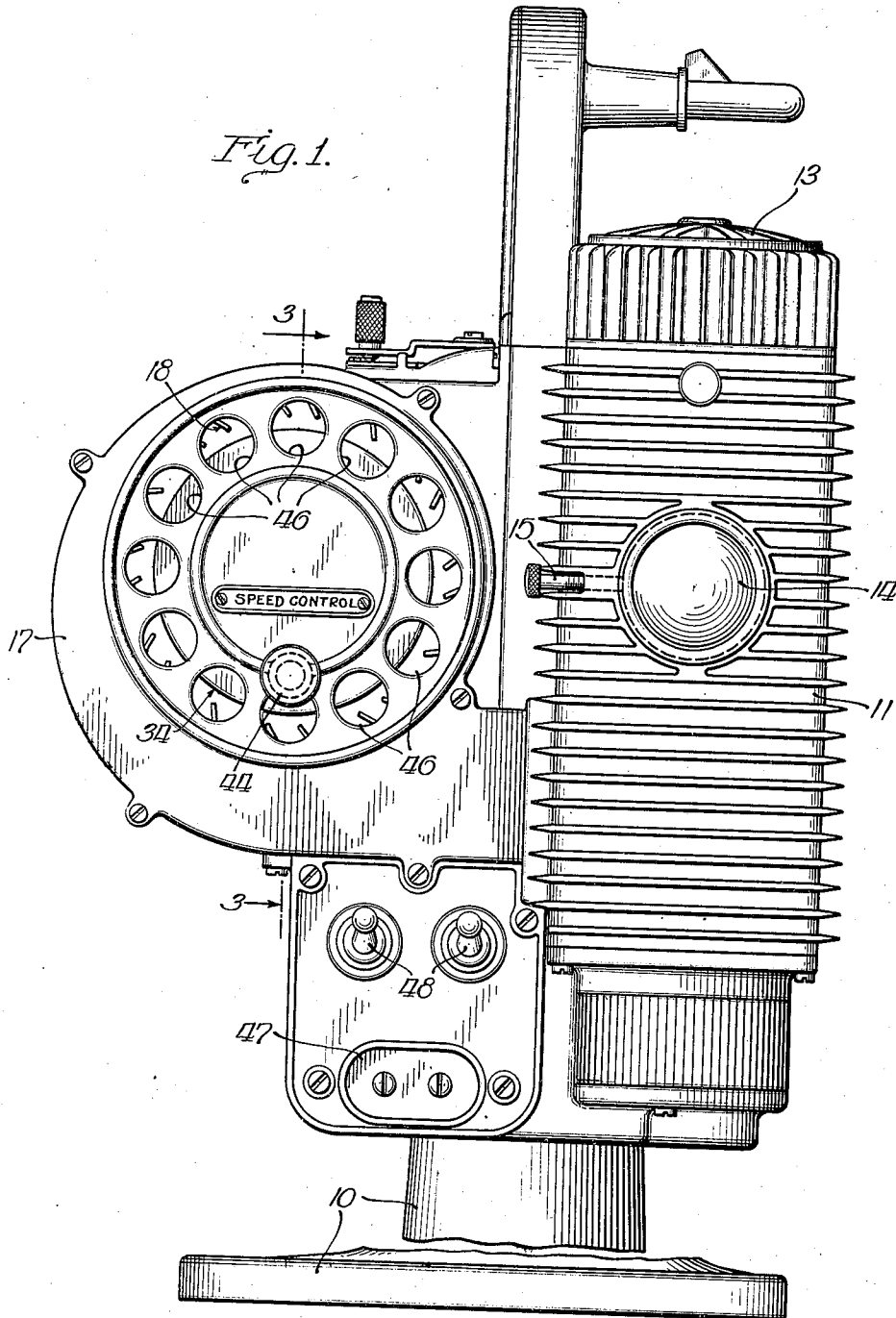
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SPEED CONTROL MEANS FOR PROJECTORS

