

July 1, 1924.

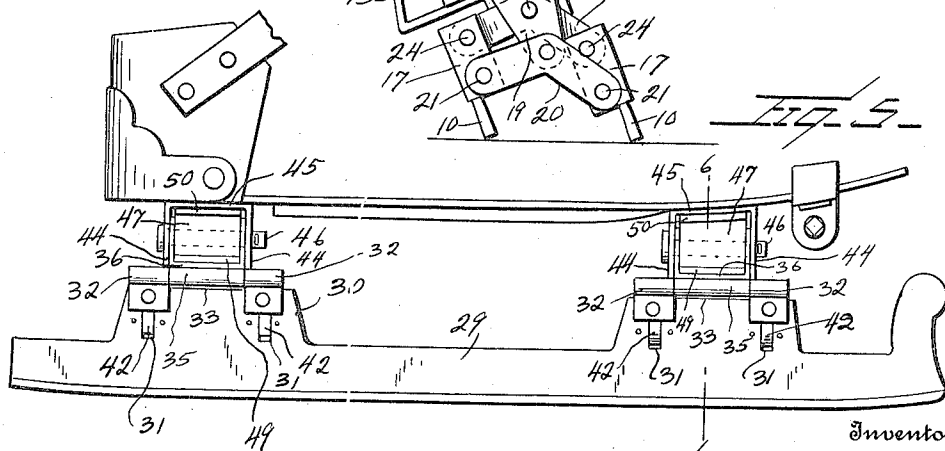
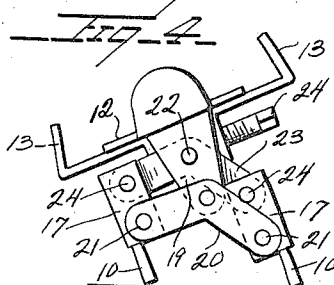
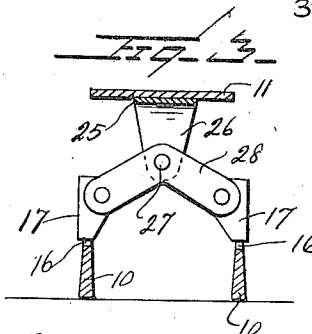
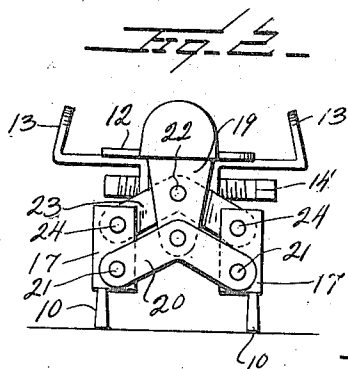
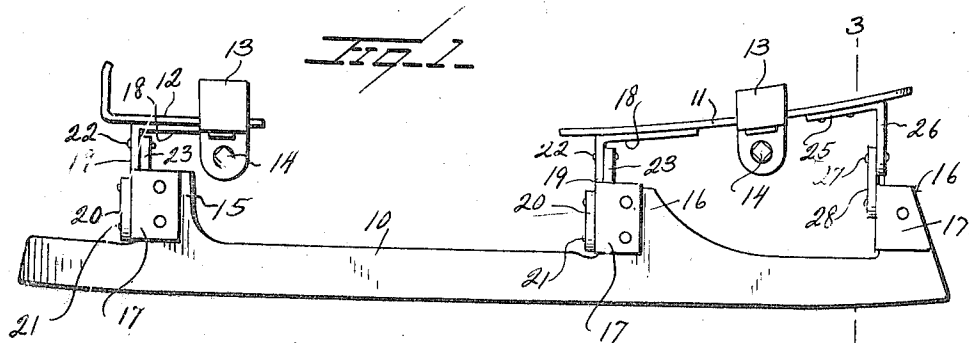
W. D. CRAWFORD

1,499,448

SKATE

Filed July 3, 1922

3 Sheets-Sheet 1



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July 1, 1924.

