June 23, 1942. H. J. B. SCHARNBERG 2,287,454

KEY

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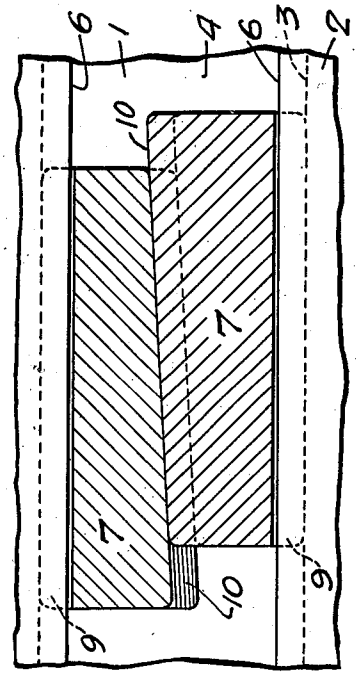

Fig. 2.

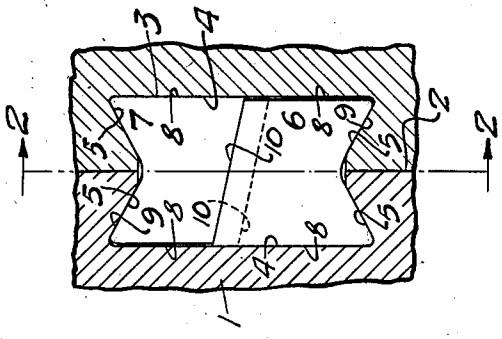

Fig. 1.

Inventor

HERMAN J. B. SCHARNBERG
DECEASED
MARIE M. SCHARNBERG, EXECUTRIX

By Ernest C. Mechlin
his Attorney

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KEY

Herman J. B. Scharnberg, deceased, late of Clewiston, Fla., by Marie M. Scharnberg, executrix, Staten Island, N. Y., assignor to said Marie M. Scharnberg

Application June 9, 1941, Serial No. 397,344

3 Claims. (Cl. 189—36)

This invention relates to a key adapted to secure two elements together.

An object of the invention is to provide a key adapted to maintain two elements in fixed relation irrespective of the forces to which they are subjected.

Another object of the invention is to provide, in a key, counterpart sections so arranged and constructed that they may be associated with a plurality of elements, and upon relative movement of the sections in a predetermined direction the elements will be secured together.

A further object of the invention is to provide a key formed of substantially counterpart sections for securing two elements together, the juncture of the sections being substantially normal to the juncture of the elements.

The above as well as numerous other objects will become apparent from a perusal of the succeeding description considered together with the accompanying drawing, wherein:

Figure 1 is a vertical sectional view taken through a structure embodying the present invention.

Figure 2 is a vertical sectional view taken along the lines 2—2 of Figure 1, looking in the direction of the arrows.

Referring now in detail to the drawing wherein like reference characters designate like parts, the numeral 1 is employed to refer to distinct elements, preferably two in number, which are associated or are positioned adjacent one another. The elements may represent separate portions of a wheel, pulley or roll and a shaft or may illustrate portions of two machine elements, such as a housing and a base. So far as the present invention is concerned it is only necessary that, without the intervention of any additional means, the elements would be movable relative to one another, and it is desirous to secure them together so as to permit them to function as a unitary structure or render them immovable between themselves. The elements have a contiguous surface or juncture 2 which presents a bearing area of appreciable extent therebetween. The elements have a conjoint wing-shaped keyway or spline 3 which may be more clearly described as a compound dovetail opening formed by two confronting substantially coextensive dovetail recesses communicating with one another. The keyway has opposite or spaced side walls 4, desirably true and parallel relative to one another, so that the inner extremity of each element recess is defined by a plane side wall 4 lying in a plane spaced from and parallel with the plane of the element juncture 2. Defining the ends of each element recess are spaced, tapered or inclined end walls 5 converging outwardly of the element toward the juncture 2 to form continuations of the interposed side wall and be disposed at an acute angle relative thereto.

