July 14, 1931. J. E. MARSHALL 1,813,944

SKATE ROLL

Filed Jan. 8, 1929

Fig. 1.

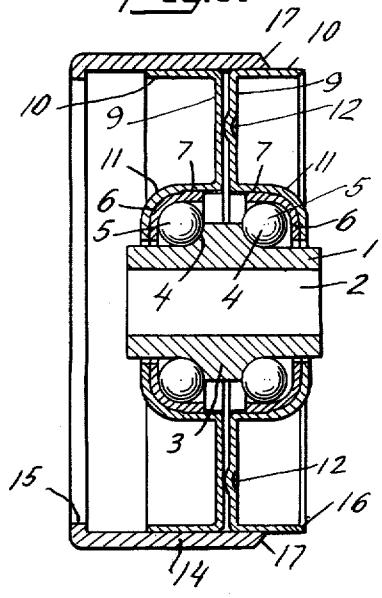



Fig. 2.

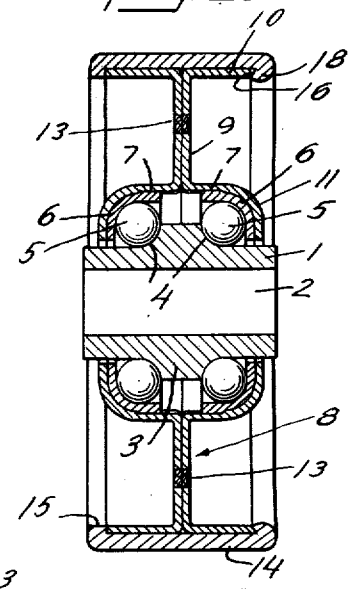



Fig. 3.

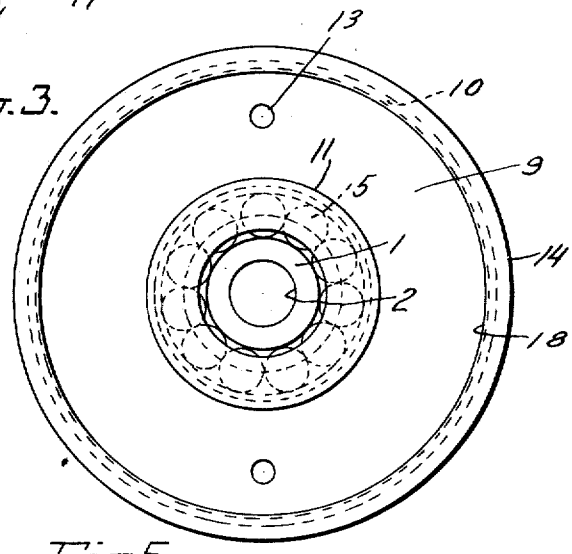



Fig. 4.

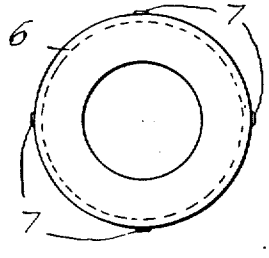
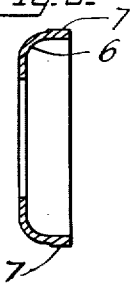



Fig. 5.




INVENTOR
James E. Marshall
BY
Pennie, Davis, Marvin & Edmonds
ATTORNEYS

Patented July 14, 1931 1,813,944

# UNITED STATES PATENT OFFICE

JAMES E. MARSHALL, OF NEW HAVEN, CONNECTICUT, ASSIGNOR, BY MESNE ASSIGNMENTS, TO WINCHESTER REPEATING ARMS COMPANY, OF NEW HAVEN, CONNECTICUT, A CORPORATION OF DELAWARE

## SKATE ROLL

Application filed January 8, 1929. Serial No. 331,045.

This invention relates to skate rolls, and more particularly to skate rolls of the ball bearing type wherein a tread and bearing cage of hard metal are employed in conjunction with a web of softer metal.