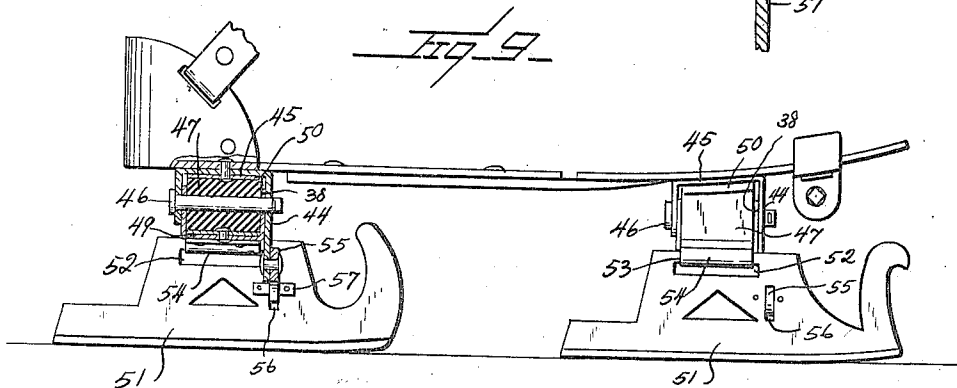
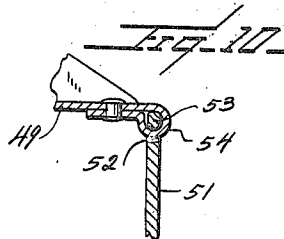
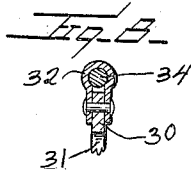
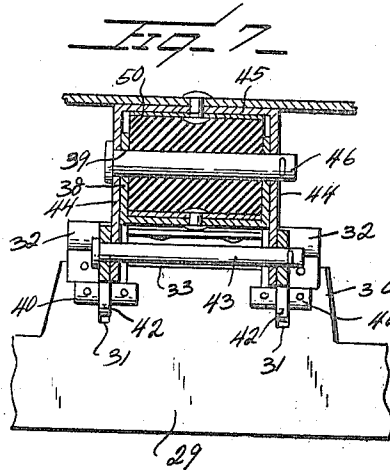
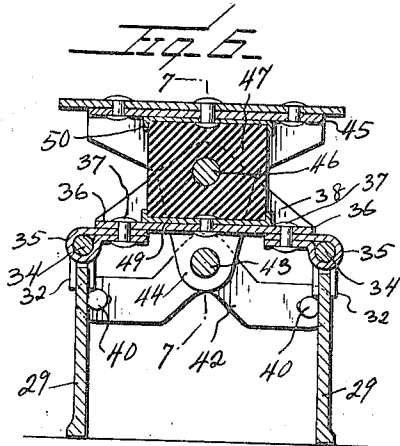
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3 Sheets-Sheet 2



