Oct. 23, 1956 E. T. GOVE 2,767,870

SELF-LOADING WHEELED CARRIER FOR ELONGATED RIGID ARTICLES AND METHOD

Filed July 14, 1952 3 Sheets-Sheet 1

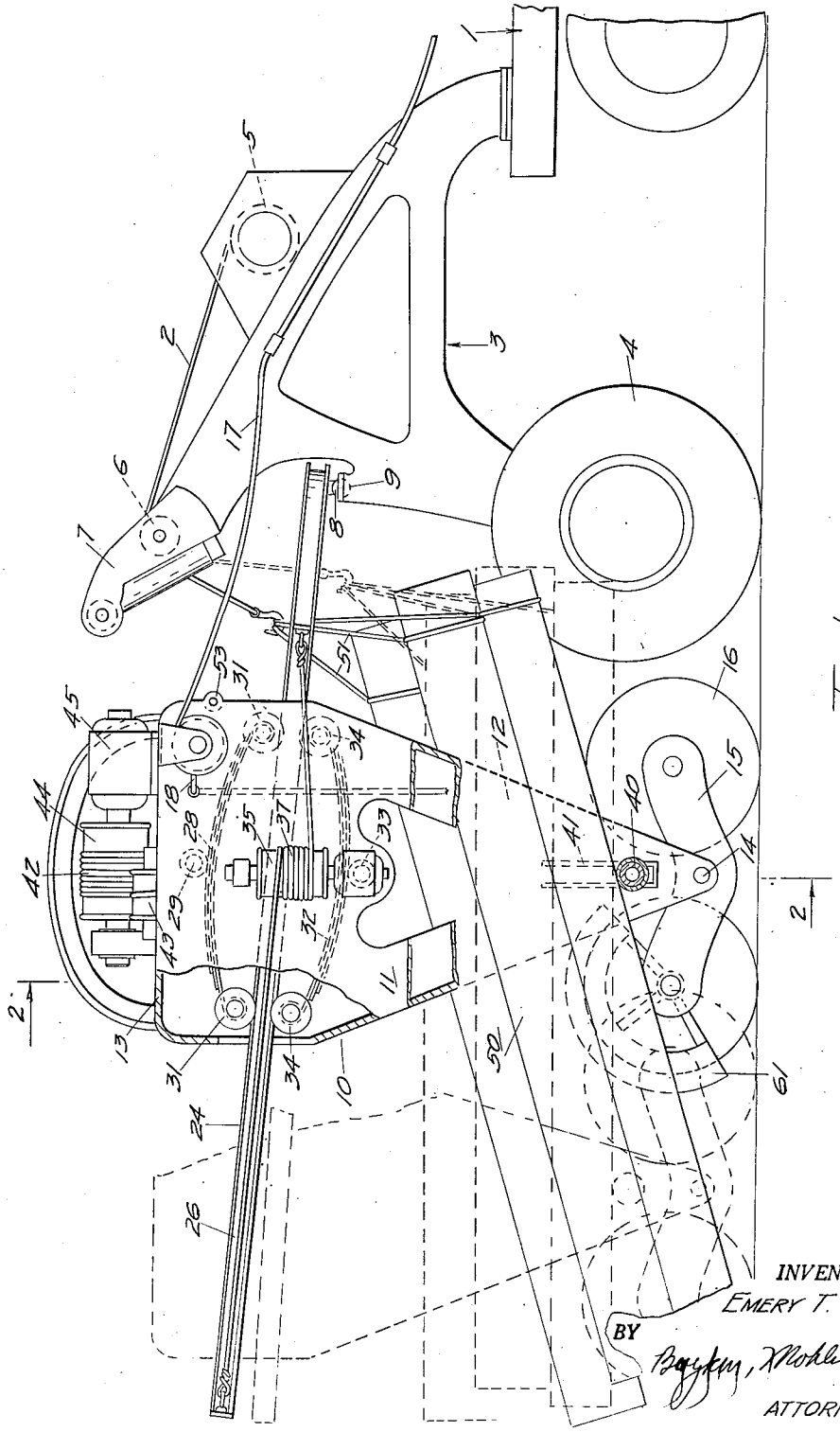


Fig. 1.

