(No Model.)

3 Sheets—Sheet 1.

J. HALL.

MANUAL GYMNASIUM FOR MUSICIANS.

No. 494,197. Patented Mar. 28, 1893.

Fig 1

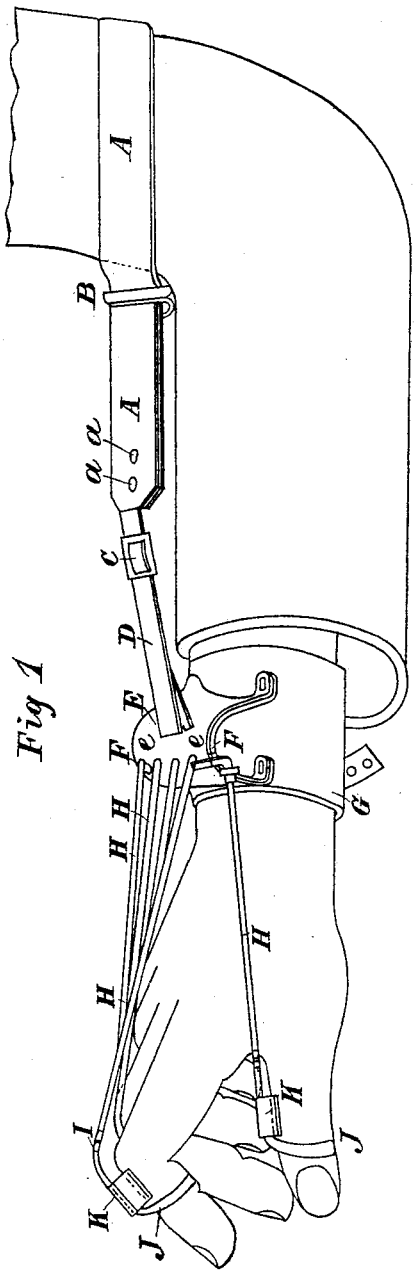
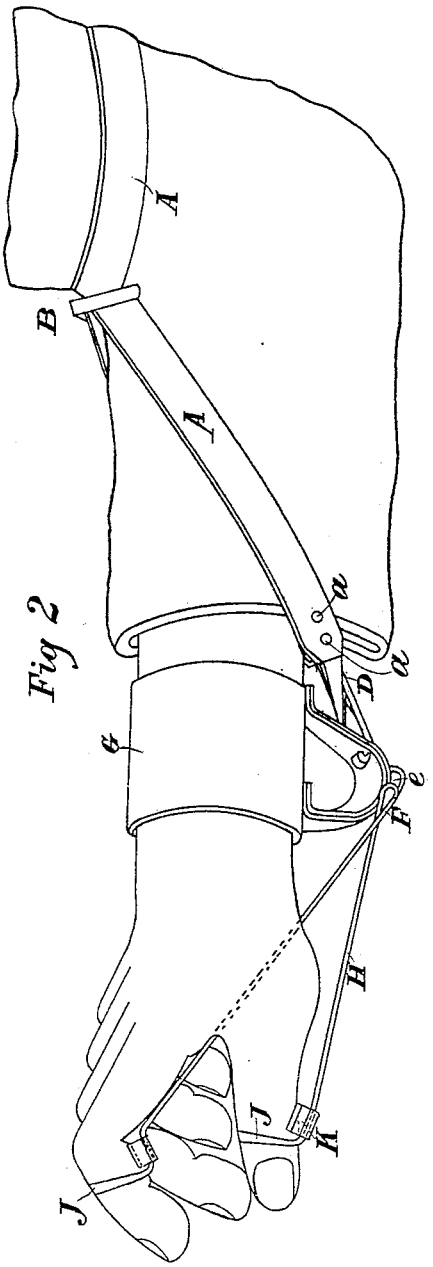


Fig 2



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J. HALL.

MANUAL GYMNASIUM FOR MUSICIANS.