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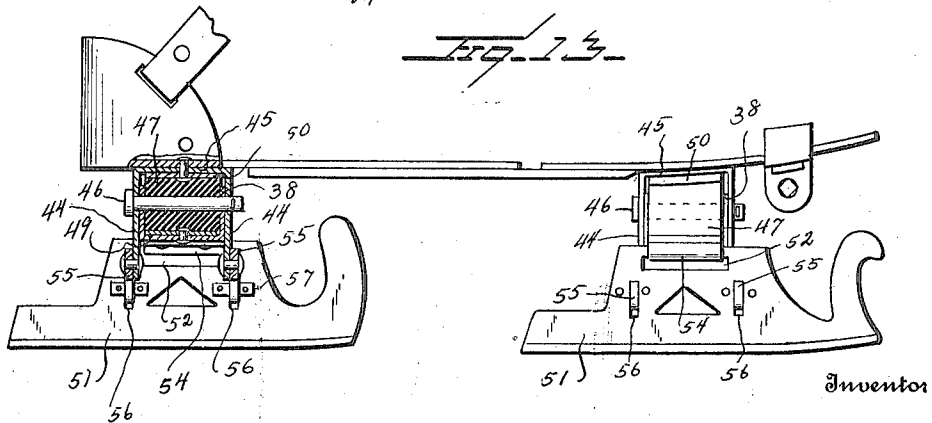
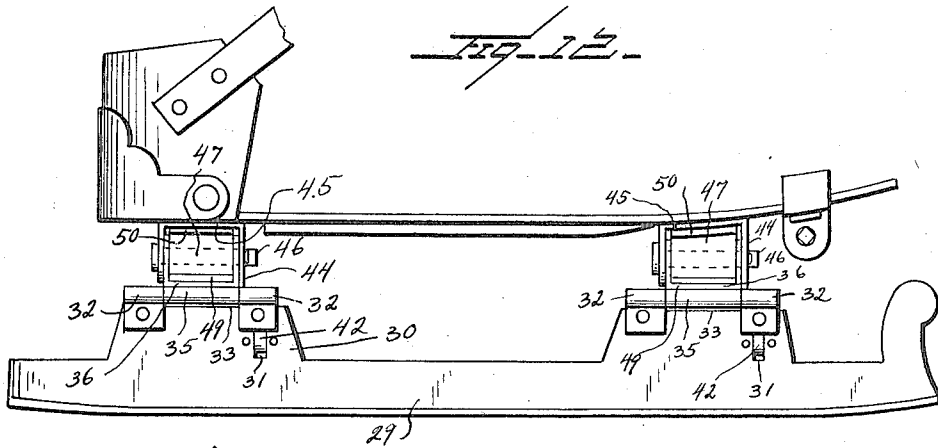
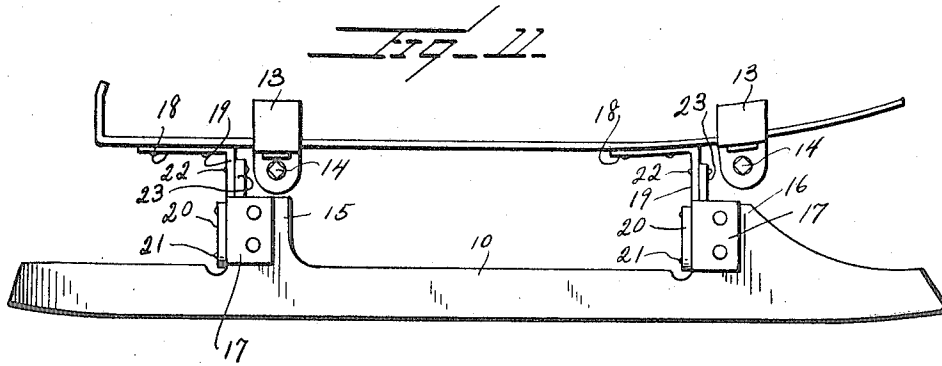
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W. D. CRAWFORD

SKATE

Filed July 3, 1922

3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE.

WILBER D. CRAWFORD, OF SCOTTSBLUFF, NEBRASKA.

SKATE.

Application filed July 3, 1922. Serial No. 572,458.

To all whom it may concern:

Be it known that I, WILBER D. CRAWFORD, a citizen of the United States, residing at Scottsbluff, in the county of Scotts Bluff and State of Nebraska, have invented certain new and useful Improvements in Skates, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to skates, and particularly to skates having double runners, that is two parallel runners.

The general object of the invention is to provide a skate of this character having a double runner which are so connected to each other and to the foot and heel plates of the skate or body of the skate as to permit the body of the skate to be inclined to the horizontal without either of the runners leaving the ice, and which will permit the skater, therefore, to perform all the evolutions possible on a single runner skate.

A further object is to provide skates of this character with double runners and provide a lever connection between the sole and heel plates or body of the skate and double runners whereby the inclination of the double runners may be controlled by the inclination of the body.

A still further object is to provide a construction of this character wherein a resilient cushion is provided tending to resist the too easy movement of the runners with relation to the body.

Other objects will appear in the course of the following description.

My invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a side elevation of one form of my improved skate;

Figure 2 is a rear elevation of the same;

Figure 3 is a section on the line 3—3 of Figure 1;

Figure 4 is a rear elevation showing the skate mounted;

Figure 5 is a side elevation of another form of skate;

Figure 6 is a section on the line 6—6 of Figure 5;

Figure 7 is a vertical sectional view on the line 7—7 of Figure 6;

Figure 8 is a fragmentary detail sectional view through the hinge leaf 32 and the adjacent portion of the skate;

Figure 9 is a side elevation of another form of skate partly in section;

Figure 10 is a cross sectional view through the plate 49 and the blade 51;

Figure 11 is a side elevation of another embodiment of my invention very much like Figure 1;

Figure 12 is a side elevation of still another embodiment of the invention showing the skate illustrated in Figure 5 but with a single control instead of a double control;

Figure 13 is a "bob" skate as in Figure 9, but showing a double control applied thereto.

Referring to the drawings, and particularly to the simplest form of my invention which is illustrated in Figures 1 to 4, 10 designates the two parallel runners of the skate. These runners are of ordinary form. The skate is illustrated as of that class in which there is a separate sole plate 11 and a heel plate 12. The sole and heel plates are provided with the usual sole and heel clamps, designated generally 13, and operated by means of the transversely extending screw 14. Inasmuch as these parts are old and well known, it is not believed necessary to describe them specifically.

Each runner 10 is formed at its rear end with an upwardly projecting lug 15 and at its forward end and intermediate the forward end and rear end with the upwardly projecting lugs 16. The lugs 16 are to support the sole plate, while the lug 15 supports the heel plate. Riveted to the lugs 15 are the angle irons 17, and attached to the under face of the heel plate 12 is the plate 18 having a downwardly depending arm 19. This arm 19 is pivoted at its lower end to an angular link 20, the extremities of which are pivoted by rivets 21 to the angular plate or iron 17. Also pivoted at 22 to the arm 19 is an angular link 23, the extremities of which are pivoted at 24 to the angle iron 17.

It will be seen from Figure 2 that the depending arm or lug 19 extends down between the confronting faces of the links 20 and 23. The lugs 16 also have applied to them the angle irons 17 and the rear of the sole plate has riveted or otherwise attached to it the plate 18 having the depending arm 19, this arm at its lower end being pivoted to an angular link 20 whose ends are pivoted to the angle iron 17, as at 21, and above the point of pivotal connection between the arm 19 and the angular link 20, the arm 19 is pivoted to the angular link 23 which is pivoted at its extremi-

ties to the upper portion of the angle iron 17. In other words, the construction for supporting the rear end of the sole plate is exactly the same as the means for supporting the heel plate.

The forward end of the sole plate is riveted to a plate 25, which forward end extends downwardly, as at 26, and is pivoted at 27 to an angular link 28, the lower ends of which are pivoted to the inward extensions of the angular irons 17.

It will be seen that the pairs of links 20 and 23 have parallel motion and that the blades or runners of the skate will be shifted into positions inclined to the vertical but always in parallel relation by any inclination to right or left of the sole and heel plates so that the runners at all times are not only parallel to each other but parallel to the tongues or arms 19, and it will be seen that the tongues or arms 19 constitute levers whereby the blades or runners of the skate are turned into inclined position to a vertical plane or into a position parallel to this vertical plane. This construction permits the skater to incline his body and incline the blades of the skate in exactly the same manner as if a single runner was used, the edges of both blades biting into the ice in the same manner that the edge of one blade would do in the ordinary skate. When the skater's body is inclined and the sole and heel plates are inclined to the horizontal, one blade does not leave the ice as it would were the blades fixed, but both blades engage the ice at the same time so that the blades follow and swing with the motion of the skater's body and permit all the necessary evolutions to be made.

