July 28, 1931. W. W. SAYERS 1,816,701

TRAVELING BACK POST FOR POWER HOES

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Fig. 1.

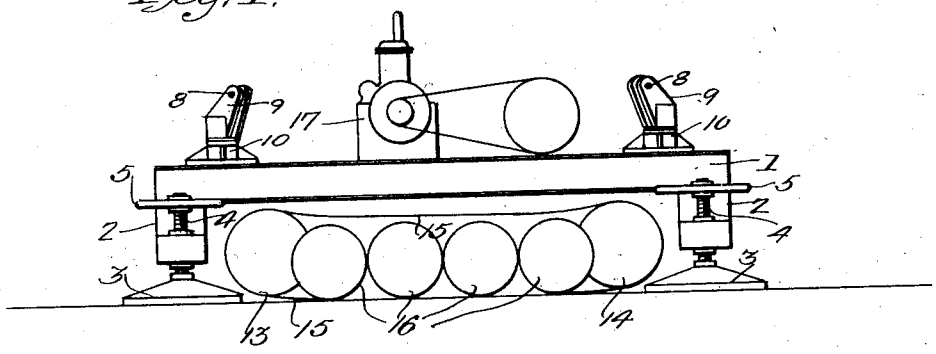


Fig. 3.

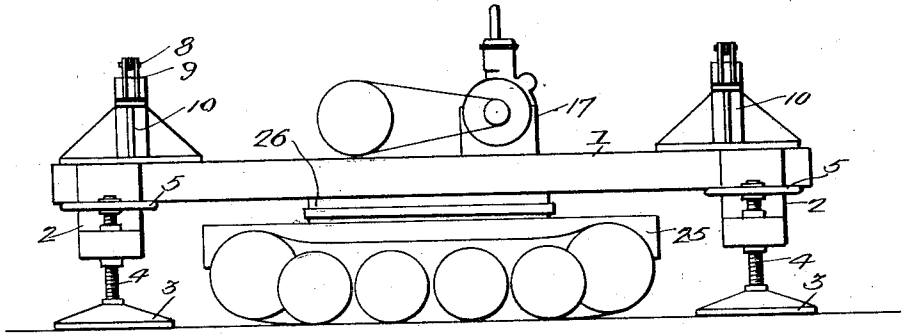
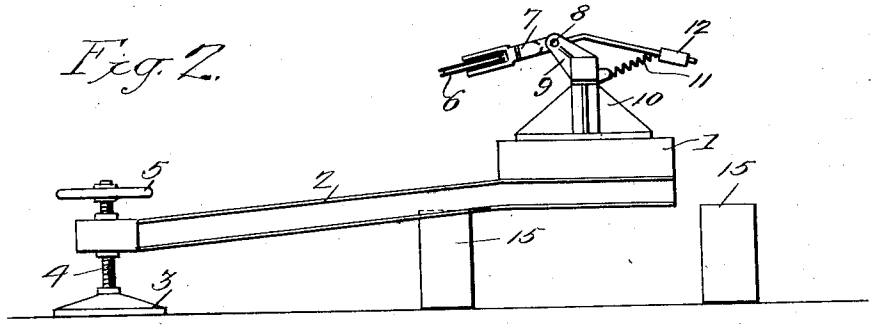


Fig. 2.



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Fig. 4.

