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PORTABLE AND SELF-PROPELLING SKI TOW

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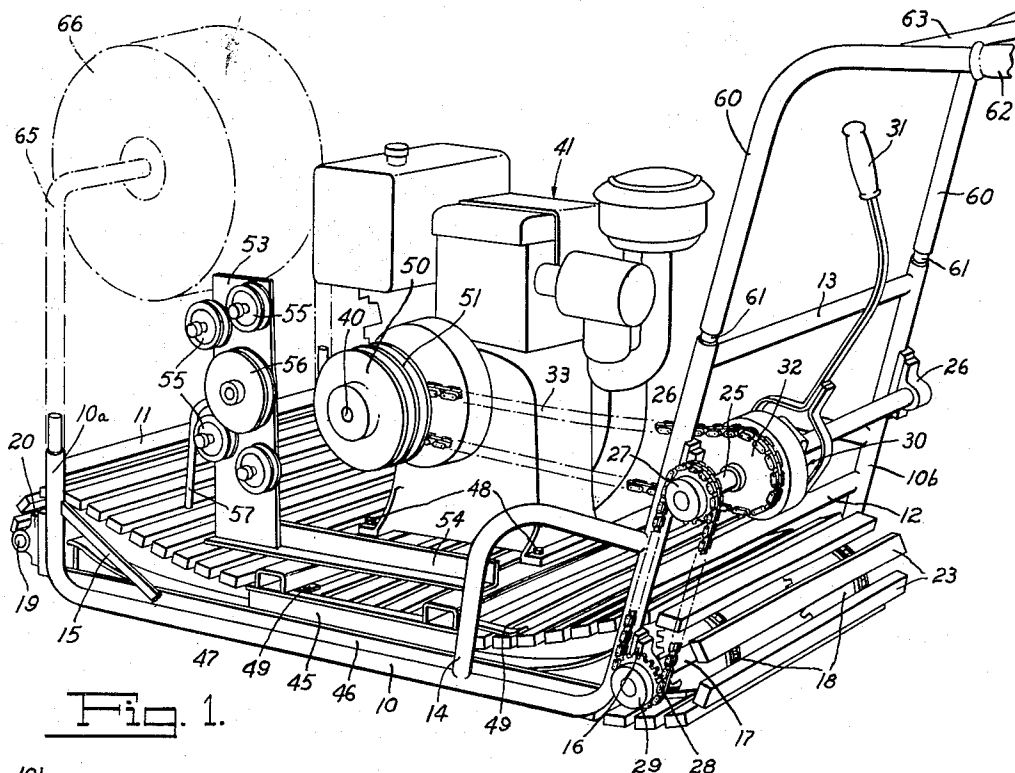


Fig. 1.

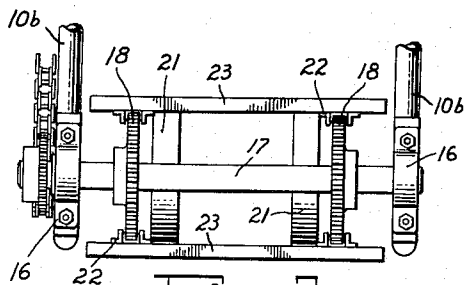


Fig. 2.

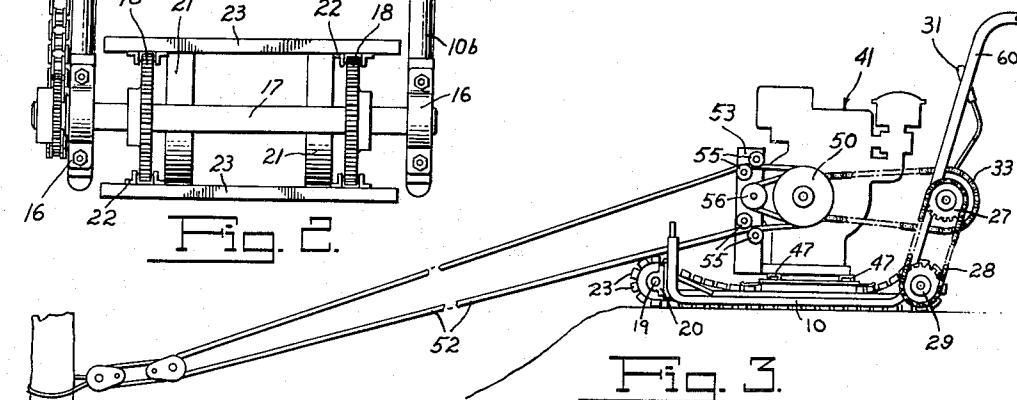


Fig. 3.