In Figures 5 to 8, I show another embodiment of my invention, and in these figures 29 designates the runner, which is of common and ordinary form, each runner being provided with an upwardly extending portion 30 disposed adjacent the forward end and rear end of the runner. Each of these upwardly projecting portions is vertically slotted at two points at 31, and riveted to the ends of each portion 30 are the hinge beads 32 which are U-shaped in form and embrace the lugs formed by cutting away the middle portion of the upwardly extending member 30, as at 33. Pintles 34 extend through each pair of hinge beads, and hinged to these pintles by means of the hinge leaves 35 are the transversely extending plates 36 which are riveted to hinge leaves 35 by means of the rivets 37. These plates 36 are formed with upwardly extending forward and rear lugs 38 perforated at 39. Riveted or otherwise attached to the portions 30 upon the inside faces thereof are pintles 40 disposed so as to intersect the slots 31 and these pintles

pass through the ends of the angular links 42. The forward pair of links 42 are pivoted to a pair of arms or tongues 44 formed by bending down the ends of a plate 45 which is riveted or otherwise attached to the sole or heel plate of the skate. It will be understood that there are two of these plates 45, one at the heel and one at the toe, and that the parts 44 are the equivalents of the tongues or arms 19 in Figure 1. Pintles 43 and 46 pass through the arms 44, the links 42 and the upwardly extending lugs 38.

It will be understood that the plates 36 constitute in effect links and are in effect equivalent to the links 23 in the construction previously described. They, however, perform another function, in that they act as holders for rubber or other elastic blocks 47 through which the pintle 46 passes. These blocks fit between the upwardly extending lugs 38 and each block rests in a seat 49 riveted to the plate 36 and having upwardly extending ends, and at their upper ends these blocks rest in seats 50 having downwardly extending ends, these seats being constituted each by a plate riveted to the plate 45. This form of skate has the same advantages as the form previously described but with a certain additional function due to the elastic blocks 47 which tend to elastically resist the movement of the skate from a vertical to an inclined position and give a greater rigidity to the skate.

The form of skate body illustrated in Figure 5 is one wherein the body of the skate extends the full length between the heel and sole so that the heel plate and toe plate are conjoined. The skate is illustrated as having a strap at the heel end whereby it may be engaged with the foot and a clamp at the forward end to engage the sole of the shoe. Inasmuch as the body of the skate is of ordinary form no special description is necessary.

In Figures 9 and 10, I illustrate the application of my invention to an extensible skate, that is a skate wherein the body may be adjusted longitudinally to fit longer or shorter feet and wherein, therefore, two pairs of runners are used, one disposed beneath the toe and one beneath the heel of the skate. In this form of the device, each runner 51 is longitudinally slotted at its upper margin, as at 52, leaving a longitudinally extending pintle 53 with which the plate 49 previously described is hingedly engaged by bending the ends of the plate around this pintle so that the ends of the plate form the hinge beads 54. Otherwise than this, this plate 49 is constructed precisely the same as the plate previously described. At the sole and heel are disposed the plates 45, as previously described, having the downwardly extending lugs 44 which are pivoted to the upwardly extending lugs 38 by the longitudinally ex-

tending pintle 46 which passes through a rubber buffer 47 in precisely the same manner as previously stated. I have illustrated, however, only one angular link, which is

designated 55. This link has its ends inserted in slots 56 and is pivoted upon pintles 57 riveted or otherwise attached to the inner face of each runner. This link is pivoted at its middle to the lower end of the arm 44.

It will be seen that in this construction only a pair of links 55 are used in place of the two pairs of links 42 illustrated in Figure 7 but that the principle of operation is precisely the same as heretofore described and that the cushioning effect is the same. The skate is capable of the same evolutions as previously described for the other skates, but in addition the skate is so constructed as to permit the body of the skate to be extended or contracted as desired. The body of the skate is of ordinary form and needs no special description.

In Figure 11, I have illustrated a skate of the same character as that shown in Figure 1 but differing from that shown in Figure 1 merely in the fact that the middle lug 16 with its attendant parts has been left off and the toe plate and heel plate are integral to form a foot plate which extends along the entire length of the skate. Otherwise than this, the skate illustrated in Figure 11 is precisely the same as that illustrated in Figure 1.

In Figure 12, I have illustrated a skate of the same form as that shown in Figure 5 but instead of having two levers 42 and two levers 44, I show only one lever 44 and one lever 42 at the rear end of the skate and one lever 44 and one lever 42 at the forward end of the skate. Otherwise than this, however, the construction is the same as that illustrated in Figure 5.

