

Dec. 25, 1951

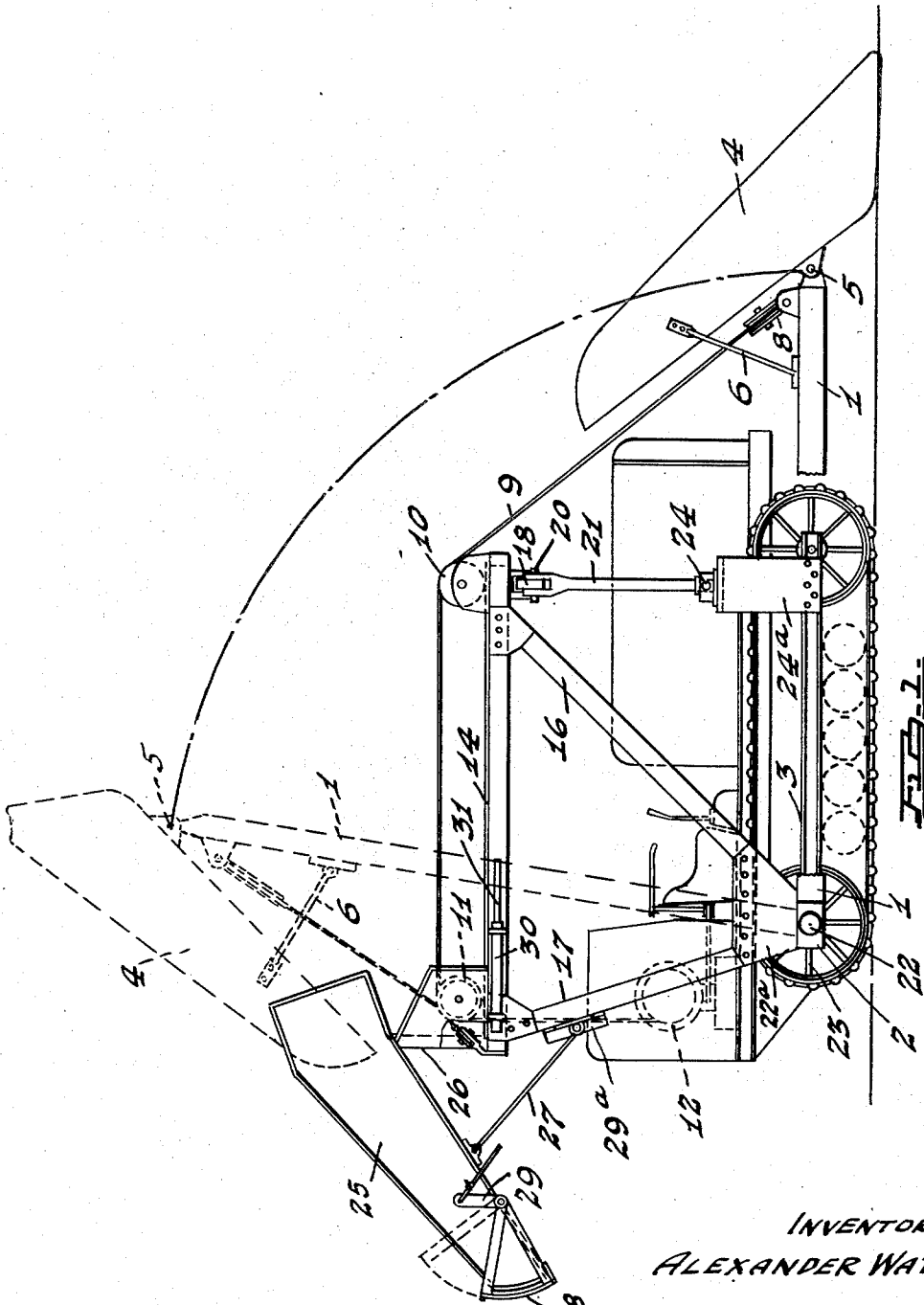
A. WATT

2,579,888

CABLE OVERTHROW LOADER FOR TRACTORS

Filed May 23, 1949

2 SHEETS—SHEET 1



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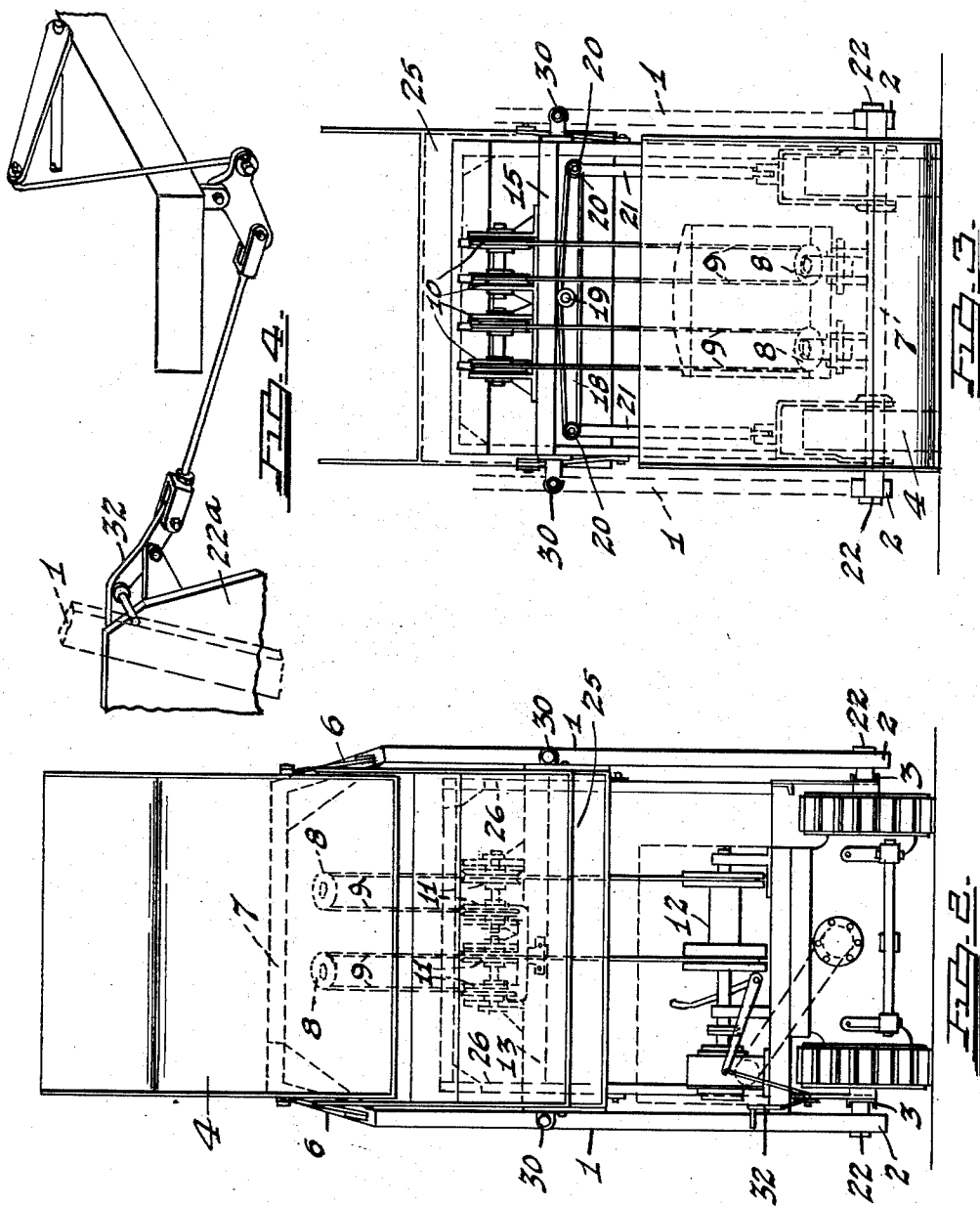
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2 SHEETS—SHEET 2



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UNITED STATES PATENT OFFICE

2,579,888

CABLE OVERTHROW LOADER FOR
TRACTORSAlexander Watt, Calgary, Alberta, Canada, as-
signor to George Archibald Robinson, Calgary,
Alberta, CanadaApplication May 23, 1949, Serial No. 94,760
In Canada June 14, 1947

2 Claims. (Cl. 214-78)

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This invention relates to overthrow loaders, that is to say, self-propelled vehicles, usually of the track crawler type, having at the end of arms attached thereto on each side a scoop adapted to be driven by the vehicle into a mass of material and when filled to be lifted by the arms longitudinally of and over the vehicle for discharge at the opposite end thereof.

Overthrow loaders of varying construction have been proposed and used, but none of them have satisfactorily met the difficulties which their design presents. Among these some of the most important are the combination of sufficient ruggedness and resistance to deformation of the scoop-carrying structure with reasonable weight, accommodation to the irregularities of the ground level over which the vehicle is required to move and simplicity of construction and operation.