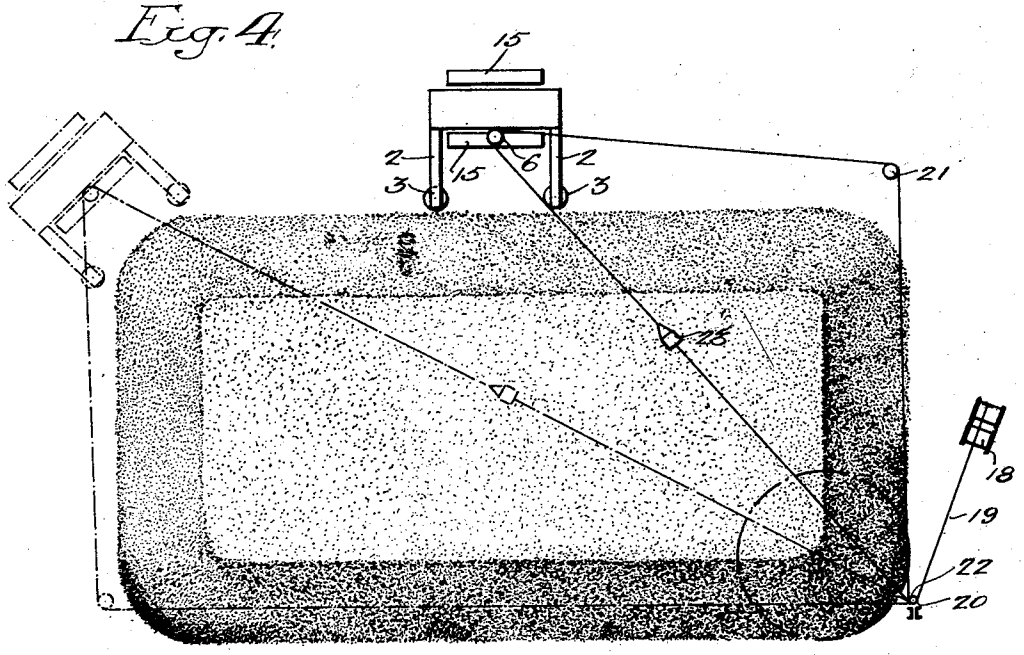
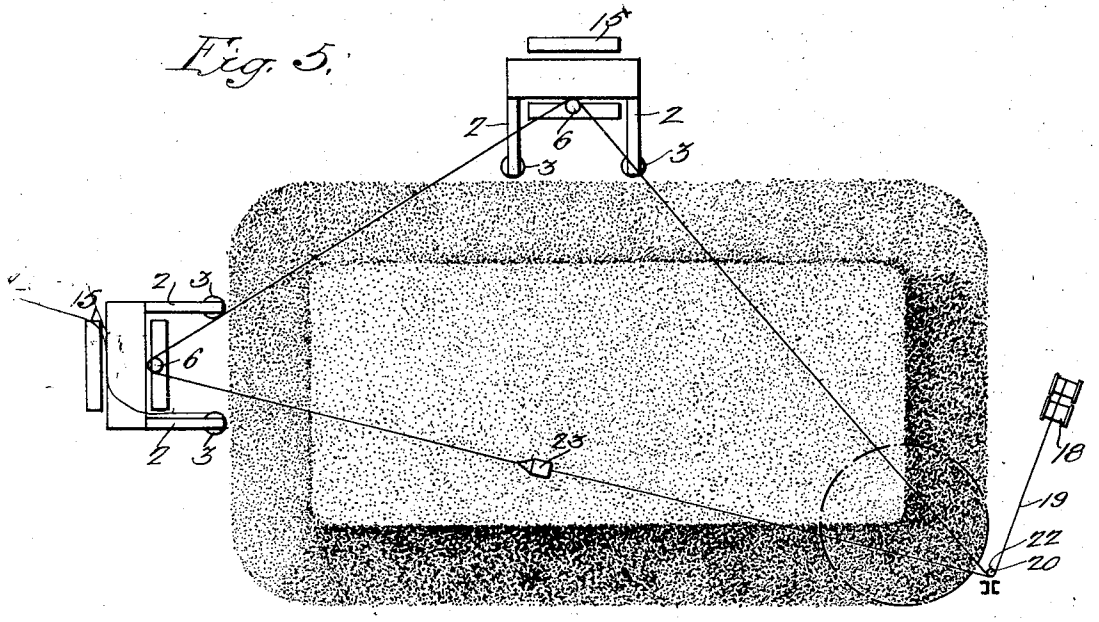


Fig. 5.



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TRAVELING BACK POST FOR POWER HOES

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Fig. 6.