Filed June 24, 1939

2 Sheets-Sheet 1



INVENTOR,-
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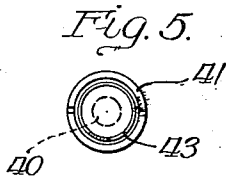
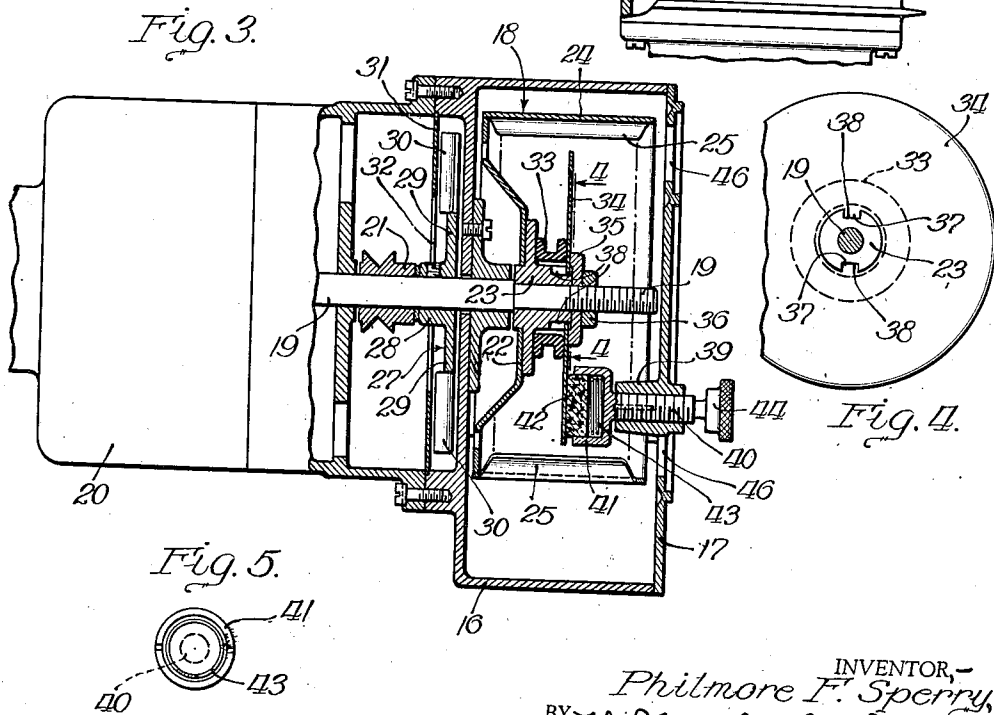
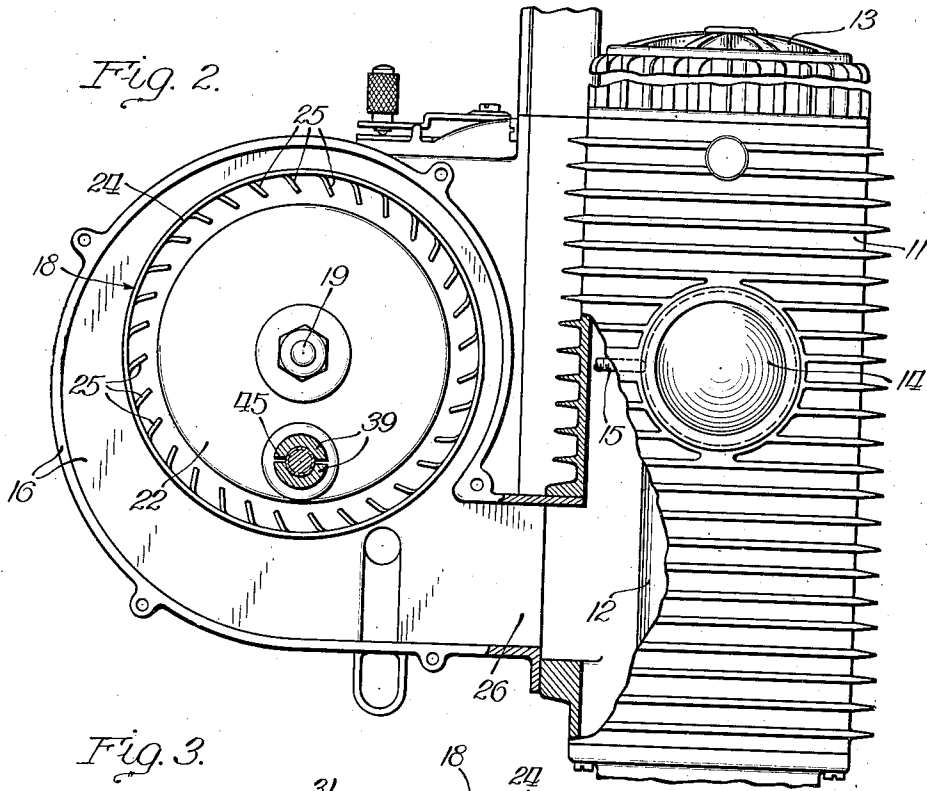
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SPEED CONTROL MEANS FOR PROJECTORS

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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SPEED CONTROL MEANS FOR PROJECTORS

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Application June 24, 1939, Serial No. 280,948

10 Claims. (Cl. 188—83)

This invention relates to speed control means for the motors of kinetoscopic projectors, and it has for its object the provision of a new and improved form and arrangement of parts by which the control of machines of this type shall be improved while at the same time the control means shall be kept simple in form so as to be easily and quickly regulated and so as to be capable of being produced easily and cheaply.

