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A. DINA

1,921,866

KEYING STRUCTURE FOR MOTION PICTURE PROJECTION MACHINES

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Fig. 3.

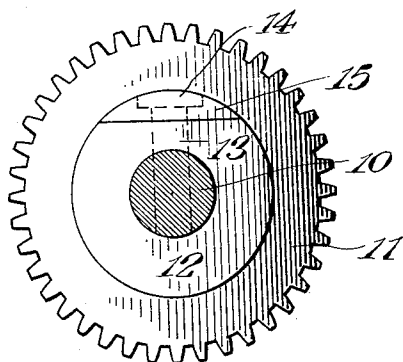


Fig. 1.

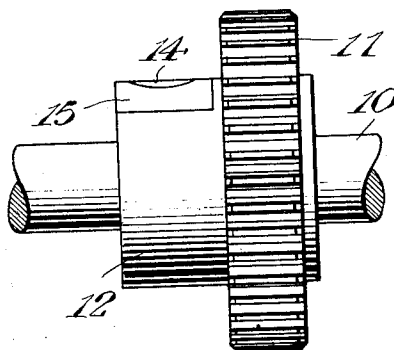


Fig. 2.

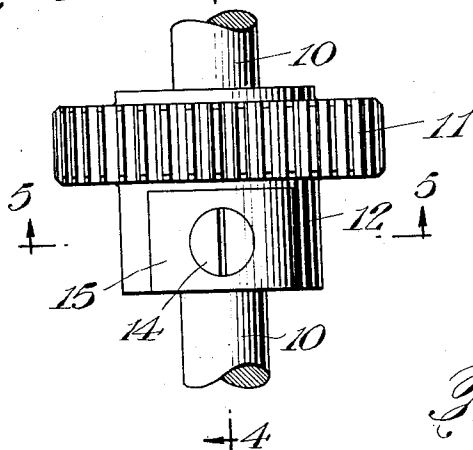


Fig. 4.

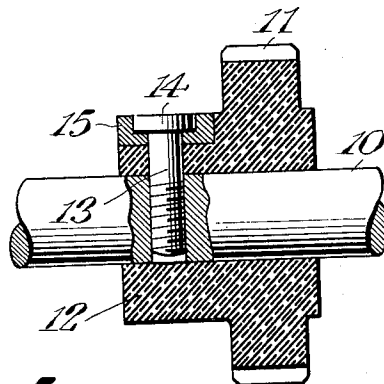
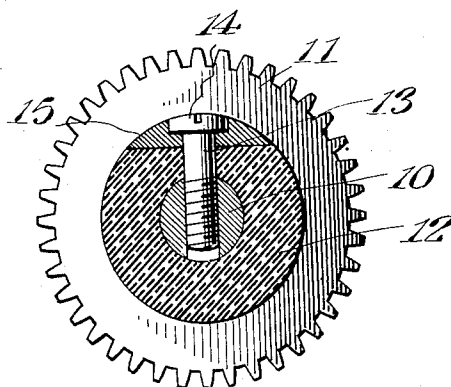


Fig. 5.



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KEYING STRUCTURE FOR MOTION PICTURE PROJECTION MACHINES

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3 Claims. (Cl. 287—52.08)

This invention relates to new and useful improvements in construction whereby an element such as a roller, gear and the like may be keyed to a support.

The object of the invention is to provide a simple, efficient construction whereby a roller or gear or similar element may be firmly attached to a support such as a shaft by a key or other device without tending to harm or damage the supported element during use especially when the supported element is of material which might otherwise be damaged during the stresses and strains of use.

Further and more specific objects, features, and advantages will more clearly appear from the detailed description given below when taken in connection with the accompanying drawing which forms part of the specification and which illustrates one present preferred form of the invention.

In the general contemplation of the invention it is to be observed that when a roller, gear, or other element is to be fastened to a support such as a shaft, there is generally used a key means such as a set screw the head of which bears in a countersink on the surface of the element and the other end of which engages the surface of the shaft or extends into a keyway therein. Now if the element such as the gear is made of wood or rubber or other composition other than metal, it is quite possible that when the key means is tightened against the surface thereof that the pressure and the stresses incidental to use and wear will cause the surface against which the head of the key bears to become worn and damaged and the tightness of the engagement between the key and the element will thus be reduced and become ineffectual. This is for the reason that in most cases where an element of wood or bakelite or formica or other composition is employed, the key is a metal screw and the head of this in use and when screwed down tightly will wear and bite into the material of the element which is much softer and will damage it and ruin the keying action in a short time especially where there is power of varying values being transmitted.

