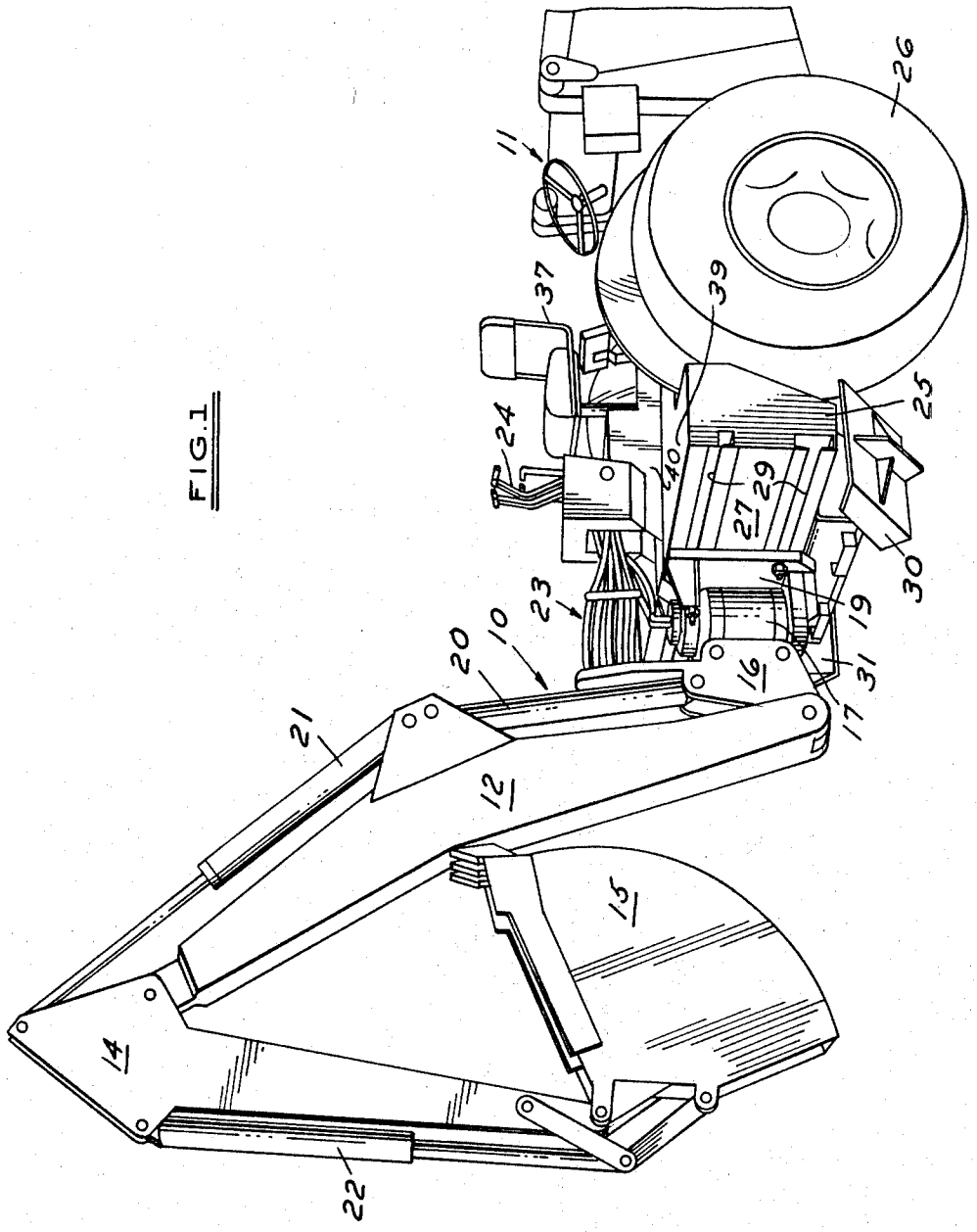
Sept. 10, 1968 R. R. OWEN 3,400,842

OFFSET BACKHOE

Filed Nov. 29, 1966 4 Sheets-Sheet 1

FIG. 1



