J. S. THOMSON.

PROPELLER FOR AUTOSLEIGH MECHANISM.

APPLICATION FILED DEC. 9, 1913.

1,105,940. Patented Aug. 4, 1914

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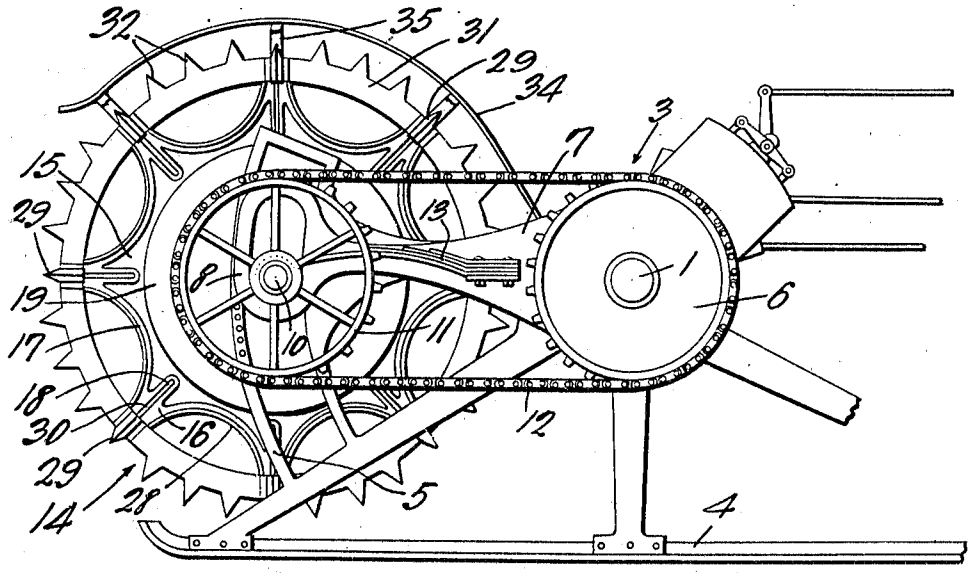


Fig. 1.

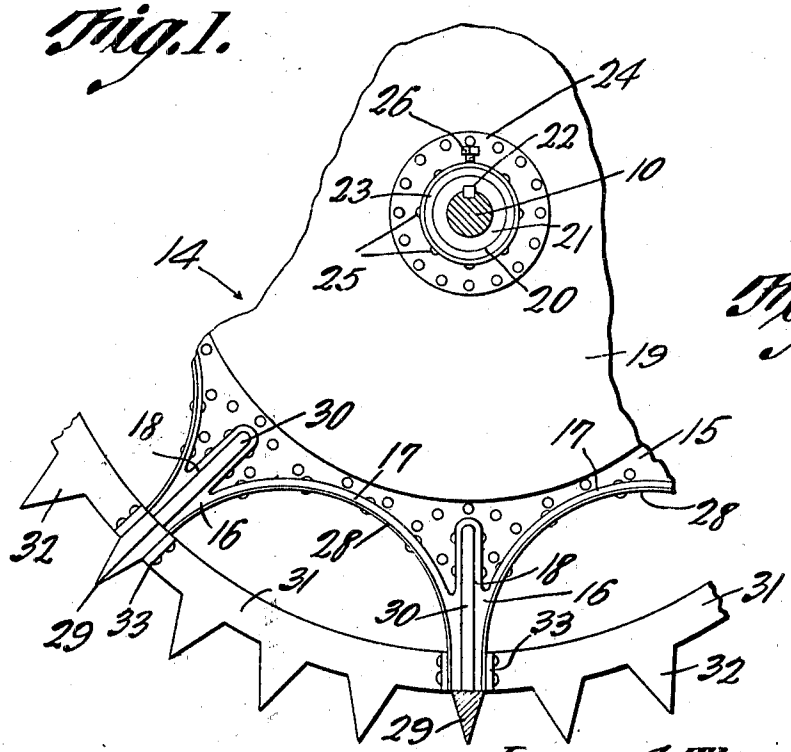


Fig. 4.

