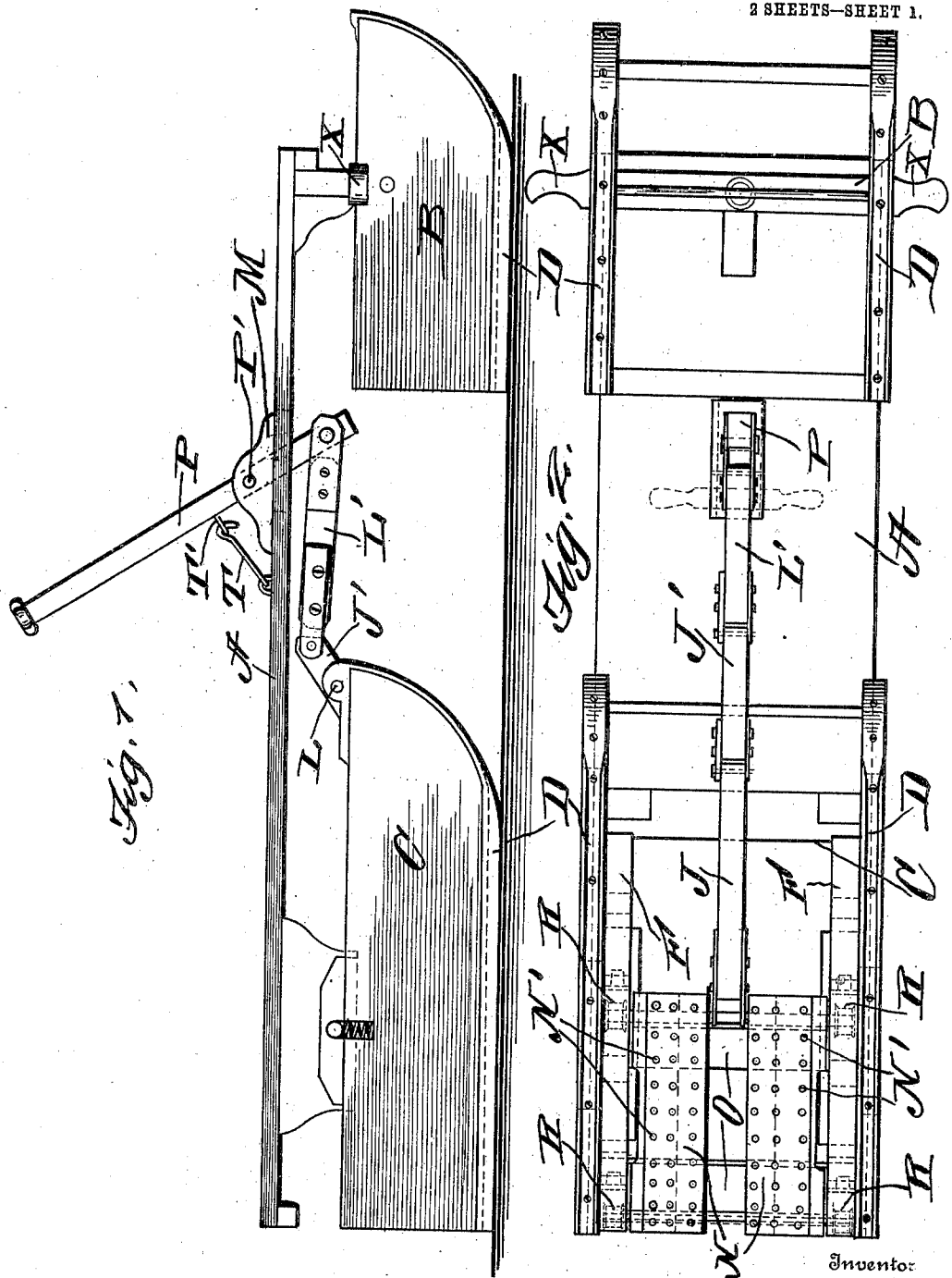


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SLED AND PROPELLING APPARATUS.
APPLICATION FILED APR. 19, 1909.

948,018.

Patented Feb. 1, 1910.

2 SHEETS—SHEET 1.



Witnesses

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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

ANDREW J. OFFORD, OF GRAND HAVEN, MICHIGAN.

SLED AND PROPELLING APPARATUS.

948,018.

Specification of Letters Patent.