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Fig. 2

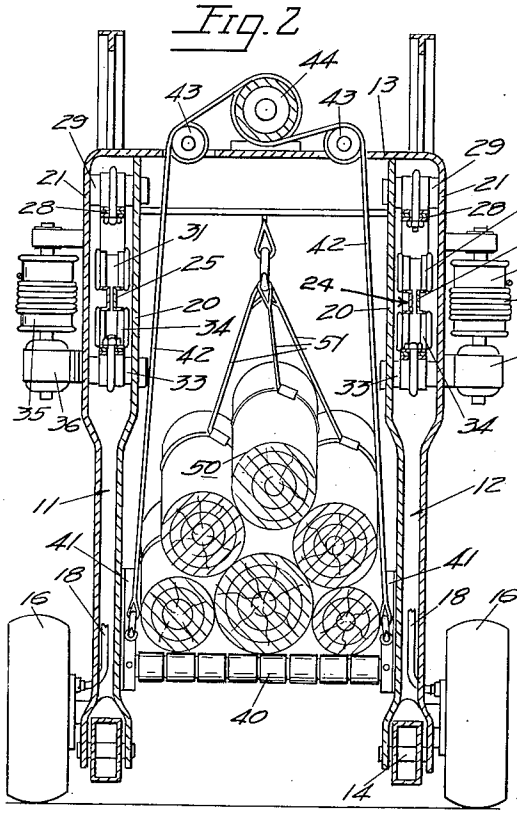
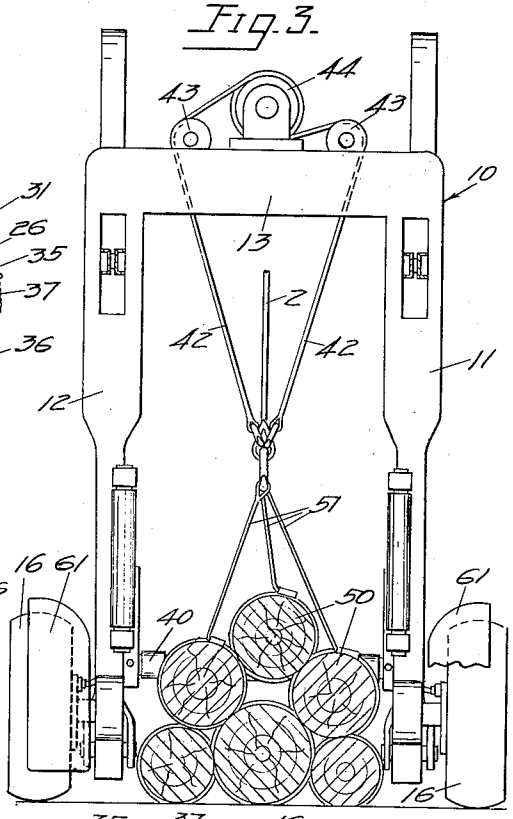


Fig. 3



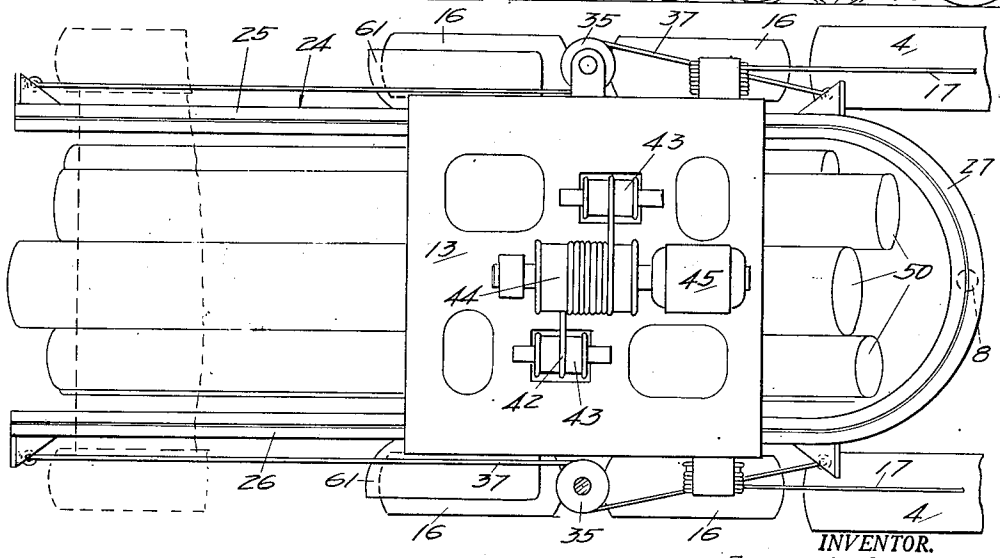


Fig. 4

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Fig. 5.