INVENTOR
ROBERT R. OWEN
BY
P. F. Hilder
ATTORNEY

Sept. 10, 1968 R. R. OWEN 3,400,842

OFFSET BACKHOE

Filed Nov. 29, 1966 4 Sheets-Sheet 2

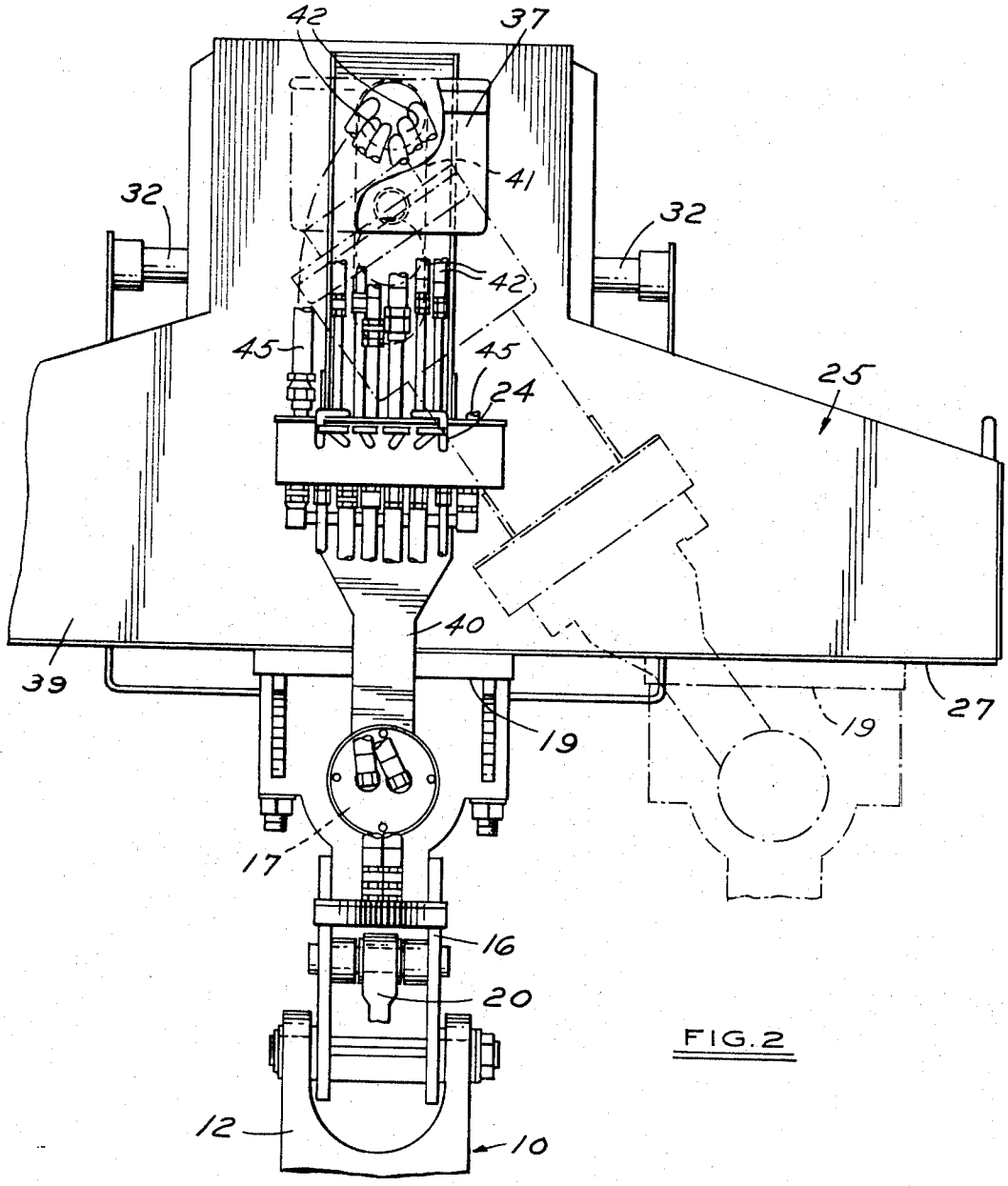


FIG. 2

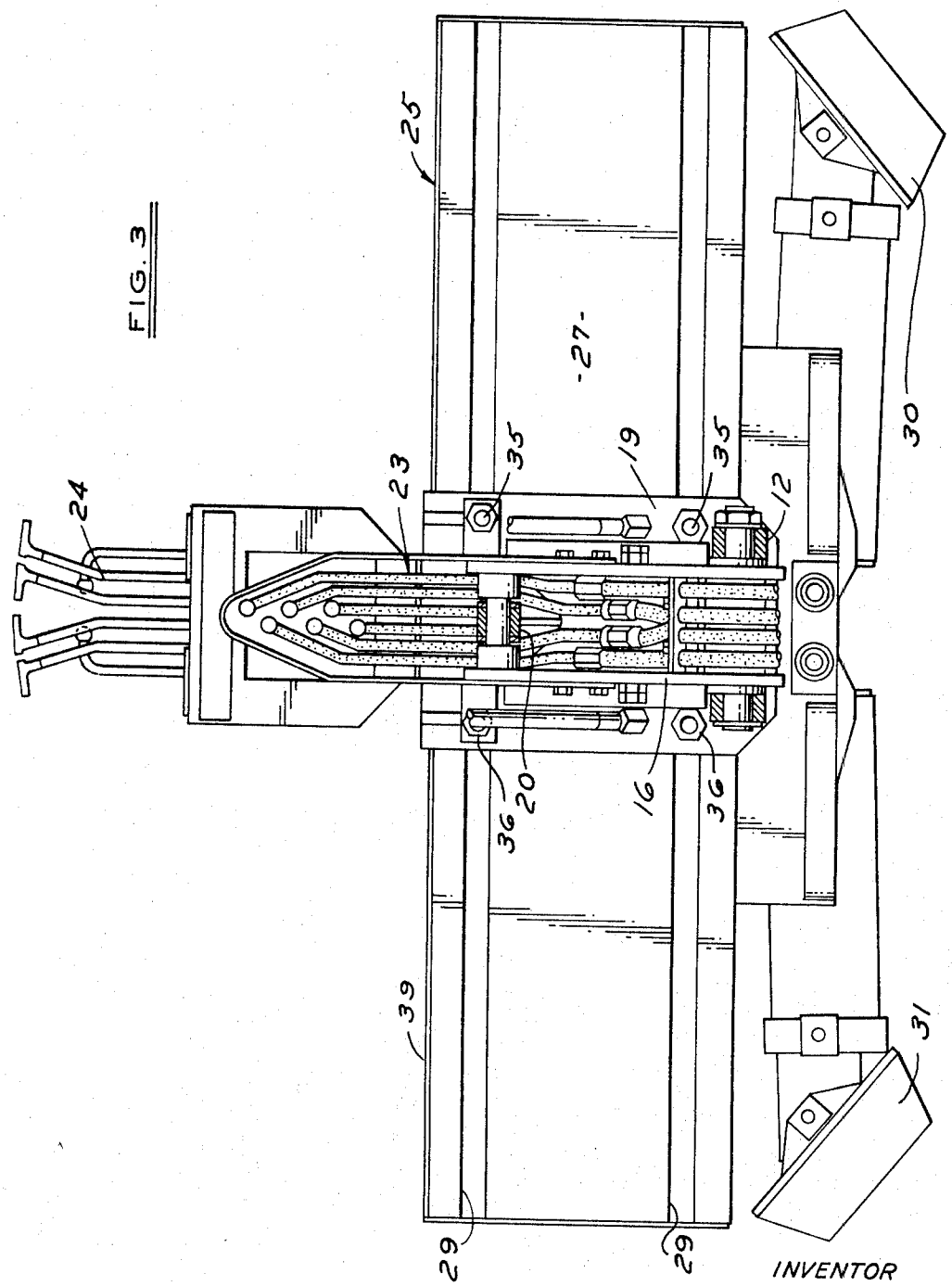
INVENTOR
ROBERT R. OWEN
BY
P. F. Hilder
ATTORNEYS

