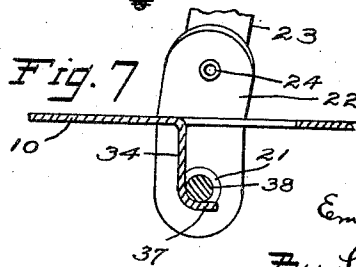
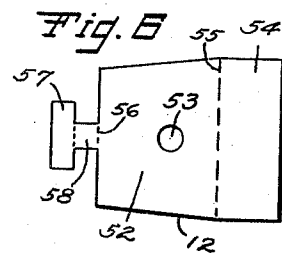
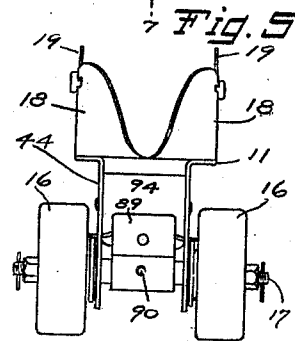
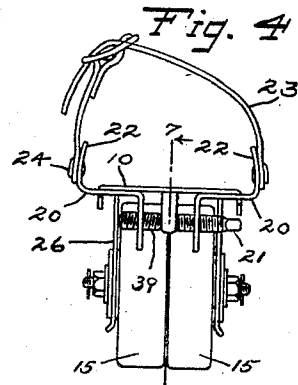
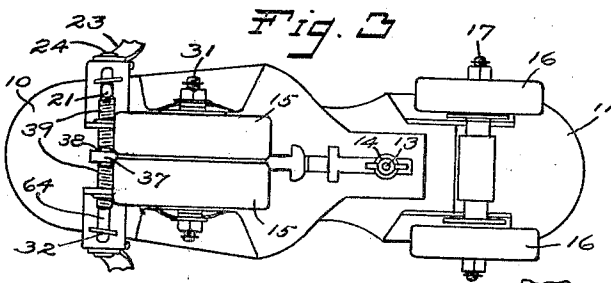
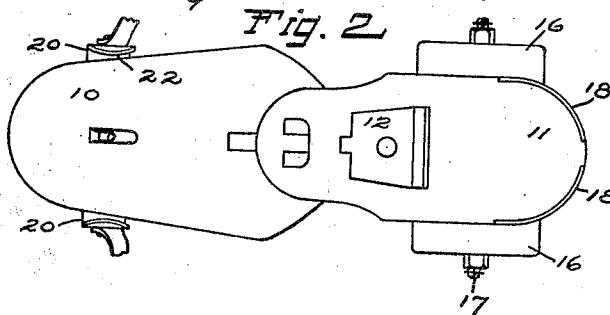
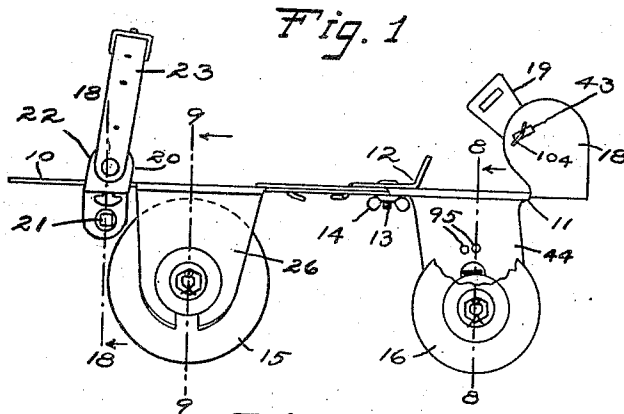


1,345,848.

E. E. HARDY.
ROLLER SKATE.
APPLICATION FILED AUG. 27, 1918.

Patented July 6, 1920.
3 SHEETS—SHEET 1.



