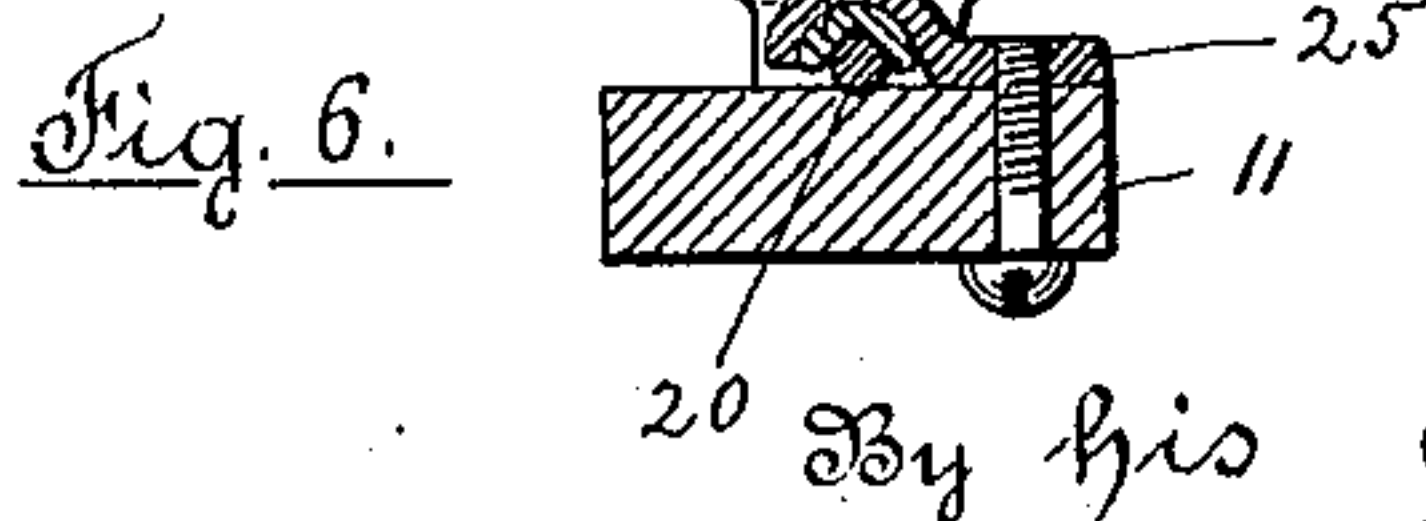
