G. H. DAVIS.

FRICTION SHOE FOR MUSICAL INSTRUMENT PLAYING MECHANISMS.

APPLICATION FILED JAN. 3, 1906.

923,148.

Patented June 1, 1909.

Fig. 1.

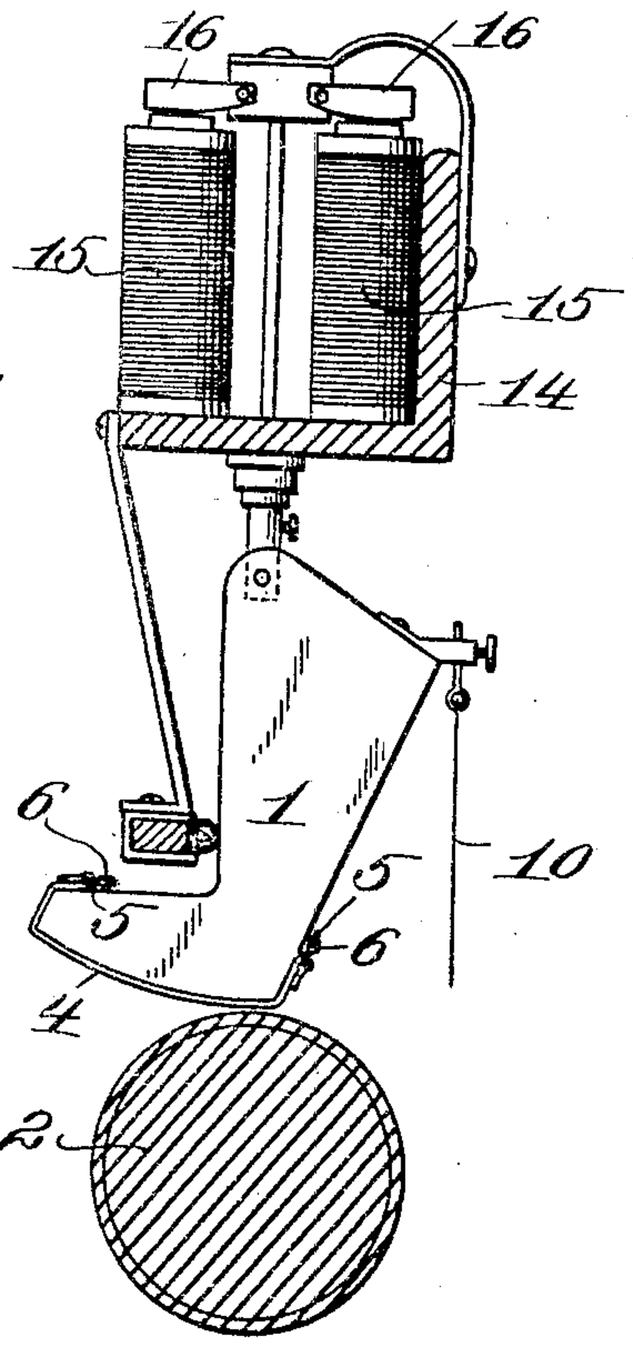


Fig. 4.

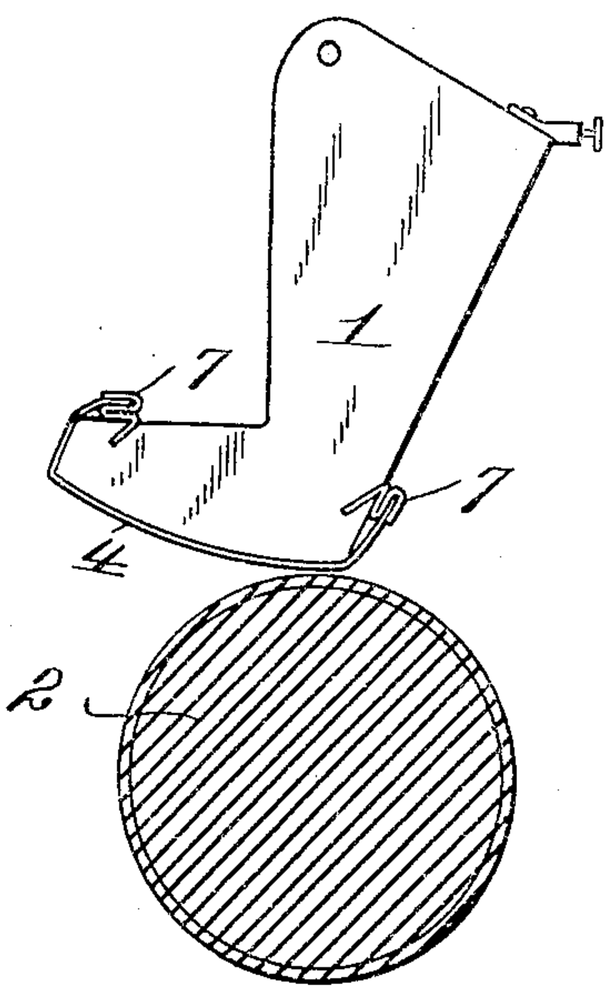


Fig. 2.

