

(No Model.)

2 Sheets—Sheet 1

J. L. NYLANDER.
LOGGING SLED.

No. 570,677.

Patented Nov. 3, 1896.

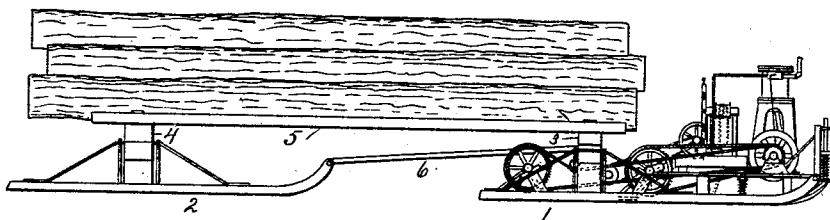


Fig. 1.

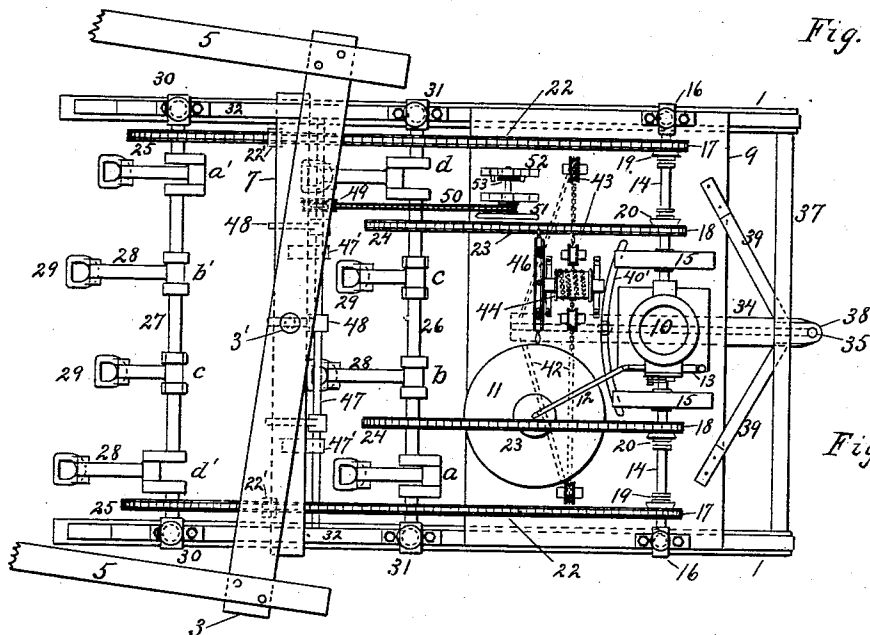


Fig. 2.

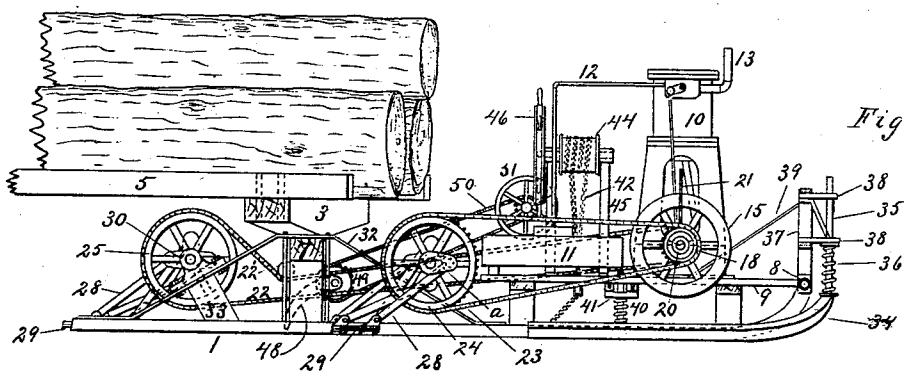


Fig. 3.

Witnesses.

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(No Model.)