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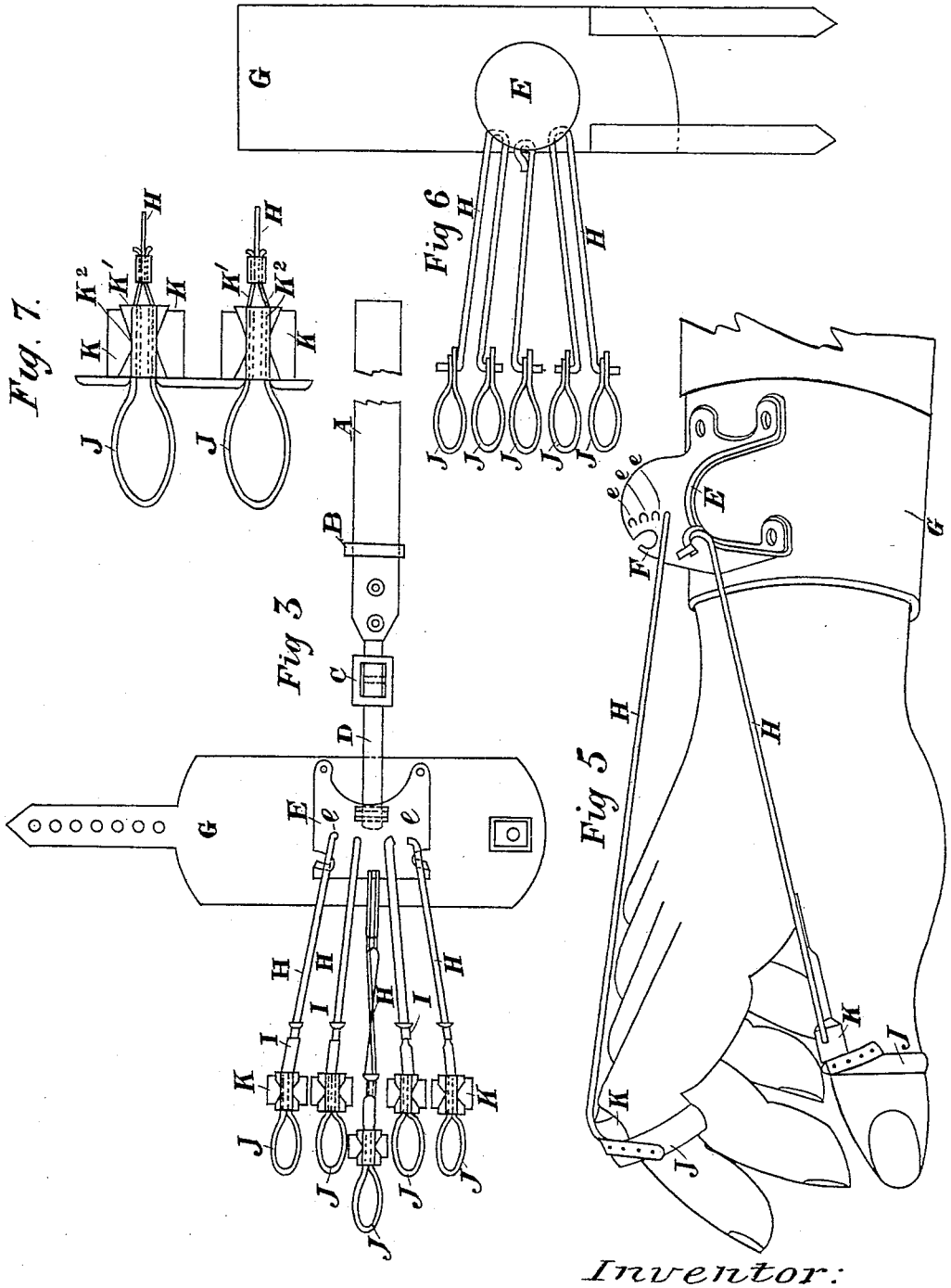

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MANUAL GYMNASIUM FOR MUSICIANS.