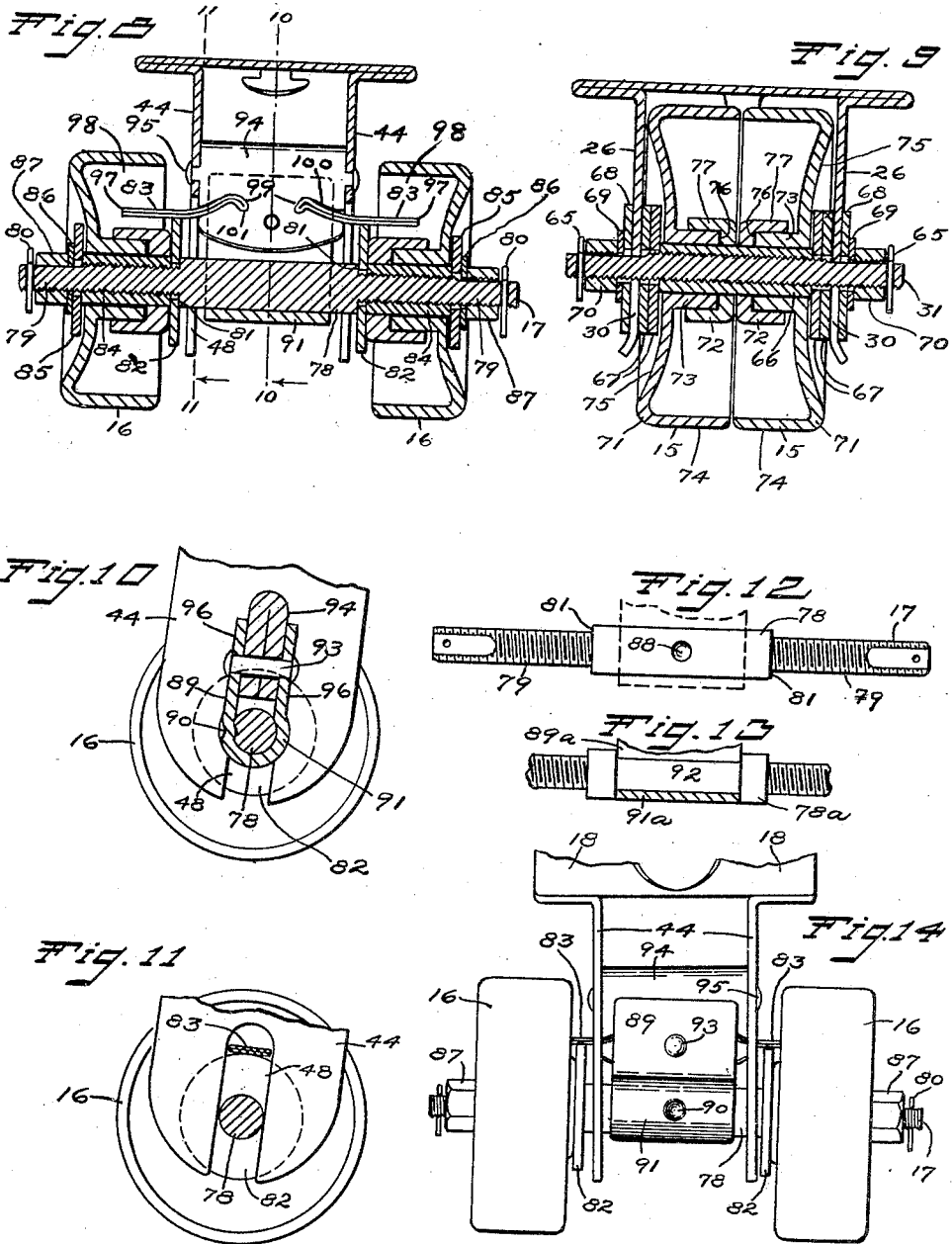
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3 SHEETS—SHEET 2.



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 3 SHEETS—SHEET 3.