2 Sheets—Sheet 2.

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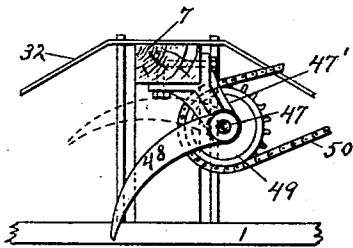


Fig. 10.

Fig. 4.

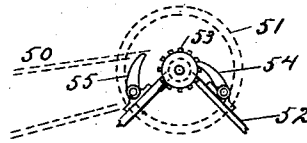


Fig. 11.

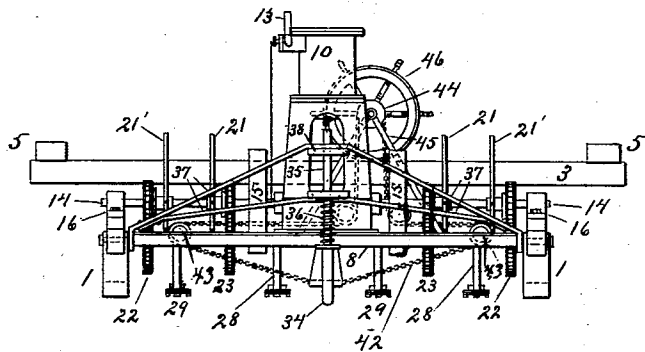


Fig. 9.

Fig. 6.

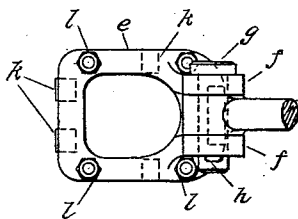


Fig. 5.

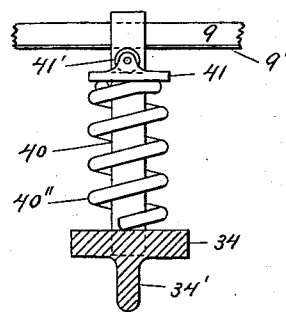
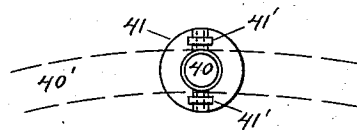


Fig. 7.

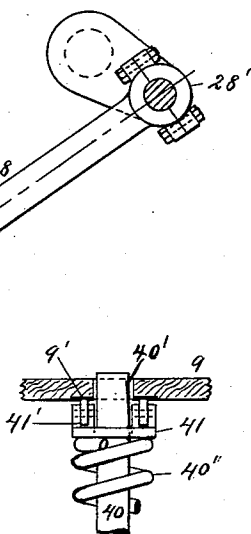


Fig. 8.

Witnesses.
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UNITED STATES PATENT OFFICE.

JOSEPH L. NYLANDER, OF DULUTH, MINNESOTA.

LOGGING-SLED.

SPECIFICATION forming part of Letters Patent No. 570,677, dated November 3, 1896.

Application filed November 25, 1895. Serial No. 570,140. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH L. NYLANDER, a citizen of the United States, residing at Duluth, in the county of St. Louis and State of Minnesota, have invented certain new and useful Improvements in Logging-Sleds; and I do hereby declare the following to be a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

The type of logging-sled to which my invention particularly relates is that wherein a motor carried by the sled is employed for the purpose of propelling the same.

The objects of my invention are to provide a logging-sled which will be simple in construction, efficient in use, easily steered and controlled, adapted for roads with or without ruts, capable of movement on rough and uneven surfaces, and by which very large and heavy loads of logs or other material may be transported with economy, safety, and despatch.

The features of novelty in my invention on which I rely for the accomplishment of these objects will be pointed out in the following description and covered in the appended claims.