Patented Feb. 1, 1910.

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To all whom it may concern:

Be it known that I, ANDREW J. OFFORD, a citizen of the United States, residing at Grand Haven, in the county of Ottawa and State of Michigan, have invented certain new and useful Improvements in Sleds and Propelling Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in propelling apparatus for sleds and consists essentially of one or more spurred shoes adapted to be reciprocated by hand-operated mechanism in such a manner that, upon a rearward pull of an operating lever, the shoes may be thrown slightly below the runners to engage the ice and exert a forward propelling movement to the sled. The invention comprises various details of construction and combinations and arrangements of parts which will be hereinafter fully described and then specifically defined in the appended claims.

My invention is illustrated in the accompanying drawings, in which:—

Figure 1 is a side elevation of a sled having propelling mechanism forming the subject matter of the present invention. Fig. 2 is a bottom plan view. Fig. 3 is a longitudinal sectional view centrally through the sled showing the cam ways for directing the movements of the spurred shoes. Fig. 4 is an enlarged detail view in perspective of one of the cam shoes showing the rollers thereon, and Fig. 5 is a cross sectional view through one of the runners.

Reference now being had to the details of the drawings by letter, A designates the platform of the sled and B and C designate respectively the front and rear bobs which are of the usual construction upon devices of this nature and provided preferably with the grooved runners D for convenience in order to prevent the runners from skidding. The rear portion of the platform is mounted preferably upon spring-actuated bolsters in order to take up vibration.

Projecting from the inner face of each of the rear bobs are the cam projections E which are preferably of the shape shown in

the drawings with their opposite edges tapering toward their ends and forming with the parallel ribs F, spaced apart from the cam projections, two parallel tracks, designated respectively by letters H and H', connected adjacent to their ends by the cam outlined passageways K, thus forming continuous passageways about the cam projection E for guiding the shoe as it is reciprocated. Projecting from the inner face of each runner of the rear bob is a curved member W forming the marginal edge of the cam passageway connecting the two rear ends of the parallel tracks upon either side of the cam projection E and projections W', curved as shown, form the forward marginal edges of the cam passageways connecting the forward ends of the parallel tracks and adjacent to the forward ends of said cam projections E. Said shoes N, there being two shown clearly in the bottom plan view of the drawings and which are fastened together by cross-pieces O, are provided with spurs N' upon the bottoms thereof and mounted in suitable bearings upon said cross-pieces are the shafts Q, one adjacent to the forward ends of the shoes and the other near the opposite ends thereof, and journaled preferably in ball bearings upon said shafts are the rollers R adapted to travel in said continuous cam outlined passageways described. A bar J is pivotally connected at one end to the forwardmost of said shafts and its other end is pivotally connected to the lever J' which is pivotally mounted upon the shaft L connecting the forward ends of the runners of the rear bob. A link or bar L' pivotally connects the forward end of the lever L with the lower end of the operating lever P which is pivotally mounted upon a pin P' carried by the bracket member M rising from the platform of the sled. In order to hold the operating lever P at its farthest rearward throw to adapt the sled for coasting purposes, a hook T fastened to said platform is adapted to engage an eye T' upon the shaft of the operating lever. Fixed to the upper marginal edge of each of said cam projections E is a pawl E' against which a spring E² bears and adapted to hold the pawl yieldingly against the upper rear edge of the cam projection, said pawls being preferably downwardly curved and projecting beyond the rear ends of the cam projections to which they are fastened.

In operation, assuming that the handles

of the lever P are at their farthest rearward throw, the shoes will be held at their highest limits and at their farthest rearward positions within said cam passageways or tracks.

5 As the operator throws the hand lever forward, the shoes will be drawn forward, the rollers connected thereto traveling upon the upper edges of the cam projections and, as the operating lever approaches its farthest forward limit, the rollers upon the shoes will pass over the upper edges of the forward ends of the cam projections and the shoes will lower to such positions that the spurs upon the lower faces thereof will project slightly below the lower edges of the runners and be adapted to engage the ice. As the operating lever is pulled rearward, the shoes cutting into the ice will cause a forward propulsive movement to be imparted to the sled and, when the operating lever approaches its rear limit, the rollers connected to the shoes, coming in contact with the curved projections W' which form the front marginal walls of the cam ways slight distances in the rear of the cam projection E, will cause the shoes to rise and, as the rollers come in contact with the projecting ends of said pawls, the latter will yield and allow the wheels to pass by the same, after which the pawls will be thrown to their normal positions by means of the springs bearing against the same and, upon a forward movement of the shoes, the wheels will be prevented by said pawls from passing down through the cam passageways and the rear ends of the cam projections and will be directed forward upon the rollers riding upon the upper edges of said cam projections.