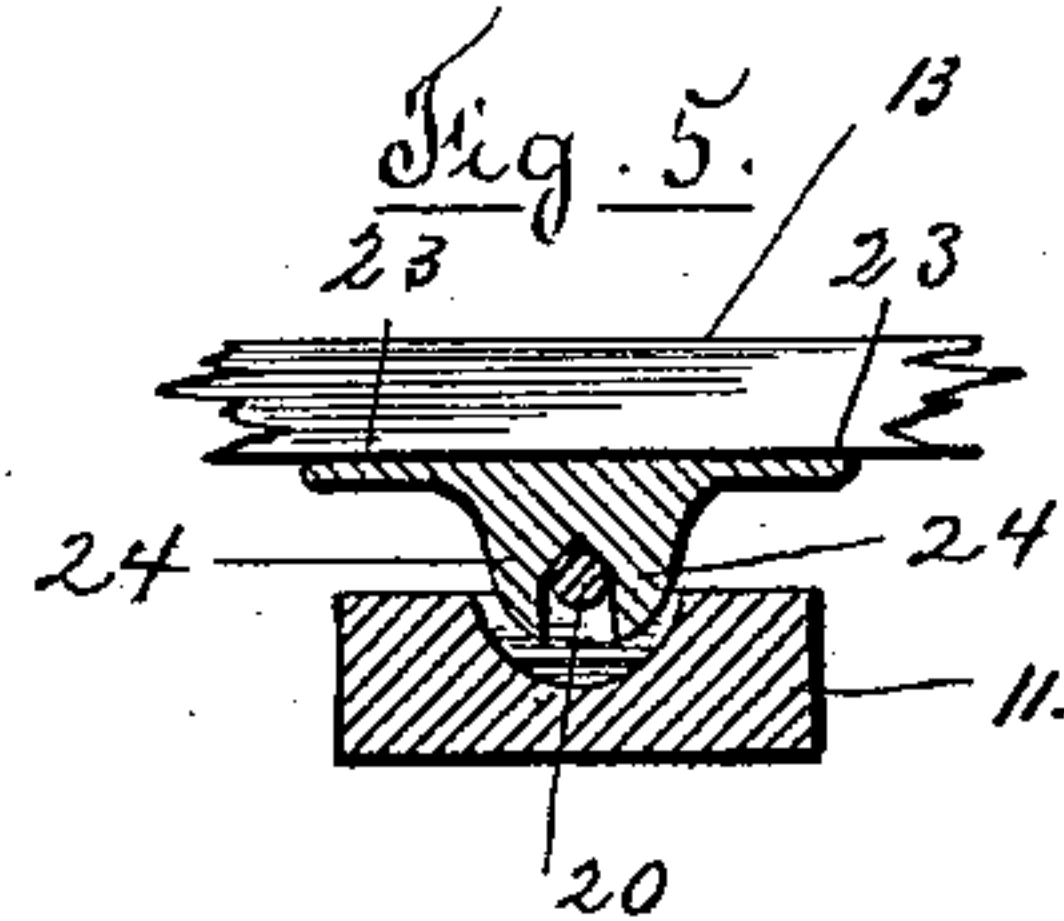