For a better comprehension of my invention attention is directed to the accompanying drawings, forming a part of the specification, and in which—

Figure 1 is a side view of the sled loaded with logs; Fig. 2, a plan view of the front sled and the mechanism carried thereon; Fig. 3, a side view of the same, showing a portion of three logs to be transported, one of the runners of the sled being cut away to illustrate the internal mechanism; Fig. 4, a front view of the sled; Fig. 5, an enlarged detail view of one of the propelling-feet, showing the means for operating the same; Fig. 6, a plan view of one of the propelling-feet, the pushing-arm for the same being broken off; Figs. 7 and 8, two detail views of the supporting-pin and connections therefor for the steering-runner; Fig. 9, a plan view of the same; Fig. 10, an enlarged detail view of one of the brake-shoes and operating mechanism therefor, and Fig. 11 an enlarged view of the mechanism for operating the brake.

In all of the above views corresponding numerals indicate the same parts.

1 2 represent the runners of the front and rear sleds, and 3 4 are the bunks thereof. 5 5 are side pieces connecting said bunks, which also serve for the purpose of holding the logs in place thereon. The bunk 4 is rigidly connected to the rear sled-runners 2, but the front bunk 3 is pivoted to the front sled by a king-pin 3', so as to allow the front sled to turn freely relative to the load.

6 is a tongue or rod connecting the front and rear sleds for the purpose of relieving the side pieces 5 of strains.

The bunks 3 and 4 may be of any convenient width, irrespective of the width of the sleds, as may be understood.

7 and 8 are cross-bars connecting the runners 1 1 of the front sled, and to the cross-bar 7 is pivoted the bunk 3, as before explained.

9 is a platform carried on the forward part of the front sled, and on which is mounted a motor 10, which may be a steam, gas, or petroleum engine, or other prime mover. I prefer, however, and illustrate a gas-engine for this purpose, which receives gas from a carbureter or tank 11 through a pipe 12 and exhausts the burned gases through a pipe 13. This engine drives a shaft 14, journaled in ball-and-socket bearings 16 on the sides of the front sled, which shaft carries one or more fly-wheels 15 15 (two being shown) and sprocket-wheels 17 17 and 18 18.

By mounting the main driving-shaft 14 in ball-and-socket bearings, as explained, the runners 1 1 may be moved independently of each other over rough roads. In this way I allow the runners of the front sled to accommodate themselves to the varying conditions of surfaces over which they may be passed, without retarding or effecting the continuous operation of the engine, which feature is of great importance, since if a perfectly-rigid front sled was employed it would be subjected to very great strains in actual use and would have to be made very heavy.

Upon the shaft 14 are mounted clutches 19 19 20 20, operated by handles or levers 21 21' 21', Fig. 4, by means of which any one or all of the sprocket-wheels 17 17 18 18 may be thrown into connection with the shaft 14.

These clutches may be of any suitable and approved construction.

Instead of employing a separate handle or lever 21 or 21' for operating the various clutches, the said clutches may all be operated simultaneously by means of a single lever, or, if desired, the sprocket-wheels may be keyed direct to the main driving-shaft 14, in which case the clutches may be dispensed with.

The sprocket-wheels 17 and 18 are connected by means of suitable sprocket-chains 22 22 23 23 with larger sprocket-wheels 24 24 and 25 25, keyed to shafts 26 and 27, mounted in ball-and-socket bearings 30 and 31 in the sides of the front sled.

Instead of employing longer sprocket-chains 22, as shown, connecting the sprocket-wheels 17 on the main driving-shaft 14 with the sprocket-wheels 25 on the driving-shaft 27, the latter shaft may be driven from the shaft 26, as will be understood. I consider the arrangement shown, however, to be preferable for the reason that the shafts 26 and 27 are entirely independent of each other, and in case of an accident to one of said shafts the other shaft may be driven from the main shaft 14.

When long sprocket-chains 22 22 are employed connecting the main driving-shaft 14 with the shaft 27, the said chains may be guided under the cross-bars 7 by means of small rollers 22' 22' secured to said cross-bar, as shown in Figs. 1, 2, and 3.

By providing the shafts 26 and 27 with ball-and-socket bearings at their ends, provision is made, as in the case of the main driving-shaft 14, for the independent working of the runners of the front sled over uneven surfaces, without effecting the correct operation of said shafts.