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Fig. 4

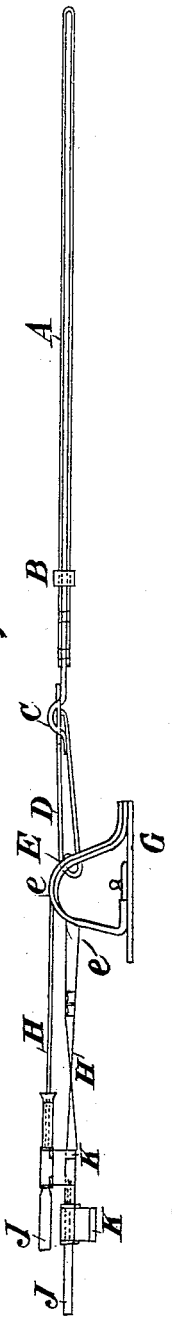


Fig. 8

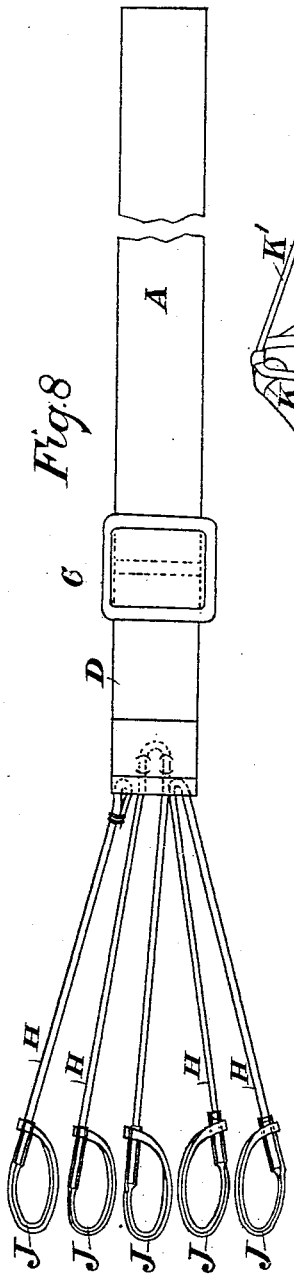
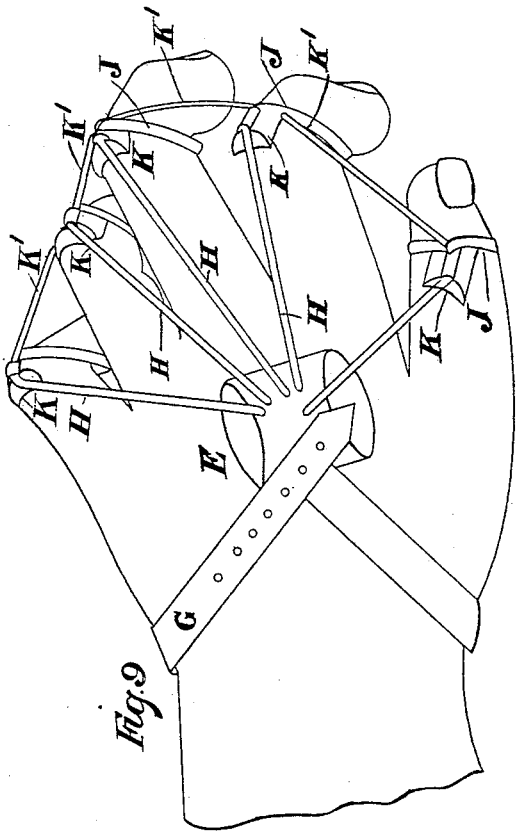


Fig. 9



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UNITED STATES PATENT OFFICE.

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MANUAL GYMNASIUM FOR MUSICIANS.

SPECIFICATION forming part of Letters Patent No. 494,197, dated March 28, 1893.

Application filed October 19, 1892. Serial No. 449,382. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH HALL, a subject of the Queen of Great Britain, residing at Kirmington, near Brocklesby, in the county of Lincoln, England, have invented new and useful Improvements in Manual Gymnasiums for the Use of Performers on Musical Instruments, Type-Writers, and other Machines, (for which I have applied for Letters Patent in Great Britain the 30th day of July, 1892, No. 13,871,) of which the following is a specification.

This invention has reference to that class of appliances known as manual "gymnasiums" which are used as an aid to improve the performance on an instrument or machine in which the fingers individually or conjointly, or the whole hand, wrist and fore-arm are used percussively, or to depress, push pull or move, one or more levers, or keys by means of which the fingers, wrists, or fore-arms are exercised; and its object is to enable the operator to obtain greater facility, strength, flexibility and precision of the various muscles and joints for the more effective manipulation of such performance or operation.

In order that the nature of my present invention and the manner of carrying it into practical effect may be fully understood, I will proceed to describe the same by reference to the accompanying sheets of drawings in which

Figure 1 shows apparatus constructed according to my invention applied to the wrist and arm for raising the fingers. Fig. 2 shows the same apparatus applied to the wrist and arm but arranged to depress the fingers. Figs. 3 and 4 are respectively a plan and an elevation of the apparatus. Fig. 5 shows the apparatus applied to the wrist only and Fig. 6 a plan of the same; Fig. 7, a plan of adjustment for loops; Fig. 8, a plan of apparatus for attachment to arm only. Fig. 9 shows the application to the back of the hand only.

Like parts in all the views are marked with the same letters of reference.