Witnesses

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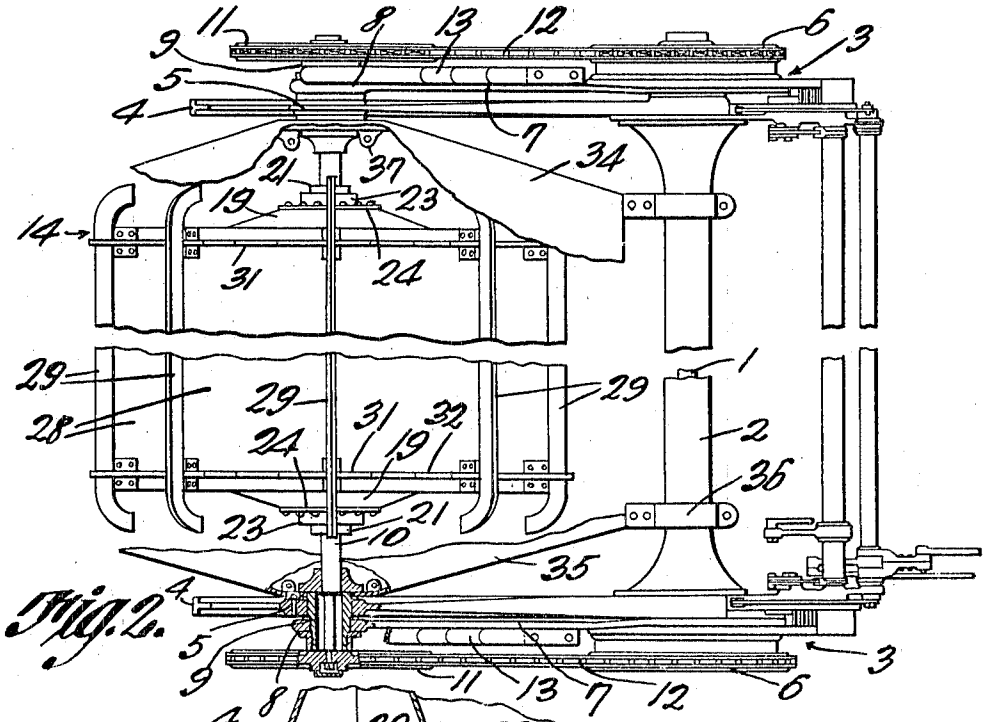
J. S. THOMSON.

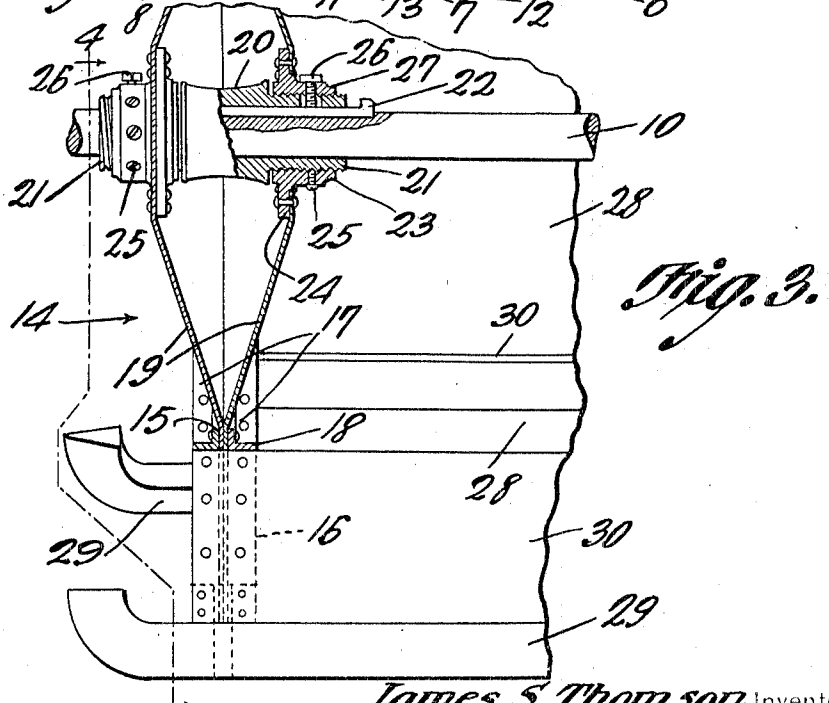
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Witnesses

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UNITED STATES PATENT OFFICE.