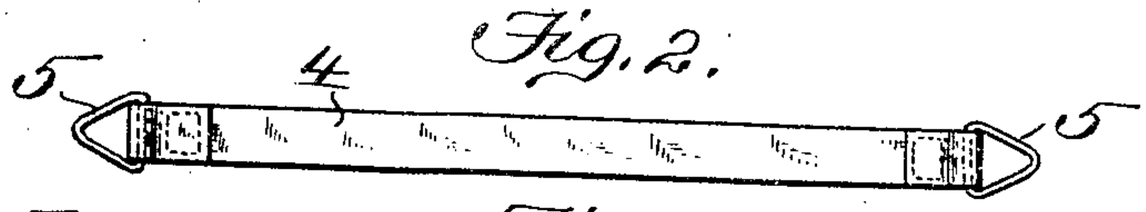


Fig. 3.

Fig. 5.

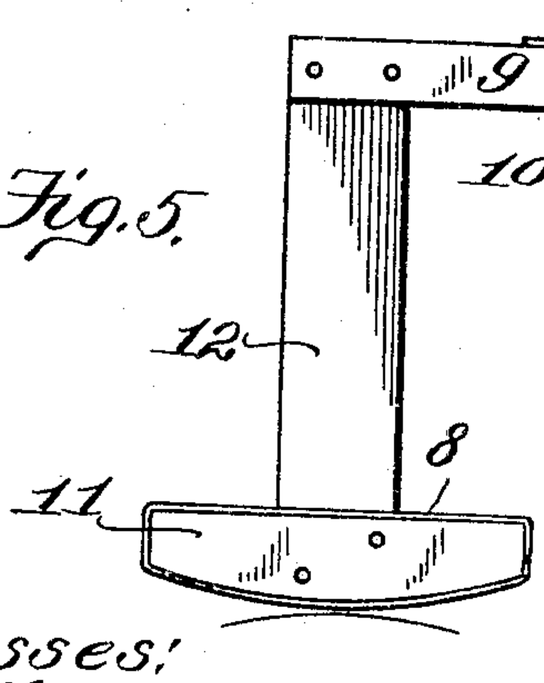


Fig. 6.

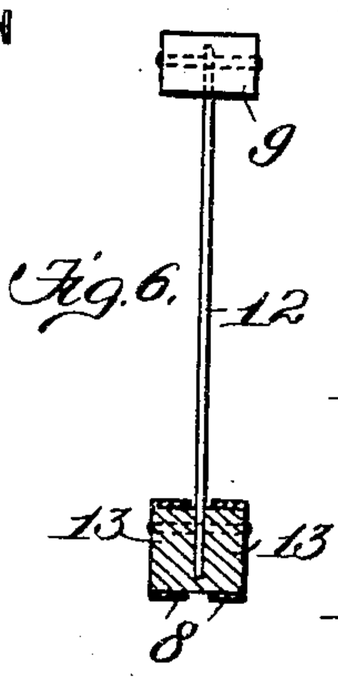
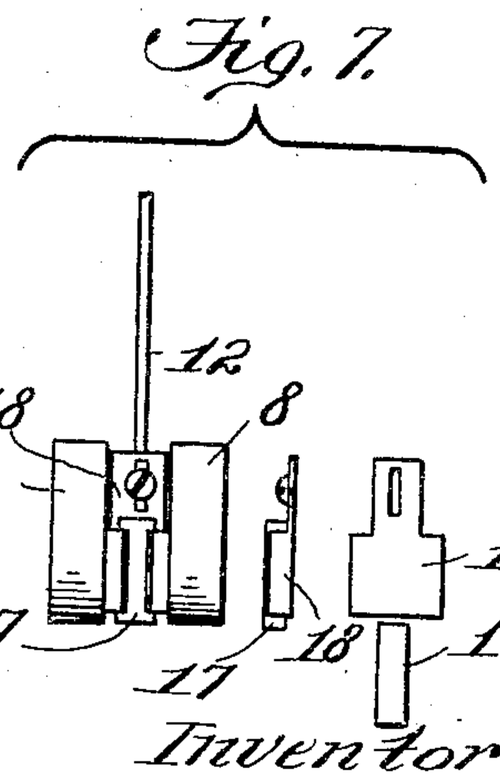


Fig. 7.



Witnesses:
W. C. Mateer.
J. J. McCarthy.

Inventor
George Howlett Davis
By Meyers, Cushman & Rea.
Attys

UNITED STATES PATENT OFFICE.