Positioned within the keyway or spline is a compound key 6 arranged and constructed so as to secure the two elements together, and for this purpose the key is desirably formed of two counterpart sections 7 preferably of a horizontal extent or width less than the distance between the recess side walls so that close or minimum tolerances or precision machining will not have to be resorted to in forming the recesses. Each key section desirably has plane, parallel, spaced side faces 8 adapted to be positioned adjacent the recess side walls, and when the two sections are initially mated and introduced into the compound opening the associated side faces of the sections are coplanar or substantially so. Each key section has an outer V-shape or fishtail surface 9 forming a continuation of or connecting adjacent extremities of the side faces so that when two sections are related the V-shape surfaces of a compound key are directed outwardly therefrom or present oppositely directed diverging surfaces. As will be hereinafter explained in detail, each section outer surface is adapted to engage or contact an end wall 5 of each element, and accordingly the juncture of the elements is arranged so as to substantially bisect the outer surface of each section. Like the end walls 5 of the keyway, the section outer surfaces are desirably parallel throughout their length or entire extent, and by reason of this surface disposition the keys may be easily manufactured. Further, upon any relative movement between the key sections the outer surfaces thereof may move along fixed predetermined parallel paths.

The key sections are provided with inner surfaces 10 which, in an assembled key, are contiguous or in full bearing relation with one another when the sections are initially mated and introduced in the keyway or spline. So as to effect a wedging action of the fishtail surfaces the inner surfaces 10 are inclined or tapered longitudinally of the key, and, as will be noted by referring particularly to Figure 2 of the drawing, a longitudinal movement of the key sections in opposite directions will result in the fishtail surfaces being urged apart. This separating or spreading action will cause the element end walls 5 to be drawn closer together; the juncture or

contiguous surfaces 2 being urged into and retained in intimate contact with one another. The degree of angularity of the longitudinal incline is relatively small, thereby eliminating any tendency of the key sections to become loosened and separate accidentally in service. It will be noted that the vertical height of the illustrated key may be increased so as to ensure a tight engagement between the key sections and associated elements. The inner surfaces 10 are also inclined, sloped or tapered transversely of the key, as most clearly illustrated in Figure 1, and by virtue of this surface disposition a movement of the key sections away from one another will also result in an increased width of the key. Any tendency to tighten the key within the spline would also result in the sections being driven into opposite corners of the keyway, urging a surface 8 of each section into intimate contact and full bearing relation with a related keyway side wall and tending to draw the related element end walls 5 therewith. The inner surfaces 10 have, therefore, what may be termed as a compound taper or inclination to increase both the height and width of the key, and since this surface disposition, in combination with the fishtail surfaces, is substantially intersected by the element juncture, it will be noted that any forces transmitted to either element in any direction, tending to urge the elements apart, will only result in a tighter engagement between the keys and elements.

It will be noted that the illustrated and described key and spline are adapted to render two otherwise relatively movable elements fixed with respect to one another and that the elements are capable of functioning as a unitary structure.

It will be observed that various changes and alterations may be made to the illustrated and described construction without departing from within the spirit and scope of the appended claims.

What is claimed is:

1. In a compound key for securing two elements together, a pair of counterpart sections each having spaced plane parallel side faces, an outer surface of V-configuration extending between said side faces of each section and adapted to engage correspondingly disposed surfaces of said elements, and contiguous inner surfaces on said sections interposed between said outer faces; said contiguous inner faces being inclined transversely and longitudinally of said key so that upon a predetermined movement of said sections said outer faces will be urged into tighter engagement with said elements and draw said elements together.

2. In combination with two juxtapositioned elements each having a dovetailed keyway, a compound key positioned in said keyway, said key comprising a plurality of substantially counterpart sections each having spaced plane side faces, outer parallel V-shaped faces extending between said side faces of said sections and adapted to engage correspondingly disposed surfaces defining portions of said keyway, and contiguous inner faces on said sections being inclined longitudinally and transversely of said key so that upon a predetermined movement of said sections said outer faces will be urged into engagement with said element surfaces to draw said elements together, and said elements will be urged into diagonally opposite corners of said keyway.

3. In combination with two elements each having a dovetailed keyway, a compound key positioned in said keyway, said key comprising a plurality of substantially counterpart sections each having spaced plane side faces, an outer V-shaped surface on each section bridging the juncture between said elements and being adapted to contact correspondingly disposed surfaces partially defining said keyway, and inner surfaces on said sections being inclined longitudinally and transversely of said key so that upon a predetermined movement of said sections in opposite directions said outer faces will draw said elements together and said sections will be urged into diagonally opposite corners of said keyway to have a side face of each thereof bear against a surface of said keyway.

MARIE M. SCHARNBERG,
Executrix of the last will and testament of Herman J. B. Scharnberg, deceased.