JAMES S. THOMSON, OF SEATTLE, WASHINGTON.

PROPELLER FOR AUTOSLEIGH MECHANISM.

1,105,940. Specification of Letters Patent. Patented Aug. 4, 1914.

Application filed December 9, 1913. Serial No. 805,601.

To all whom it may concern:

Be it known that I, JAMES S. THOMSON, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented a new and useful Propeller for Autosleigh Mechanism, of which the following is a specification.

The present invention appertains to a propeller for auto sleigh mechanisms, and is adapted more particularly for use in connection with the sleigh attachment for motor vehicles disclosed in my co-pending application Serial No. 794,977, filed Oct. 13, 1913, although the propeller may be employed with various other mechanisms to which it is suited.

It is the object of the present invention to provide a propeller of such unique construction, as to enhance its tractive effort, when engaing the snow, or ice over which the sleigh traverses.

Another object of the present invention is to provide a propeller which shall have means for effectively engaging and compressing loose snow, to facilitate the tractive effort and which shall also have means for engaging icy or compact surfaces, in order that the propeller will be effective under the varying conditions.

The present invention also contemplates the provision of a propeller of the nature indicated, which shall be comparatively simple, light, substantial and inexpensive in construction, as well as possessing a high degree of efficiency in its use.

It is also within the spirit of the invention, to provide a propeller of the character specified, which shall embody means for preventing skidding or lateral slip.

With the foregoing general objects outlined, and with other objects in view, which will be apparent as the nature of the invention is better understood, the present invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

The invention has been illustrated in its preferred embodiment in the accompanying drawings, wherein:—

Figure 1 is a side elevation of a sleigh attachment for a motor vehicle, embodying the improved propeller, portions being broken away. Fig. 2 is a plan view of the parts depicted in Fig. 1, portions being broken away, and portions being shown in section. Fig. 3 is an enlarged fragmental view of the propeller. Fig. 4 is a fragmental end view of the propeller, parts being shown in section, with the section taken on the line 4—4 of Fig. 3.

The present propeller is designed particularly for employment on the sleigh attachment for motor vehicles disclosed in the above mentioned application, although the propeller may be otherwise employed, as will be apparent to those versed in the art. The sleigh attachment forming the subject matter of the co-pending application above noted, is of no particular moment with respect to the propeller *per se*, and need not be illustrated or described in detail, a rough disclosure in the present application being sufficient for the purposes.

In the drawings, the numeral 1 designates the rear driving axle or shaft of a motor vehicle or automobile, which is inclosed by the usual housing 2. To the ends of the housing 2 are applied or attached, a pair of mechanisms 3 which are operatively connected to the ends or spindles of the axle shaft 1. Each of the mechanisms 3 embodies a runner 4 mounted for pivotal movements and having a rear upstanding slotted arcuate guide 5. Each mechanism 3 also includes a sprocket wheel 6, or its equivalent, secured to the respective end of the axle shaft 1, to rotate therewith. Each mechanism 3 further includes a rearwardly projecting lever 7 pivoted to swing about the axis of the shaft 1 as a center, and arranged to be mechanically raised and lowered. Each lever 7 is provided with an arcuate slotted guide 8 at its free end, cooperating with the corresponding guide 5 of the runner 4, the guides 8 and 5 being relatively short and long respectively.

Disposed within the guides 5 and 8 of each pair, is a boxing 9, through which boxings the terminal portions of the propeller shaft 10 are journaled. To the extremities

of the propeller shaft, are secured sprocket wheels 11 which are connected to the respective sprocket wheels 6 by means of sprocket chains 12, although it is to be understood that the propeller shaft 10 may be operatively connected with the mechanisms 3, in any well known manner. The journal boxings or boxes 9 are slidable within the guides 5 and 8, whereby the propeller shaft has limited movements relative to the levers 7, leaf springs 13 being carried by the levers 7 and engaging the outer ends of the boxings 9 to yieldably depress the boxings and propeller shaft carried thereby. It is evident that by raising and lowering the levers 7, the propeller shaft may be raised and lowered away from and toward the surface traversed.