In the usual construction of skate rolls the bearings are arranged surrounding a center cone which receives the axle and a bearing cage of hard metal is arranged over the bearings and carried by the web of the roll. The web may advantageously be formed of soft metal and is shaped to receive the bearing cage. To prevent relative movement of the web and bearing cage I preferably form a number of projections on the exterior of the bearing cage and as the bearing cage fits snugly in a recess provided for it in the web of the roll, these projections will embed in the soft metal of the web and thus prevent relative turning of the bearing cage and web of the roll.

To permit assembly of the roll the web is preferably formed of two sections, one of which is provided with a series of indentations and after the two sections of the web have been assembled with the cone, bearings and bearing cages, I connect them at these indentations by spot welding. The provision of the indentations localizes the effect of the electric current and permits the sections of the web to be more readily welded to each other.

The two sections of the web are then inserted in a tread of hard metal and this tread is provided with a flange at one side which engages the web flange to position the inner case within the tread. The circumferential edge of the other web flange is bevelled and after the case is in position the corresponding edge of the tread, which is also bevelled, is spun over the adjacent flange of the web so that the metal flows to the inside tread and flows over the bevelled edge of the web.

In the accompanying drawings,

Fig. 1 is a central sectional view of a roll partially assembled;

Fig. 2 is a similar view after the assembly has been completed with the case inside the tread and the edge of the tread spun over the flange of the web;

Fig. 3 is a side elevation of the assembled roll;

Fig. 4 is a similar view of one of the bearing cages; and,

Fig. 5 is a detailed, sectional view thereof.

Referring to the drawings, the reference numeral 1 designates the usual cone member which consists of a metallic cylinder having a central bore 2 and having its intermediate portion increased in diameter as at 3 to form a pair of race-ways 4. Ball bearings 5 are adapted to be received in these race-ways. The ball bearings are retained in position by bearing cages 6, one of which is shown in detail in Figs. 4 and 5 of the drawings. The bearing cages are suitably shaped to fit around the bearings and are preferably formed of hard metal to prevent wear. These bearing cages are provided with a plurality of radial projections 7 on their outer surfaces as shown in Figs. 4 and 5 of the drawings.

The bearing cages are adapted to be received in web sections 8. As shown, the web sections consist of disc portions 9 and peripheral flanges 10. Adjacent the center of the web it is shaped as at 11 to receive a bearing cage and is provided with a central opening of slightly greater diameter than the cone member 1. The webs are made of relatively soft metal and when the bearing cages, which fit snugly in the recesses or cups 11, are inserted the projections 7 embed themselves in the metal of the web section and are thus firmly held against relative rotation. As shown, one of the web sections is provided with a plurality of indentations 12 whereby the web sections may be welded

to each other by spot welding as indicated at 13 in Fig. 2 of the drawings. The inner case consisting of the cone, bearings, bearing cages and web sections is adapted to be inserted in a tread member which is made of relatively hard metal to withstand wear and which is substantially cylindrical in the form of a ring of proper diameter to snugly receive the case. As shown in Fig. 1 of the drawings, the case is inserted in the tread 14 from one side and the opposite side of the tread is provided with a flange 15 which is adapted to limit the inward movement of the case. When the inner case occupies the position shown in Fig. 2 of the drawings, the roll is ready for the final operation which is adapted to lock the inner case to the tread to prevent relative rotation. As shown, one of the web flanges 10 is provided with a bevelled edge 16 and the adjacent edge of the tread is bevelled as at 17. When the inner case is in its proper position within the tread member 14, the bevelled edge 17 is adapted to be spun inwardly over the bevelled edge 16 of the web flange, as indicated at 18 in Fig. 2 of the drawings to lock the inner case to the web.

In assembling the roll the bearing cups are first inserted in the webs and the web without the indentations is inserted in the tread to the position shown in Fig. 1 of the drawings. The set of bearings to the left in Fig. 1 of the drawings and the cone are then seated, the other set of bearings are then arranged in position and the other web section placed over the cone and bearings to complete the assembly of the inner case. The case is then forced downwardly in the tread until the lower web section engages the flange 15. The two webs are then fused to each other at the points of the indentations 12 by means of spot welding which localizes the effect of the electric current and welds the web sections to each other as indicated at 13 in Fig. 2 of the drawings. The bevelled edge on the outside of the tread is then spun over the bevelled edge 16 of the adjacent web section as indicated at 18 in Fig. 2 of the drawings to lock the inner case to the tread.