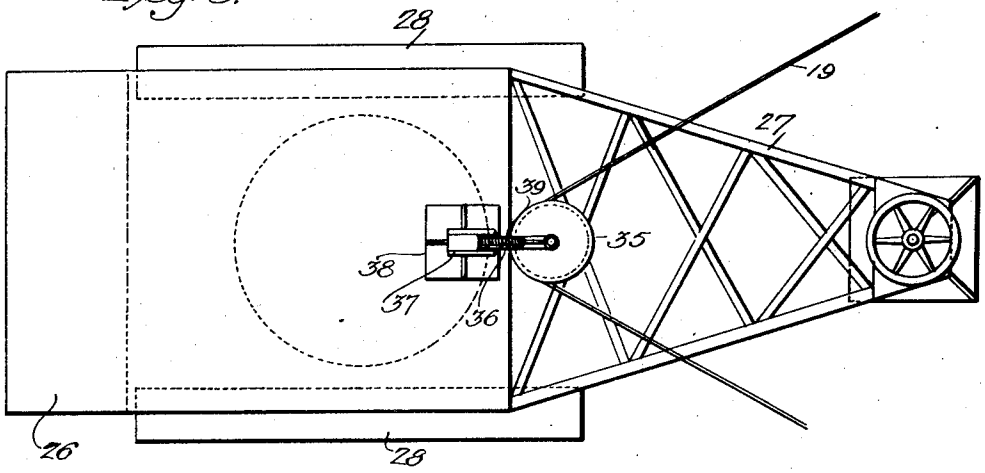


Fig. 7.

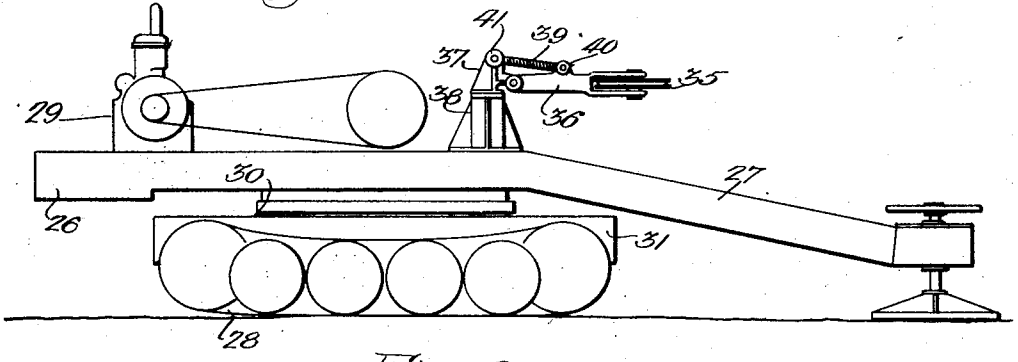
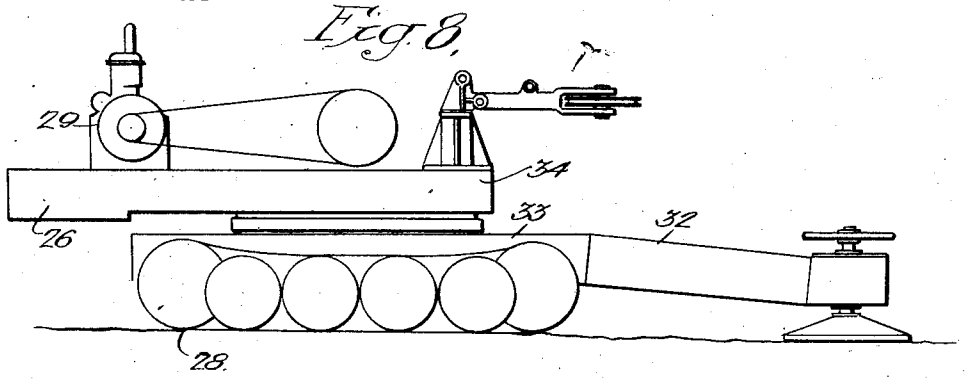


Fig. 8.



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TRAVELING BACK POST FOR POWER HOES

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Fig. 9.