By a continuous forward and backward movement of the hand-operating lever, it will be noted that this operation will be repeated, the spurs of the shoes being forcibly set into the surface of the ice and a forward propulsive movement imparted to the sled as the operator pulls back upon the handles of the operating lever. The ear-like projections X, X on the front of the sled, which form foot rests, are to enable the operator to steer the sled while the same is in operation.

50 While I have shown and described my invention as being applied to a hand-operated sled, it will be understood that any power apparatus may be substituted for the hand lever if desired. Neither will it be understood that I confine my invention to the exact details of construction shown, as such construction may vary without departing from the spirit of the invention.

What I claim to be new is:—

60 1. A propelling apparatus for sleds comprising a bob, a shoe carried thereby provided with spurs upon its bottom, rollers carried by said shoe, cam outlined passageways upon the inner faces of the runners of the bob and adapted to guide said shoe as it

is reciprocated, and means for operating said shoe, as set forth.

2. A propelling apparatus for sleds comprising a bob, a shoe carried thereby provided with spurs upon its bottom, rollers carried by said shoe, cam outlined tracks upon the inner faces of the runners of the bob in which said rollers are guided, causing the shoe to travel in different parallel planes as it is reciprocated, and means for operating the shoe, as set forth.

3. A propelling apparatus for sleds comprising a bob, a shoe carried thereby provided with spurs upon its bottom, rollers carried by said shoe, cam projections upon the inner faces of the runners of said bob and about which projections continuous cam outlined tracks are formed, and in which said rollers are adapted to travel, pawls secured at corresponding ends of said cam projections and adapted to allow said rollers to pass by said pawls in one direction only, and means for operating the shoe, as set forth.

4. A propelling apparatus for sleds comprising a bob, a shoe carried thereby provided with spurs upon its bottom, rollers carried by said shoe, cam projections upon the inner faces of the runners of said bob and about which projections continuous cam outlined tracks are formed and in which said rollers are adapted to travel, spring-actuated pawls fastened to corresponding ends of said cam projections and extending beyond the rear ends of the latter and designed to allow the rollers to pass by said pawls as the shoe travels in one direction only, and means for operating the shoe, as set forth.

5. A propelling apparatus for sleds comprising a bob, a platform, a pivotal operating lever mounted upon the latter, a spurred shoe, a shaft connected thereto, rollers upon said shaft, pivotal link and lever connections between said shoe and operating lever, cam projections and ribs upon the inner faces of the runners and spaced apart, curved projections connecting said ribs beyond the ends of the cam projections forming a continuous cam outlined track in which said rollers travel, and means for preventing the rollers from passing in one direction by the rear ends of said cam projections, as set forth.

6. A propelling apparatus for sleds comprising a bob, a platform, a pivotal operating lever mounted upon the latter, a spurred shoe, a shaft connected thereto, rollers upon said shaft, pivotal link and lever connections between said shoe and operating lever, cam projections and ribs upon the inner faces of the runners and spaced apart, curved projections connecting said ribs beyond the ends of the cam projections forming a continuous cam outlined track in which said

rollers travel, pawls fixed to the upper surfaces of said cam projections and extending beyond the rear ends thereof and in the path of said continuous cam track and serving to prevent the rollers from passing in one direction by said cam projections, as set forth.

7. A propelling apparatus for sleds comprising a bob, a platform, a pivotal operating lever mounted upon the latter, a spurred shoe, a shaft connected thereto, rollers upon said shaft, pivotal link and lever connections between said shoe and operating lever, cam projections and ribs upon the inner faces of the runners and spaced apart, curved projections connecting said ribs be-

yond the ends of the cam projections forming a continuous cam outlined track in which said rollers travel, curved pawls fastened at their forward ends to the upper edges of said cam projections and their rear ends extending beyond the latter and into said cam outlined track, and springs for holding said pawls normally in contact with said projections, as set forth.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

ANDREW J. OFFORD.

Witnesses:

IRENE C. OFFORD,
M. L. Woods.