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SWIVEL SEAT FOR MECHANICAL SHOVELS

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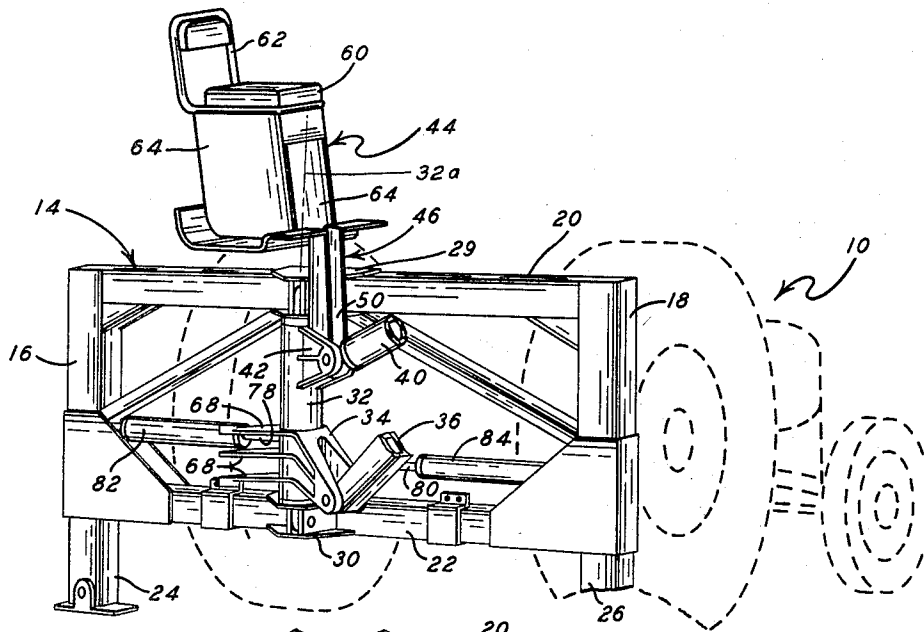


FIG 1

FIG 2

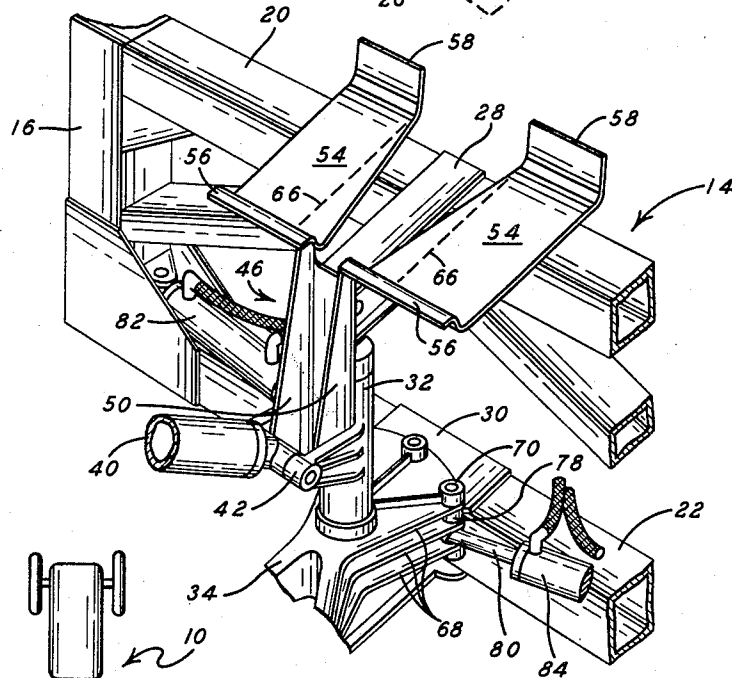
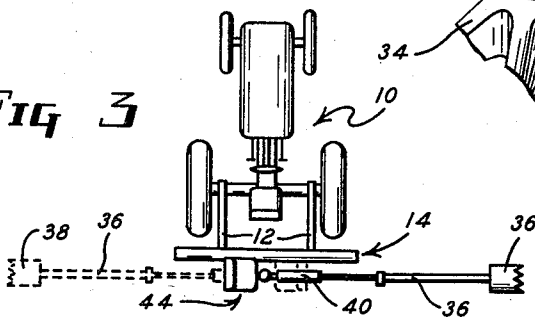