In the arrangement shown, the several objects have been effected by the provision of a resilient disk arranged so as to rotate with the motor shaft, said disk being supported in position by a yielding bearing member which is adapted to yield longitudinally of the shaft when pressure is applied thereto both by reason of the resiliency of the bearing member and by reason of the resiliency of the disk itself. In the construction illustrated, braking means have been provided engaging the face of the disk, comprising a block of cork which is adjustably mounted so as to be movable longitudinally of the shaft for varying the pressure conditions between the disk and the block, the means for pressing the block into contact with the disk also comprising preferably a yielding member.

It is another object of this invention to provide a compact construction by reason of which the operating parts shall take up a minimum of space within the housing of the machine. For accomplishing this purpose, the braking means have been mounted on the shaft at a point within the centrifugally acting fan or pump by which a stream of air is energized for cooling the portion of the housing within which the lamp is located. For further carrying out the object of providing compactness of arrangement, a second fan member has been provided upon the motor shaft adjacent to the fan first mentioned for drawing air through the motor for keeping it at the desired working temperature.

It is another object of this invention to improve devices of this type in sundry details hereinafter pointed out. The preferred means by which the several objects of the invention have been accomplished are illustrated in the accompanying drawings, in which—

Fig. 1 is a rear face view of a projector embodying a preferred form of the invention, partially broken away at the base portion thereof;

Fig. 2 is a view similar to a portion of Fig. 1, but with the rear housing plate removed at one side of the machine and with a portion of the housing broken away at the opposite side;

Fig. 3 is a vertical sectional view taken substantially at the line 3—3 of Fig. 1;

Fig. 4 is a vertical sectional view taken substantially at the line 4—4 of Fig. 3; and

Fig. 5 is a face view of a socket member and a coiled spring therein for holding the braking block yieldingly in position, as seen from the left in Fig. 3 with the braking block removed.

Referring now to the several figures of the drawings, in which corresponding parts are indicated by the same reference characters, 10 indicates a standard of any suitable type for supporting the improved projector. The portion of the projector shown comprises a housing member 11 within which a lamp 12 is mounted, the top wall portion 13 of the housing being provided with openings for permitting ventilation. In the arrangement shown, a reflector 14 of any suitable type is removably held in position in the back wall of the housing member 11 by means of a securing screw 15 engaging the side face of the reflector unit.

At the rear face portion of the machine, a housing 16 is provided at the opposite side from that at which the housing member 11 is positioned, such housing member in the arrangement shown being closed normally by means of a plate 17, as is shown in Fig. 1. Within the housing 16, there is mounted a centrifugal fan or pump 18, such fan being mounted upon the shaft 19 of a motor 20 positioned in front of the housing 16, as is clearly shown in Fig. 3. In the arrangement shown, the motor 20 is an electric motor, but it may be of any other suitable type as may be desired. At an intermediate point between the fan or pump 18 and the motor 20, a drive pulley 21 is fixedly mounted in position on the shaft 19 for driving the shutter and the controlling and moving means for a film to be carried through the machine by intermittent movements as is well understood in the projector art. Inasmuch as the means for driving the film intermittently from the shaft 19 forms in and of itself no part of the present invention, such means is not shown nor described.

As is clearly shown in Fig. 3, the fan or pump 18 comprises a sheet metal disk 22 fixedly mounted in position upon a head member 23 carried by the motor shaft 19, the disk 22 being connected at its outer edge with a cylindrical sheet metal member 24 in the form of a drum or cage, the wall of which is cut out at intervals and shaped for providing fins or paddles 25 in spaced relation to each other about said member. The arrangement is such, as is well understood in

connection with devices of this type, that when the drum 24 is driven in counter clockwise direction in Fig. 2 a stream of air is forced toward the right in Fig. 2 through an outlet port 26 into the housing 11 so as to be brought into effective contact with the lamp 12 for preventing the production of unduly high temperatures in the lamp chamber.