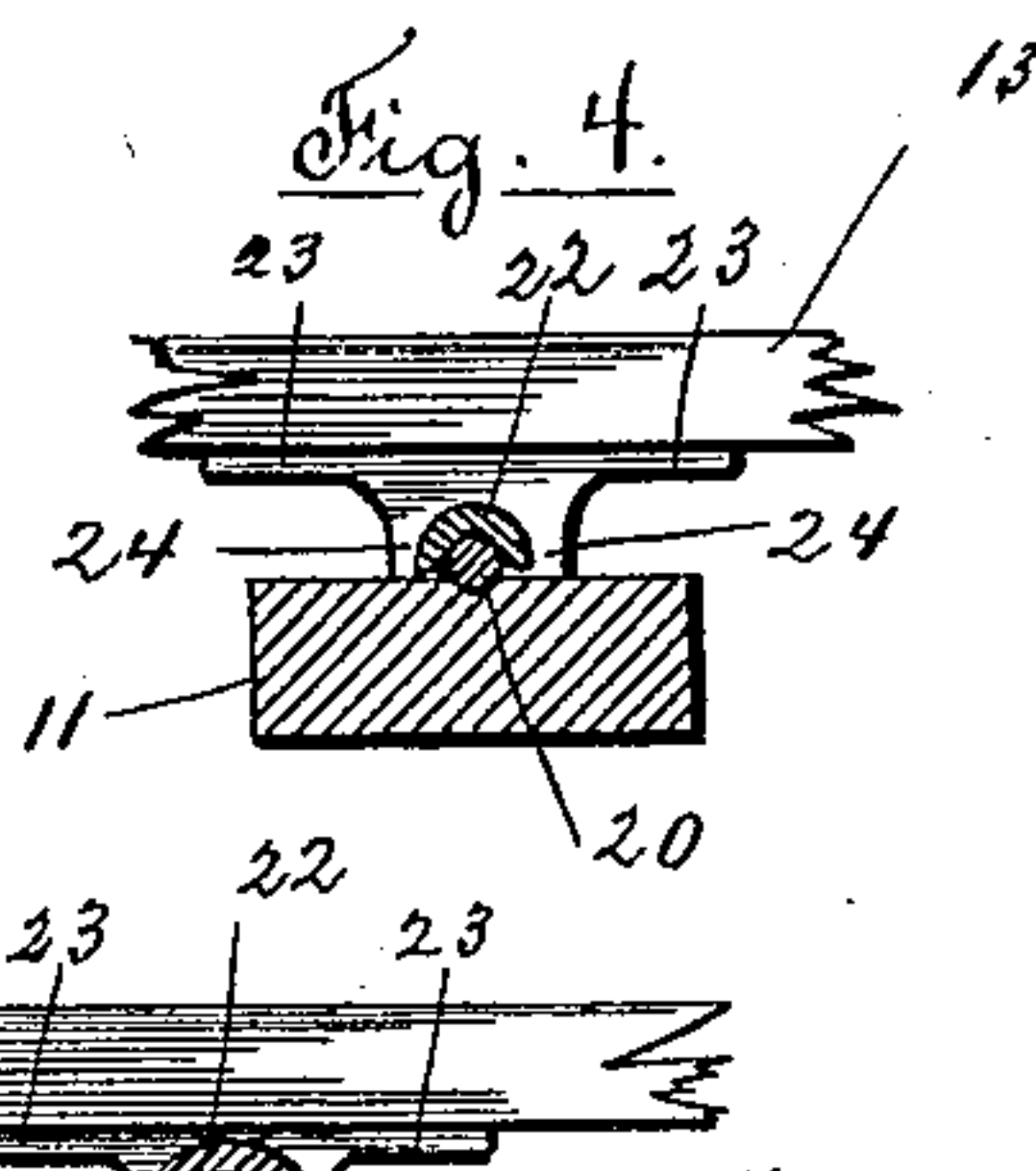
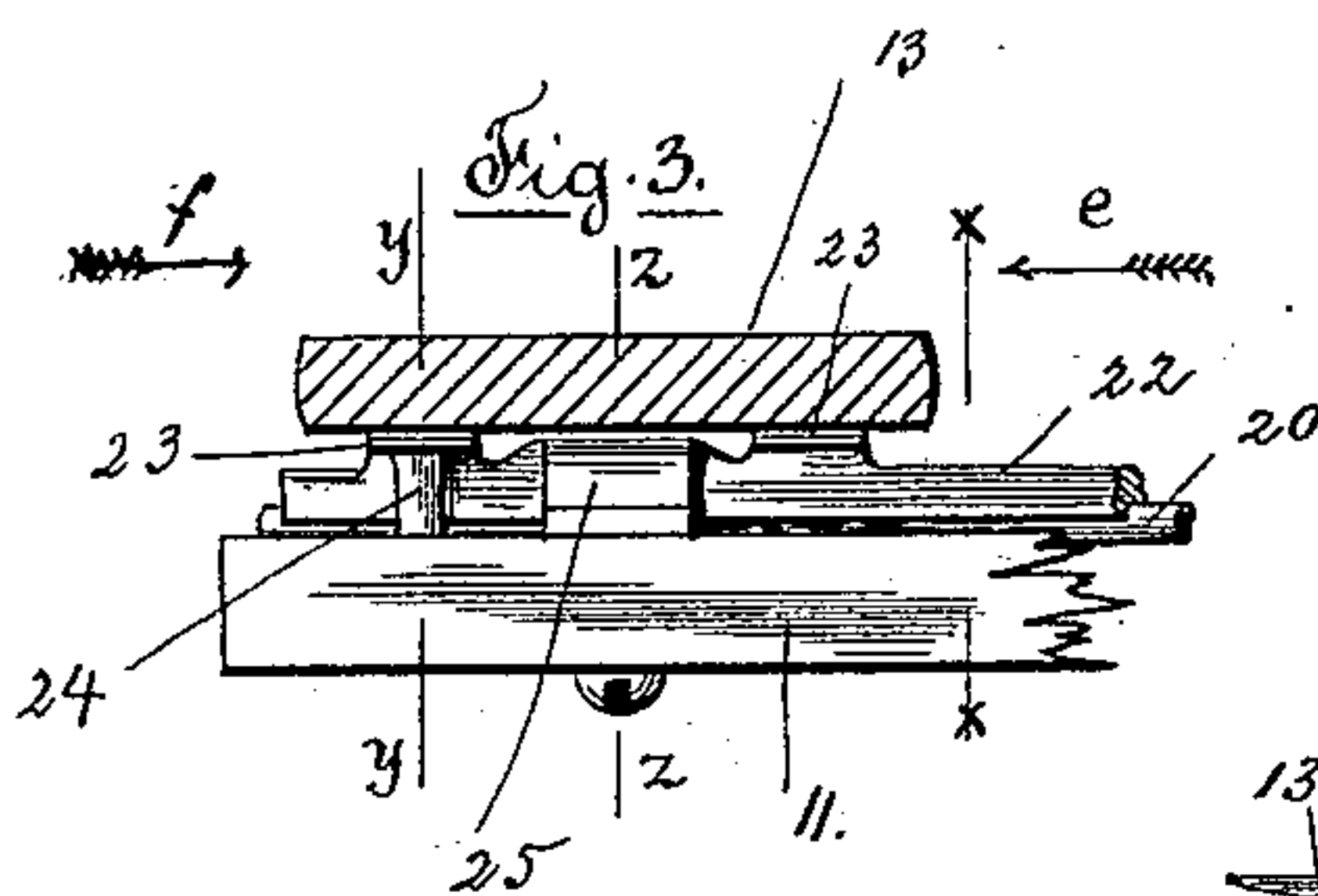