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PORTABLE AND SELF-PROPELLING SKI TOW

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3 Claims. (Cl. 180—9.1)

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This invention relates to portable power plants and more particularly, but not exclusively, to devices commonly known as "ski tows" utilizing such power plants, and used for towing skiers uphill.

The need for a small power plant, such as one having capacity of 5 H. P.—15 H. P. and easily transportable over long distances to the locality of its intended utilization, and thereupon easily taken over rough, hilly or swampy ground to the place of its installation, has been keenly felt in the art. While ski tows represent one of the instances where such a power plant is highly advantageous, many other instances where availability of such a power plant is a matter of critical importance may also be cited. Well drilling, mining, emergency water pumping, road and building constructions, various farm and military uses, are also instances where bringing up a regular power plant over the deep snow, sand, deep mud, swamp, steep wooded hills may be impossible, and where availability of such power may mean the difference between success or failure of the job or undertaking.

In the case of ski towing, for instance, it is usually necessary, first, to take the ski tow to the locality of skiing which may be 5–30 miles distant. With the device weighing approximately 350 lbs. its loading and transportation presents serious difficulties under the actual conditions of its use. Use of a truck and a mechanical hoist is usually necessary for handling such loads. Unloading a device of this nature at the locality of skiing by hand and by inexperienced personnel presents the possibility of accidents, dangerous exertion, and damage to the device itself. After the device is unloaded it has to be brought, often over deep snow and up steep hills, to the place of installation; this usually presents the most difficult part of the problem.

Attempts have been made to assemble ski tows on toboggans or sleds. It can be easily appreciated that all of the above discussed difficulties of loading, unloading and transportation remain unsolved with such devices. While pulling such a device over deep snow is made easy over level ground, taken uphill, the heavy easily sliding device presents a danger of running away and injuring people in its way as well as being damaged by hitting a tree, overturning, or falling off from a hillside.

One of the objects of the present invention is to provide an improved device in which the above difficulties are overcome and largely eliminated, and a safe and practical device is provided.

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Another object of the present invention is to provide an improved portable and self-loading power plant, which power plant is also self-propelling, and which can be easily loaded and unloaded in long distance transportation, and which can proceed under its own power for shorter distances to places of its use, to which places ordinary land vehicles cannot travel.

A further object of the present invention is to provide a self-propelling power plant of the nature specified in the preceding paragraph, which can go over deep snow, sand, swampy or boggy localities, climb relatively steep hills and go downhill without the danger of running away.

A further object of the present invention is to provide an improved ski tow which can be easily loaded by a single person into the rear compartment of a passenger automobile and unloaded therefrom at a desired locality, and thereupon driven under its own power to the skiing site, uphill if necessary, and after the use easily and safely taken downhill, loaded into the car and taken back, whereupon it may be unloaded and even driven into the basement of a house for storage.

A still further object of the present invention is to provide an improved ski tow which can be converted simply and easily into a small and compact power plant which is portable and self-propelling, has both pulley type power take-off and pulling capacity and very high passability over difficult terrain, and which can be used all year around in a large number of applications.

It is an added object of the present invention to provide a device of the foregoing nature, which is simple and rugged in construction, safe and dependable in operation, relatively inexpensive to manufacture, and easy to repair and service.

Further objects and advantages of the invention will be apparent from the following description, taken in connection with the appended drawings, in which:

Fig. 1 is a perspective view of my improved ski tow embodying the present invention.

Fig. 2 is a fragmentary view taken on the lower rear portion of the ski tow with the portions of the track removed to expose the driving shaft and the driving sprockets.

Fig. 3 is an elevational view illustrating the use of my ski tow.

It is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of

being practiced or carried out in various ways. Also it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

In the drawings there is shown, by way of example, a ski tow embodying the present invention. Referring to the drawings, the construction illustrated therein comprises a frame, which may be termed the main or track frame, on which there is operatively mounted an endless or caterpillar track. The main frame is of a tubular welded construction, and it comprises two side members 10 having upstanding ends 10a and 10b. The upstanding ends of the side members 10 are secured together by the cross members 11, 12 and 13. Rear corner reinforcing members 14 and front corner braces 15 are provided to insure desired strength and rigidity of the frame. To the upstanding ends 10b are secured bearings 16 in which there is journaled a driving shaft 17 having two driving sprockets 18 secured thereon. A front shaft 19 is similarly journaled in bearings 20 provided on the upstanding ends 10a. Idler wheels 21 are mounted on the shaft 19. The track comprises two endless chains 22 engaging the driving sprockets 18 and a plurality of wooden planks or cross members 23 bolted or otherwise secured to the chains 22 to form a single endless track. The planks 23 bear directly on idler wheels 21 in front of the track.