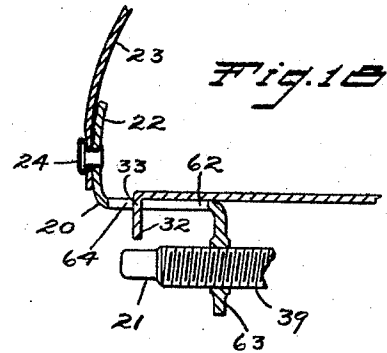
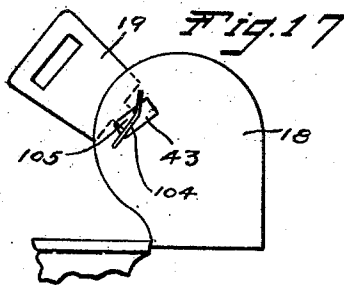
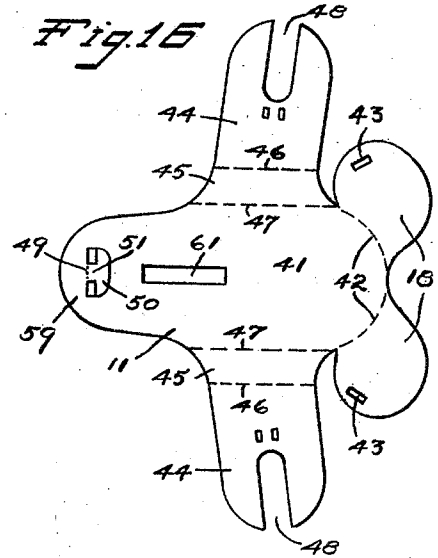
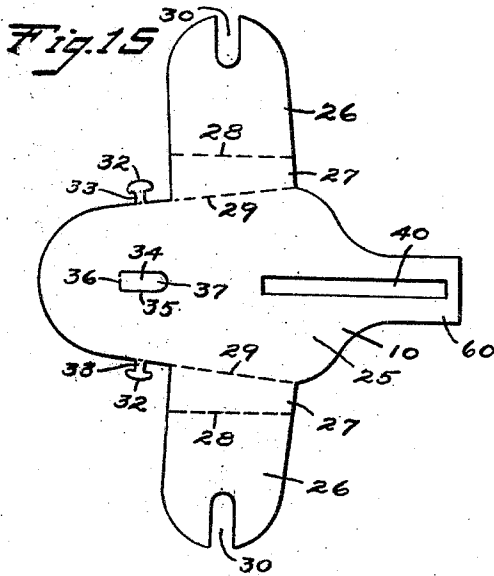
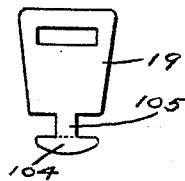


Fig. 19



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ROLLER-SKATE.

1,345,848.

Specification of Letters Patent.

Patented July 6, 1920.

Application filed August 27, 1918. Serial No. 251,609.

To all whom it may concern:

Be it known that I, EMERY EASTMAN HARDY, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Roller-Skates, of which the following is a specification.

My invention relates to improvements in roller skates and the object of my improvement is to simplify the construction and to introduce certain novel and useful features in roller skates of the general form such as shown in the patents previously granted to me, to wit:—

Patent No. 1,152,813, September 7, 1915,
Patent No. 1,228,111, May 29, 1917, and
Patent No. 1,276,212, August 20, 1918.

In the accompanying drawing:—

Figure 1 is a side elevation of my improved roller skate.

Fig. 2 is a plan view of the same.

Fig. 3 is bottom view of the same.

Fig. 4 is an end elevation of the front end.

Fig. 5 is an end elevation of the rear end.

Fig. 6 is a plan view of the blank for the front heel lug member, on an enlarged scale.

Fig. 7 is a sectional view on the line 7—7 of Fig. 4.

Fig. 8 is a sectional view on the line 8—8 of Fig. 1.

Fig. 9 is a sectional view on the line 9—9 of Fig. 1.

Fig. 10 is a sectional view on the line 10—10 of Fig. 8.

Fig. 11 is a sectional view on the line 11—11 of Fig. 8.

Fig. 12 is a rear elevation of the rear shaft, showing the indentation for positioning the shaft connecting member, an outline of a portion of the said member being indicated by broken lines.

Fig. 13 is a rear elevation of a modification of the said shaft, showing different means for positioning the connecting member, the connecting member being shown in section.

Fig. 14 is a rear elevation showing the parts in a different position from that shown in Fig. 8, involving a relative swinging or rocking of the parts.

Fig. 15 is a plan view of the blank for the front member.

Fig. 16 is a plan view of the blank for the rear member.

Fig. 17 is a side elevation showing the pivotal connecting means for the heel strap.

Fig. 18 is a fragmentary sectional view on the line 18—18 of Fig. 1.

Fig. 19 is a plan view of the blank for the heel strap connecting member.

My improved roller skate comprises a skate body that is made up of a front member 10, a rear member 11, and an adjustable front heel lug member 12, held together by means of a screw 13 and a nut 14.