Upon the shaft 19 adjacent to the front wall of the housing 16, there is mounted a second fan 27, said second fan comprising a heavy plate or bracket 28 provided with arms 29, the outer end portions 30 of which are obliquely disposed for causing a stream of air to pass through the housing of the motor 20 for cooling it during the operation of the motor. In front of the fan 27, a partition plate 31 is provided covering the outer end portions of the blades 30 of the fan 27 so as to cause the air moved by the fan to pass into fairly close proximity to the shaft 19 and the driving pulley 21 through a central opening 32 in said partition plate, as is clearly shown in said Fig. 3.

On the rear face of the head member 23, about a rearwardly extending hub portion thereof, there is mounted a ring 33 of rubber, the ring in the arrangement shown being in the form of a channel in cross section. Next to the ring 33, a thin resilient plate 34 of steel is mounted also about the hub portion of the head 23, such plate 34 being held in position by means of a washer 35 which in turn is held in position by a nut 36 secured by means of screw-threads upon the motor shaft 19. As is clearly shown in Fig. 4, the plate 34 is provided with lugs 37 at its central opening which are adapted by engagement with grooves 38 in the head member 23 to hold the plate 34 against rotary movement with respect to the head member. The arrangement of the parts is such that when the nut 36 is tightened in position the ring 33 is compressed slightly between the plate 34 and the head member 23. The compression of the rubber ring member 33 is not so great however as to prevent the plate 34 from moving readily toward the support 22 when pressure is applied on said plate 34 from the right in Fig. 3.

Upon the plate 17 which closes the housing 16 at the rear as above described, there is provided a sleeve 39 which in the arrangement shown is formed integrally with said plate 17. Within the sleeve 39, I have mounted a pin 40 by means of screw-threads, such pin 40 being provided on its front end with a socket member 41 in the form of a cup within which a bearing member 42 of cork is slidably mounted in position to engage the rear face of the plate 34. In the arrangement shown, a coiled spring 43 is interposed between the bearing block 42 and the rear wall portion of the socket member 41 serving normally to urge the bearing member 42 constantly against the rear face of the plate 34. Upon its outer end, the pin 40 is provided with a knurled head 44 by which the pin may be rotated for adjusting the socket and the bearing member 42 toward or away from the plate 34. As is best shown in Fig. 2, the sleeve 39 is split transversely at 45 at its front end portion, and the sleeve 39 is flattened slightly so as to have a frictional grip upon the pin 40 for holding it normally in adjusted position.

The improved arrangement as above described is effective for controlling the speed of rotation of the shaft 19. With the plate 34 resilient in form and resiliently mounted upon the head 23, being formed preferably of steel, and with the

socket 41 adjusted with respect to the plate, the bearing member 42 of cork serves as a brake for frictionally controlling the movement of the plate 34 so as to regulate its speed of rotation. The arrangement is sufficiently flexible as to respond quickly to varying applications of power through the shaft 19, the arrangement being such as to maintain the speed of rotation of the shaft constant to a high degree of accuracy during the application of power continuously to the shaft from the electric motor 20 or from any other desired type of power means. If it is desired that the speed of rotation be cut down slightly, the pin 40 and the bearing member 42 are adjusted to a very slight extent toward the left in Fig. 3, as will be readily understood.

In the arrangement shown, the closure plate 17 is provided with a series of openings 46 there-through for the admission of air to the fan 18. Electric current is to be fed to the motor 20 by means of a socket member 47 as shown in Fig. 1, and switch devices 48 of any suitable type are provided for controlling the delivery of current to the motor 20 and to the lamp 12.

While I prefer to employ the form and arrangement as shown in my drawings and as above described, it is to be understood that my invention is not limited to such form and arrangement except so far as the claims may be so limited, since changes might well be made in the construction without departing from my invention.

I claim:

1. In a mechanism of the type described, the combination of a support, a shaft rotatably mounted on said support, a thin resilient plate of metal mounted on said shaft in transverse position thereon so as to rotate with the shaft, a second support in spaced relation to said plate, and a bearing member having a face portion of frictional material adjustably mounted on said second support so as to be movable longitudinally of the shaft for pressing with a variable degree of pressure against said plate at one point only adjacent to its periphery for controlling the speed of rotation of said shaft and serving to displace said plate slightly longitudinally of the shaft at the point of pressure thereon.

2. In a mechanism of the type described, the combination of a support, a shaft rotatably mounted on said support, a plate yieldingly mounted on said shaft in transverse position thereon so as to rotate with the shaft and so as to move slightly longitudinally of the shaft, a second support in spaced relation to said plate, and a bearing member having a face portion of frictional material adjustably mounted on said second support so as to be movable longitudinally of the shaft for pressing with a variable degree of pressure against said plate for controlling the speed of rotation of said shaft.