Each shaft 26 and 27 is provided thereon with a suitable number of cranks, preferably two or a multiple of two, four of said cranks being shown, and which are arranged to operate in any desired order. I prefer to arrange these cranks in such a way that the cranks, at equal distances on each side of the center, will operate together, so that there will be no tendency to swerve the front sled from side to side. As shown in Fig. 2, the cranks on the shafts 26 and 27 are arranged in this way, *a* and *a'*, *c* and *c'*, *d* and *d'*, *b* and *b'*, operating together in the order given. These various cranks each carry a pushing-arm, at the lower end of which is pivoted a shoe 29. (Shown particularly in Figs. 5 and 6.)

Each shoe consists of the frame *e*, provided with lugs *ff* thereon, between which is pivoted the lower end of the pushing-arm 28, on a pin *g*, held in place by a split pin *h*, whereby a hinge-joint is formed between the pushing-arm and shoe.

The frame *e* is made preferably of iron and is provided on its under side with a steel shoe *i*, removably secured to the frame *e* by means of bolts *l*, and provided on its under bearing-

surface with sharp projections or calks *k*, whereby said shoes will engage the ground tightly and will be prevented from slipping. Each frame *e* and shoe *i* are open in the center in order to allow for the escape of snow and ice and prevent clogging thereof.

The connection between each pushing-arm 28 and the shoe 29 at the lower end thereof should be preferably such that the line of thrust passes as nearly as possible through the center of the shoe, whereby the shoe will be forced flat upon the ground.

In order to properly guide the apparatus, provision should be made for the movement of the front sled with respect to the load, which can be effected by means of a connection between the front sled and the side pieces 5, or the front bunk 3, as will be understood. I prefer, however, to employ a separate steering-runner 34 for this purpose, so that the front sled, both as to its means of propulsion and steering, will be self-sustained and entirely independent of the back sled and load. This steering-runner 34 is carried under the forward central portion of the front sled in the manner to be explained, and consists of a flat metal bearing-surface, having a downwardly-projecting web 34' for engagement within the hard-packed snow or ice, so as to grip the same. The forward portion of this steering-runner is bent upwardly, more or less, and is connected with a pin 35, carried in bearings 38 38, and capable of vertical movement in said bearing.

36 is a heavy coiled spring surrounding the pin 35, and forcing the forward end of the steering-runner into engagement with the snow or ice. The bearings 38 are suitably stiffened by means of an appropriate arrangement of braces 37 and 39.

Near the rear end of the steering-runner 34 is secured a pin 40, which passes up through a slot 40' in the platform 9. Mounted upon the pin 40 is a sliding washer or plate 41, carrying rollers 41', which engage with and bear upon the under side of the platform 9, adjacent to said slot.

40'' is a heavy spiral spring mounted between said washer or plate 41 and the steering-runner 34, so as to force the rear portion of said runner into close engagement with the snow or ice. By mounting this steering-runner in the manner I have explained it will at all times be forced down upon the surface of the snow or ice, so that the web 34' thereof will be forced therein so as to tightly grip the same, and at the same time provision is made for the movement up or down of said runner when heavy obstructions are encountered, such as logs and stones.

In order to move the steering-runner 34 to one side or the other for the purpose of steering the sled, I employ chains 42 42, connected with the rear end thereof, passing over suitably-arranged sheaves 43 and connected with a drum 44, carried on a shaft in suitable standards 45, and operated by a hand-wheel

46, of appropriate construction. This steering apparatus is conveniently mounted on the platform 9, so that the operator may control the same while within easy reach of the valves and other parts of the engine.

By operating the hand-wheel to one side or the other the chains 42 will move the rear end of the steering-runner 34 in the desired direction and to the proper extent, said steering-runner moving pivotally in the bearings 38, and since the web 34' is embedded within the snow or ice the said runner will deflect the front sled to one side, whereby the apparatus may be effectively and easily steered.