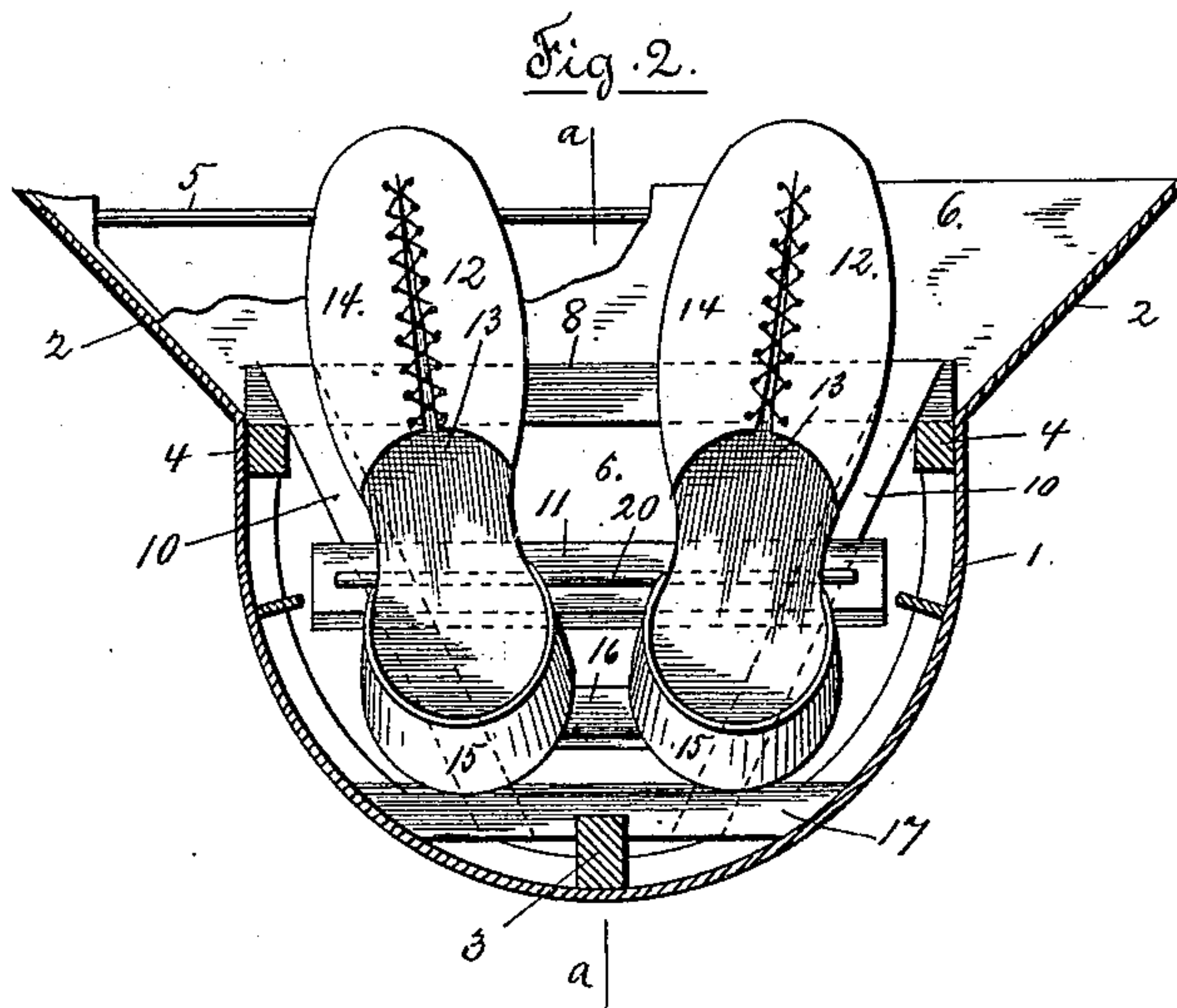