GEORGE HOWLETT DAVIS, OF WEST ORANGE, NEW JERSEY.

FRICTION-SHOE FOR MUSICAL-INSTRUMENT PLAYING MECHANISMS.

No. 923,148. Specification of Letters Patent. Patented June 1, 1909.

Application filed January 3, 1906. Serial No. 294,456.

To all whom it may concern:

Be it known that I, GEORGE HOWLETT DAVIS, a citizen of the United States, residing at West Orange, in the county of Essex and State of New Jersey, have invented new and useful Improvements in Friction-Shoes for Musical-Instrument Playing Mechanism, of which the following is a specification.

My present invention has to do generally with the actuating mechanism of self-playing musical instruments, or musical instrument players, wherein is embodied a rotary element, such as a shaft, drum or roll and a plurality of friction shoes constructed and arranged to be brought into and out of contact with said rotary element and to be operated thereby to cause the sound producing devices (such as the hammers of a piano) to be actuated; but specifically, the invention relates to certain new and useful improvements in the friction shoes themselves. Heretofore such friction shoes have been provided with friction faces of cork or other suitable material attached thereto by means of glue, and, by reason of the nature of the sole or facing, the glue has worked into the body thereof, and at times entirely therethrough, defracting materially from the effectiveness thereof for the purposes intended, and causing the shoes to slip more or less upon the surface of the actuating element or roll.

It has been found that the permeation of the friction facing by the glue deadens the same, or takes the life out of it as it were, destroying the desirable frictional holding quality thereof. Furthermore, actual and continued use of the shoe and roll mechanism of the character described, has demonstrated that the friction face of the shoe, or that face which makes the contact with shaft or roll, sooner or later becomes so worn as to render it inactive or nonresponsive to its demands, and to overcome this objection it has been necessary either to substitute new shoes for those that have become worn, or, where the shoes have been previously provided with permanently attached faces, (which faces have heretofore been affixed with glue) to remove said faces and apply new ones. To substitute new shoes is not only very expensive, but considerable time and labor in reassembling is required, as each new shoe must be separately readjusted. To remove old and worn-out shoe-faces, that were attached in the first instance with glue, has been found to be inconvenient for the reason that the operations of stripping and craping the shoes almost invariably result in breaking or bending the supporting means or elements therefor if an attempt is made to do this work without detaching the shoes, and to detach and then reassemble them is costly. To obviate these difficulties which now exist, I have provided a friction-shoe with a detachable face that can be easily and quickly attached or removed as occasion demands, without removing the shoe from its carrying element and without the utilization of glue, as heretofore practiced.

The present invention, therefore, resides, broadly, in providing a friction shoe of the character described with a removable facing or covering; and also in the provision of a friction-shoe having such a facing connected thereto by mechanical devices as contradistinguished from the attachment thereof by means of glue or other adhesive.

In the accompanying drawing I have shown, by way of examples, several specifically different forms of friction shoes and facings, and means of attachment thereof to the shoes.

In said drawing—Figure 1 is an elevation of a friction-shoe, provided with a facing according to my invention, and showing the shoe-actuating element in section. Fig. 2 is a top plan of the shoe facing illustrated in Fig. 1. Fig. 3 is an elevation. Fig. 4 is a sectional view of a different form of shoe-facing and attaching device. Fig. 5 is a side elevation of a different form of shoe and facing therefor, according to my invention. Fig. 6 is an end view thereof showing the foot of the shoe and the facing in section. Fig. 7 shows the application to the toe of the shoe of a wear piece, and also shows said wear piece and its holder separated.

In the said drawing the reference numeral 1 designates the friction-shoe, two forms of which are shown as examples.

2 designates the shoe-actuating element, shown as a rotatable roll which works against the convex end or sole of the shoe. The sole of the shoe is provided with a facing of some suitable, flexible, yielding or resilient material, having a frictional capacity, such that the actuation of the shoe by the actuating element is insured. The facing 4 may be

constructed of rubber, leather or of cork, or of other suitable material, and is, as shown in Fig. 2 of the drawing, in the form of a strip of a length suitable to cover the sole of the shoe and have its ends turned up about the toe and heel thereof, as shown in Fig. 1, to be detachably connected to the shoe. For this purpose, and as one example of my invention, the shoe-sole facing has combined therewith, loops 5 which are connected thereto by folding the ends of the facing strip through the loops and attaching such ends to the body portion, as best shown in Fig. 3. The loops illustrated are of triangular shape, but as to the shape thereof my invention is not restricted. The looped or open ends of the facing are designed to engage complementary attaching devices, such as studs or pins 6, with which the shoe is provided as shown in Fig. 1.