According to my invention on a suitable strap G formed of india rubber, felt, cloth, webbing, velvet, leather, or a combination of two or more of these analogous and suitable materials which is buckled or otherwise fastened round the arm wrist or hand, is mounted, formed on, or attached an erection or projection E hereinafter called the bridge. This may either be hollow or solid of any suitable material either rigid or plastic such as metal, wood, cork, papier-maché india rubber filled with air when required in any convenient manner, leather felt or other suitable substance or combination of substances formed on or attached to the strap mentioned in such a manner that it may form a projection of suitable height above that part of the wrist or hand to which the strap G is fastened.

In practice I prefer to form the bridge E of a piece of sheet brass or other suitable metal which is made in the shape of an arch placed transversely to and nearly the width of the wrist and having a covering of pliable material preferably leather and I fix the metal arch to the strap G by lugs turned at an angle to the walls of the arch, and its covering by riveting, eyeleting, or by other suitable means, fastening three thicknesses together.

To the bridge E at or near its summit I attach one or more pieces of india rubber cord, or tubing H of sufficient length to extend from the bridge to the fingers or thumb or to both. These rubber cords or tubes, hereinafter called the springs H, I preferably attach to the bridge by passing the ends through holes *e e* punctured in the covering of the metal arch and this covering being strained tightly over the metal with ends of the springs between is under ordinary circumstances sufficient to connect the springs with the bridge, but the connection may be further strengthened by sewing, gluing, or riveting the terminals of the springs after passing them through holes into the space between the metal and leather.

The leather covering of the bridge may, when desired be dispensed with by attaching the springs directly to the metal bridge by means of a strip of leather for each spring, being passed through rectangular or other holes punched in the metal, the ends of the leather strips being attached to the rubber springs by metal clips. Or the ends of the springs may be passed through holes in the metal bridge and knotted. The knots inside the bridge would prevent the springs slipping and a loose eyelet may be threaded on each spring to keep the rubber from being cut by friction on the edges of the holes in the metal bridge.

The eyelet may be of brass, leather or the like. The thumb spring is attached in the center of the bridge preferably when carried over the hooks F on either side of the bridge so as to bring it nearly in line with the springs.

At a variable and sufficient distance along each spring from the bridge end are attached loops J of leather, felt, india rubber, tape, webbing, or velvet, or a combination of these or other suitable and analogous materials and substances or combination of substances sufficiently large to fit the second joint of the fingers or to fit the thumb at or near the knuckle of the first joint. These loops J I preferably attach to the rubber springs by placing the ends of the material forming the loop one on each side of the rubber and firmly clasping the whole together by a thin strip of metal as shown at I Fig. 1; but the loops may also be formed of a continuation of the springs themselves as shown at Fig. 8, where tubing is used that part forming the loop being packed with any pliable but inelastic substance such as cotton wool.

To the rubber springs immediately behind the loop itself or partly to the spring and partly to the loop, I attach a pad or pads K hereinafter called knuckle pads of a suitable shape and material to rest firmly and easily upon the fingers at upon or near the joints mentioned and of sufficient height to keep the springs from touching the fingers or hand during the gymnastic motion. Each loop may be connected with the contiguous loop by one or more short elastic cords or tubing K′ passing from loop to loop and the pads K may be connected with each other in a similar manner. That is to say as shown at Figs. 7 and 9 a piece of india rubber K′ similar to that forming the springs H may be carried through from, preferably the brass ferrules or eyelets K^2 fixed in one knuckle pad K to the contiguous ferrule K^2 in the second knuckle pad to strengthen the side motion of the fingers. All or any of the pads K including that from the thumb may be so joined. These pads may when preferred be distended india rubber bags filled with air in any convenient manner and they may form part of the rubber springs or be attached to them. In some cases and when preferred the springs H may be formed of metal spiral springs.

In practice I preferably attach a triangular, or other shaped, piece K hereinafter termed a pad of felt to each loop J. The pad being wider at its base than at the top is provided with a groove on the underside to rest on or near the knuckle and at the top I make a cut or slit of sufficient length and depth in which the springs H or end of the loop J rest. Or the loops may be attached to the pads K and springs H in the following manner: A hole is pierced on one side of the above named groove through which one end of the spring H is passed and carried round the front of the pad and is then passed through a second hole which is cut in the opposite side of the said groove in the pad for forming an elastic band under which the ends of a strip of the material forming the loop J are passed. On each end of the loop being passed under the elastic band, so formed, on the opposite side of the felt pad, on the india rubber springs being stretched or drawn tight holds the slip forming the loop J firmly in position against the pad. The pad and strip of material when combined in this manner form a loop of variable and adjustable dimensions. A separate elastic band may also be used for attaching the strip forming the loop J to the pad K in which case the spring H would be allowed to simply terminate in the felt. The plan just described of forming the loops to the pad by means of an elastic ring is suitable for first adjusting the loops to size and then fixing them in position but in the drawings the pads are illustrated as sliding on the springs H—whereby the loop and pad may be adjusted as required.