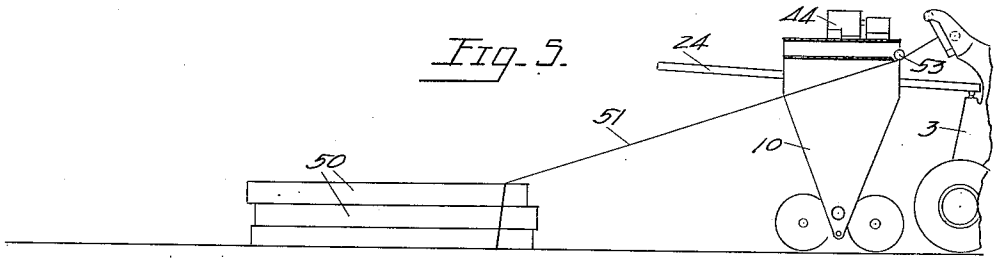


Fig. 6.

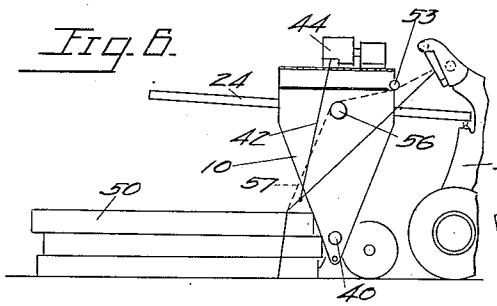


Fig. 7.

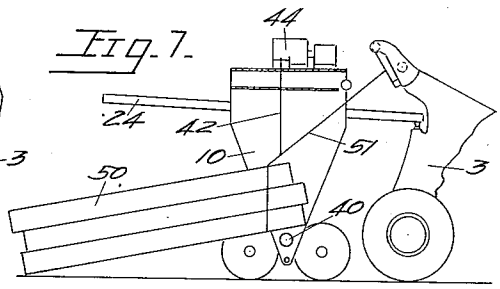


Fig. 8.

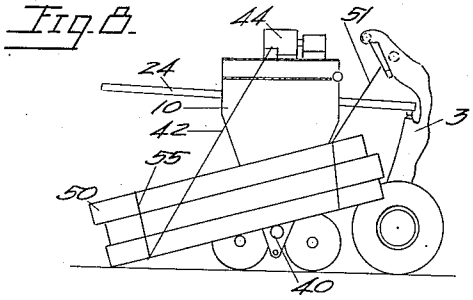


Fig. 9.

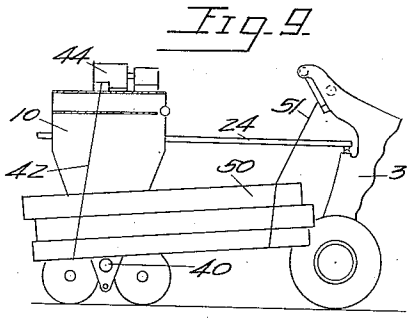


Fig. 10.

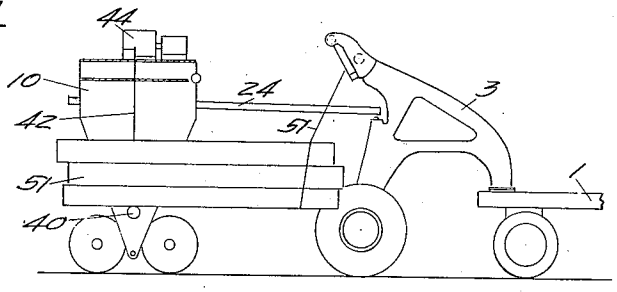
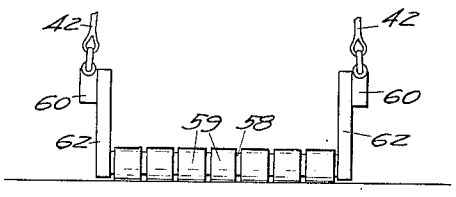


Fig. 11.



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2,767,870

SELF-LOADING WHEELED CARRIER FOR ELONGATED RIGID ARTICLES AND METHOD

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Application July 14, 1952, Serial No. 298,868

17 Claims. (Cl. 214—351)

This invention relates to a carrier for handling logs, pipe and many elongated rigid articles that heretofore have been difficult to elevate from the ground and to carry from one place to another.

In the case of trees that have been felled, trimmed and cut to suitable lengths for transporting over roads to a flume, river, pond, mill or elsewhere, it has been customary to connect one of the ends of a number of such logs to cables and to pull or skid them over the ground to the road where they may then be loaded onto logging trucks for carrying the remaining distance to their destination over said road. Usually it is not desirable to skid the logs on the road or for any great distance because of injuring to both the road and to the logs, and the difficulty of making turns that may be in the road. Also the skidding of logs for any great distance is not economically practical.

One of the objects of the present invention is the provision of a means and method to enable the gathering or skidding of logs and the like to substantially parallel side by side relationship and to then elevate the logs off the ground and to rapidly transport them to their destination without releasing them from their connection with the vehicle that skidded them to their said relationship. By this means and method, the logs are safely carried without injury to them or to the road to their destination in a fraction of the time now required and with less equipment and substantially less labor, and when such logs reach their destination, they are more readily and quickly unloaded.