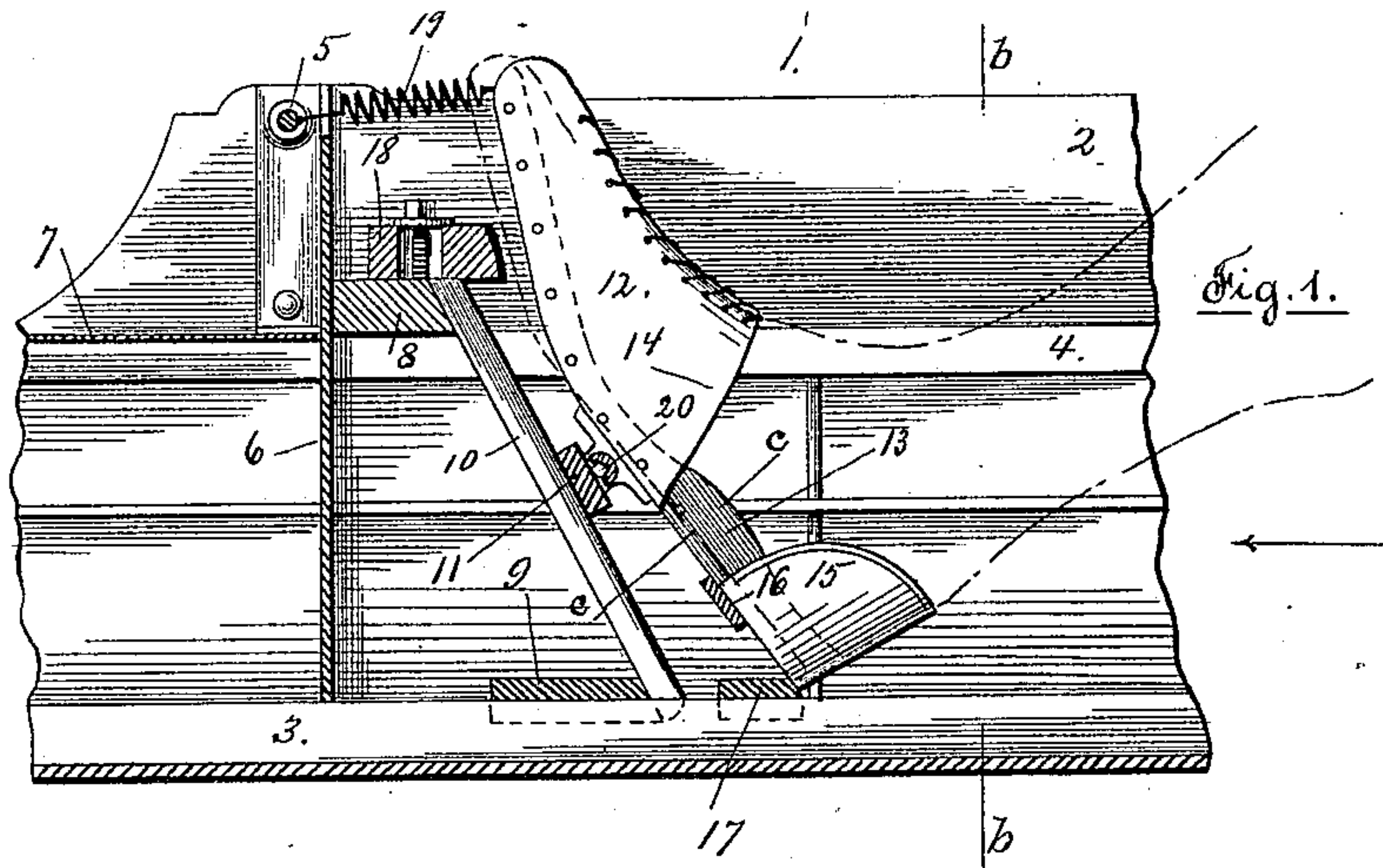


