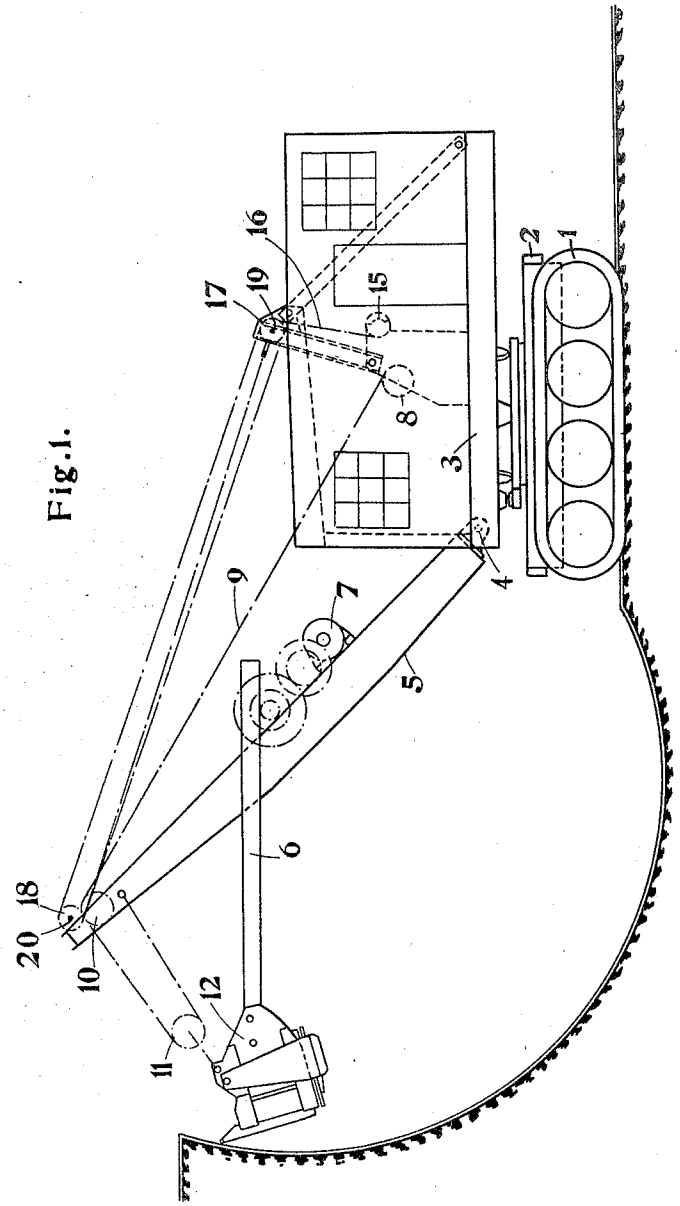
Dec. 19, 1933. K. WISSMANN 1,940,616

EXCAVATOR

Original Filed March 18, 1930 2 Sheets-Sheet 1

Fig.1.



Inventor
K. Wissmann:
by
W. E. Evans
Attorney.