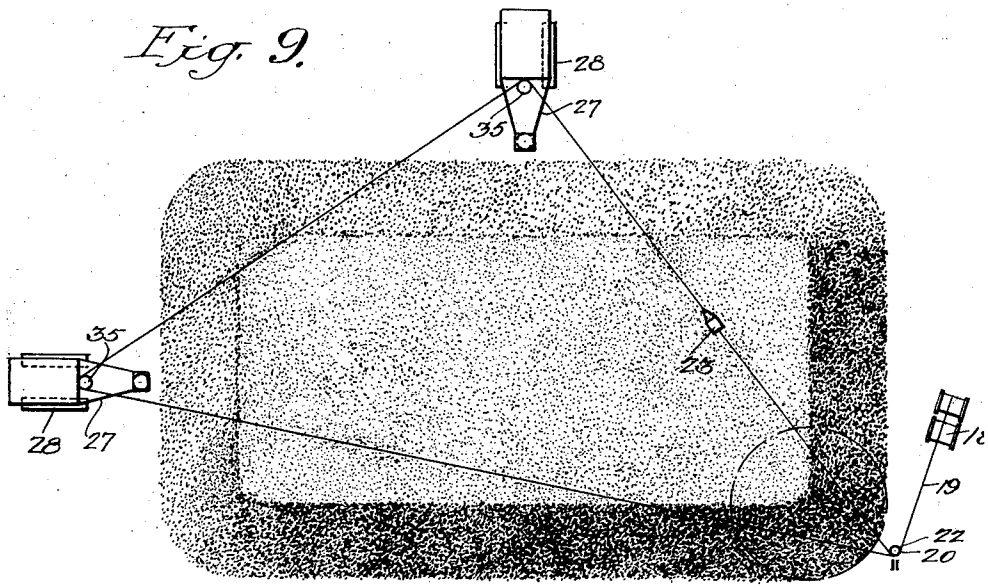
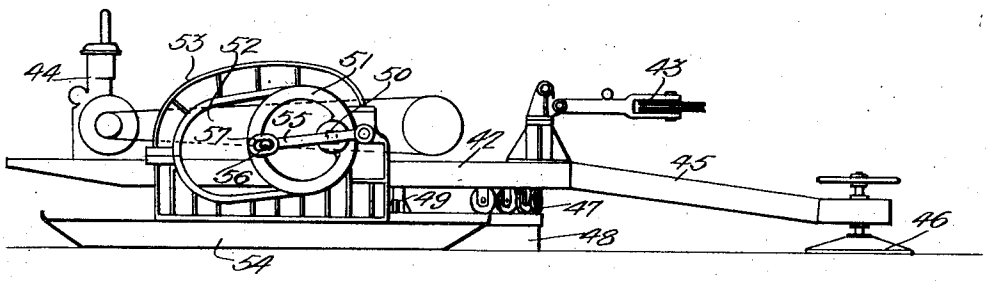


Fig. 10.



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Patented July 28, 1931 1,816,701

UNITED STATES PATENT OFFICE

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TRAVELING BACK POST FOR POWER HOES

Application filed November 18, 1927. Serial No. 234,161.

This invention relates to improvements in power hoe equipment of the type used in storage yards, and the principal object of the invention is to provide a novel form of traveling back post having many and material advantages over the types of traveling back post used heretofore.

Several different types of mobile back post have been used prior to this invention including those mounted on a standard wheeled truck adapted to travel on the ground surface, and others adapted to travel on more or less permanently installed rails. The former type of back post has advantages over the latter, the chief of which is its greater freedom of movement and the greater flexibility of the system employing this type; it possesses, however, distinct limitations as to weight and power. The latter type of back post while having no limitations as to weight and power is an expensive installation involving grading the ground surface and the laying of tracks and has certain definite limitations of utility not found in a back post movable at will over the ground surface.

The present invention contemplates the provision of a traveling back post which shall have in full measure the advantages of both the above named types, and which shall entirely lack the disadvantages. Furthermore, this back post has certain novel characteristics which in themselves render the device highly desirable for the purpose.