In order to stop the apparatus quickly, or to retard its movement when it is going down hill, I employ a brake mechanism, which is clearly illustrated in the drawings.

47 is a shaft supported in suitable bearings 47', secured to the cross-bearing 7. (See Fig. 10.) This shaft 47 carries a series of curved arms 48, which are keyed to the same, and is provided with a sprocket-wheel 49, by which the said shaft may be operated.

50 is a sprocket-chain connecting the sprocket-wheel 49 with a smaller sprocket-wheel secured to the shaft of the operating hand-wheel 51, mounted in bearings 52 on the platform 9. The hand-wheel 51 is mounted adjacent to the steering-wheel 46, so that it can be operated by one hand of the operator without effecting the steering of the device.

Carried on the shaft of the hand-wheel 51 is a ratchet-wheel 53, with which oppositely-set pawls 54 and 55 are adapted to engage. By turning the hand-wheel 51 in one direction the curved arms 48 will be caused to engage the surface of the snow or ice, so as to cut therein and retard the movement of the apparatus, or entirely stop the same, and by employing the pawl 54 the arms 48 can be held in this position.

By making use of the pawl 55 the arms 48 may be held out of the way of the surface of the snow or ice, as shown in dotted lines in Fig. 10, when it is not desired to employ the brake.

I am aware that it is not new to provide a series of pushing-arms for propelling a sled, and also that the idea of making use of a motor for operating pushing-arms for this purpose has been suggested before. I therefore do not claim such features broadly.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is as follows:

1. The combination with a logging-sled, of a steering-runner pivoted at its forward end to said sled, a spring for forcing the forward end of said runner downward, a vertical extension at or near the rear end of said runner, engaging beneath the sled-frame but movable with respect to the same, and a spring on said extension for forcing the rear end of the runner downward, substantially as set forth.

2. The combination with a logging-sled, of a steering-runner pivoted at its forward end

to said sled, a spring for forcing the forward end of said runner downward, a vertical extension at or near the rear end of said runner, engaging beneath the sled-frame but movable with respect to the same, a spring on said extension for forcing the rear end of the runner downward, and a rolling bearing between said connection and the sled-frame, substantially as set forth.

3. The combination with a logging-sled, of an engine carried thereby, a main driving-shaft, connections between said engine and said shaft, one or more driven shafts carried by the sled, a series of pushing-arms operated by said driven shafts, connections between said main driving-shaft and said driven shaft or shafts, and clutches for disengaging said connections with the main driving-shaft, substantially as set forth.

4. The combination with a logging-sled, of an engine carried on said sled, a main shaft, connections between said shaft and said engine, two or more driven shafts mounted on the sled, a series of pushing-arms operated by said driven shafts, and independent connections between said driven shafts and said main shaft, substantially as set forth.

5. The combination with a logging-sled, of an engine mounted on said sled, a main driving-shaft, connections between said engine and said shaft, two or more driven shafts mounted on the sled, a series of pushing-arms operated by said shafts, independent connections between said driven shafts and said main shaft, and a separate clutch for each of said connections whereby said driven shafts may be operated independently of each other, substantially as set forth.

6. The combination with a logging-sled, of an engine mounted on said sled, a main shaft 14, sprocket-wheels 17 and 18 on said main shaft, two or more driven shafts 26, 27, mounted on the sled, sprocket-wheels 24 and 25, on said driven shafts sprocket-chains 22 connecting the sprocket-wheels 17 and 25, and sprocket-chains 23 connecting the sprocket-wheels 18 and 24, substantially as set forth.

7. The combination with a logging-sled, of an engine mounted on said sled, a main shaft 14, sprocket-wheels 17 and 18 on said main shaft, clutches 19 and 20, for throwing said sprocket-wheels into and out of engagement with said shaft, two or more driven shafts 26 and 27 mounted on the sled, a series of pushing-arms operated by said driven shafts, a sprocket-chain 22 connecting the sprocket-wheels 17 and 25, and a sprocket-chain 23 connecting the sprocket-wheels 18 and 24, substantially as set forth.