In Figure 13, the construction illustrated is the same as that in Figure 9, except that Figure 9 shows a single control comprising the downwardly extending lever or arm 44 and the angular lever 55. In Figure 13, however, I have shown two pairs of levers 55, one pair for each pair of runners 51 and two pairs of arms or levers 44 which engage with these levers 55. In other words, the construction shown in Figure 13 is precisely the same as that shown in Figure 9, except that a double control is illustrated instead of a single control.

The purpose of Figures 11, 12 and 13 is to illustrate the fact that the controlling elements may be either single or double on any one of the different forms of skate. It will be obvious, however, that the double control, that is the controls having four arms attached to the body of the skate and extending downward to the runners, and four transversely extending angular levers, is a stronger and firmer construction than that in

which only two of these coacting arms and levers are provided.

I claim:

1. A skate having two runners and a body, the body having a plurality of downwardly depending arms, and a pair of links pivoted at their middles to each arm at different heights, the ends of the links being pivoted to the runners at different heights whereby to cause the runners to tilt laterally in the same direction upon the tilting of the body.

2. A skate having two runners and a body, the body having a plurality of downwardly depending arms, a pair of angular links pivoted at their vertices to each arm at different heights, the ends of the links being pivoted to the runners at different heights whereby to cause the runners to tilt laterally in the same direction upon the tilting of the body.

3. A skate having two runners and a body, the body having a plurality of downwardly depending arms and a pair of links pivoted at their middles to each arm at different heights, the ends of the links being pivoted to the runners at different heights whereby to cause the runners to tilt laterally in the same direction upon the tilting of the body, and means elastically resisting the tilting movement of the runners out of a vertical plane.

4. A skate having two runners and a body, the body having a plurality of downwardly depending arms and a pair of links pivoted at their middles to each arm at different heights, the ends of the links being pivoted to the runners at different heights whereby to cause the runners to tilt laterally in the same direction upon the tilting of the body, and blocks of elastic material disposed between the body and one of said links and resisting pivotal movement of the link relative to the body.

5. A skate having two runners and a body, the body having a plurality of pairs of downwardly depending arms, the runners being connected to each other adjacent their upper margins at a plurality of points by transversely extending links operatively hinged to the runners, each link having upwardly extending lugs, links pivoted to the runners below the first named links, each of said last named links being pivoted to the lower ends of one of said arms, the lugs on the first named links extending upward and between the pairs of arms on the body and being pivoted thereto, and resilient means disposed between the body and the first named links and resisting pivotal movement of the body relative to said first named links.

6. A skate having two runners and a body, the body having a plurality of pairs of downwardly depending arms, the runners

being connected to each other adjacent their upper margins at a plurality of points by transversely extending links operatively hinged to the runners, each link having
5 upwardly extending lugs, links pivoted to the runners below the first named links, each of said last named links being pivoted to the lower ends of one of said arms, the lugs on the first named links extending up-
10 ward and between the pairs of arms on the body and being pivoted thereto, and elastic blocks disposed between the first named links and the body and resisting pivotal movement of the body relative to the first
15 named links, the pivots connecting the arms to the first named links passing through said rubber blocks.

7. A skate having a forward pair of runners and a rearward pair of runners,
20 upper and lower parallel links pivotally connected at their ends to said runners

whereby the runners shall have parallel motion, and a body having arms pivotally connected to each of said pairs of links at the middle thereof.

8. A skate having a forward pair of runners and a rearward pair of runners, upper and lower parallel links pivotally connected at their ends to said runners whereby the runners shall have parallel mo-
30 tion, a body having arms pivotally connected to each of said pairs of links at the middle thereof, elastic blocks supported upon the upper pair of links and against which the body bears, means holding said blocks from
35 lateral movement and said blocks resisting pivotal movement of the body with relation to said upper pair of links.

In testimony whereof I hereunto affix my signature.

WILBER D. CRAWFORD.