(No Model.)

E. J. KERNS.  
ROWING APPARATUS.

No. 421,080.

Patented Feb. 11, 1890.



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# UNITED STATES PATENT OFFICE.

EDWARD J. KERNS, OF WORCESTER, MASSACHUSETTS.

## ROWING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 421,080, dated February 11, 1890.

Application filed October 3, 1889. Serial No. 325,835. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD J. KERNS, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Rowing Apparatus; and I do hereby declare that the following is a full, clear, and exact description thereof, which, in connection with the drawings making a part of this specification, will enable others skilled in the art to which my invention belongs to make and use the same.

My invention relates to rowing apparatus for boats and rowing-machines, and more particularly to the shoes used in boats and rowing-machines, in connection with the sliding seats, in which the feet of the rower are placed and held during the operation of rowing.

The object of my invention is to improve upon the construction of the shoes now in general use in boats and rowing-machines, and to make shoes which will adjust themselves to the different positions of the feet of the rower as the sliding seat moves back and forth, and prevent the heels from being drawn out of the shoes and the feet from being bent and cramped in the operation of rowing.

Heretofore the shoes used in boats and rowing-machines, in connection with sliding seats, in which the feet of the rower are placed and held while rowing, have been rigidly secured in place in one fixed position, so that there was no movement of the shoes, and the rower in the forward position of the sliding seat at the beginning of the stroke would draw his heels out of the heel portion of the shoes and bend or cramp the toe part of his feet in the toe portion of the shoes, there not being any movement of the shoes to correspond with the different positions of the feet of the rower as the sliding seat moved back and forth. It will thus be seen that at every stroke of the oars the heels of the rower will be moved out and in in the heel portion of the shoes, causing a continual chafing of the heels, and the toe part of the feet will be bent and cramped, preventing the rower from obtaining the full length of his reach at the beginning of the stroke.

My invention consists in an improved construction of the shoes above described, and in making them movable or adjustable, so

that they will conform to the different positions of the feet of the rower as the sliding seat moves back and forth, and thus prevent the heels of the rower from being drawn out of the heel portion of the shoes, and also prevent the bending or cramping of the toe portion of the feet in the toe portion of the shoes, and enabling the feet of the rower to remain firm and solid in their normal position in the shoes during the operation of rowing, all as will be hereinafter fully described.

Referring to the drawings, Figure 1 represents a central longitudinal section of a portion of a boat with my improved shoes applied thereto taken on line *a a*, Fig. 2. Fig. 2 is a cross-section on line *b b*, Fig. 1, looking in the direction of the arrow, same figure. Fig. 3 is a detail taken on line *c c*, Fig. 1, looking in the direction of the arrow, same figure, showing the manner of attaching the shoes. Fig. 4 is a cross-section on line *x x*, Fig. 3, looking in the direction of the arrow *e*, same figure. Fig. 5 is a cross-section on line *y y*, Fig. 3, looking in the direction of the arrow *e*, same figure; and Fig. 6 is a cross-section on line *z z*, Fig. 3, looking in the direction of arrow *f*, same figure.

I have shown in the drawings my improved shoes applied to a boat; but it will be understood that they can equally well be applied to a rowing-machine.

In the accompanying drawings, 1 is a section of a shell or racing boat of ordinary construction, having the rounded bottom and flaring-sides 2 with the keel 3 extending longitudinally in the bottom of the boat, and the gunwales 4 extending along each side of the boat at the upper portion. A tie-rod 5 extends between the flaring sides 2, and a vertical partition 6 extends from the keel to the top of the flaring sides 2 and shuts off the back portion of the boat, which is covered with canvas, as indicated at 7, Fig. 1, from the central portion, in which the rower sits, all in the ordinary way.

In the upper part of the boat a cross-bar 8 extends just in front of the vertical partition 6, and rests upon and is secured to the gunwales 4. In the bottom of the boat, resting upon the keel, is supported and secured a cross-piece 9, which is a little nearer the bow of the boat than the upper cross-bar 8. Two braces 10, inclining outwardly and rearwardly, extend between the cross-bar 8 and



cross-piece 9 and are firmly secured thereto. A central cross-bar 11, parallel with the cross-bar 8 and cross-piece 9, extends between the inclined braces 10 and is firmly secured thereto.