To the bridge E is fixed an intermediate strap D adjusted by a buckle C. The strap D may be fixed to an arm loop A by any convenient means such as eyelets *a a*. The arm loop A may be adjusted to fix on to the arm by means of a buckle B as shown at Figs. 1 and 2.

When using the appliance see Fig. 8 attached to the arm above the elbow sufficient elevation is obtained to dispense with the use of the bridge and in that case I attach the rubber cords directly to the strap by the same method as described in attaching them to the covering of the bridge. But a bridge upon a strap similar to the wrist strap in Figs. 1, 2 and 5 may be adjustably attached thereto to slide to any position on the arm strap between the springs and the elbow and such movable strap with its bridge may form the retainer for adjusting the arm loop.

When attaching the springs to the strap direct, one or more pieces of felt india rubber or suitable material may be adjustably attached to them to prevent the springs touching the hand and the material may be so shaped as to rest comfortably on the hand and may become in part substitutes for the bridge. Where rubber is used for the last named purpose I prefer that it should be an inflated air tight cushion E such as shown at Fig. 9.

Having now fully described the construction of the machine I will proceed to explain its action and application. In using the apparatus for influencing the fingers and thumbs after placing the loop A around the arm above the elbow, I attach the strap G firmly to the wrist and place the loops J, upon the digit or digits required to be acted upon. Preferably I place the pads immediately in front of the second knuckle of the finger and the first knuckle of the thumb. When properly adjusted the digits have to overcome the resistance of the springs and in so doing the muscles are strengthened and the return of the digit to its first position being acceler-

ated by the contraction of the springs the suppleness of the joints is increased notably those at the junction of the digits to the hand. A similar effect is produced on the wrists when the strap is attached to the arm above the wrist or elbow and the hand moved bodily using the wrist as the fulcrum. I would have it understood that the arm loop A may in some cases be dispensed with and the bridge E fastened directly to the wrist as at Fig. 5 or the back of the hand by strap G′ as at Fig. 9 or as shown at Fig. 8 the apparatus may be provided with loops J having pads K or loops without pads, a slip buckle C would be placed on a broad strap D to hold that portion forming the arm loop above the elbow and to adjust it to the length of the arm. This form would have five finger loops attached by rubber springs directly to strap D. The apparatus may thus be used with the springs above the back of the hand or underneath the palm of the hand as shown at Fig. 2 with equal facility and advantage.

Having now particularly described and ascertained the nature of my said invention, what I claim is—

1. The combination of the arm loop provided with an adjusting buckle, an intermediate strap and its adjusting buckle, a bridge, wrist strap, flexible springs, finger loops, and pads, and intermediate springs passing from loop to loop and from pad to pad, as set forth.

2. In hand gymnasiums such as herein described the combination of the finger loops J, and pads K with the flexible springs H, bridge E and wrist strap G said pads being arranged directly in rear of the loops and projecting laterally from the springs to bear upon the fingers and keep the springs elevated therefrom, substantially as described, as set forth.

3. In hand gymnasiums such as herein described the combination of finger loops J, pads K, elastic tubing K′, ferrule K^2, and springs H as set forth.

4. In a hand gymnasium such as herein described the combination of the wrist strap G, bridge E, of arched form arranged on the strap with its arched opening extending transversely of the wrist—springs H, and finger loops J as set forth.

5. In hand gymnasiums such as herein described the combination of the finger loops J—flexible springs H, with the arm loop A and its adjusting buckle B as set forth.

6. In hand gymnasiums such as herein described, the combination of the arm loop A,—bridge E adjustably attached to wrist strap G, springs H, intermediate springs I, finger loops J, and pads K all as set forth.

7. In hand gymnasiums such as herein described, the combination of the arm loop A and its adjusting buckle, intermediate strap D, bridge E wrist strap G, flexible springs H intermediate springs I finger loops J and pads K all as set forth.

8. In hand gymnasiums such as herein described the combination of an arm loop A—provided with an adjusting buckle B, intermediate strap D, buckle C, bridge E, wrist strap G, flexible springs H, intermediate springs I, finger loops J, elastic tubing K′, and ferrules K^3 as set forth.

In testimony whereof I have hereunto signed my name to this specification in presence of two subscribing witnesses.

JOSEPH HALL.

Witnesses:

EDMUND WILLIAM BOSWELL,

ALFRED ERNEST MARTIN.