Coming to the propeller *per se*, which has been designated generally by the numeral 14, the same is mounted upon the shaft 10 between the guides 5 of the runners 4, and it is of drum or rollers form, so as to occupy the space between the rear runners 4, to insure an effective tractive effort, the propeller being disposed in the rear of the automobile or motor vehicle body, as is apparent. The propeller drum is preferably of a length, approximately equal to the width of the vehicle body, it being desirable in some instances to remove the rear elliptical springs, so they will not interfere with the ends of the propeller, whereby the propeller may be of the greatest length possible. It will be observed, however, that the removal of the rear elliptical springs is not necessary, inasmuch as the propeller may be made of such a size to work freely between the springs.

The propeller drum comprises a plurality of star wheels or spiders, of which there may be two or more, according to the length of the drum, and according to the conditions to which the propeller is subject in use. In the drawings, two end wheels are shown although it is to be understood that one or more intermediate star wheels or spiders may be provided, they being of precisely the same construction as the end ones. Each of the star wheels or spiders embodies a pair of companion or complementing rim members or annuli 15 having the radial projections or "points" 16 and the concaved seats or portions 17 between the projections 16, the projections 16 of the companion rim members 15 having the radial open slots or kerfs 18. The star wheel or spider also includes a pair of oppositely dished sheet metal disks or plates 19, which have their peripheries resting flatly together, and riveted or otherwise secured between the rim members 15.

Each of the star wheels or spiders is mounted upon the propeller shaft 10 by means of a hub 20 slipped upon the shaft 10 and having its end portions reduced and externally threaded, as at 21. The hub 20 is secured upon the shaft 10 by means of a key 22, and collars 23 are threaded upon the reduced end portions 21 of the hub 20, and at their inner or adjoining ends are provided with the flanges 24, to which the central portions of the disks 19 are riveted or otherwise secured, the flanges 24 being preferably on the interior of the disks 19. The threads of the end portions 21 of the hub 20 are right and left handed, in order that when the two collars 23 are turned in the same direction, they will be moved toward each other, or apart, according to the direction in which they are rotated. A plurality of set screws 25 are also threaded through each of the collars 23 to engage the respective end portion of the hub, for locking the collar in position, one of the set screws 26 being designated to pass through the slot or opening 27 in the reduced end portion 21 to engage the key 22.

It will be evident that by rotating the star wheel or spider with respect to the hub, the set screws having been loosened, will permit the collars 23 to be rotated upon the end portions of the hub 20, whereby the collars may be moved apart to create a strain upon the disks 19 whereby they will be maintained taut so as to withstand the strains to which the propeller is subjected. After the collars 23 have been set properly, they may be locked in position by tightening the set screws.

The periphery of the propeller drum or roller comprises a series of arcuate or concaved plates 28 extending longitudinally of the drum, and riveted or otherwise secured to the concaved seats 17 of the star wheels or spiders. Thus, the drum is provided with a corrugated of longitudinally grooved or channeled periphery for facilitating the tractive effort when the surface traversed is covered with snow.

Disposed along the meeting edges of the concaved plates 28 are the longitudinally disposed bars 29 having their outer edges sharpened and having flat web-like shanks 30 riveted or otherwise secured within the slots 18 of the star wheels or spiders. Thus, the traction bars or ribs 29 extend along the ridges between the concavities or depressions of the periphery of the drum, the ends of the bars 29 being preferably extended beyond the endmost star wheels or spiders and being curved inwardly to provide a finished effect. The traction bars 29 are designed to engage icy or hard surfaces in order that the propeller may secure a firm grip thereon.

Associated with each of the star wheels or spiders is a series of arcuate sections 31 spanning or bridging the concaved plates 28, and having the radial teeth or spurs 32, the ends of the sections 31 having the ears 33

riveted or otherwise secured to the end portions of the plates 28 and the ends of the projections 16. The arcuate sections 31 of each series coöperate to provide a circular or annular hoop whereby the propeller may rotate or revolve upon the hoop members without any appreciable pirouetting effect. The teeth 32 are designed to engage the underlying surface to facilitate the tractive effect, and to also prevent lateral or sidewise skidding, as will be apparent.