Sept. 10, 1968 R. R. OWEN 3,400,842

OFFSET BACKHOE

Filed Nov. 29, 1966 4 Sheets-Sheet 3

FIG. 3



INVENTOR
ROBERT R. OWEN
BY
P. F. Hilden
ATTORNEY

Sept. 10, 1968 R. R. OWEN 3,400,842

OFFSET BACKHOE

Filed Nov. 29, 1966 4 Sheets-Sheet 4

FIG. 4

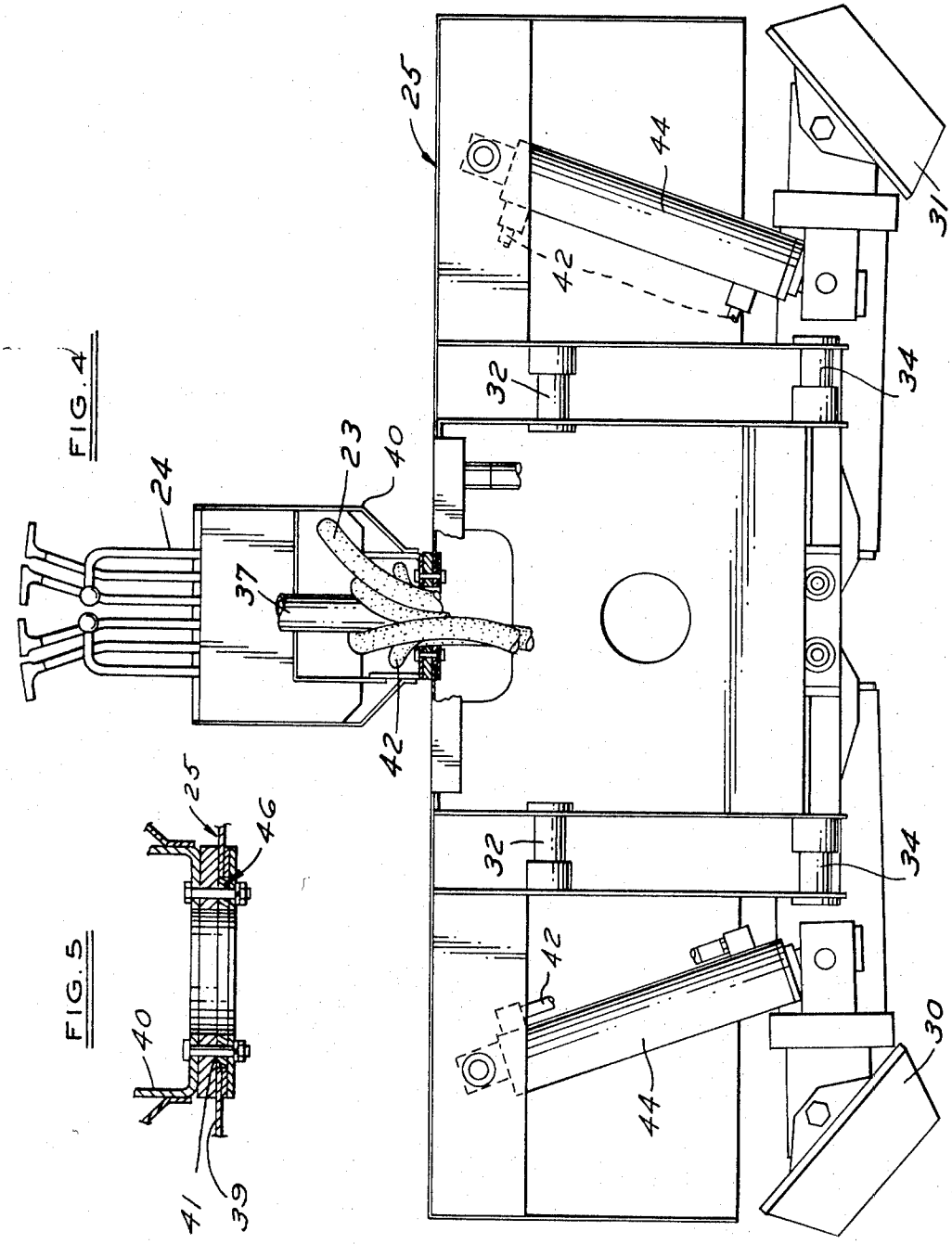


FIG. 5

INVENTOR
ROBERT R. OWEN
BY
P. F. Hilden
ATTORNEY

United States Patent Office 3,400,842 Patented Sept. 10, 1968

3,400,842

OFFSET BACKHOE

Robert R. Owen, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich., a corporation of Delaware

Filed Nov. 29, 1966, Ser. No. 597,700
5 Claims. (Cl. 214—138)

ABSTRACT OF THE DISCLOSURE

An offset backhoe in which the transversely adjustable carriage for the boom is attached to an elongated member centrally pivoted within a slot on a platform which extends on both sides of the center line of the tractor.

This invention relates to adjustable offset backhoes of the type in which the boom is supported on a carriage which is mounted on a transverse track for movement to a position laterally offset to either side of the longitudinal center line of a tractor.