With reference to the drawings:

Figures 1 and 2 are, respectively, a side elevation and an end elevation of a preferred embodiment of my invention;

Fig. 3 is a side elevation of a modified form of back post within the scope of the present invention;

Figs. 4 and 5 are diagrammatic views illustrating the operation of back posts of the type illustrated in Figs. 1, 2 and 3;

Figs. 6 and 7 are, respectively, plan and side elevational views illustrating a further embodiment of my invention;

Fig. 8 is a side elevational view illustrating a modification within the scope of the invention of the type of back post illustrated in Figs. 6 and 7;

Fig. 9 is a diagrammatic view illustrating operation of back posts of the type shown in Figs. 6, 7 and 8, and

Fig. 10 is a side elevational view of a further embodiment of my invention.

Referring to Figs. 1 and 2 of the drawings, 1 represents the body or main frame of the back post, to the opposite ends of which are secured arms 2, 2 which in the present instance project laterally and which have at their outer ends vertically adjustable ground-engaging feet or anchors 3. In the present instance, these anchors are carried at the bottom of stems 4 which are threaded in the outer ends of the arms 2 and which have at their tops hand wheels 5 by means of which the stems may be rotated to bring the anchor members into contact with the ground surface or to elevate them thereabove.

Mounted on the body 1, in the present instance one at each end, are sheaves 6 rotatably supported in each instance on an arm 7 which is pivotally secured at 8 to a bracket 9. The arm 7 by reason of the pivot 8 is movable in a vertical plane, and the bracket 9 is pivotally secured on a vertical axis to a pedestal 10 whereby the entire upper structure may rotate horizontally. As shown in Fig. 2, the arm 7 extends rearwardly and has attached to its rear end a spring 11 whose other end is secured to the bracket 9, this spring normally resiliently retaining the arm and the sheave 6 in a predetermined normal position. To further counteract the weight of the sheave 6, the rear end of the arm 7 may carry a suitable weight member 12. Sheaves without counter-balance means may be used if desired.

In a preferred embodiment and as illustrated, the main frame or body 1, with the associated parts described above, is mounted on crawler mechanism preferably of the type including a pair of spaced sprocket wheels 13 and 14, around which operates an endless chain belt 15, and intermediate the said sprocket wheels are mounted a plurality of wheels 16 which travel on the belt 15 as a tread and by which the frame is directly supported. Power may be applied to one of the sprockets 13 or 14 to operate the belt

15 which results in a forward movement of the entire machine with the wheels 16, which bear the weight of the body 1, rolling upon the lower reach of the endless belt. In the present instance, motive power is supplied through a suitable motor 17 mounted on the frame 1, and this motor preferably takes the form of an internal combustion engine, although it may take other forms, such for example as that of an electric motor or hand winch.

The method of operation of the aforedescribed machine and its function in the storage system of which it forms a part are illustrated in Figs. 4 and 5. In each instance, the apparatus comprises a suitable winding machine 18 and a cable 19, which in Fig. 4 extends from the winding machine around a relatively fixed sheave 20 to a sheave 6 on the traveling back post. From this sheave it passes to a third and relatively fixed sheave 21, thence around a fourth sheave 22 at the position of the sheave 20, and then to the other of the winding drums. Intermediate the sheave 20 and the sheave 6 on the traveling back post, the cable carries a drag bucket 23. The operation of the drums to carry the drag bucket back and forth on a line between the sheave 20 and the sheave 6 on the traveling back post will be readily understood. It will be apparent that the traveling back post may be manipulated to cover any desired area.

In the system illustrated in Fig. 5, the relatively fixed sheave positions are eliminated and two of the traveling back posts used instead of one. The apparatus in principle is the same as that described above, and the corresponding parts of the mechanism are given corresponding reference numerals.

The characteristic of the type of tread described above which renders it of outstanding value as a traction tread for traveling back posts is its relatively extended contact with the ground surface. This contact, which embraces the chain and, in the present instance, at least four wheels on each side of the frame, extends continuously over a substantial part of the entire length of the main frame. Also the width of the tread is relatively great, and the weight is also distributed over a much greater ground surface than when simple wheels are used. As a result, extreme stability is obtained in the back post and an extraordinary ability for any given weight to withstand the pulls exerted by the cables. For any given weight, therefore, the back post is of exceptional power and is capable of withstanding a cable pull far exceeding that possible with the old forms of back post.