FIG 3



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SWIVEL SEAT FOR MECHANICAL SHOVELS

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5 Claims. (Cl. 214—131)

This invention relates generally to seat constructions, and pertains more particularly to a swivel seat especially adapted for use in conjunction with mechanical shovels.

One important object of the invention is to provide a seat structure that will rotate or pivot in unison with the boom on which the mechanical shovel is mounted, thereby affording the operator an opportunity to watch and control properly the shovel's movements without having to turn in his seat to see the work being performed by the shovel.

Another object of the invention is to provide a seat structure of sturdy construction, yet one that will be quite comfortable under the rather rigorous circumstances encountered in actual use. In this regard, it is an aim of the invention to incorporate into the structure a degree of resiliency capable of minimizing the abrupt vibration or shock that would otherwise be transmitted at times to the operator from the shovel via the boom. Another feature of the invention relating to comfort is the provision of appropriate foot rests, such a feature lending itself very readily to incorporation into the more basic seat structure forming the subject matter of the present invention.

A further object of the invention is to provide a seat structure of the foregoing character that will be of simple design and yet at the same time serve its intended purpose without interfering with parts constituting the boom actuating mechanism. More specifically, it is planned that the boom actuating mechanism be adjustable to swing the boom from a center position through 90° to either side at the selection of the operator, and the invention contemplates that the operator's gaze be automatically directed to either of these selected side positions as well as a more central one. To accomplish this, provision is made for rotating the seat structure with ample clearance so as to avoid obstruction with other parts, as mentioned above.

The invention, together with other objects attending its production, will be more clearly understood when the following description is read in connection with the accompanying drawings, in which:

Figure 1 is a perspective view of the seat structure as it appears in actual use, a tractor for supplying suitable fluid power to the boom actuating mechanism being depicted in phantom outline;

Figure 2 is a fragmentary perspective view with the chair unit removed so as to illustrate to better advantage the chair mounting platform that would otherwise be partially concealed; and

Figure 3 is a plan view of the combination pictured in Figure 1, the view additionally including the mechanical shovel in one of two extreme side positions that it may assume with the other side position being indicated in phantom outline.

Referring in detail to the drawing, the invention is exemplified in association with a tractor indicated generally by the numeral 10, the tractor being equipped with a hydraulic pressure system from which boom actuating power can be obtained via appropriate control valves

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(not shown). Suitable tie rods 12 (Figure 3) extends from the tractor 10 to a generally rectangular frame 14. The frame 14 includes a pair of vertical studs 16, 18 connected by transverse members 20, 22. While not important to an understanding of the instant invention, the studs 16, 18 are of rectangular cross-section into which are telescopically received leg elements 24, 26, these legs being vertically adjustable in an individual manner so as to maintain said frame level when employed on rough terrain.

The frame 14 has projecting therefrom in cantilever fashion a pair of relatively short beams 28, 30, the upper beam 28 being fixedly secured to the transverse member 20, and the lower beam being welded or otherwise rigidly secured to the transverse frame member 22.

The function of the vertically spaced beams 28, 30 is to journal therebetween a swivel post 32. A lower clevis element 34 pivotally anchors the lower end of a boom 36 which in turn has suspended therefrom a mechanical shovel 38 (Figure 3). The boom 36 may be raised and lowered by means of a hydraulic cylinder 40, this hydraulic cylinder being pivotally anchored to the swivel post 32 by a clevis 42.

