Nov. 16, 1937. D. M. SHAW 2,099,319

GRIP, HANDLE, OR SHAFT OF PERCUSSIVE OR SWINGING IMPLEMENTS

Filed July 8, 1935

Fig. 1.

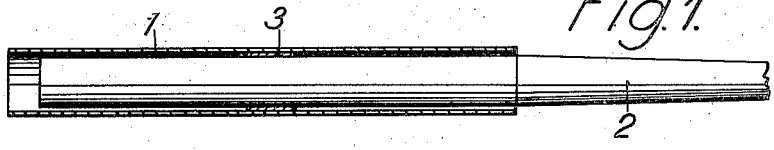


Fig. 2.

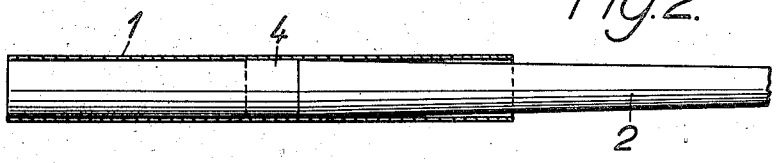


Fig. 3.

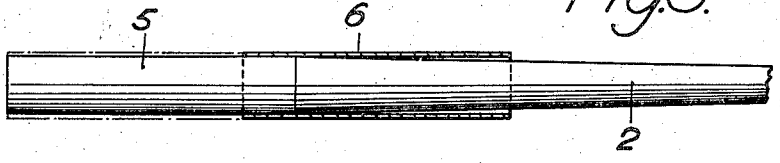
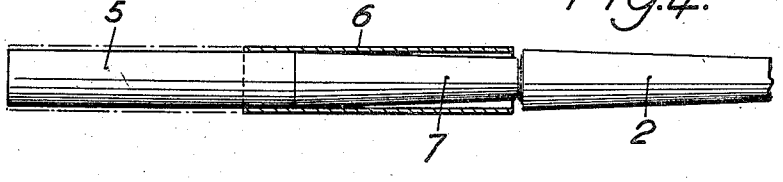


Fig. 4.



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2,099,319

GRIP, HANDLE, OR SHAFT OF PERCUSSIVE OR SWINGING IMPLEMENTS

David Mackintosh Shaw, Sydenham, London, England

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In Great Britain July 12, 1934

4 Claims. (Cl. 273—81)

My present invention relates to improvements in grips or handles for the shafts of percussive or swinging implements.

The invention is designed more particularly for use with bi-manual implements such as golf clubs, baseball and cricket bats, fishing rods and similar implements of sport but is equally applicable for use with sledge hammers or other bi-manually wielded implements of a like nature.

The uni-nodal region in the shaft of a bi-manual implement is that point of the shaft whereat when in use the amplitude of the bending, torsional and vibratory movements of said shaft tend to be reduced to a minimum. In applied mechanics it is well known that if a body or implement is held or hinged so that it can only move about a fixed axis, it is always possible to find the point at which the body may be struck, and the direction of the blow, which will tend to produce an instantaneous rotation about this particular axis and therefore to produce no pressure at the hinge. The ballistic pendulum is always struck in such a way, and the point at which it is struck is called the "centre of percussion".

In a percussive instrument with a definitely fixed point or small area where percussion must always take place, there is therefore one axis—the correct location of which upon the shaft is separately ascertained by trial and with respect to each different length, weight, whip, etc., of each type of club or implement—about which the instrument should be held and swung so that no jarring impulse is imparted to the hands of the wielder. The uni-nodal region mentioned above is situated on this axis.

An object of the construction forming the present invention is to provide that the portions of the shaft enclosed by the handle sleeve which lie adjacent on either side of the nodal region—and particularly the shaft portion underlying the hand which is furthest away from the body of the operator and which is nearest to the point of percussion of the implement—are kept out of checking and jarring contact with the sleeve by an annular clearance space provided by the greater diameter of said sleeve and thus to provide a shaft construction for a bi-manual implement which, as compared with the known golf shafts, or clubs or similar bi-manual implements having the same overall length, provides an additional two or more inches of resilient and unrestrained shaft activity.

Briefly stated the invention comprises a tubular grip sleeve or hollow handle cover of substantially greater diameter than the shaft, which sleeve concentrically encloses or encircles the shaft, and is rigidly attached to the shaft only about its uni-nodal region and extends below said nodal region a sufficient distance to accommodate that hand of the wielder of the implement nearest to the operative end.

My invention is shown by way of example in the accompanying drawing applied to the steel shaft of a golf club.

In the drawing Figure 1 shows a longitudinal section of the grip sleeve and the nodal region of the shaft enclosed by and joined thereat to the said sleeve, and the portions of sleeve-covered shaft extending on either side of said joint are kept out of contact with the shaft by the annular clearance space also shown.

Figure 2 shows an alternative form of the invention in which the grip sleeve is attached to the end of the shortened shaft.

Figure 3 shows another alternative form of the invention in which the sleeve is shortened and adapted to be grasped only by the hand furthest away from the body of the operator, and

Figure 4 shows another alternative form of the invention in which the sleeve is shortened as in Figure 3, and that portion of the shaft enclosed by the sleeve has its diameter reduced and tapered.