I have devised a construction in which all the more desirable characteristics of an overthrow loader are present. In this construction the vehicle arms carrying the scoop are moved by cables attached to a winch deriving its power in the usual manner from the engine of the vehicle. As has been previously proposed, these arms and also the overhead cable sheave supporting frame are carried on girders on the sides of the vehicle forming part of its chassis below any springs with which it may be equipped, but the principal feature of my construction upon which its advantages chiefly depend consists in the pivotal character of the connections between the girders and the horizontal cable sheave carrying frame, which relieve undue strain on the latter due to the movement of the loaded scoop and permits the adjustment of the frame to irregularities in the level of the ground on which the vehicle is operated.

The connections are made by members pivotally mounted on the girders so as to allow of a limited movement of the frame relative to the unsprung members of the vehicle chassis, both longitudinally and transversely of the latter and at the same time properly to transmit the weight of the scoop and its load to the chassis in the varying positions which these may occupy between the beginning of the lift and the discharge of the load. Their nature will more fully appear from the description which follows.

In the figures:

Figure 1 is a side elevation of an overthrow loader embodying my invention, the upward position of the scoop being shown in broken lines;

Figure 2 is a rear elevation with the jib arms shown in a vertical position;

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Fig. 3 is a front elevation showing the jib arms in vertical position partially in broken lines; and Figure 4 shows one form of an automatic braking means on a larger scale.

