My invention provides a power device especially designed as a car puller and hence is herein designated as a car puller, although capable of various analogous uses. Car pullers as well known are used to move cars short distances around loading and unloading stations where a locomotive is not always available. The source of power frequently used for these car pullers is an electric motor arranged to be thrown into and out of action simultaneously with the operation of the car puller and in such an arrangement, an electric motor of about ten horse-power is required. The minimum current-consuming rating on electric motors and the like is from fifty cents to one dollar for horse-power per month. For example, on a one dollar horse-power rating, a minimum of at least ten dollars per month would have to be paid in the use of a ten horse-power motor even if the actual current consumed during the month did not anywhere reach that amount. My invention provides a power device in the nature of a car puller that is operated pneumatically preferably by compressed air supplied from a storage tank. The air under proper pressure may be supplied or maintained in the storage tank from various available sources from which the power is acquired not simply during the operation of a puller but through relatively long periods of time. For further example, the air pressure in the storage tank may be maintained from an air pump operated by two horse-power electric motor, the minimum rating on which would not exceed two dollars per month; or the storage tank from which the air to operate the car puller is supplied may be a part of some other apparatus already installed at the place of use of a puller. The air supply tank just referred to may be the air storage tank of a wagon or truck dumping apparatus very generally installed at elevators and other places where grain or other material is received or from which grain or other material is distributed.

The improved pneumatic car puller as preferably designed is illustrated in the accompanying drawings wherein like characters indicate like parts throughout the several views. Referring to the drawings:

Fig. 1 is a plan view, some parts being diagrammatically shown and some parts being removed illustrating an installation of the improved car puller;

Fig. 2 is an elevation with some parts sectioned on the line 2—2 of Fig. 1 and with some parts broken away;

Fig. 3 is a section on the line 3—3 of Fig. 1, showing the parts on a larger scale; and

Fig. 4 is a detail in vertical section of the controlling valve for throwing the puller into and out of action.

The numeral 5 indicates one of the rails of an ordinary railway track and the numeral 6 indicates a fragment of a car body. The numeral 7 indicates a concrete anchoring block embedded in the ground close to one side of the track and the numeral 8 indicates another concrete anchoring block or foundation embedded in the ground farther away from the track than the block 7. Firmly anchored on the foundation 8 is a trussed upright metal frame 9, to the upper and lower portions of which a quite large upright cylinder 10 is firmly anchored. This cylinder 10 at its lower end is shown as provided with an expanded head 11 that rests on the lower portion of the frame 9 and at its upper end said cylinder is provided with a flanged head 12, the axial sleeve of which is anchored to the upper portion of said frame 9. Long nut-equipped bolts 14 passed through the heads 11 and 12 outside of the cylinder rigidly clamp the said heads together and to the base of the frame 9.

Working in the cylinder 10 is a piston head, the stem 15 of which works through a suitable stuffing box formed in the axial sleeve of the head 12. To the upper and outer end of the piston stem 15 is rigidly secured a forked bracket 16 in which is journaled a quite large sheave or grooved pulley 17. The numeral 18 indicates a windlass drum the shaft 19 of which is journaled in suitable bearings on the frame 9 and at one end is provided with an operating hand,
piece in the form of a hand wheel 20. Windlass shaft 19 is also provided with a ratchet wheel 21 that is subject to a lock dog 22 pivoted on one of the uprights of the frame 9. A cable 23 is attached to and adapted to be wound upon the drum 18. This cable 23 is passed over the sheave 17 and thence downward under a guide sheave 24 journaled in suitable bearings on uprights of the frame 9. From sheave 24 cable 23 is passed over another guide sheave 25 and at its extended end is provided with a grapple or hook 26 that is engageable with some suitable part of the car to be moved. Guide sheave 25 is journaled to a wheel bracket 27 that is loosely anchored to a flanged anchoring plate 28 which, in turn, is bolted or otherwise rigidly secured to the anchoring bracket 27.

The numeral 29 indicates an air storage tank in which air under pressure is maintained at the desired pressure say 100 pounds per square inch, by suitable means such as those above considered. This air storage tank 29 is connected by a pipe 30 to the casing 31 of a three-way control valve. This valve casing 31 has three ports and 34, to the first of which pipe 30 is connected. A pipe 32 connects port 33 to a port 36 in the lower cylinder head 11 and which port opens into the lower end of the cylinder 10. Port 34 leads to the atmosphere, as shown, through a short pipe 37. Working in the casing 31 is a rotary valve 38 which has three ports, as clearly shown in Fig. 4. Valve 38 has an operating handle 39.