8. The combination with a logging-sled, of an engine mounted on said sled, a main shaft 14 flexibly mounted on said sled, connections between said engine and said main shaft, and mechanism operated from the main shaft for propelling the sled, substantially as set forth.

9. The combination with a logging-sled,

of an engine mounted on said sled, a main shaft 14 mounted in ball-and-socket bearings on said sled, connections between said shaft and said engine, and mechanism operated
5 from said shaft for propelling the same, substantially as set forth.

10. The combination with a logging-sled, of an engine mounted on said sled, a driven shaft mounted in flexible bearings on the
10 sled, a series of pushing-arms connected with said driven shaft, and connections between said driven shaft and said engine, substantially as set forth.

11. The combination with a logging-sled, of an engine mounted on said sled, a driving-shaft mounted in ball-and-socket bearings on said sled, a series of pushing-arms operated by said driving-shaft, and connections
15 between said driving-shaft and said engine, substantially as set forth.

12. The combination with a logging-sled, of an engine mounted on said sled, a main driving-shaft 14 mounted in flexible bearings on the sled, connections between said engine
25 and said main driving-shaft, a driven shaft mounted in flexible bearings on the sled, a series of pushing-arms operated by said driven shaft, and connections between said main driving-shaft and said driven shaft, substantially as set forth.

13. The combination with a logging-sled, of an engine mounted on said sled, a main driving-shaft mounted in ball-and-socket bearings on said sled, connections between
35 said engine and said main driving-shaft, a driven shaft mounted in ball-and-socket bearings on said sled, a series of pushing-arms operated by said driven shaft, and connections between said main driving-shaft and
40 said driven shaft, substantially as set forth.

14. The combination with a logging-sled, of an engine mounted on said sled, two or more driven shafts mounted in flexible bearings on
45 said sled, a series of pushing-arms operated by said driven shafts, and connections between said engine and said driven shafts, substantially as set forth.

15. The combination with a logging-sled, of an engine mounted on said sled, two or more
50 driven shafts mounted in ball-and-socket bearings on said sled, a series of pushing-arms operated by said driven shafts, and connec-

tions between said engine and said driven shafts, substantially as set forth.

16. The combination with a logging-sled, of
55 an engine mounted on said sled, a main driving-shaft flexibly mounted on said sled, connections between said engine and said driving-shaft, two or more driven shafts flexibly
60 mounted on said sled, a series of pushing-arms operated by said driven shafts, independent connections between each of said driven shafts and said main driving-shaft, and an independent clutch for each of said
65 connections for throwing said driven shafts into and out of engagement with said driving-shaft independent of the others, substantially as set forth.

17. The combination with a logging-sled, of a shaft mounted on said sled, means for oper-
70 ating said shaft, one or more cranks on said shaft, a pushing-arm connected with said cranks, a shoe at the lower end of each pushing-arm for engagement with the snow or ice, said shoe being provided with a vertical open-
75 ing, substantially as set forth.

18. The combination with a logging-sled, of a shaft mounted on said sled, means for oper-
80 ating said shaft, one or more cranks on said shaft, a pushing-arm engaging with each of said cranks, an open frame pivoted to the lower end of each pushing-arm, and an open shoe removably secured to said open frame, substantially as set forth.

19. The combination with a logging-sled, of
85 a shaft flexibly mounted on said sled, means for operating said shaft, and means operated by said shaft for propelling the sled, substantially as set forth.

20. The combination with a logging-sled, of
90 a shaft carried by said sled, two or more arms keyed to said shaft, a hand-wheel mounted on the sled, and connections between said hand-wheel and said shaft for partially rotating said shaft whereby said arms will be
95 forced into engagement with the snow or ice for stopping or retarding the movement of said sled, substantially as set forth.

In testimony whereby I affix my signature in presence of two witnesses.

JOSEPH L. NYLANDER.

Witnesses:

GEO. F. DAVIS,
FRANK HAYES.