Other objects and advantages will appear in the description and in the drawings.

In the drawings,

Fig. 1 is a part elevational and part sectional side view of the carrier.

Fig. 2 is a sectional view taken along line 2—2 of Fig. 1.

Fig. 3 is an end elevational view of the carrier of Fig. 1, but showing the logs in section, and with one of the wheel guards partly broken away.

Fig. 4 is a top plan view of the carrier.

Fig. 5 is a schematic view showing the initial step in the method of transporting the logs, in which they are initially secured to a cable for dragging to the carrier.

Fig. 6 is a schematic view similar to that of Fig. 5 with the logs at the carrier.

Fig. 7 is a schematic view showing the leading ends of the logs elevated onto the support on the carrier.

Fig. 8 is a schematic view showing the logs moved more completely onto the support that is on the carrier, and showing the trailing ends of the logs ready for elevation off the ground.

An optional log elevating step is indicated in dotted line in Fig. 6.

Fig. 9 is a schematic view showing the carrier moved rearwardly to elevate the rear ends of the logs off the ground, with their leading ends suspended from the cables that dragged them to the carrier.

Fig. 10 shows the logs loaded and ready for transport to their destination.

Fig. 11 is a modified form of a log supporting cross-member that may be used in place of the one shown in Fig. 2.

In detail, the traction vehicle, generally designated 1 is any power operated vehicle such as a tractor, etc. that includes a power actuated winding cable 2 capable of being connected to one of the ends of one or more logs or other elongated rigid articles for elevating such ends.

The mechanism or vehicle with which cable 2 in the drawings is connected with, is, in most respects, a conventional arch such as is employed in lumbering operations and comprises a carriage 3 mounted on a pair of wheels 4 and carrying a power actuated winding drum 5 on which the cable 2 is wound. The cable may pass over a pulley 6 that is on a rearwardly and upwardly projecting portion 7 of the carriage 3.

Usually the carriage 3 is in the form of an arch with one of the wheels 4 on the lower end of each leg, and said wheels, and any ground wheels mentioned in this application may have pneumatic tires or the wheels may be crawler wheels having endless tracks. Both types are used in the industry, according to ground conditions.

The carriage 3 in the present instance may differ from the conventional arches or carriages in that it is provided with means thereon, such as a socket or detachable socket clamps adapted to receive the ball 8 of the structure of this invention to provide a universal joint 9. This joint need not necessarily be a ball and socket type, but it should be one that provides for substantially universal movement and for detachment of the structure to be connected to the carriage 3 by said joint. Also, as already stated, carriage 3 may be a portion of any traction vehicle, and it may be permanently connected with the device connected thereto, although it is preferable that such device be detachable.

The principal structure of this invention comprises an arch 10 providing legs 11, 12 and an overhead member 13 (Fig. 3) connecting said legs at their upper ends.

Journalled on the lower end of each leg 11, 12 is a shaft 14 (Fig. 2) that pivotally supports a side truck frame 15 that in turn carries a wheel 16 on each end. As already mentioned, crawler wheels or endless tracks can be substituted for the wheels 16 without invention, and where ground wheels are mentioned in this description and in the claims, the word is intended to include such crawler wheels.

Conventional pneumatic or hydraulic brake mechanisms may be applied to wheels 16, supplied with fluid under pressure from a flexible line 17 and pipes 18 (Fig. 1) as will later be described more in detail.

The word "arch" as used hereafter, is intended to refer to the arch 10 unless the carriage 3 is specifically mentioned by number, thereby avoiding any confusion, the carriage 3 being either the pulling vehicle or connected thereto.

Arch 10 may be of any suitable construction, but is preferably of box construction to provide hollow legs. Each hollow leg 11, 12 thus has opposed sides 20, 21, the sides 20 being the inner sides that are adjacent to each other at opposite sides of the space between the legs, and sides 21 being the outermost sides (Fig. 2).

A generally U-shaped frame generally designated 24 is disposed generally horizontally with one of its leg 25 extending through the upper end portion of the hollow leg 11 and with the other leg 26 extending through leg 12 (Fig. 2). This U-shaped frame may be of substantially an I beam in cross sectional contour although the preferred form is a pair of channel strips with their webs vertical and in adjacent spaced relation and with their

sides or flanges coplanar. Suitable spacers connect the strips. The closed end **27** of the frame is adjacent to the carriage **3** and may carry the ball **8** of the ball and socket point **9**.