A set of wheels is supported by the said body, comprising a pair of wheels 15 at the front, positioned side by side so as to be operable as one wheel, and a pair of rear wheels 16 in spaced relation, at the ends of the rear shaft 17.

At the back lateral edges of the rear member 11 is a pair of upstanding fixed rear heel lugs 18 to which are connected by means of a special locking pivotal connection heel strap connecting members 19.

Operatively connected to the front member 10 is a pair of toe clamping members 20 that have threaded connection with the key operated clamping screw 21 and are provided with up-standing lugs 22 to which are connected the toe straps 23 by means of eyelet rivets 24.

The blank for the front member 10, shown in Fig. 15, comprises a symmetrical structure having the body portion 25 at the axis and a pair of wings extending laterally from the sides composed of the arm portions 26 at the outer ends and the intermediate connecting portions 27. The portions 26 and 27 mentioned are connected along the folding line 28 and the connecting portion 27 is connected to the body portion 25 along the folding line 29. The arms 26 are provided at the outer ends with slots 30 for the front shaft 31.

In front of the wings described is a pair of laterally extending lugs that are bent downwardly to provide a sliding and supporting connection for the toe clamping members 20, each of which comprises a head portion 32 at the outer end and a relatively narrow neck portion 33 connecting the said head portion 32 with the body portion 25 of the front member 10.

At the middle of the body portion 25, between the toe clamping member lugs 32, an integral finger 34 is formed from the blank by a U-shaped slit 35 that is bent down-

wardly at the connected end 36 and has the free end 37 curled around in circular form, as shown in Fig. 7, to fit in the reduced, unthreaded portion 38 of the key operated clamping screw 21, between the threaded portions 39, suitably to serve as positioning means for the said clamping screw. The said finger 34, it will be noted, is directed along the longitudinal axis in the blank, the connecting portion 36 being positioned across the said axis, and when bent downwardly and curled, as described, the material of the said finger extends across the vertical axial plane.

The rear portion of the front member 10 is provided with a slot 40 that extends along the axis for an appreciable part of the length of the blank.

The blank for the rear member 11, as shown in Fig. 16, comprises the body portion 41 at the middle, extending along the axis, and symmetrically arranged relatively thereto are the following elements:—the two rear heel lugs 18 that are bent upwardly along the connecting lines 42 and which are each provided with an inclined slot 43 for receiving the heel strap connecting member 19, the said lugs 18 being at the rear end; in front of the lugs 18 are a pair of laterally directed wings that are composed each of an arm portion 44 at the outer end, and a connecting portion 45 intermediate the said arm portion 44 and the body portion 41, the said wings being bent along the folding lines 46 and 47 so as to position the arm portions in pendent position, under the body portion 41, suitably to provide the proper support for the rear wheels and connected parts, the arm portions 44 being provided with slots 48 for receiving the rear shaft 17 and certain other parts to be described; and in the front part of the body portion 41 is a T-shaped lug that is formed from the material of the blank and is bent downwardly along the connecting line 49 and comprises the head portion 50 at the outer end and the relatively narrow connecting neck 51 intermediate the said head portion 50 and the connecting line 49. Back of the lug 50 is a longitudinal slot 61.

The blank for the front adjustable heel lug member 12, as shown in Fig. 6, is generally rectangular and comprises the body portion 52 generally at the middle having the hole 53 for the clamping screw 13; the heel engaging lug 54 at the rear end and bent upwardly along the connecting line 55; and at the front end is a T-shaped lug that is connected along the line 56 and is bent downwardly along the said line, and that is composed of the overhanging head portion 57 at the front or outer end and the relatively narrow neck portion 58 intermediate the said head portion 57 and the connecting line 56.

In assembling the body or frame structure the front end 59 of the rear member is brought into position above the rear end 60 of the front member 10, the neck 51 of the T-shaped lug on the rear member 11 being positioned in the slot 40 and the head 50 of the said lug being engaged with the border walls of the said slot 40 on the under side of the body portion 25 of the front member 10, thus providing a partial connection for the front member 10 and the rear member 11.

That is to say, provision is made as described for connecting the members 10 and 11 at one point. In order to effect an efficient and proper connection of these members it is necessary to provide a second connection, appreciably separated from the first connection, and provision is made for doing this by utilizing for the second connection the clamping screw 13, as will be described. Also, provision is made for such two point connection for the heel lug member 12, with the clamping screw 13 serving as one of the connecting means.