A countershaft 25 rotatably mounted in bearings 26 secured to the upstanding ends 10b of the frame members 10 above the sprocket shaft 17 has a driving sprocket wheel 27 engaging with the aid of a driving chain 28 a driven sprocket wheel 29. On the countershaft 25 there is operatively interposed a clutch mechanism generally designated by the numeral 30 and having a control handle 31 and a driven sprocket wheel 32. The wheel 32 is drivably connected to the driven member (not shown) of the clutch and rotates on the shaft 25. Operating the control handle 31 to engage the clutch causes completion of driving connection between the sprockets 32, 27, 29 and 18, and therefore movement of the track. When the clutch is disengaged, the sprocket wheel 32 idles on the shaft 25, and the track remains stationary.

The sprocket 32 is drivably connected with the aid of a chain 33 to the power shaft 40 of a gasoline engine generally designated by the numeral 41 and operatively mounted on the supplementary frame secured to the main or track frame in such a manner as to bridge over and clear the track.

The supplementary or engine-supporting frame comprises longitudinal members 45 welded to member 46 which, in turn, are welded to the side members 10 of the track frame. To the members 45, which are of angular cross section, there are bolted or otherwise secured transverse channel members 47 to which the engine 41 is secured with the aid of bolts 48. Runners 49 are secured to the members 47 to hold the track down in operation.

The engine or motor may be of any suitable type. The engine as such does not form a part of the present invention and for this reason it need not be described herein in detail. For the purposes of ski towing a single cylinder, air-cooled gasoline engine gives very good results, and is employed in the construction illustrated in the drawings. A carburetor control flexible member (not shown) may be brought out and

secured to cross member 13 to be within easy reach of the operator.

The engine or motor may have a power take-off of any type suitable for the desired application of power of the engine. In the embodiment illustrated the take-off is exemplified by a drum pulley 50 having two rope grooves 51 adapted to receive an endless rope 52.

A guide pulley assembly is provided to insure proper running of the rope. Said assembly is mounted on a plate 53 secured to an angular member 54, which, in turn, is bolted or otherwise secured to the cross channel members 47. It should be noted that while the small pulleys 55 are disposed in the adjacent planes parallel to the plane of the driving rope pulley 50, pulley 56 is mounted in an inclined plane, which mounting may be effected by bending the plate 53 or corresponding inclination of the pulley shaft bearing. Such mounting of the pulley 56 insures proper guiding of the rope. Rope retaining bar 57 is provided to prevent slipping off of the rope from the guiding pulleys. Arrangement of the rope on the pulleys is shown in Fig. 3. As can be seen from an examination of said figure, the rope 52 is passed over the drum pulley 50 in one of its grooves, brought over the pulley 56 and passed over the pulley 50 a second time. By virtue of the above construction proper frictional engagement between the drum pulley and the rope, as well as smooth running of the rope are insured. By eliminating slippage, wear of the rope is decreased and the life of the rope is increased.

Steering means are exemplified by a vertically extending frame having side members 60 detachably connected to the ends 10b of the track frame members 10, as shown at 61, and having handles 62 provided on their upper ends. Cross member 63 connects the members 60 and adds rigidity to the construction.

The front ends 10a of the side members 10 are adapted to receive extensions 65 supporting rope reel 66. By virtue of such an expedient, the rope, which after use may be wet and weigh nearly 100 lbs., may be wound on the reel, and be mounted on the device for easy and convenient transportation.

In use, the ski tow is anchored, or tied to a tree or any other stable object at the top (or the bottom) of a hill or ski run. One end of its rope is wound over the drum pulley 50 as explained, while the other end thereof is put over a single-groove pulley secured to a tree, or a post, or "a snow tree" i. e. a log buried in the snow, at the bottom (or top) of the hill, as shown in Fig. 3. With the engine running and the clutch disengaged, the track remains stationary while the rope runs (similarly to a belt on a machine) at a speed of approximately 500 feet per minute. Skiers taking hold of the upwardly running side of the rope are pulled toward the top of the hill where they release their hold on the rope and walk toward the upper end of the ski run for skiing downhill. Thus the difficulty of climbing the hill is greatly reduced and more enjoyment is derived from skiing.