One of the chief difficulties and causes of trouble in the use of skate rolls is the loosening of the tread from the inner case. The provision of the bevelled edge 16 on one of the web flanges and the spinning of the metal of the tread over this bevelled edge will effectually prevent this trouble. Furthermore, the spaced spot welding of the web sections to each other at the points 13, intermediate the center of the roll and its periphery, causes the outer flanges of the webs to tend to spring away from each other when pressure is placed on the roll which creates pressure against the folded edge 18 of the outside tread. This pressure together with irregularities in the surface of the bevelled edge 16 will lock the case of the tread and prevent the outside tread from slipping when the roll is turned.

By way of illustration the invention has been described in connection with skate rolls, but it will be apparent that its utility is not limited to this art. It may be employed, for instance, in the construction of castor rolls, particularly when adapted to be used on various types of trucks which are submitted to rough usage and on which the wear is proportionately great. It may also be employed on other rolls of various types.

I claim:

1. A skate roll comprising a bearing cage and a web, the web being shaped to snugly receive the bearing cage, the web being formed of softer metal than the bearing cage, the exterior of the bearing cage being provided with extensions adapted to embed in the softer metal of the web.

2. A skate roll comprising a pair of web sections and a tread, the web sections being provided with circumferential flanges adapted to be received in the tread, the edge of one of said web flanges being bevelled, the adjacent portion of the tread being spun over said bevelled edge, said web sections being spot welded to each other at points spaced from said flanges whereby pressure on said roll will tend to spread said flanges and cause said bevelled edge to lock said tread against relative movement.

3. A skate roll comprising an inner case consisting of a cone forming a pair of race-ways, bearings arranged in said race-ways, a pair of web sections having cups formed therein, bearing cages fitting snugly in said cups and adapted to receive said bearings, said bearing cages being provided with external projections adapted to embed in the wall of said cups, said web sections having disc-like portions adapted to be arranged beside each other and welded to each other at intervals, said web sections being provided with circumferential flanges, and a tread member snugly receiving said inner case, said tread member having a flange at one side adapted to engage the outer edge of one of the web flanges to position the inner case in the tread member, the outer edge of the other web flange being bevelled, and the adjacent edge of the tread member being spun over the bevelled edge of said web flange.

4. A skate roll comprising an inner case consisting of a cone forming a pair of race-ways, bearings arranged in said race-ways, a pair of web sections having cups formed therein, bearing cages fitting snugly in said cups and adapted to receive said bearings, said web sections having disc-like portions adapted to be arranged beside each other

and welded to each other at intervals, said web sections being provided with circumferential flanges, and a tread member snugly receiving said inner case, said tread member having a flange at one side adapted to engage the outer edge of one of the web flanges to position the inner case in the tread member, the outer edge of the other web flange being bevelled and the adjacent edge of the tread member being spun over the bevelled edge of said web flange.

In testimony whereof I affix my signature.

JAMES E. MARSHALL.

and welded to each other at intervals, said web sections being provided with circumferential flanges, and a tread member snugly receiving said inner case, said tread member having a flange at one side adapted to engage the outer edge of one of the web flanges to position the inner case in the tread member, the outer edge of the other web flange being bevelled and the adjacent edge of the tread member being spun over the bevelled edge of said web flange.

In testimony whereof I affix my signature.

JAMES E. MARSHALL.

## CERTIFICATE OF CORRECTION.

Patent No. 1,813,944. Granted July 14, 1931, to

JAMES E. MARSHALL.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, line 83, claim 1, before the word "web" second occurrence insert the words central portion of the; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 29th day of September, A. D. 1931.

(Seal)

M. J. Moore,
Acting Commissioner of Patents.

# CERTIFICATE OF CORRECTION.

Patent No. 1,813,944. Granted July 14, 1931, to

JAMES E. MARSHALL.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, line 83, claim 1, before the word "web" second occurrence insert the words central portion of the; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 29th day of September, A. D. 1931.

(Seal)

M. J. Moore,
Acting Commissioner of Patents.