In the use of the pneumatic car puller above described, to pull a car on the track, cable 23 is drawn outward until hook 26 is properly attached to the car. In drawing out this cable lock dog 22 will be raised so that the anchoring windlass drum 18 will freely rotate if further slack than already available in the cable is required. When the hook is properly attached to the car, the operator, by quite rapid rotation of the hand wheel 20 and hence of windlass drum winds up all the slack of the cable and puts the cable under tension to pull. Then the operator moves control valve to the position shown by full lines in Fig. 4 and this admits air from storage tank 29 to the lower end of the cylinder 10, causing piston 14, stem 15, bracket 16 and sheave 17 to be raised. Upward movement of the sheave 17 acting on the cable causes the free end of the cable, the hook 26 and hence the car body to move on the track toward the anchoring block 7. If the car body is not given sufficient movement by one upward movement of the piston and momentum required in the car body, then the piston will be again lowered, the anchoring windlass again rotated to take up slack in the cable and the piston will be given another upward movement and, in fact, as many movements as required. When valve is in position shown by full lines in Fig. 4, air is admitted and the piston is moved upward as above described, but when valve 38 is given a ninety degree movement by movements of its handle 39 from the full line position to the dotted line position shown in Fig. 4, then supply of compressed air to the lower end of the cylinder will be cut off and the lower end of the cylinder will be connected for exhaust to the atmosphere and piston and the parts carried thereby will then, under the action of gravity, be quite quickly moved back to their normal lowermost positions.

To provide positive means for moving a car body in the direction described, past the anchoring block 7, a further auxiliary device is provided, to wit: another anchoring block 7a is embedded in the bracket as shown in Fig. 1, a flanged anchoring plate 28a is secured thereto, a wheel bracket 27a is anchored to said flange plate and a sheave 23a is journaled to said bracket 27a. In this arrangement and for the purpose last noted, the cable 23 is passed, as indicated by dotted lines in Fig. 1, over pulley 28 and around pulley 25a. It will be understood that block 7a may be located as far ahead of block 7 as may be desired.

The device or apparatus described is of simple construction, has no parts likely to get out of order, is efficient for the purposes had in view and has all of the advantages noted and others. The term "pneumatic" is used in a broad and liberal sense and it will be understood, for example, that other fluids such as air may be used although compressed air is a better motor-operating medium.

From the foregoing, it is evident that the device is capable of modification within the scope of the invention herein disclosed and claimed.

What I claim is:

1. A car puller comprising an anchored frame, a cylinder anchored to said frame, a piston working in said cylinder and having a projecting stem, a cable-guiding sheave carried by the projecting end of the piston stem, a cable passed over the sheave carried by said piston stem, a windlass adjustable anchoring one end of said cable to said frame, said cable at its free end having means for attachment to a car body, and a cable guide intermediate of the sheave carried by the piston stem and the free end of said cable.

2. A car puller comprising an anchored frame, a cylinder anchored to said frame, a piston working in said cylinder and having a projecting stem, a sheave carried by the projecting end of the piston stem, a cable passed over said sheave, an anchoring drum mounted on said frame and to which
one end of said cable is attached, means for securing said anchoring drum against rotation under tension from the cable, said cable at its free end having means for attachment to a car body, and means for connecting one end of said cylinder alternately to a supply of fluid pressure and to exhaust.

3. A car puller comprising an anchored frame, a cylinder anchored to said frame, a piston working in said cylinder and having a projecting stem, a sheave carried by the projecting end of the piston stem, a cable passed over said sheave, an anchoring drum mounted on said frame and to which one end of said cable is attached, means for securing said anchoring drum against rotation under tension from the cable, said cable at its free end having means for attachment to a car body, means for connecting one end of said cylinder alternately to a supply of fluid pressure and to exhaust, and an anchored cable-guiding sheave intermediate the cable carried by the piston stem and the free end of the cable.

In testimony whereof I affix my signature.

ANDREW E. ROTHGÄRN.