Above each leg **25**, **26** and within the upper closed end of each leg **11**, **12** of the arch is a generally semi-elliptical spring **28** (Fig. 1) supported centrally of its ends and above the same on a horizontal member **29** so that each spring **28** will be held within each leg **11**, **12** for yieldable movement about each member **29**.

Carried on the end of each spring is a roller **31** that rides on the upper sides of the flanges of the channel strips forming frame **24**.

Below the legs **25**, **26** of the frame **24** is the same spring structure, except that the springs are inverted. Thus a semi-elliptic spring **32** is below each leg with its concave side facing the latter. Each spring **32** is mounted on each leg by a central support **33** and a roller **34** on each end of each spring engages the lower side of each leg **25**, **26**.

From the above structure it will be seen that the frame **24** may rock about a horizontal axis extending through legs **25**, **26**, and also the frame is sprung on the legs or vice versa since the connection between the legs of the frame and the legs of the arch is a yieldable one insofar as up and down movement of the arch and frame is concerned.

The rollers **34** permit the arch **10** to move longitudinally of the frame and the substantial spacing between the rollers **31** and between the rollers **34** at each side of the frame or along each leg thereof, materially contributes to the rigidity of the arch at any point along the frame.

Secured on each of the outermost sides **21** of each leg **11**, **12** is a winding drum **35** with its axis vertical, and each is connected with any suitable power means, such as a motor **36** for driving each drum. Extending around each drum **35** is a cable **37**, each cable extending from opposite sides of the drum along each leg **25**, **26** to the end of each leg where it is suitably secured. By rotating said drums simultaneously in one direction the arch **10** will be moved toward the free ends of frame **24**, and by rotating said drums in the opposite direction the arch will be moved to a point close to the end **27** of the frame and to a point closely adjacent to the carriage **3** or pulling vehicle.

A generator (not shown) on the pulling vehicle will provide electricity for motors **36**, but it is to be understood that any suitable motor means, fluid or mechanically may be used to move the arch along the frame.

Extending between the lower ends of legs **11**, **12** of the arch, is a cross member **40** (Fig. 2) that is connected at its ends to said legs and which member may or may not, but preferably so, support one or more rollers thereon, as indicated. The ends of said member **40** connects the legs and are vertically slidable in guides **41** (Fig. 1) carried by said legs.

Lengths of cable **42** extend downwardly from spaced pulleys **43** mounted on the overhead member **13** of the arch alongside the adjacent inner sides of said legs, and on said overhead member the cable **42** extends over a winding drum **44** connected to a motor **45** for simultaneously winding or unwinding the cable on the drum. The lower ends of the vertically extending cable lengths are connected to the ends of cross member **40** for raising or for lowering the latter, or they may be unhooked from said cross member for hooking to each other or for connecting with any other loop or cable or article, as desired.

As seen in Fig. 1, the forward or closed end of frame **24** may be slightly lower than the part that is supported between the sets of rollers **31**, **34**. By this arrangement, when the arch **10** is adjacent to the carriage **3**, the outer or free ends of the U-shaped frame will be elevated above the closed end (Fig. 1). However, as the arch is moved toward said free ends, the legs of frame **24** will be lowered so the frame will be substantially horizontal.

In operation, the logs **50** each have one of their ends connected to a cable **51** and the arch **10** is moved to its

closest point to the carriage **3** or adjacent to closed end **27** of the frame, and the cable **2** is extended between legs **11**, **12** to be connected with each of the cables **51** (Fig. 5). The power driven drum **5** is then actuated to pull the logs **50** toward and to a position with their leading ends between the legs or at least almost between said legs, as seen in Fig. 6. A pulley or roller **53** (Fig. 1) on the overhead member may engage the cable **2** under certain circumstances as seen in Fig. 5.

At the time the cables **51** are connected with cable **2** the logs usually extend somewhat divergently from the ends that are connected with cables **51**, and said ends are spaced apart, but as soon as cable **2** is connected with cables **51** and the cable **2** is wound on drum **5** to pull the logs toward the arch **10**, the leading ends of the logs are gathered together and the logs straighten out to generally parallel side by side relationship so that the leading ends will pass between the legs **11**, **12** of arch **10**.

Once the leading ends of the logs are adjacent arch **10**, the cable lengths **42** may be disconnected from the cross member **40** and connected to cables **51** (Fig. 3) and by actuating the drum **44** to wind the cable **42** thereon the forward ends of said logs will be lifted onto said cross member. Actuation of drum **5** at the same time as drum **44** will pull the logs onto the rollers of cross member **40**, and to the position seen in Fig. 7, after which the cable lengths **42** can be disconnected from the cables **51** and connected to a cable **55** that extends around the trailing ends of the logs (Fig. 8) or else merely extended below said trailing ends.