The cross-bar 8, cross-piece 9, inclined braces 10, and central bar 11 form the frame which I prefer to use in connection with my improved shoes, and said frame is adapted to be firmly secured in a boat or rowing-machine and the shoes supported and secured thereto in such a manner as to have a rocking motion to conform to the different positions of the feet of the rower placed in said shoes. The shoes 12 are preferably made with a wooden sole 13 and the toe portion provided with leather sides 14, laced together. The heel portion has a metal cup 15, into which the heel of the rower extends. The two shoes are preferably joined together by a bar 16 at the heel portion, so as to move together as one shoe. The shoes 12 are secured or pivoted to the central cross-bar 11, preferably just below the ball of the foot, (see Fig. 1,) so as to be movable or to have a rocking motion, as indicated by dotted lines, Fig. 1, relatively to the cross-bar 11 and yet be securely attached to said cross-bar. A cross-piece 17, secured in the bottom of the boat, against which the heel portions of the shoes are adapted to strike, (see Fig. 1,) limits the backward rocking motion of the shoes. An adjustable stop 18, in this instance secured to the top cross-bar 8 and adapted to strike against the toe portion of the shoes, limits the forward rocking motion of the shoes. A spiral spring 19, attached at one end to the tie-rod 5 and at the other end to the toe portion of the shoes, acts to draw over the toe portion of the shoes against the pressure of the heels of the rower in the heel portion of the shoes.

The shoes 12 may be attached to their supporting-frame either in a boat or in a rowing-machine, so as to have a rocking motion, in any ordinary and well-known way by means of hinges, pivot pins or rods, or otherwise; but I prefer to attach them in the manner shown in the drawings, and which I will now proceed to describe. A rod 20 extends in a central longitudinal groove in the central cross-bar 11, with its ends bent and extending into holes at each end of the cross-bar (see Figs. 2 and 3) to prevent said rod 20 from getting out of place. A bar 22, having a longitudinal groove in its lower side adapted to receive the rod 20, has its bearing and turns on said rod. The bar 22 has upon its upper surface, and preferably made integral therewith, projecting ears 23, extending directly under the soles of the shoes, which are rigidly secured thereto by means of screws or otherwise, thus communicating the rocking motion of the bar 22 on the rod 20 to the shoes. Ears 24 project down from the bar 22 to straddle the rod 20, (see Fig. 5,) to hold the bar in proper position on said rod. A strap 25, preferably under each shoe, (see Figs. 3

and 6,) is secured to the central bar 11 and secures the rocking bar 22 upon the bearing-rod 20. It will thus be seen that by means of the central cross-bar 11, rod 20, the grooved bar 22, having ears or means for securing the shoes thereto, and the straps 25, I am enabled to give a rocking motion to the shoes and at the same time attach them securely to the central cross-bar 11, so that they cannot be drawn away from the same and must always rock in the same horizontal plane, whether at the beginning or end of the stroke.

By changing the position of the stop at the heel portion of the shoes or at the toe portion I can vary the amount of the rocking motion of the same.

I have shown in the drawings and described my invention as applied to an ordinary form of shoe used in row-boats and rowing-machines; but it will be understood that I do not limit myself to the special form or construction of the shoe proper shown, as my invention may be applied to and used in connection with any shoe or equivalent device in which the feet of the rower may be placed and held during the operation of rowing.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a rowing apparatus, the combination, with a stationary support or frame, of a shoe hinged on said frame, so as to have a rocking or tilting motion in a vertical plane to allow of a rocking motion of the foot of the rower in the direction of the length of the rowing apparatus, substantially as set forth.

2. The combination, in a rowing apparatus, with a stationary frame rigidly secured thereto, of shoes or devices adapted to receive the feet of the rower, hinged upon their under side on said frame, so as to have a rocking or tilting motion thereon, and means for limiting said rocking motion, substantially as set forth.

3. The combination, with a cross-bar rigidly secured in a rowing apparatus, a rod extending in a groove therein, a bar extending over said rod and having its bearing thereon, and means for securing the rod and bar to the cross-bar, of shoes secured to the bar on the rod, to have a rocking motion with said bar, for the purpose stated, substantially as set forth.

4. The combination, with a cross-bar rigidly secured in a rowing apparatus, a rod extending in a groove therein, a bar extending over said rod and having its bearing thereon, and means for securing the rod and bar to the cross-bar, of shoes secured to the bar on the rod, to have a rocking motion with said bar, and means for adjusting the rocking motion, substantially as set forth.

EDWARD J. KERNS.

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