In Fig. 4 of the drawing the shoe is provided at its toe and heel parts with ductile clips 7 fashioned to receive the ends of the sole and suitably secured to the shoe, as by means of tongues which enter sockets in the shoe.

In Figs. 5 and 6 the sole-facing shown consists of a pair of endless elastic bands 8 preferably of rubber normally of a circuit less than the circuit of the surface of the foot of the shoe, which bands may be stretched and disposed upon the foot of the shoe as shown and closely hug the same and maintain their position in use. In this example of my invention, and without desiring, in the broader aspects thereof, to limit myself thereto, but for which, because of the value of the special construction, a specific claim is hereinafter made, the shoe consists of a head 9, to which is attached the element 10 by which the influence of the action of the shoe is transmitted to the sound producing device, such as a hammer of the piano, (not shown); and a foot portion 11 connected with the head by a relatively thin web 12, preferably of metal, and having connection with the head and foot as by means of pins as shown. The foot portion projects laterally at opposite sides of the web as best shown in Fig. 6 to provide endless band receiving wings 13. The friction shoes described, are as stated, adapted for coöperation with an actuating element by which the shoes are made in a known manner to cause the operation of sound producing devices (such as the hammers of the piano) of musical instruments and a detail description of such corelated mechanism or illustration thereof is not deemed essential, but for the purpose of illustrating in a general way, the operative situation of the shoes, I have shown in the drawing, conventionally, the magnet rail 14 supporting magnets 15, the armatures 16 of which are combined with the shoes for the purpose of placing the soles of the shoes in operative contact with the actuating element 2. Such magnets constitute elements of well known mechanism and may be energized in any of the well known manners, but since such mechanism and manners of energizing the magnets are not concerned in the present invention, the same are not illustrated or described. The wear of the friction shoe facing first manifests itself and in practice has been found to be greatest at the toe of the shoe, as said toe rides off of the prime actuator referred to. To increase the life of the facing at this point I have designed, in one aspect of my invention, to provide a protector for the toe corner of the shoe, one suitable arrangement of which is illustrated in Fig. 7 of the drawing, and is shown, for example, in connection with the type of shoe and shoe sole facing, illustrated in Figs. 5 and 6. This device consists of a wear piece 17 preferably of rawhide or similar tough material secured to the toe part of the shoe with its active end in position to contact with the prime actuator as the toe of the shoe rides off therefrom, and sustain the wear at this point, thus preserving the shoe sole facing proper and increasing the life thereof. The wear piece 17 may be secured in position in any suitable way, for example, by means of a holder 18 which may be attached to the toe part of the shoe by means of a screw as shown, and having lateral wings which may be folded about and into clamping engagement therewith, as illustrated in Fig. 7. In this figure the view at the left shows the wear piece assembled, and in operative relation and this figure also shows the same and its holder separated as well as the holder with its lateral wings folded about and clasping the wear piece.

According to each example of my invention shown, the facing is attached to the shoe without the employment of glue or other adhesive, and therefore, avoids the objections to such previous manners of attachment which are hereinbefore set forth. The attachment is made by mechanical means, several examples of which are shown in the drawing, in such manner that when the soles become worn, as referred to, they may be readily detached from the shoes without in any way disturbing the adjustment of the latter or without removing the same from their embodiment in the mechanism for the purpose of applying new friction soles.

The detachable friction shoe facing of my invention is of economical manufacture, and can be supplied in quantity to purchasers of instruments in which the friction shoes are incorporated; and the arrangement for connection of the facings to the shoes is of such simple character that when they become

worn they may be readily disconnected from the shoes and new ones supplied without special skill.

Having thus described my invention what I claim as new is:—

1. A friction shoe having a detachable face, and means carried by said detachable face whereby it may be attached to the shoe.

2. A friction shoe having a detachable face, and means carried by said detachable face at its opposite ends whereby it may be attached to the shoe.

3. A friction shoe having a detachable face, and means carried by the shoe and the detachable face whereby said face may be attached to the shoe.

4. A friction shoe having a detachable face of resilient material, and means carried by the shoe and the face whereby the latter may be attached to the shoe, said face adapted to lie in close contact throughout with the sole of the shoe.

5. A friction shoe having a detachable face and members at opposite ends of said detachable face, and on the shoe adjacent its heel; and toe portions whereby said detachable face may be attached to the shoe.

6. A friction shoe having a convex sole, and a detachable facing or covering extending over said sole and in close contact therewith, means carried by said detachable facing at its opposite ends and by the shoe adjacent its toe and heel portions whereby said covering may be attached to the shoe.

7. A friction shoe of the character described, having a detachable face, and means engaging the opposite ends of said face and the toe and heel portions of the shoe for securing the face in position.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

G. HOWLETT DAVIS.

Witnesses:

GEO. W. REA,

GERTRUDE M. STUCKER.