In the embodiment of the invention shown in the drawings, jib arms 1 on each side of the loader (broken away in Figure 1) are pivotally attached at their inner ends 2 to girders 3 forming part of the chassis of the vehicle below the springs thereof, and at their outer ends there is attached a scoop 4 at the points 5. The jib arms and the scoop are also connected by side brackets 6, by which the angular relation between them is maintained.

Between the outer ends of the jib arms 1 there extends a cross-piece 7 to which are bearably bracketed cable sheaves 8, and around these pass double ended cables 9 extending over sheaves 10 and 11 to a winch 12, one end of each cable being anchored to one winding drum of the twin drum winch and the other to the fixed framework, preferably the cross member 13 of the overhead sheave carrying frame 14.

This frame 14 consists of two longitudinal members and at least two cross members 13 and 15, all the members being rigidly connected to one another. It is supported on each side by a V-shaped member having arms 16, 17 connected with it near its forward and rearward ends respectively, and it is centrally supported also at its forward end by a transverse beam member 18 rocking on a pivot 19 and supported pivotally at each of its outer ends, as shown at 20, by vertical pillars 21.

At the lower end of each V-shaped member near the point at which the axes of the arms 16 and 17 meet (which may preferably correspond with the horizontal centre line of the axle) is a longitudinal pivotal connection 22 indirectly plate-connected with the unsprung chassis members of the vehicle as shown at 22a, and this may preferably be on the vertical centre line of a rear driving wheel 23 as illustrated. Each forward pillar 21 is likewise pivotally connected with the unsprung chassis members either directly with the forward end of girder 3 or, as shown at 24, indirectly through a plate 24a attached thereto.

For simplicity of operation and convenience it is preferred that the ends of the jib arms 1 should not swing further towards the rear of the vehicle than the vertical, and that the scoop 4 should discharge into a chute 25 adjustably attached to the frame 14 by a support 26 and a hinged support 27 and having its outlet controlled by a gate 28 which can be manipulated by the operator of

the loader through a connection with the lever 29, an adjustment bracket 29a permitting support 27 to be raised or lowered as desired for chute adjustment.

To form a stop to prevent the jib arms from moving too far towards the rear of the vehicle, cylinders 30 are provided with piston rods 31 for engagement by the jib arms as they near the end of their desired travel, and the compression effected within the cylinders 30 reacts to start the arms and scoop on their return movement toward the loading position until they are affected by the force of gravity.

To avoid the overwinding of the cables 9 when the jib arms 1 have lifted the scoop into position to discharge its contents into the chute 25, provision must be made whereby the clutch and brake mechanisms of the winch are automatically governed by the movement of the jib arms. This may be done by any convenient device, for example, a bell crank 32 on the rear leg 17 of one of the V-shaped members, engaged by one of the jib arms.

It will be observed that when the scoop 4 has been filled and the winch is operated to begin to lift the jib arms 1 the chief strains will be divided between the inner pivoted ends 2 of the jib arms 1 and the forward overhead sheaves 10. The latter of these strains will be transmitted to the chassis through the pillars 21 and the forward legs 16 of the V-shaped members, and will tend to cause both the V-shaped members and the pillars to tilt forwardly on their pivots 22 and 24 respectively, but as the jib arms 1 rise the strain on legs 16 will be gradually relieved and transferred to the rear legs 17 of the V-shaped members and through these to the unsprung chassis until substantially the whole weight of the scoop and load is carried directly on the said chassis through the jib arms 1 to the pivots 22 as the jib arms reach the vertical position. When the scoop load is transferred into the chute 25 its weight will be chiefly transmitted to the chassis through the rear legs 17 of the V-shaped members.

Irregularities in the ground level, especially transverse irregularities affecting the forward

portion of the loader but not the rear portion thereof, will tend to be compensated for by the movement of the cross-piece 18 on its pivot 19 in conjunction with that of the pivoted pillars 21, and avoidable strains on the cable sheave supporting frame will be thus relieved.

What I claim as my invention is:

1. A cable operated overthrow loader for use with a crawler type tractor which comprises a chassis, jib arms pivotably mounted on the unsprung parts of said chassis adjacent the rear axle, a scoop attached to said jib arms, an overhead cable sheave supporting frame, a V-shaped support for said frame mounted at its lower end to each side of the unsprung parts of said chassis for limited pivotal movement in a longitudinal plane and rigidly attached at the upper ends of its arms near the forward and rear extremities of said frame, a cross-piece centrally mounted to the forward end of said frame for pivotal movement in a transverse plane and at a point forwardly of the point of attachment of the upper end of the forward arm of the V-shaped support, and a substantially vertical pillar at each side of said chassis attached at its lower end to said chassis for limited pivotal movement in a longitudinal plane, and attached at its upper end to said cross-piece for pivotal movement in a transverse plane.

2. A cable operated overthrow loader according to claim 1 in which said frame is substantially rectangular, comprising two longitudinal members and transverse members, and said cross-piece is attached centrally of the forward transverse member.

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