As the next step the arch **10** may be moved rearwardly by actuation of motors **36** and as the leading ends of the logs are held suspended above the ground by cable **2**, the arch will move rearwardly along the logs until the rear ends of the logs are above the ground, and when so elevated they may be suspended by cable **42** (Fig. 9) or may be supported by the rollers and cross member **40** (Fig. 10). By securing the lower ends of cables **42** to the ends of said cross member **40**, it can be elevated above the ground to a greater distance than its normal lowermost position.

In some instances a conventional side opening pulley **56** (Fig. 6) below overhead member **13** may be provided, and cable **2** may be extended over said pulley as indicated at **57** in dotted line in Fig. 6. By such an arrangement the cables **42** need not be used to elevate the forward ends of the logs onto member **40**, but cable **2** may serve this purpose, and it may then be slipped off the pulley **56** after the logs are on said member **40**.

In Fig. 11 is a cross member **58** having rollers **59** thereon, and which cross member has guide blocks **60** on the ends the same as cross member **40**. However, cross member **58** is offset downwardly from the said guide blocks by arms **62** so that the rollers **59** can rest on the ground when the logs are pulled onto them, and thereafter the actuation of cables **42** that are connected with the guide blocks will elevate the cross member and the logs thereon.

In order to protect the wheels **16** against injury from the logs, I provide guards **61** extending over the inner sides of the rear wheels of each set, and which guards may be secured to the arch.

From the description it will be seen that the method employed, irrespective of what apparatus may be used, consists in first gathering together one of the ends of the logs. Then the gathered ends are elevated and the opposite ends are gathered together. Pulling the logs alone will effect this latter gathering step to a certain degree, but if they are not fully gathered, the movement of arch **10** rearwardly will push them together.

The next step, which may be simultaneous with the second gathering step, or may be next in succession, is elevating the rear or trailing ends of the logs off the ground, and finally the logs, when fully off the ground, are transported to their destination.

It will be seen that by moving the arch **10** over the

logs with the forward carriage **3** adjacent to the arch **10** and also in straddling relation to the logs, and then connecting said logs with cables **42** and the brakes on the wheels **10**, the arch **10** may be held stationary and carriage **3** moved forwardly. Actuation of cables **42** and **2** will then elevate the logs and a cross bar can be positioned between the logs of the arch below the logs to permit the elevated logs to be supported on such cross bar.

It has already been mentioned that pipe and other elongated rigid articles can be handled in substantially the same manner. Elongated crated articles, one or more at a time, can readily be handled by the present invention.

When the articles reach their destination it is a simple matter to run the arch **10** forward until the rear end or ends of the articles overbalance the forward end or ends and rest on the ground or floor. Release of cable **2** from the article or articles and continued forward movement of arch **10** will result in the cross member **40** moving from under the logs, pipe, crate, box, etc. and whatever has been carried will rest on the ground.

I claim:

1. The method of transporting elongated relatively rigid articles that includes the steps of; gathering one of the ends of said articles together with their remainders extending generally in the same direction away from the ends so gathered, elevating said ends off the ground and suspending them above the ground, then and while said one of their ends are so suspended gathering the opposite ends of said articles together so the latter are in substantially parallel, side by side relationship and elevating said opposite ends off the ground and supporting them in said elevated position suspended from said one of their ends and from said opposite ends only and then carrying said articles so suspended to wherever desired.

2. The method of transporting elongated relatively rigid articles that includes the steps of; gathering one of the ends of said articles together with their remainders extending generally in the same direction away from the ends so gathered, elevating said ends off the ground and suspending them above the ground, then gathering the opposite ends of said articles together so the latter are in substantially parallel, side by side relationship and progressively moving an elevated supporting surface under said articles from a point adjacent to their first mentioned ends toward said oposite ends while holding said first mentioned ends relatively stationary and suspended above the ground until said opposite ends are off the ground, and thereafter carrying said articles so elevated to wherever desired.

3. A carrier for elongated, rigid articles comprising, an arch providing horizontally spaced legs and an overhead member connecting their upper ends, wheels on the lower ends of said legs supporting said arch for movement over the ground, article supporting means carried by said arch for supporting said articles elevated above the ground in a position extending between said legs and projecting horizontally therefrom to one side of said arch, a horizontally extending frame connected with said arch and projecting to said one side and means on the projecting end of said frame for securing said end to a pulling vehicle, means mounting said arch on said frame for horizontal movement of said arch along said frame to different distances from the projecting end of said frame, and means connected with said arch for so moving the latter.