Dec. 19, 1933. K. WISSMANN 1,940,616

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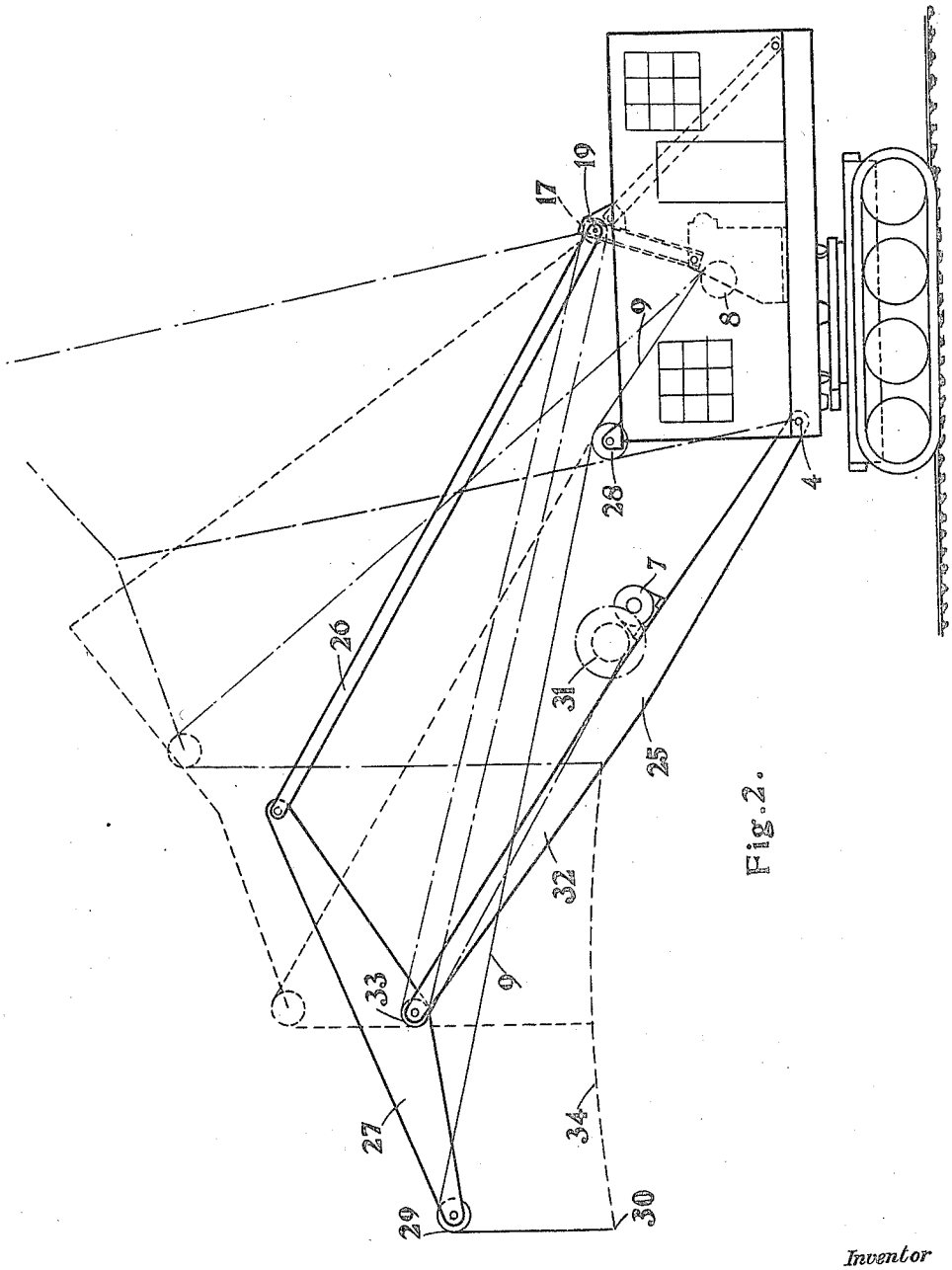


Fig. 2.

Inventor
K. Wissmann:
by
W. E. Evans,
Attorney.

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EXCAVATOR

Kurt Wissmann, Duisburg, Germany, assignor to Demag Aktiengesellschaft, Duisburg, Germany

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4 Claims. (Cl. 214—135)

This invention relates to an implement resembling a shovel navvy, which is designed to be used for all kinds of work in the ground, in rock, on slopes, on building lands or in quarries. To adapt it to these different working conditions the bogie frame of the navvy (that is to say the underframe with the endless tractors and the upper carriage with the engine house) which in the usual type of construction, carries the jib and the shovel shaft, has connected to it according to this invention a luffing system with a jib which can be drawn in while under load and with a horizontal luffing path. With this luffing system the navvy when working with grabs can in most cases carry out its cycle of operations without troublesome movement along the ground. The alteration in the distance of the grab from the centre of rotation of the navvy is effected by luffing. The luffing mechanism may be conveniently separate from the drawing-in mechanism.

An additional feature of the invention is that the luffing movement is produced by the mechanism which advances the shovel and therefore avoids the use of a separate luffing driving gear. The difficulty in applying an additional or luffing drive is thus overcome in the engine house which is already very cramped for room, by placing this mechanism on a part of the luffing system.

The construction according to the invention is hereinafter described with reference to the drawings in which a navvy is shown and in which

Figure 1 shows the navvy as a shovel navvy, and

Figure 2 shows the navvy as a digging navvy (a luffing grab navvy).