Adjustable offset backhoes of the above type customarily are provided with a seat and valve bank which may either be mounted on the swing frame to move and swing with the backhoe, fixed on the center line of the tractor or be mounted on the carriage to move laterally with the backhoe. In either type of construction, there is a problem of visibility of the digging operation and a problem of accommodating the required length of connecting hydraulic hose necessary to offset the backhoe the maximum amount but excess length when the backhoe is more or less centered on the tractor.

According to the present invention, the operator's seat and valve bank are mounted on a member pivotally connected between the center of the main frame and the carriage whereby the seat and valve bank are turned towards the backhoe regardless of the degree of offset but at the same time the operator may look along the side of the boom into the excavation. Preferably this member also carries the hydraulic hoses leading to the valve bank from the hydraulic pump and stabilizers.

Among the objects of the present invention is to provide an improved offset backhoe construction in which the seat, while stationary during the digging cycle, is turned towards the adjusted position of the backhoe; to provide such a construction accommodating slack in the hoses in certain adjusted positions of the backhoe; to provide such a construction in which the hazard of damaging hoses during lateral movement of the carriage is markedly reduced; and generally to improve offset backhoe constructions of the type described.

Other objects, and objects relating to details of manufacture and use will be more apparent from the detailed description to follow.

My invention is clearly defined in the appended claims. In the claims, as well as in the description, parts may at times be identified by specific names for clarity and convenience, but such nomenclature is to be understood as having the broadest meaning consistent with the context and with the concept of my invention as distinguished from the pertinent prior art. The best form in which I have contemplated applying my invention is illustrated in the accompanying drawings forming a part of this specification in which:

FIGURE 1 is an isometric view of a tractor with backhoe and loader attached, only the rear portion of the tractor and loader being shown.

FIGURE 2 is a top plan view of the backhoe shown in FIGURE 1, a portion of the main frame and the boom being broken away. Alternative offset positions of the backhoe are indicated in broken line.

FIGURE 3 is a rear elevation of the backhoe, the boom, dipstick and bucket being omitted.

FIGURE 4 is a front elevation of the backhoe, portions of the main frame and associated parts being shown in vertical section.

FIGURE 5 is an enlarged vertical section showing the attachment of the seat and valve bank supporting member to the operator's platform.

Referring to FIGURE 1, the backhoe **10** of the present invention is adapted for mounting on a tractor **11**. The backhoe comprises a boom **12**, a dipstick **14** and a bucket **15** which are articulated and operated in the usual manner. The boom **12** is pivotally mounted for vertical swinging movement on a swing frame **16**, which is supported for horizontal swinging movement by a rotary cylinder **17** supported by a carriage **19**. The boom **12**, dipstick **14** and bucket **15** are operated in the customary manner by hydraulic cylinders **20**, **21** and **22**, respectively. Operation of these cylinders is controlled by a bank **24** of manually operated hydraulic control valves connected with the cylinders **20**, **21** and **22** by hoses **23** extending between the valve bank and the boom **12**.

The backhoe **10** is supported on the tractor **11** by a main frame **25** secured to the chassis of the tractor. The main frame **25** extends between the rear wheels of the tractor, one wheel **26** being shown and projects somewhat behind the wheels, terminating in a vertical, relatively flat rear face **27** provided with a pair of vertically-spaced, parallel, horizontal, rearwardly-opening C-shaped slots **29** extending from side to side of the tractor and supporting the carriage **19**, as will be described. A pair of stabilizers **30** and **31** are pivotally mounted on the lower portion of the main frame **25** and may be lowered during use of the backhoe to aid in stabilizing the tractor **11** against overturning and to take the weight off the rear wheels of the tractor.

The main frame **25** may be mounted on the chassis of the tractor **11** by means of coupling mechanism generally similar to that shown in Holopainen U.S. Patent 3,047,109. This coupling mechanism includes fixed pins **32** and **34** mounted on the main frame **25** of the backhoe (see FIG. 4) which are adapted to be engaged by notched links, not shown, of the type shown in the Holopainen patent.

The carriage **19** which supports the swing frame **16** of the backhoe is clamped against the vertical rear face **27** of the main frame by four bolts **35** engaged within the C-shaped slots **29** and having nuts **36** adapted to be tightened against the carriage. Upon loosening the nuts **36**, the carriage may be moved to any position along the slots and reclamped prior to use of the backhoe for digging.