It will be noted that in each instance shown in Fig. 4 the traveling back post is so positioned with respect to the pull exerted upon it by the cable 19 that the outrigger arms 2 more or less directly oppose the pull of the cable. Since in this embodiment the outrigger arms project transversely from the direction of movement of the crawler treads 15, it will be apparent that these treads also function to a maximum extent to resist lateral movement of the back post as a whole and, therefore, materially assist in opposing the pull exerted by the cable. Obviously this resistance, as stated above, is materially greater with the form of tread described than where the back post is supported on the ordinary four wheeled trucks. It is not essential, however, that the outrigger arms extend transversely to the direction of movement of the treads 15, since these treads are capable of being locked in position, so that even with the pull of the cable directly in alignment with the direction of movement of the treads 15, the extended contact between the treads and the ground is still effective to prevent movement of the back post and to resist the pull of the cable.

This particular form of crawler tread is particularly well adapted for back post purposes for other reasons than that of the extended tread contact described above. Crawler mechanisms of this general type are characteristically able to move over ground surfaces of quite soft and rough character, and with my back post as described above, it is accordingly possible to utilize for storage purposes and without prior preparation ground surfaces or areas which would be entirely incapable of use with other types of back post. Furthermore, the fact that the crawler tread is relatively extended and capable of movement over all types and conditions of ground surface makes it possible to greatly increase the overall weight of the back post and to mount upon the back post a power unit for locomotion. In this respect, the back post compares favorably with the back post of the type mounted on rails, but has material advantages, thereover, in that it avoids the expense of laying the rails, which also involves a requirement for grading the ground surface, and it may be manipulated, in contrast to the rail mounted back post, with entire freedom covering any desired area. In other words, there is no restriction with my back post as to the areas selected for storage purposes. The crawler tread also has the advantage of being capable of manipulation around extremely sharp corners and in restricted spaces. It will be noted that the crawler tread confers upon the back post certain highly desirable characteristics not found in the other types of back post, and materially increases the utility and scope of the machine.

In Figs. 3, 6, 7 and 8, I have illustrated modifications of the back post within the scope of the invention. In each instance, the characteristic crawler tread is employed. In

Fig. 3, the superstructure is essentially the same as that described above and illustrated in Figs. 1 and 2, with the exception that the body or frame 1 of the machine is so mounted upon the crawler truck 25 as to be clearly rotatable in a horizontal plane for adjustment purposes. Any desirable form of turntable 26 may be employed, and this portion of the mechanism may or may not be operatively associated with the motor 17 so that in addition to operating the crawler tread, the motor may be utilized to turn the frame 1 on the crawler truck. It will be obvious that with this mechanism the frame 1 may be adjusted to the pull of the cables independently of the truck 25.

In the embodiments of Figs. 6, 7 and 8, the main frame 26 is provided with a single outrigger arm 27 which normally projects from the end of the machine or in a direction parallel to the operation of the crawler tread 28. To counterbalance the body, the motor 29 in this instance is mounted adjacent the end thereof opposite to that from which the outrigger arm 27 projects. In the embodiment of Figs. 6 and 7, the entire body including the outrigger arm 27 is mounted on a turntable 30 on the crawler truck 31, so that the frame is angularly adjustable horizontally with respect to the truck 31. In the embodiment shown in Fig. 8, the outrigger arm 32 is attached directly to the crawler truck 33 instead of to the body or frame 34. This embodiment in all other respects is similar to the embodiments shown in Figs. 6 and 7.

With particular reference to Fig. 7, it will be noted that in this instance a slightly modified form of sheave support is illustrated. In this case, the sheave 35 is held on an arm 36 pivoted to a bracket 37, which latter is pivotally mounted on a standard 38, all substantially as previously described. The arm 36, however, in this instance has no rear extension, and is supported resiliently by a spring 39 which extends from a point 40 intermediate the ends of the arm to an upward extension 41 of the bracket 37.