4. A carrier for elongated, rigid articles comprising, an arch providing horizontally spaced legs and an overhead member connecting their upper ends, wheels on the lower ends of said legs supporting said arch for movement over the ground, article supporting means carried by said arch for supporting said articles elevated above the ground in a position extending between said legs and projecting horizontally therefrom to one side of said arch, a horizontally extending frame connected with said arch and projecting to said one side and means on the projecting end of said frame for securing said end to a pulling vehicle, means mounting said arch on said frame for relative horizontal movement between said arch and said frame, means connected with said arch and frame for causing said relative movement and for securing said frame and said arch against said relative movement.

5. A carrier for elongated, rigid articles comprising an arch providing horizontally spaced legs and an overhead member connecting their upper ends, wheels on the lower ends of said legs supporting said arch for movement over the ground, article supporting means carried by said arch for supporting said articles elevated above the ground in a position extending between said legs and projecting horizontally therefrom to one side of said arch, a horizontally extending frame connected with said arch and projecting to said one side and means on the projecting end of said frame for securing said end to a pulling vehicle, means mounting said arch on said frame for relative horizontal movement between them and for swinging movement of said frame about a horizontal axis extending through the legs of said arch.

6. A carrier for logs and the like comprising; an arch providing vertically extending legs and an overhead member connecting them at their upper ends, ground wheels on the lower ends of said legs, a horizontally disposed cross member extending between and connecting the lower ends of said legs, means for supporting said cross member with a load thereon at different levels above the ground, a horizontally elongated frame connected with the upper end of said arch, means on one end of said frame for connecting it with a load pulling vehicle, means connecting said frame with said arch for horizontal movement of said frame and said arch relatively, power actuated means connected with said arch and with said frame for so moving them relatively.

7. A carrier for logs and the like comprising; an arch providing vertically extending legs and an overhead member connecting them at their upper ends, ground wheels on the lower ends of said legs, a horizontally disposed cross members extending between and connecting the lower ends of said legs, means for supporting said cross member with a load thereon at different levels above the ground, a horizontally elongated frame connected with the upper end of said arch, means on one end of said frame for connecting it with a load pulling vehicle, means connecting said frame with said arch for horizontal movement of said frame and said arch relatively, power actuated means connected with said arch and with said frame for so moving them relatively, said cross member comprising a rotatable roller, and the means for supporting said cross member with a load thereon including cables extending to said overhead member and power actuated winding means on which said cables are adapted to be wound and unwound for elevating and for lowering said cross member.

8. A carrier for logs and the like comprising; an arch providing vertically extending legs and an overhead member connecting them at their upper ends, ground wheels on the lower ends of said legs, a horizontally disposed cross member extending between and connecting the lower ends of said legs, means for supporting said cross member with a load thereon at different levels above the ground, a horizontally elongated frame connected with the upper end of said arch, means on one end of said frame for connecting it with a load pulling vehicle, means connecting said frame with said arch for horizontal movement of said frame and said arch relatively, power actuated means connected with said arch and with said frame for so moving them relatively, said means connecting said frame with said arch including guide members on said arch engaging said frame and means supporting said guide members on said arch for pivotal movement to enable swinging said frame member about a horizontal axis perpendicular to the longitudinal axis of said frame.

9. In combination with a traction vehicle having a front and a rear end and a power actuated cable extending from said rear end for pulling logs and the like to be connected thereto toward said vehicle, a horizontally elongated frame, means at one end of said frame connecting it with said rear end of said vehicle, an arch connected with said frame having a pair of opposed, vertically extending legs between which said cable is adapted to be extended for pulling one of the ends of logs connected to said cable to a position between said legs and with said one of the ends of said logs elevated above the ground, means on said arch for supporting such logs thereon and elevated above the ground when said one of the ends of such logs are connected with said cable, and are elevated above the ground, said means on said arch for supporting such logs elevated including a horizontally extending rotatable roller extending between the lower ends of said legs and cables connected with the ends of said legs extending upwardly to the upper end of said arch, cable winding means on said upper end of said arch with which said cables are connected for winding so as to move said roller upwardly to different distances above the ground.

10. In combination with a traction vehicle having a front end and a rear end and a power actuated cable extending from said rear end for pulling logs and the like to be connected thereto toward said vehicle, a vertically disposed arch adjacent to said rear end providing a pair of legs and an overhead member connecting them at their upper ends, wheels on the lower ends of said legs for supporting said arch for movement over the ground with said vehicle, said arch being positioned for extension of said cable between said legs when said arch is moved with said vehicle, a horizontally extending frame connecting said arch with said vehicle for pulling said arch by said vehicle to effect said movement of the arch with said vehicle, means suspended from said overhead member for engaging below logs drawn between said legs by said cable and for elevating such logs off the ground.