In the construction shown in Figure 1 of the drawing, the gripping sleeve or handle **1** is attached to the shaft **2** at about the middle of its length by means of the concentrically interposed bridging collar **3** to which both the internal surface of the sleeve **1** and the shaft **2** are welded or otherwise rigidly connected. As shown in Figure 1 excepting only at the connecting point between the sleeve **1** and the shaft **2** formed by the collar **3**, the mutually-opposite concentric surfaces of the shaft and the enclosing sleeve are held and maintained out of contact with one another by the extent of an annular clearance space corresponding with the thickness of the bridging collar **3** which joints said members together. In use the two hands of the operator act homocentrically on the shaft **2** solely through the connecting collar **3**. In action the shaft **2** is quite free in swinging, impact and recoil to bend and twist as far as up to the connecting joint between the shaft and the sleeve formed by the collar, that is to say, the lower hand, in a right handed person the right hand, does not interfere with the bending or other rhythmical movements of the shaft. Thus the above described nodal sleeve construction, by inducing singleness or non-

plurality of node and ventral (that is, internodal) segment in the activated shaft and implement, uniquely favours and permits, when the implement is being swung or wielded, a character of evenness and smoothness of "flow" and acceleration in the motion of the "swing" and abolishes or much reduces any unwanted or unintended manual "damping" or the like interference with the acquired momentum and the vibratory and other kinds of energy which have been transferred and momentarily stored in the bent, twisted and strained material or substance of the implement as the result of the swinging, thrusting or hitting effort and act of the operator; and so the construction allows the maximum possible amount of such transferred and stored energy to be usefully expended on the object or substance being operated upon, and thereby also promotes the attainment of a high maximum velocity at impact or end of thrust or swing.

The nodal-sleeve construction in use tends to avoid or minimize any unwanted or unintended antagonism between the respective actions of the two hands on the actually free part of the shaft, inasmuch as the two hands act more nearly as one on the bending and vibratory shaft, and across or through the narrow connecting bridge **3** only and also eliminates or much reduces the liability to jarring the hands experienced with some percussive implements. It effects the advantage by a method which is in marked contradistinction to those known constructions wherein damping, cushioning, or slotting devices are employed.

I have described above the use of an interposed bridging collar **3** to which the internal surfaces of the sleeve **1** and the shaft **2** are welded or otherwise rigidly connected. In Figures 2, 3 and 4, I show constructions in which the bridging collar **3** is eliminated and that portion of the shaft which it is desired to connect to the sleeve is brazed or spot welded directly to the internal surface of said sleeve. Such a connection between the grip sleeve and its shaft may form a simpler and cheaper construction for many purposes than the bridging collar shown in Figure 1.

In the alternative form shown in Figure 2, the end **4** of the shaft **2** is expanded and brazed or spot welded to the internal surface of the sleeve about the middle of its length. The shaft tapers from its end-connection with the gripping sleeve so that at the shaft end of the sleeve there is ample annular clearance space between the shaft and the internal surface of said sleeve for the free and independent movement of said shaft.

In the alternative form shown in Figure 3, I show a shortened sleeve **6** adapted to be gripped in use only by the hand furthest away from the body of the operator. The internal surface of this sleeve is attached by brazing, soldering or spot welding at its end nearest to the body of the operator when in use, at about or near the centre of that portion of the shaft which is ordinarily directly overspread and grasped by the hands of the wielder of the implement. That portion **5** of the shaft extending beyond the sleeve towards its free end, is grasped in use by the hand nearest to the body of the operator.

In the construction shown in Figure 4 a short grip sleeve **6** is shown similar to that shown in Figure 3, and that portion **7** of the shaft immediately enclosed by the sleeve **6** has its diameter reduced and more steeply tapered than usual in golf club shafts, so as to allow of a more ample clearance space for the independent movement of the shaft than the clearance space shown in Figure 2 in which the taper of the shaft is that usual in golf club shafts. Beyond the grip sleeve the diameter of the shaft is increased again for the sake of appearance.

What I claim is:—

1. A grip for the shafts of bi-manual percussive or swinging implements comprising an implement shaft, a tubular grip sleeve or hollow handle cover of substantially greater diameter than said shaft and of a length to be grasped by both hands of the user adapted concentrically to encircle said shaft and means for rigidly attaching said grip sleeve only about the center of the length of said sleeve to said shaft.

2. A grip or handle for the shafts of bi-manual percussive or swinging implements comprising an implement shaft, a tubular grip sleeve or hollow handle cover of substantially greater diameter than said shaft and of a length to be grasped by both hands of the user adapted concentrically to encircle said shaft and a bridging collar for rigidly attaching said grip sleeve only about the center of the length of said sleeve to the shaft.

3. A grip or handle for the shafts of bi-manual percussive or swinging implements comprising an implement shaft with that portion of the shaft immediately enclosed by the grip sleeve or handle cover reduced in diameter and tapered towards the operative head of the implement, a tubular grip sleeve or hollow handle cover of substantially greater diameter than said shaft and of a length to be grasped by both hands of the user adapted concentrically to encircle said shaft and means for rigidly attaching said grip sleeve only about the center of the length of said sleeve to said shaft.

4. A grip for the shafts of bi-manual percussive or swinging implements comprising an implement shaft, a tubular grip sleeve or hollow handle cover of substantially greater diameter than said shaft adapted concentrically to encircle said shaft and means for rigidly attaching said grip sleeve only about the center of the length of said sleeve to said shaft.

DAVID MACKINTOSH SHAW.