The navvy is equipped with endless tractors 1 which are mounted on the under carriage 2. On the upper carriage 3 is provided the pivot pin 4 for the jib 5, which carries the dipper stick 6 of the shovel 12. This latter is operated by the gearing 7 for advancing it. The hoisting gear consists of the drum 8, the rope 9, the guide pulley 10 on the jib, and the shovel pulley 11 on the shovel 12. Drawing in is carried out from the drum 15 by means of the rope 16, which passes over the pulleys 17 and 18 at the centres of rotation 19 and 20.

If the navvy is to be used as a luffing grab navvy as illustrated in Figure 2, the jib 5 is replaced by a jib 25 which can likewise be rotated about the pivot pin 4. The shaft or spindle 19 is used as an axis of rotation for a guide link 26 to the upper end of which the top jib 27 is attached, which jib is supported upon the jib 25. The hoisting rope 9 passes from the drum 8 to a pulley 28 and thence over the top pulley 29 to the grab attached at the point 30.

Luffing is effected by means of the gearing 7 which for this purpose is mounted on the jib 25 and is provided with a drum 31. The drawing-in rope 32 passes from the drum 31 to the pulley 33 at the upper end of the jib 25, thence to the pulley 17 and is secured at any one of these points. The hoisting mechanism is, as shown in the drawings, entirely independent of the drawing-in mechanism. Therefore, when luffing and when the hoisting mechanism is not moving, the load is not raised, but moves along the line 34 which approximates closely to a horizontal line. It will be understood that if it be desired the hoisting mechanism may run while drawing in so that the grab is also raised and lowered, and thus any desired curve may be described. The various positions of the jib luffing system are indicated in Figure 2 by dotted and dot and dash lines.

It is advantageous but not essential to use a composite luffing system; a simple jib will suffice provided only one mechanism be used for obtaining the horizontal luffing path for the load, such as a pulley block hoist, a rocking lever, a sliding track or the like. When a composite luffing system is used it may be so selected in known manner that the apex of the jib moves along a horizontal line during luffing.

As the hoisting mechanism according to the invention is completely relieved of the drawing-in movement, it may be connected to other gearing, such as to the running mechanism or the like, so as to make better use of the driving motor and if necessary also to simplify the construction.

I claim:

1. A convertible implement for excavating, comprising a supporting carriage, a rotatable upper carriage thereon, a jib pivot, hoisting gear and jib anchorage member upon the said upper carriage, exchangeable jibs adapted to be fitted alternatively upon the jib pivot, a shovel dipper stick carried by one of said jibs, a shovel mounted upon said dipper stick, a top jib and a guide link pivotally connected to the second of the said jibs, said guide link being pivotally attachable to said jib anchorage member, a means for suspending a grab from said top jib, a jib gearing mountable upon either jib, and adapted respectively to operate said shovel dipper stick and to luff the second jib, the said hoisting gear serving through a flexible element to hoist said shovel or said grab.

2. A convertible implement for excavating, according to claim 1, having a hoisting drum and

a flexible luffing element for engagement with the said drum for luffing the second jib.

3. A convertible implement for excavating, according to claim 1, provided with a pivot spindle on the jib anchorage member, a pulley for mounting upon the said pivot spindle and a flexible element for connecting the said pulley with the head of the jib carrying the shovel dipper stick, the said pivot spindle being adapted for connection to the guide link of the second jib.

4. In a convertible implement for excavating, a supporting carriage having a jib pivot and a jib anchorage member, a main jib mounted on said jib pivot and carrying a rotary guide element at the outer end thereof, a top jib pivotally mounted at the outer end of the main jib, a hoisting gear on the carriage, a flexible element operated by said gear and in guided running engagement with one end of the top jib for movably suspending a grab therefrom, luffing gearing carried by the main jib, a rotary guide element on the jib anchorage member, a control link pivotally connected at one end with the other end of the top jib and at its opposite end to the jib anchorage member coaxially with the rotary guide element thereon, said link operating to control the movements of the top jib in a luffing movement of the main jib to luff the grab in a substantially horizontal plane, and a luffing cable operated by said luffing gear and extending diagonally across the space between the main jib and control link and in running engagement with said rotary guide elements on the main jib and jib anchorage member.

KURT WISSMANN.