When the skiing is over, the engine is stopped, the rope is untied and removed from the drum pulley, wound on the reel and the reel is mounted on the ski tow. Thereupon the engine is started, the clutch is engaged for driving the track, and the operator taking hold of the handles 62 steers the device toward the car or any other desired location. The ski tow moves under its own power

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at a speed of approximately 6 M. P. H. on the level ground. When going downhill, the engine acts as a brake, and therefore running away of my improved ski tow, which running away may easily occur in ski tows assembled on toboggans or sleds, is prevented. My ski tow may also be used as a tractor and used to pull a toboggan or a sled with equipment and supplies or a tired skier.

For transportation in a passenger automobile, the rope reel with its supports and the handle frame are removed, and the ski tow is driven up a board into the rear compartment of the automobile. With the device of the size and character described there are no difficulties in loading it into the rear compartment of passenger automobiles of most makes and partly closing the lid. Upon returning home, the tow is merely slid down the board and taken to a garage or other suitable storage place. If desired, it may be even taken into a house basement, providing the door and the stairway are not too narrow to permit its passage.

My improved ski tow may be used year around for various other purposes, since it is, in effect, a small and compact power plant with a pulley type power take-off and possessing pulling capacity. It is portable and self-propelling. Brought in a passenger car, by a single person if necessary, it can be taken to any desired location on a job, uphill, through sand, snow, swamp, to do the work wherever power is required: in irrigation, lumber camp, building or road construction, open pit mine, lighting installation, and the like. It may be used to drive farm machinery or be applied to various uses in military operations.

There is thus provided an improved device of the character described whereby the objects of the present invention listed above and numerous additional advantages are attained.

I claim:

1. In a device of the nature described, a main frame comprising two tubular C-shaped side members with the free portions of the C's directed upwardly and a plurality of tubular cross members connecting said side members at the upwardly extending portions thereof, the upward extent of the free portions of said members being less than the extent that would interfere with the device going into the baggage compartment of a passenger automobile; a supplemental frame having plow-type steering handles and connectable by telescopic joints to the ends of rear free portions of said side members to bring said handles to the predetermined elevation for convenient use by an adult person, two shafts operatively mounted on the upwardly extending portions of said side members, one at the rear and one at the front thereof, two driving sprockets mounted on the rear shaft, two smooth-rim idlers mounted on the front shaft, an endless track including two driving chains engaged by said sprockets, respectively, and a plurality of wooden bars secured to said chains and bearing on said smooth-rim idlers; a second supplementary frame bridging across said track and secured to the middle portions of said side members, and a gasoline engine mounted on said second supplementary frame, the

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upward extent of said engine being approximately that of the ends of the rear upwardly extending portions of said C-shaped side members.

2. In a device of the nature described, a main frame comprising two tubular C-shaped side members with the free portions of the C's directed upwardly and a plurality of tubular cross members connecting said side members at the upwardly extending portions thereof, the upward extent of the free portions of said members being less than the extent that would interfere with the device going into the baggage compartment of a passenger automobile; a supplemental frame having plow-type steering handles and connectable by telescopic joints to the ends of rear free portions of said side members to bring said handles to the predetermined elevation for convenient use by an adult person, two shafts operatively mounted on the upwardly extending portions of said side members, one at the rear and one at the front thereof, two driving sprockets mounted on the rear shaft, two smooth-rim idlers mounted on the front shaft, an endless track including two driving chains engaged by said sprockets, respectively, and a plurality of wooden bars secured to said chains and bearing on said smooth-rim idlers; a second supplementary frame bridging across said track and secured to the middle portions of said side members, and a gasoline engine mounted on said second supplementary frame, the upward extent of said engine being approximately that of the rear ends of said C-shaped side members; a counter-shaft mounted on the rear upward portions of the C-shaped side members and drivingly connected to the engine and to the sprocket shaft, a clutch carried by said counter-shaft and operatively interposed between the engine and the driving sprocket for selectively connecting and disconnecting the engine therefrom, and a control handle for said clutch disposed in front of the steering handles and reachable by the operator without releasing the hold on one of said steering handles.

3. The device defined in claim 2, and including a standard detachably connected to the end of one of the front free portions of the C-shaped side members by a telescope joint and adapted to carry a rope reel.

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