11. In combination with a traction vehicle having a front end and a rear end and a power actuated cable extending from said rear end for pulling logs and the like to be connected thereto toward said vehicle, a vertically disposed arch adjacent to said rear end providing a pair of legs and an overhead member connecting them at their upper ends, wheels on the lower ends of said legs for supporting said arch for movement over the ground with said vehicle, said arch being positioned for extension of said cable between said legs when said arch is moved with said vehicle, a horizontally extending frame connecting said arch with said vehicle for pulling said arch by said vehicle to effect said movement of the arch with said vehicle, means mounting said arch on said frame for movement of said arch rearwardly away from said vehicle with the logs drawn to said vehicle by said cable disposed between said legs, power actuated means connected with said arch for so moving the latter when said vehicle is stationary, and means on said arch for elevating the logs therebetween off the ground whereby said logs will be supported by said arch where they pass through the latter.

12. In combination with a traction vehicle having a front end and a rear end and a power actuated cable extending from said rear end for pulling logs and the like to be connected thereto toward said vehicle, a vertically disposed arch adjacent to said rear end providing a pair of legs and an overhead member connecting them at their upper ends, wheels on the lower ends of said legs for supporting said arch for movement over the ground with said vehicle, said arch being positioned for extension of said cable between said legs when said arch is moved with said vehicle, a horizontally extending frame connecting said arch with said vehicle for pulling said arch by said vehicle to effect said movement of the arch with said vehicle, means mounting said arch on said frame for movement of said arch rearwardly away from said vehicle with the logs drawn to said vehicle by said cable disposed between said legs, and means on said arch for elevating the logs therebetween off the ground whereby said logs will be supported by said arch where they pass through the latter, inside fenders extending across the inner sides of said wheels for protecting the latter against injuring from logs that are between said legs, upon movement of said arch away from said vehicle.

13. In combination with a traction vehicle having a front end and a rear end and a power actuated cable extending from said rear end for pulling logs and the like to be connected thereto toward said vehicle, a vertically disposed arch adjacent to said rear end providing a pair of legs and an overhead member connecting them at their upper ends, wheels on the lower ends of said legs for supporting said arch for movement over the ground with said vehicle, said arch being positioned for extension of said cable between said legs when said arch is moved with said vehicle, a horizontally extending frame connecting said arch with said vehicle for pulling said arch by said vehicle to effect said movement of the arch with said vehicle, means mounting said arch on said frame for movement of said arch toward and away from said vehicle, brakes on said wheels for securing them against rotation at any distance of said arch from said vehicle, power actuated means connected with said arch for causing said movement and for holding said arch against said movement at any distance of said arch from said vehicle.

14. The method of transporting logs and the like that includes the steps of simultaneously gathering one of the ends of a plurality of said logs together with their remainders extending divergently but generally in the same direction away from the ends so gathered, then pulling all of said logs at one time in one direction from said one of their ends with their said ends leading whereby said logs will assume a substantially parallel side by side relationship and simultaneously elevating said leading ends, then holding said leading ends elevated and simultaneously elevating their said remainders and thereafter carrying the logs so elevated to wherever desired.

15. In combination with a traction vehicle having a front and a rear end, a frame member extending rearwardly of said vehicle and connected with the latter, an arch having generally vertically extending legs and an overhead member and ground wheels carried by the lower ends of said legs supporting said arch for movement over the ground, means connecting said arch with said frame member for movement of said arch relative to the latter in direction toward and away from said vehicle, and power means connecting said arch with said frame member for causing said movement of said arch independently of movement of said vehicle, power actuated means carried by said arch and disposed between its legs for engagement with logs for elevating such logs above the ground.

16. A carrier for elongated, rigid articles such as logs, pipe and the like comprising: an arch providing horizontally spaced legs connected at their upper ends, wheels on the lower ends of said legs supporting said arch for movement over the ground, a frame member, means for securing said frame member to a pulling vehicle, means connecting said arch with said frame member for relative movement between said frame member and said arch and which movement includes the horizontal movement of said arch over the ground, power actuated means connected with said arch and frame member for causing said relative movement independently of movement of said vehicle, and means carried by said arch and disposed between its legs for elevating such logs, pipe and the like off the ground for carrying by said arch.

17. A carrier for elongated, rigid articles comprising,

an arch providing horizontally spaced legs and an overhead member connecting their upper ends, wheels on the lower ends of said legs supporting said arch for movement over the ground, article supporting means carried by and depending directly from said overhead member whereby the weight of a load on said means will be taken directly by said arch, a horizontally extending frame, means connecting said arch with said frame for movement of said arch on the ground in opposite directions relative to said frame, and power actuated means connected with said arch for so moving the latter over the ground relative to said frame and in said opposite directions as desired, and for holding said arch stationary relative to said frame at any point in said movement of said arch.

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