With particular reference to the embodiment shown in Fig. 8, in which the outrigger arm 32 projects from the end of the crawler truck 33, it will be noted, as set forth above, that this type of crawler tread permits of locking the tread against movement so that full advantage is obtained, even where the outrigger arm projects in the direction of movement of the tread, of the relatively great frictional contact between the machine and the ground surface.

In Fig. 10, I have illustrated another form of tread which partakes to large degree of the desirable characteristics outlined above of the crawler tread. In this instance, the main frame 42 of the back post, which supports the usual sheave 43 and motor 44 and which also may include an outrigger arm 45 having the aforedescribed anchor member 46 at its outer end, is supported on wheels 47 which travel on a circular track upon a base 48, this base being also permanently secured through a central pivotal connection 49 to the frame. The base 48 is adapted to rest upon the ground surface and to constitute a support for the entire superstructure. The main frame also carries a transverse rotary shaft 50 which may be operatively connected with the motor 44, which shaft carries at each end an eccentric wheel 51, each of which operates in a slightly elongated slot 52 in a structure 53 which includes at its lower end an elongated tread member 54. A connecting rod 55 is pivotally secured to the structure 53 at one end of the opening 52, and has at the opposite end a slotted opening 56 into which projects a pin 57 on the eccentric wheel 51. By rotating the shaft 50 and with it the eccentric wheels 51, there results an action, which first elevates and advances the body 42 and with it the base 48 with respect to the treads 54 which engage the ground surface, and following the return of the base 48 into contact with the ground in the advanced position, elevates and in turn advances the tread members 54, these consecutive movements of the base 48 and the treads 54 constituting a cycle which with the continued rotation of the shaft 50 is repeated. By turning the body 42 on the base 48 when the treads 54 are elevated, it will be apparent that the direction of movement can be regulated as desired. A tread of this character forms the subject-matter of U. S. Patent No. 1,627,984, dated May 10, 1927.

In some instances it may be desirable to form the body 42 integral or relatively fixed with respect to the base 48. In such case the direction of movement of the machine as a whole may be determined by moving one tread while holding the other stationary. For this purpose the transmission between the prime mover and the treads may be suitably modified.

It will be apparent that this type of tread possesses the same general desirable characteristics as the crawler tread described above, in that the contact surface with the ground of a back post equipped with this tread is relatively great, extending over a material portion of the entire length of the main frame of the back post, and in this instance including not only the tread elements 54 but the base 48. The stability of a back post made as described is exceedingly high. The tread is also adaptable for use on rough, uneven and unstable ground surfaces.

There obviously may be many other modifications without departure from the invention which I consider as covering broadly the employment of a multiple wheeled crawler or other tread, as herein described, or in fact

any means of locomotion involving a relatively extended contact surface between the machine and the ground surface over which it travels, and which affords a high mobility over practically all conditions of ground surface.

I claim:

1. A traveling back post for power hoes consisting of a main frame, a sheave adjustably mounted on said frame, a crawler tread supporting said frame, and a motor carried by the frame and operatively associated with said tread.

2. A traveling back post for power hoes comprising a main frame, a sheave adjustably mounted on said frame, a multiple wheeled crawler tread upon which said frame is supported, and a motor carried by the frame and operatively associated with said tread.

3. A traveling back post for power hoes comprising a main frame, a sheave adjustably mounted on said frame, and a traction support for said frame including at least three sets of wheels distributed longitudinally of the frame and supporting the latter.

4. A traveling back post for power hoes comprising a main frame, a sheave adjustably mounted on said frame, a traction support for said frame including at least three sets of wheels distributed longitudinally of the frame and supporting the latter, with an endless chain operating around the corresponding wheels of the said sets and constituting a movable tread therefor.

5. A traveling back post for power hoes including a frame, a sheave adjustably mounted on said frame, and traction means supporting said frame and including means affording a contact surface between the tread and the ground surface which extends uninterruptedly over a material portion of the length of the frame.

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