The heel lug member 12 is assembled with the body portion 52 above the body portion 41 of the rear member 11, the neck 58 being extended through the slots 61 and 40 and the head 57 being engaged with the walls of the slot 40 in the front member 10, as in the case of the lug head 50, on the under side of the body portion 25. Thus one connection is provided for the heel lug member 12. The second connection for the same is provided by the clamping screw 13, which passes downwardly through the hole 53, the slot 61, and the slot 40, the nut 14 engaging with the under side of the body portion 25 of the front member 10, as shown in Fig. 3.

The toe clamps 20, as shown in Fig. 18, comprise each the body portion 62 that is positioned transversely of the body portion 25 of the front member 10, on the under side thereof, has the upstanding lug 22 on the outer end, and at the inner end has the pendent arm 63 that is threaded to engage with the threaded portion 39 of the clamping screw 21. The body portion 62 has a longitudinal slot 64 for receiving and engaging with the toe clamp lug composed of the neck 33 and the head 32.

The wheels are all provided with a rigid shaft and bearing support, constructed and arranged so that the clamping nuts on the ends of the shaft can be screwed up tightly without effecting a clamping of the wheels themselves or interfering with the free operation of the wheels, as will be described.

The wheels themselves are all made after the same plan, the only difference between the front wheels and the rear wheels being in the size, the front wheels being of appreciably greater diameter than the rear wheels 16.

Considering the front wheel supporting structure, the front shaft 31 extends through the slots 30 in the front arms 26, are threaded for substantially the entire length, as shown in Fig. 9, and have holes for cotter pins 65 at the ends.

Mounted on the middle portion of the shaft 31 is a sleeve 66 that serves as the bearing for the two front wheels 15, is slightly longer than the combined thickness of the two hub portions of the wheels, and is appreciably shorter than the width of the open space between the two arms 26. Washers 67 fill the space along the shaft 31 between the ends of the sleeve 66 and the opposed arms 26. The washer 67 on the side of the wheel 15 serves as a thrust bearing for the wheel and for this reason is of appreciably greater diameter than the sleeve 66. Washers 69 and 68 may be provided between the clamping nuts 70 and the outer faces of the arms 26.

Considering the wheels 15, these are composed of a main part 71 and an auxiliary hub member 72. The main parts 71 comprise a sleeve like hub portion 73 at the middle that fits along the sleeve bearing 66, a cylindrical tread portion 74 at the periphery, and a single web portion 75 connecting the ends of the portions 73 and 74. The wheels are positioned preferably, for looks' sake, with the web portions 75 on the outer or exposed side of the wheels' structure. The webs 75 are dished inwardly, as shown, to provide operating space between the wheel and the supporting arm 26 for the thrust bearing washer 67.

The hub member 72 is a cup-like structure, having a radial end wall 76 that is perforated to fit the sleeve bearing 66, and which in use abuts against the mating end wall 76, and extending inwardly from the end wall 76 is a cylindrical sleeve 77 that fits over the hub portion 73 of the main part 71.

Considering the rear wheel structure, the rear shaft 17 comprises a relatively large portion 78 at the middle that is of sufficient length to extend through and slightly beyond the slots 48 in the arms 44, and reduced threaded end portions 79 of appreciable length and having holes adjacent the extreme ends for cotter pins 80, a shoulder 81 being formed at the junction of the two portions 78 and 79. Mounted on the end portion 79 and abutting against the shoulder 81 is a washer 82 of appreciable diameter that serves as a thrust bearing for the rear wheel 16 and also serves as the support for the free end of the positioning or rocking spring 83.

In abutment with the washer 82 and also mounted on the threaded end portion 79, is the sleeve bearing 84 that is slightly longer than the hub portion of the rear wheel 16

that is mounted thereon. At the end of the bearing sleeve 84 is the end thrust washer 85. A second washer 86 may be interposed between the thrust bearing washer 85 and the clamping nut 87.

The enlarged portion 78 of the shaft 17 has an indentation 88 in the peripheral wall into which the material of the shaft connecting member 89 is forced, as shown at 90 in Fig. 10, for positioning these parts against longitudinal separation, the said connecting member 89 having a sleeve 91 at the lower end that encircles the shaft 17.