Because of these difficulties, the present invention has been developed to provide the surface of the element, adjacent and including the area occupied by the head of the key, as formed of or made into such a material as will be much harder than the material of which the main body of the element is formed and which will

thereby resist the wearing and biting action of the key head much more effectively. For instance, in a formica gear body, the portion which receives the screw head is cut away and there is substituted a portion of harder material such as metal in the form of what may be called a saddle which lies beneath the head of the key screw and this saddle takes the wear and tear of the screw. The saddle has a contact area with the gear which is much larger than the area of the head of the screw so that the pressure of the screw on the saddle is by it distributed over a generous area and therefore the pressure per square inch on the softer material of the gear is reduced and consequently the likelihood of the material of the gear wearing out faster due to this key pressure is entirely eliminated.

The drawing shows the present preferred form of the invention and in them,

Fig. 1 is a side elevation of a shaft with a gear keyed thereto;

Fig. 2 is a plan view thereof;

Fig. 3 is an end elevation of the same;

Fig. 4 is a longitudinal section on the line 4—4 of Fig. 2, and

Fig. 5 is a transverse section on the line 5—5 of Fig. 2.

In accordance with the form of the invention preferred and shown in the drawing, the invention contemplates the attachment to a shaft or support 10 of an element such as a gear 11 having a hub 12. The gear 11 is of any suitable material which for instance may be a composition such as bakelite or formica.

This element through the hub 12 may be fastened to the shaft 10 by means of a suitable keying element such as the screw 13 the head 14 of which ordinarily bears against the surface of the gear in a countersink formed therein. In this instance, however, and because the gear 10 is made of wearable material, that portion of its surface which includes and lies adjacent the head of the key or screw 13 is cut away and there is substituted a bearing surface of harder material such as metal which is preferably called a saddle 15. The outer surface of this saddle 15 is curved to lie flush with the adjacent surface of the hub 12 and have the same curvature and is provided with a suitable countersink to receive the head 14 of the key 13. The inner surface of the saddle or bearing surface is flat to lie snugly against the exposed surface of the hub 12 and afford a surface of contact therewith which is of ample area to take the

pressure of the key screw as it is clamped or screwed down and distribute it over this ample area to reduce the pressure per square inch and thus lessen the damaging per square inch pressure on the softer material of the gear and hub. The contacting surfaces between the screw or key and the bearing surface or saddle are between materials somewhat alike as to their degree of hardness and therefore they will not damage each other even when the key is considerably tightened up.

The key may project all the way through the shaft 10 as shown or may project only a short way thereinto as into a groove therein if desired. The material of which the saddle 15 is made is optional as long as it is of sufficient hardness to take the pressure of the key head without wear and damage and distribute it over the larger under area without damage to the beneath softer gear or hub 12.

It is obvious that this action can not be effected by the use of an ordinary washer since the intimate contact here obtained is not obtained by the usual washer. The washer usually employed is not part of the gear or element whereas the saddle here shown is formed as part and parcel with the element and the transmission of the power is the same as if there were no saddle at all. Furthermore the washer is not provided with a countersink and is of lighter material and there is no variation between the area of the upper and lower surfaces thereof. The washer is an added element whereas this saddle is a substituted surface or element.

While the invention has been described in detail and with respect to a present preferred form thereof, it is not to be limited to such details or forms since many changes and modifications may be made and the invention embodied in other forms and modifications without departing from the spirit and scope of the invention in its broadest aspects. Hence it is desired to cover any and all forms and modifications which may

come within the language or scope of any one or more of the appended claims.

What is claimed is:

1. In combination, a shaft or support, an element such as a gear thereon, a key such as a screw to fasten the gear to the shaft, said gear being of non-metallic material, and a saddle of metal disposed between the screw or key head and the adjacent surface of the gear, said saddle having a flat inner surface to contact with the gear and an outer curved surface to simulate the curvature of the gear, and taking the pressure of the key and contacting with the head thereof, the area of contact between the head and the saddle being small and the area of contact between the saddle and the gear being relatively large to distribute over a larger area the pressure between the head and the saddle to prevent wear and damage to the gear surface.

2. In combination a shaft, an element with a curved peripheral surface of relatively soft material to be mounted on said shaft, said element having a peripheral portion cut away, a saddle of harder material having one surface to contact with the surface on the cut away portion and an opposite surface curving to simulate the continuation of the peripheral curvature of the element, and a screw passing through the saddle and the element to engage said shaft, the pressure of the head of the screw being taken by the harder surface of said saddle.

3. In combination, a hub of relatively soft material to be disposed on a shaft, said hub having a sector-shaped portion cut away, a saddle having one face flat to lie against the cut away portion of the hub and the opposite face curved to form a continuation of the curvature of the hub's periphery, said saddle being of metal, and a screw passing through the saddle and the hub to engage the shaft, the pressure of the head of the screw being taken by the saddle.

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