3. In a mechanism of the type described, the combination of a support, a shaft rotatably mounted on said support, a thin resilient steel plate yieldingly mounted on said shaft in transverse position thereon so as to rotate with the shaft and so as to be movable slightly longitudinally of the shaft, a second support in spaced relation to said plate, and a bearing member having a face portion of cork adjustably mounted on said second support so as to be movable longitudinally of the shaft for pressing with a variable degree of pressure against said plate for controlling the speed of rotation of said shaft.

4. In a mechanism of the type described, the

combination of a support, a shaft rotatably mounted on said support, a head fixedly mounted on said shaft, a ring of yielding material engaging said head about said shaft, a plate on said shaft in engagement with said yielding ring, means for pressing said plate toward said head so as to compress said ring, a second support in spaced relation to said plate, and a bearing member adjustably mounted on said second support so as to be movable longitudinally of the shaft for pressing with a variable degree of pressure against said plate for controlling the speed of rotation of said shaft.

5. In a mechanism of the type described, the combination of a support, a shaft rotatably mounted on said support, a head fixedly mounted on said shaft, a ring made of yielding material in the form of a channel with one side face bearing against said head concentrically thereof, a thin resilient plate of metal mounted on said shaft in transverse position thereon so as to rotate with the shaft in engagement with said ring, means for holding said ring normally pressed against said head, a second support in spaced relation to said plate, and a bearing member adjustably mounted on said second support so as to be movable longitudinally of the shaft for pressing with a variable degree of pressure against said plate for controlling the speed of rotation of said shaft.

6. In a mechanism of the type described, the combination of a support, a shaft rotatably mounted on said support, a thin resilient steel plate yieldingly mounted on said shaft in transverse position thereon so as to rotate with the shaft and so as to be movable slightly longitudinally of the shaft, a second support in spaced relation to said plate, a bearing member, and means for mounting said bearing member adjustably in position on said second support so as to be movable longitudinally of the shaft for pressing with a variable degree of pressure against said plate for controlling the speed of rotation of said shaft and including a spring adapted to permit the bearing member to move a short distance in the direction away from the plate.

7. In a mechanism of the type described, the combination of a support, a shaft rotatably mounted on said support, a thin resilient steel plate yieldingly mounted on said shaft in transverse position thereon so as to rotate with the shaft and so as to be movable slightly longitudinally of the shaft, a second support in spaced relation to said plate, a bearing member having an operative face portion of cork, and means for mounting said bearing member adjustably in

position on said second support so as to be movable longitudinally of the shaft for pressing with a variable degree of pressure against said plate for controlling the speed of rotation of said shaft and including a spring adapted to permit the bearing member to move a short distance in the direction away from the plate.

8. In a mechanism of the type described, the combination of a support, a shaft rotatably mounted on said support, a member carried around by said shaft having a face portion disposed transversely of the shaft and adapted to yield lengthwise of the shaft upon the application of a slight pressure thereon, a second support in spaced relation to said first-named support, a socket member adjustably mounted on said second support so as to be movable longitudinally of the shaft toward and from said transversely disposed face portion, a bearing member slidably mounted in said socket member so as to be movable thereby longitudinally of the shaft for pressing with a variable degree of pressure against said plate for controlling the speed of rotation of said shaft, and a coiled spring in said socket adapted by engagement with said bearing member to press it yieldingly against said plate.

9. In a mechanism of the type described, the combination of a housing, a rotor in the form of a cage in said housing, a shaft rotatably mounted in said housing for driving said rotor, a thin resilient metal plate mounted on said shaft within said rotor transversely thereof so as to rotate with the shaft, and a bearing member adjustably mounted adjacent to said plate so as to be movable longitudinally of the shaft for pressing with a variable degree of pressure against said plate for controlling the speed of rotation of said shaft and said rotor.

10. In a mechanism of the type described, the combination of a housing having a removable closure plate forming one side face of the housing, a rotor in the form of a cage in said housing, a shaft rotatably mounted in said housing for driving said rotor, a thin resilient metal plate yieldingly mounted on said shaft within said rotor transversely thereof so as to rotate with the shaft and so as to be movable slightly longitudinally of the shaft, a bearing member having a facing of cork next to said plate, and means mounted on said cover plate for holding said bearing member in engagement with said plate and adjustable for causing said bearing member to press with a variable degree of pressure against said plate for controlling the speed of rotation of said shaft and said rotor.

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