In the modification shown in Fig. 13 the enlarged portion 78^a of the shaft 17^a has a reduced portion 92 along the middle that serves as the holding means for the sleeve 91^a of the connecting member 89^a.

The connecting member 89 serves as the means for connecting the rear shaft 17 with the frame structure and the connection for the said connecting member 89 with the frame structure is in the form of a pivotal connection, provided by means of the pivotal pin 93 in the following manner:—A fixed block 94 is rigidly secured between the two arms 44 in any suitable manner, as by means of integral rivets 95, and is positioned in a generally vertical plane, in line with the two slots 48 in the arms 44, and is, furthermore provided in the lower end portion, appreciably above the shaft 17, with a hole for the pivotal pin 93.

The connecting member 89 is formed of sheet material that is bent at the middle to form the sleeve 91 and to provide two upwardly extending arms 96 that are spaced suitably to receive between them the said lower portion of the block 94 and that are also perforated to receive the pivotal pin 93.

When supported in the manner described the shaft 17 is free to swing or rock relatively to the frame structure, and in such movement the shaft is guided by the engagement of the portions that extend through the slots 48 in the arms 44 with the side walls of the said slots.

Thus, as described, means are provided for a swinging movement of the rear wheels 16 relatively to the frame structure, which permits of maintaining both of the rear wheels 16 in contact with the floor with an appreciable range of lateral to and fro movement of the frame structure, such as is usual in use in the movements of the foot.

In order to provide for positively tilting or swinging the shaft and wheels for the purpose mentioned I incorporate in the structure suitable spring devices comprising a pair of springs 83, one on each side.

The said springs 83 are formed of flat spring material, extend laterally from the block 94 and through the slots 48 suitably bear in each case on the peripheral edge of the thrust bearing washer 82 and be sup-

ported thereby, and have the free end portions 97 that extend outwardly beyond the said washers 82 housed in the open space 98 that is provided on the inner sides of the wheels 16.

As a structural detail, the inner end portion 99 of the spring 83 is housed in a slot 100 in the block 94 of hook or curved form at the extreme end, as shown at 101, suitably to lock the spring in position against longitudinal displacement, and the spring is locked in the slot 100 against lateral displacement by means of the two arms 96 of the connecting member 89 that bear against the opposite faces of the block 94 and close the sides of the said slot 100.

The free end portions 97 of the springs 83 operate upwardly and downwardly in the slots 48 in the arms 44 and are guided in their movements by the side walls of the said slots.

As described, the washers 82 serve in each case as one of the thrust bearings for the opposed rear wheel 16 and also as the bearing or contact device on the shaft 17 for cooperating with spring operated rocking or tilting mechanism for swinging the wheels 16 relatively to the frame structure.

The heel strap connecting member 19, the blank for which is shown in Fig. 19, comprises a plate-like body portion that has a slot at the upper end for receiving the heel strap and that has at the lower end a T-shaped lug of the general form of the T-shaped lugs already described, consisting of a head portion 104 at the outer end and a reduced neck 105 connecting the said head portion 104 and the body portion. The neck 105 is bent so as to position the head portion 104 in off-set relation to the body portion, and may be slightly twisted, as shown in Fig. 1.

The upstanding rear heel lugs 18 have each a slot 43 for cooperating with the lug on the connecting member 19 for providing a pivotal connection therewith, the head 104 being threaded through the said slot 43, leaving the neck 105 in engagement with the said slot 43. The slot 43 is preferably inclined, as shown, and is appreciably shorter than the width of the head 104, being of sufficient length to permit of freely assembling the parts in the manner described, and to permit of an appreciable range in the adjustment of the relative positions of the parts to conform to different positions of the heel straps on the foot, such adjustment including a pivotal movement of the parts.

I claim as my invention:—

1. A roller skate comprising a frame that is composed of a front frame member and a rear frame member having overlapping parts, the said parts comprising a lower part that extends rearwardly from the front frame member and has a longitudinal slot

and an upper part that extends forwardly from the rear frame member, overlays the said lower part, and has a T-shaped lug that is projected through the said slot for serving as one means of connection of the frame members, and the said frame members being provided with means for receiving a bolt and nut for serving as a second means of connection of the frame members.

