(No Model.)

W. H. HARVEY.

ICE OR SNOW LOCOMOTIVE.

No. 600,672. Patented Mar. 15, 1898.

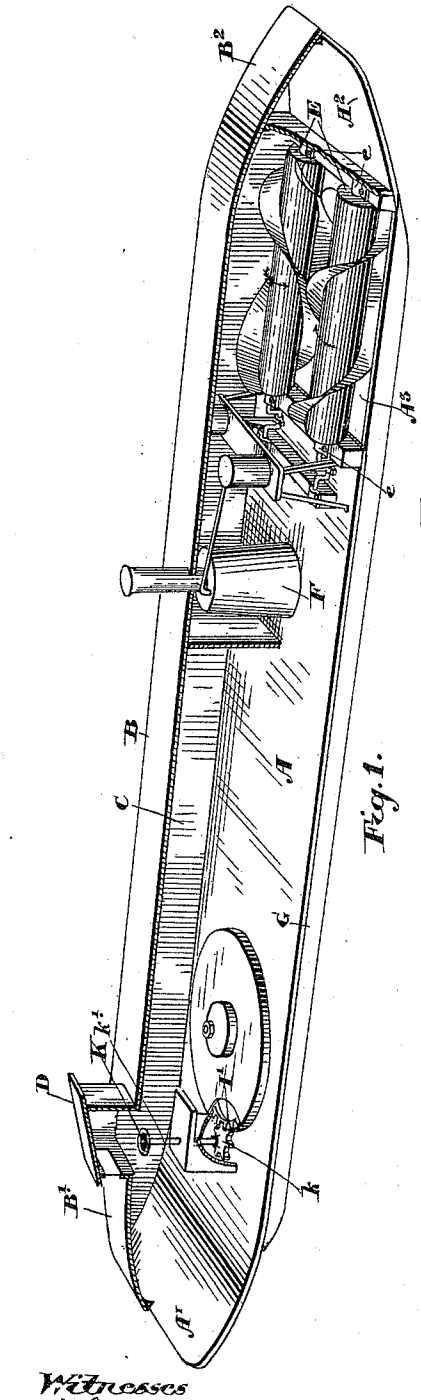


Fig. 1.

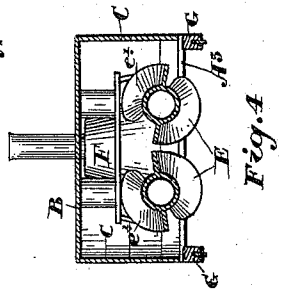


Fig. 4

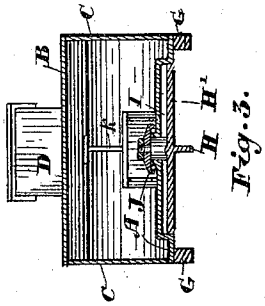


Fig. 3.

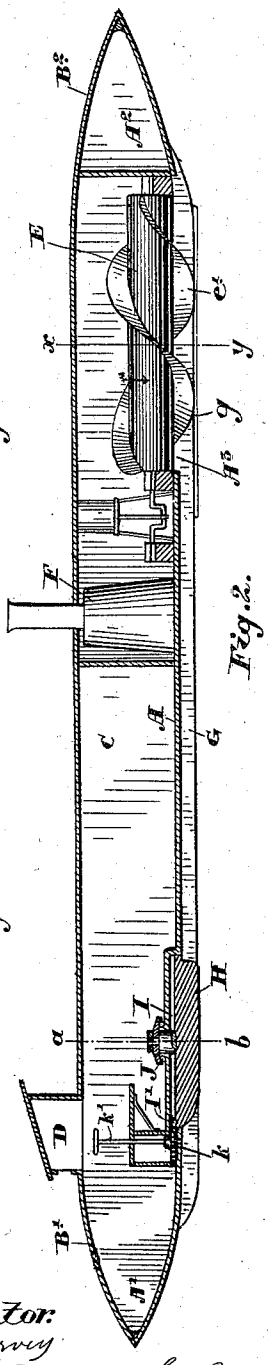


Fig. 2.

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UNITED STATES PATENT OFFICE.

WILLIAM HENRY HARVEY, OF TORONTO, CANADA.

ICE OR SNOW LOCOMOTIVE.

SPECIFICATION forming part of Letters Patent No. 600,672, dated March 15, 1898.

Application filed September 13, 1897. Serial No. 651,501. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HENRY HARVEY, mechanic, of the city of Toronto, in the county of York, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Ice or Snow Locomotives, of which the following is the specification.

My invention relates to improvements in ice and snow locomotives; and the object of the invention is to design an engine of this class which may be adapted for use in the winter-time and designed to draw freight and passenger trains in districts covered with snow and ice and not penetrable by the ordinary railroad-locomotive; and it consists, essentially, of a locomotive formed on the toboggan principle and provided with runners, convolute propelling-wheels extending through an opening in the bottom of the locomotive and situated, preferably, at the rear, and a suitable steering-runner situated, preferably, at the front of the same, the parts being constructed and arranged as hereinafter more particularly explained.