In connection with the propeller there is preferably employed an arcuate apron or shield 34 disposed over the propeller, to protect the same, and including the end spider frames 35 which are pivoted to the axle housing 2, as at 36, and which are also connected to the inner ends of the boxings 9 as at 37, whereby the apron or shield 34 may swing vertically with the propeller.

The construction of the propeller drum is such that the component parts thereof may be readily assembled, the propeller drum being comparatively light and substantial in order that it will be suitable for the purposes.

In operation, when the levers 7 are lowered, the propeller drum will be yieldably brought into engagement with the underlying surface, in order that the traction bars 29 and teeth or spurs 32 may engage an icy or hard surface, for facilitating traction. Should the propeller encounter loose snow, the depressions or concavities provided by the curved plates 28, will engage the snow in an effective manner to compress the same, for facilitating traction, and to further provide a compressing action, tending to compress the snow. Thus, the propeller has the effect of a roller, whereby the machine will tend to make or promote a sleighing bed, instead of destroying it, the machine leaving a compressed snow bed in its wake.

It will be apparent that the dished plates 28 and bars 29 connect the respective star wheels or spiders to increase the rigidity of the propeller drum, while the arcuate sections 31 connect the end portions and the plates 28 and the bars 29 to further strengthen the structure. The number of plates 28 and bars 29 employed may be varied according to the diameter of the drum, and according to other conditions which are met with.

From the foregoing, the advantages and capabilities of the improved propeller will be obvious to those familiar in the art, without particular reference to the construction and operation of the propeller and controlling and actuating mechanism forming the subject matter of the co-pending application above noted.

Having thus described the invention, what is claimed is:—

1. A propeller drum including spaced wheels, longitudinal concaved plates secured to the said wheels, and longitudinal traction bars secured to the wheels and extending along the edges of the said plates.

2. A propeller drum including spaced wheels, longitudinal concaved plates secured to the wheels, and toothed sections secured to the wheels and spanning the said plates.

3. A propeller drum including spaced star wheels, having concaved seats between the points, and longitudinal concaved plates secured to said seats of the star wheels.

4. A propeller drum including spaced star wheels having slotted projections, and longitudinal traction bars having shanks secured within the slots of the projections of the star wheels.

5. A propeller drum including spaced star wheels having slotted projections and concaved seats between the projections, longitudinal concaved plates secured to said seats, and longitudinal traction bars having shanks secured within the slots of the said projections.

6. A propeller drum including spaced star wheels, having concaved seats between the projections, longitudinal concaved plates secured to said seats, and longitudinal traction bars secured to the projections of the said wheels.

7. A propeller drum including spaced star wheels having concaved seats between the projections, longitudinal concaved plates secured to the said seats, and toothed sections secured to the projections of the star wheels and spanning the said plates.

8. A propeller drum including star wheels having concaved seats between the projections, longitudinally concaved plates secured to the seats, longitudinal traction bars secured to the projections of the star wheels, and arcuate toothed sections terminally secured to the projections of the star wheels and spanning the said plates.

9. In a propeller drum, a plurality of spaced wheels, each comprising a pair of companion rim members, a pair of oppositely dished disks having their peripheries secured between the rim members, and a hub carried by the central portions of the disks, and longitudinal traction members connecting the rim members of the wheels.

10. A propeller drum embodying a plurality of star wheels each comprising a pair of companion rim members, a pair of oppositely dished disks having their peripheries secured between the rim members, and a hub carried by the central portions of the disks, the rim members having radial projections and concaved seats between the projections, longitudinal concaved plates secured to the said seats of the star wheels, and longitudinal traction bars secured to the projections of the said wheels.

11. A propeller drum including spaced wheels, longitudinal concaved plates secured

to the wheels, longitudinal traction bars secured to the wheels and extending along the edges of the said plates, and arcuate toothed sections terminally secured to the wheels and spanning the said plates.

12. A propeller drum including a plurality of spaced wheels each comprising a pair of companion rim members, a pair of oppositely dished disks having their peripheries secured between the rim members, and a hub carried by the central portions of the disks, and longitudinal traction members secured to the rim members of the wheels.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JAMES S. THOMSON.

Witnesses:
JOHN O. WALTON,
C. R. HEPLER.