2. A roller skate comprising a front frame member having a slot, a rear frame member having a slot and a T-shaped lug, a heel lug member having a hole for a clamping screw and a T-shaped lug, and the said members being adapted for being adjustably connected together with the lug on the rear frame member cooperating with the slot in the front frame member, the lug on the heel lug member cooperating with the slots in both of the frame members, and a clamping screw entered in the said hole and also both of the slots in the frame members.

3. A roller skate having a frame structure made of sheet material and a pair of toe clamps operatively supported by the said structure, the said frame structure having a pair of pendent T-shaped lugs connected to opposite edges, and the said toe clamps being each slotted suitably to receive and engage with one of the said lugs for providing an adjustable connection with the frame structure.

4. A roller skate having a rear frame member that is provided with a pair of upstanding, fixed rear heel lugs and having a pair of heel strap connecting members for being connected one to each of the said lugs, and means integral with the said members cooperating with means integral with the said lugs for effecting a connection of the parts so as to permit of a combined pivotal and limited relative sliding movement of the parts.

5. A roller skate as described in claim 4 having the said rear heel lugs provided with a slot, and the means for pivotal connection comprising a T-shaped lug on the said connecting member engaged with the said slot.

6. A roller skate having a front member, toe clamping mechanism operatively supported on the under side of the said member and comprising a transversely directed clamping screw, the said screw having a reduced portion at the middle, and a positioning finger for the said screw extending downwardly from the said front member and having a curled end portion fitting and engaged with the said reduced portion.

7. A roller skate as described in claim 6 having the front member made of sheet material, and the said finger being formed of material that is integral with the material of the said front member.

8. In a roller skate, a shaft for supporting a pair of rear wheels, a wheel receiving

structure mounted on the ends of the said shaft and composed of a bearing sleeve and an end washer at each end of the said sleeve, means in the form of a shoulder for limiting the movement of the said structure along the said shaft engaged with one of the said washers, the said sleeve having threaded engagement with the said shaft, and a clamping nut on the said shaft and operative to effect a clamping against the other of the said washers, so as to effect a holding of the said wheel receiving structure in place and effect a locking of the parts in operative position.

9. A wheel for a roller skate composed of a main part and an auxiliary hub part, the said main part comprising two concentric cylindrical portions that are connected by a web portion, the inner of the said cylindrical portions serving as a hub and bearing portion and extending laterally from one side of the said web portion, and the said auxiliary hub part being in the form of a thimble structure, having a radial wall at one end that abuts against the end of the said hub and bearing portion and a cylindrical sleeve portion connected to the said radial wall and that is slipped along over the outer side of the said hub and bearing portion.

10. A roller skate having a frame structure, a pair of rear wheel supporting arms extending downwardly from the said structure and in spaced relation, the said arms having mating, approximately vertically directed slots, a shaft extending through the said slots and having end portions projected outside the said arms, wheels mounted on the said end portions, means for pivotally connecting the said shaft and frame, and a pair of springs supported by the said frame structure and having bearing engage-

ment with the said shaft for positioning the said shaft relatively to the said frame structure.

11. In a roller skate, a frame having a pair of arms for supporting the front wheel structure, a shaft extending through the said arms, a bearing structure mounted on the portion of the said shaft between the said arms and composed of a bearing sleeve for the major portion of the length and a bearing washer at each end of the said sleeve, clamping nuts on the ends of the said shaft for holding the parts in position, the said sleeve being internally threaded, and the said shaft being provided with a screw thread for the entire length for having threaded engagement with the said sleeve and the said nuts.

12. A roller skate as described in claim 10 having bearing devices for the said wheels on the said end portions of the shaft, clamping nuts on the said end portions for holding the said bearing devices in place, and the said end portions of the shaft having cotter pins that are positioned outside of the said nuts.

13. A roller skate as described in claim 10 and having a pair of washers mounted on the said shaft and positioned in spaced relation, the said washers serving as bearing members for the said shaft in coöperation with the said springs.

14. A roller skate as described in claim 13 and having means for limiting the pivotal movement of the said shaft relatively to the said arms, and the said means comprising on each side one of the said washers in coöperation with one side of the said spring and the end wall of one of the said slots in coöperation with the other side of the said spring.

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