No. 108,917. PATENTED NOV. 1, 1870.

J. LOGAN.

SLEIGH RUNNER.

Fig.1.

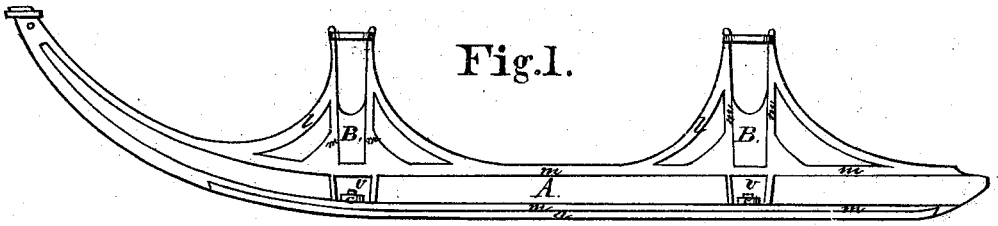


Fig.2.

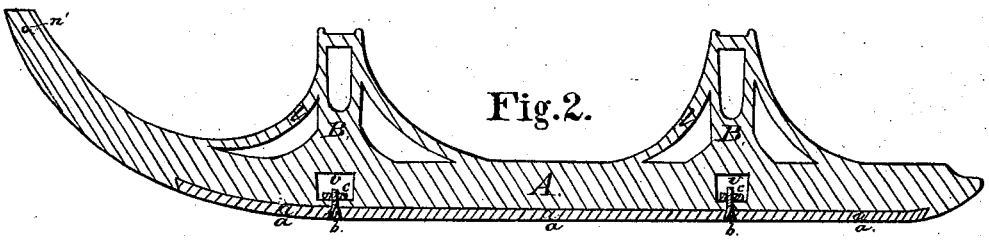


Fig.3.

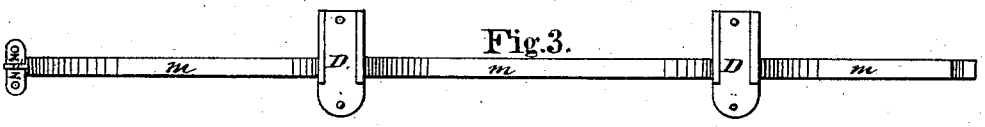


Fig.4.

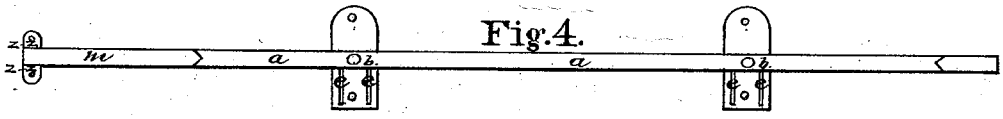
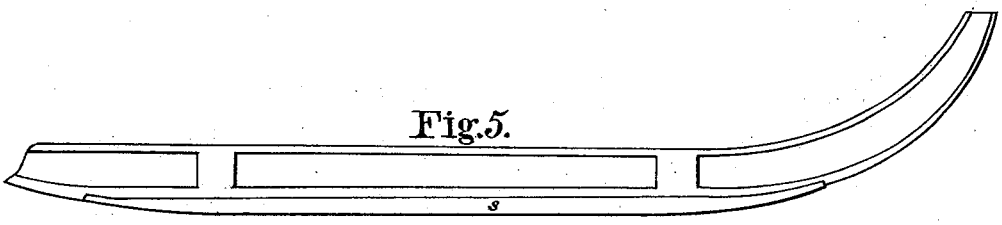


Fig.5.



Witnesses,
E. W. Anderson,
L. L. Kane,

Inventor,
John Logan,
Chipman, Kasmer & Co
Attorneys,

United States Patent Office.

JOHN LOGAN, OF WATERLOO, IOWA.

Letters Patent No. 108,917, dated November 1, 1870.

IMPROVEMENT IN SLEIGH-RUNNERS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, JOHN LOGAN, of Waterloo, in the county of Black Hawk and State of Iowa, have invented a new and valuable Improvement in Sled-Runners; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawing is a side view of my invention.

Figure 2 is a central vertical longitudinal section of the same.

Figure 3 is a top view of the runner.

Figure 4 is a bottom view, showing the steel shoe.

Figure 5 indicates the manner of applying and letting in the chill in casting the runner.

My invention relates to cast-iron runners for sleds, and consists mainly in the construction and novel arrangement of devices whereby such cast-iron runners are shod with steel in a simple and durable manner.

The letter A represents the body of a cast-iron runner.

a represents the steel shoe, forked and dovetailed at each end. The shoe is sprung into place, and when in position is prevented from coming out at the ends by the dovetailed joint, the forked shape of which enables it also to operate in the prevention of any side-wise movement.

The shoe is permanently secured to the runner with tapered bolts *b b* and nuts *c c*, for convenience in the application of which the openings *v v* are made in the cast runner below the knees B B.

The tapering form of the bolts *b b* operates to prevent their becoming loose as the steel shoe wears away.

D represents the top of the knee, to which is bolted the beam and rave.

To the lugs *z z*, cast on each side of the front end of the runner, is bolted the end of the rave, which is mortised to receive the projection *a'*.

On the inner side of the runner, under the plate or knee-cap D, are the braces *e e*, between which rests the end of the cross-beam.

The knees B B are still further strengthened by the braces *l l*, connecting the upper part of the knee on each side with the upper edge of the sled-runner.

In the cast body of my runner lightness has been obtained by economy in the use of metal, strength being preserved by the flanches *m m*, which bound the runner and knees on the inside and outside edges.

In casting the runner a chill, *s*, which expands as the hot-metal is poured on its upper face, is let into the runner at each end to the depth of one-eighth of an inch or more.

The letter *n'* designates the bearing for one end of the tongue-roller.

What I claim as my invention, and desire to secure by Letters Patent, is—

The cast-iron sled-runner A, herein described, having chilled bottom, steel shoe *a*, tapering bolts *b b*, openings *v v*, braces *e e l l*, constructed and arranged to operate as specified.

In testimony that I claim the above, I have hereunto subscribed my name in the presence of two witnesses.

JOHN LOGAN.

Witnesses:

JOHN MCCABE,

H. P. HERRING.