Figure 1 is a perspective view with top in section, showing the construction of my ice and snow locomotive. Fig. 2 is a longitudinal section through same. Fig. 3 is a cross-section on the line *a b*, Fig. 2, looking toward the front. Fig. 4 is a cross-section through the locomotive on the line *x y*, Fig. 2, looking toward the front.

In the drawings like letters of reference indicate corresponding parts in each figure.

A is the bottom of the locomotive, which is provided with the upwardly-curved front and rear ends A′ and A^2.

B is the top, and C are the sides. The top B is preferably provided with downwardly-curved front and rear ends B′ and B^2, which meet the front and rear ends A′ and A^2, respectively, forming apexes, as shown. The sides C completely close in the locomotive.

D is the lookout for the steersman.

A^3 is the rectangular opening made in the bottom.

E is a pair of propelling-wheels having convolute flanges. The propelling-wheels are suitably journaled in bearings *e* at each end of the opening A^3 and are so driven as to turn toward each other, or, if preferable, from each other. The engine F or any other suitable source of power may be employed for this purpose.

G are runners extending lengthwise of the locomotive and secured to the bottom thereof, one toward each side. These runners are designed more particularly for use when the locomotive is being run over ice or hard snow. When the snow is soft or not densely packed, the bottom A of the locomotive will rest upon the snow and the front A′ will serve to pack the snow sufficiently, so that the bottom will run more easily and support the weight of the locomotive in its course.

It will be noticed that the convolute flanges *e′* of the propelling-wheels extend down slightly below the level of the bottom of the runners, so as to maintain a gripping clutch upon the ice or snow, or both, as the case may be.

I provide in the runners G, at each side of the propelling-wheels, skating-strips *g*, which are designed to prevent the lateral swaying of the locomotive at the rear when it is being driven over ice. The upwardly-curved rear end A^2 permits of the motions of the propelling-wheels being reversed and the locomotive driven rearwardly, if such should be necessary.

It is intended that my locomotive may be employed to draw any desired number of sleds or toboggan-like sleighs, which may be coupled together in any suitable manner.

In order to provide for the steering of the locomotive, I provide a supplemental front central runner H, which is designed ordinarily to be set parallel with the side runners G. The supplemental center runner H is secured to a plate H′, which is journaled underneath a circular plate I and is connected thereto by any suitable form of ball-bearings J, upon which the runner is designed to turn. The front of the plate H′ is provided with a toothed rack I′, which is engaged by a pinion *k*, secured to the screw-spindle *k′*, designed to be turned by a hand-wheel K. This hand-wheel may be manipulated by the steersman, who is situated toward the front of the locomotive in the lookout D, and the course of the locomotive may thereby be controlled with facility.

It is not intended that this snow-locomotive should take the place of ordinary lines of railroad, but form branch lines to outlying

districts not easily gotten at in the winter-time by reason of the depth of the snow and severity of the climate.

My locomotive is also particularly designed to take the place of what is known in severe climates as "pack-trains"—that is to say, trains in which dogs serve to draw trains of sleds.

What I claim as my invention is—

1. An ice and snow locomotive comprising a flat bottom with upturned ends and a propelling wheel or wheels provided with convolute flanges suitably journaled on the bottom of the locomotive and designed when driven to have a running grip upon the snow or ice as and for the purpose specified.

2. An ice and snow locomotive comprising a flat bottom with upturned ends and provided with an opening in the same, and a propelling wheel or wheels provided with convolute flanges extending through such opening and designed when driven to have a running grip upon the snow or ice as and for the purpose specified.

3. An ice and snow locomotive comprising a flat bottom with upturned ends and provided with an opening in the same, a propelling wheel or wheels provided with convolute flanges extending through such opening and designed when driven to have a running grip upon the snow or ice and longitudinal runners extending throughout the length of the locomotive and to each side of the propelling-wheels as and for the purpose specified.

4. An ice and snow locomotive comprising a flat bottom with upturned ends and provided with an opening in the same, a propelling wheel or wheels provided with convolute flanges extending through such opening and designed when driven to have a running grip upon the snow or ice, longitudinal runners extending throughout the length of the locomotive and to each side of the propelling-wheels and supplemental gripping-runners situated in the main runners directly to each side of the propelling-wheels as and for the purpose specified.

5. An ice and snow locomotive comprising a flat bottom with upturned ends and provided with an opening in the same, a propelling wheel or wheels provided with convolute flanges extending through such opening and designed when driven to have a running grip upon the snow or ice, longitudinal runners extending throughout the length of the locomotive and to each side of the propelling-wheels and a supplemental front central steering-runner, and means for manipulating the same as and for the purpose specified.

6. An ice and snow locomotive comprising a flat bottom with upturned ends and provided with an opening in the same, a propelling-wheel provided with convolute flanges extending through such opening and designed when driven to have a running grip upon the snow or ice, longitudinal runners extending throughout the length of the locomotive and to each side of the propelling-wheels, a supplemental central steering-runner, a toothed rack on the turning-plate of the runner and an engaging pinion-rod and hand-wheel all arranged as and for the purpose specified.

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Witnesses:

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