An operator's seat **37** is provided facing rearwardly of the tractor above the generally horizontal upper surface **39** of the main frame, the surface **39** serving as the operator's platform. The seat **37** is mounted a short distance forwardly of the valve bank **24** to provide for convenient manual operation of the valves by an operator while seated.

Both the valve bank **24** and the seat **37** are mounted on an elongated member **40** lying generally along the platform **39** of the main frame, one end of the member being pivotally connected to the carriage and the other end being pivotally connected to the forward portion of the platform **39**. Preferably, the member **40** is of fixed length and has a fixed pivotal connection coaxial with the swing frame **16** and a forward end pivotally reecived within a fore-and-aft-extending slot **41** in the forward portion of the platform **39** (see FIGS. 4 and 5). The slot **41** is of sufficient length to permit the forward end of the member **40** to move rearwardly a sufficient distance to permit full movement of the carriage **19** along the rear face **27** of the main frame to the broken line position indicated at the right of FIGURE 2.

Hoses **42** connecting the valve bank **24** with the customary stabilizer cylinders **44** provided for raising and lowering the stabilizers **30** and **31** and hoses **45** for connecting the valve bank with a source of hydraulic fluid under pressure are led along the member **40** and through the slot **41** in the platform **39**. Preferably, the member **40** is of inverted channel section and some or all of the hoses are led within the interior of the member to contain them and protect them against damage. A bushing or collar **46** may be provided at the forward end of the member **40** to form a sliding pivot for the member within the slot **41** and protect the hoses against damage by the margins of the slot.

It will be apparent that there is a substantially constant distance preserved between the valve bank **24** and the boom **12** regardless of the offset position of the backhoe, the distance being affected principally by the swinging of the swing frame **16** and the boom. Accordingly, there is no requirement to make provision for excess length of hoses **23** to permit full movement of the carriage **19** from side to side of the main frame **25**. It is necessary to provide some excess length of the hoses **42** to provide for forward movement of the collar **46** within the slot **41** on the platform when the carriage **19** is moved to control position. This movement, however, is held to a minimum and there is plenty of space beneath the platform to accommodate the excess length of hoses required. Moreover, this hose slack is remote from the area along the rear face **27** of the main frame and the hoses are not apt to become pinched and damaged by movement of the carriage **19** or operation of the backhoe.

Mounting of the seat **37** on the member **40** automatically positions the seat to always face the valve bank **24** and the backhoe. Moreover, mounting the seat in the manner described maintains it towards the center of the platform **39** at all times, thus providing adequate clearance between the seat and the wheels of the tractor and facilitates mounting an enclosed operator's cab about the platform. At the same time, the seat is directed at all times towards the backhoe and when the backhoe is offset in either direction from central position, the position of the seat assists the operator in looking past the side of the boom and into the excavation during digging to facilitate control of the unit.

What is claimed is:

1. In a tractor-mounted offset backhoe having a main frame provided with a generally flat horizontal operator's platform and a track extending transversely from side to side of one end of a tractor, a carriage mounted for movement along the track and provided with means for supporting an end of a backhoe boom for movement about horizontal and vertical axes, an operator's seat, and a valve bank of manually operated hydraulic control valves mounted in front of the seat for operating the backhoe, the improvement comprising: the seat and valve bank being mounted on an elongated member lying generally along the upper surface of the platform and having one end portion pivotally mounted for swinging movement thereon and the other end pivotally connected to the carriage, the platform extending on both sides of the longitudinal center line of the tractor and the elongated member being pivotally mounted on said longitudinal center line and extending from said center line in all adjusted positions of the carriage.

2. In a backhoe as claimed in claim **1**, the elongated member having a fixed length, the platform having a slot along its longitudinal centerline and the platform-mounted end of the member moving fore and aft within the slot upon adjustment of the carriage along the track.

3. In a backhoe as claimed in claim **2**, the carriage-mounted end of the member being pivotally mounted coaxially with the vertical axis of the boom.

4. In a backhoe as claimed in claim **2**, the platform having an elongated slot extending along the longitudinal center line of the tractor and pivotally and slidably receiving a hollow pivot member extending from the end of the elongated member, and hydraulic hoses extending from below the platform through the hollow pivot member and then along the elongated member to the valve bank.

5. In a backhoe as claimed in claim **4**, the elongated member forming a channel receiving said hydraulic hoses.

References Cited

UNITED STATES PATENTS

3,250,410 5/1966 Dorkins ---------- 214—138

HUGO O. SCHULZ, *Primary Examiner.*