The operator's seat structure and spring mounting therefore which constitute my invention include the seat proper, designated as a whole by the numeral 44, two spaced generally horizontal spring steel seat supporting platforms 54, and a rigid upright metal pedestal 46 supported by the swivel post 32, and which in turn supports the platforms 54.

The seat proper may be of any desired type. The seat illustrated includes spaced upright panels 64 which serve as supporting side legs, a back 62, and a panel supported seat bottom 60.

The upright pedestal 46 is of channel cross section with a portion of the web being removed at its upper end to provide the flanges 50 with free upper ends, these ends preferably being rounded to fit the mating ends of the platforms 54. The lower ends of pedestal flanges 50 are securely welded to the spaced forwardly projecting arms of the clevis 42, as shown.

The forward end of each seat supporting platform 54 is offset bent to a general Z cross section configuration, the bend radius being substantially the same as the radius of curvature of the upper ends of the pedestal flanges 50.

The offset bent forward ends of the platform springs 54 are complementally fitted against and welded to the curved upper ends of flanges 50 with the major portions of the platforms projecting rearwardly in a substantially horizontal common plane to clear the upper end of frame 14 as the swivel post 32 is rotated, as clearly shown in Fig. 2. It will be noted that the platforms 54 are separated from each other, and that each is of sufficient width as the project laterally outward from that flange of the pedestal to which it is welded. The above described mounting provides a cantilever support for the platforms 54, thus greatly increasing their ability to absorb shocks transmitted from the swivel post through the pedestal 46.

To complete the structure, the spaced side legs 64 of seat 44 are welded or otherwise suitably secured to the respective platform springs 54 along fore and aft disposed lines 66, leaving a portion of each platform exposed outside each respective side of the seat to serve as foot rests for the shovel operator.

Since the mechanism for oscillating the swivel post 32 to swing the boom 36 from side to side is not a part of this invention, it is not believed necessary to describe its construction and operation.

From the above description it will be understood, however, that as the swivel post is rotated in either direction about its axis the operator's seat 44 is necessarily moved through the same arc, and seat 44 is always in a position

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facing the boom. Platform springs 54 constitute a shock absorbing support for the seat 44 of the operator, and thereby minimize operator fatigue. The springs are so arranged and independently supported so that each may absorb a shock load independent of the other, and so that they cooperate to support the shifting weight of the operator, regardless of which spring may necessarily support the greater portion of such weight.

It will be apparent from the drawings and from the above description that the applicant has provided a novel cantilever seat structure for a mechanical shovel which is distinguished by a pedestal 46 connected to one side of the shovel swivel post and which extends upwardly beyond any surrounding frame structure together with a cantilever support 54 which is connected to the pedestal at its forward end and which rearwardly overhangs the frame structure 14 for unimpeded movement of the assembly from side to side about the post axis. The seat 44 is connected to the cantilever support at a region rearwardly of the connection to the pedestal in order to provide cantilevered springing of the seat. Moreover, the pedestal is of relatively narrow cross section as shown so that it may be swung with the swivel post through a maximum angle on the order of 180° without any interference with the frame 14.

With regard to the specific rearward offset of the frame of the seat with respect to the pivot axis, it will be apparent from the drawing that the seat is so arranged that the pivot axis of the swivel post, when extended upwardly, intersects the region occupied by the body of the operator when seated on said seat. For convenience, the extended axis of the swivel post 32 is identified in Fig. 1 as 32a. It will be apparent to one skilled in the art upon inspection of the drawing that the invention contemplates that the swivel post 32 and pedestal 50 be rigid with one another forming, for structural purposes, an integral unit.

Having described the invention with sufficient clarity to enable those familiar with this art to construct and use it, I claim:

1. In a mechanical shovel of the class wherein a rigid upright frame journals the upper and lower ends of an upright boom swinging swivel post the axis of which lies outside the plane of the frame, a shock absorbing seat structure for the shovel operator comprising: a rigid upright pedestal carried rigidly by said swivel post on that side of the post which is normally remote from the shovel frame, said pedestal projecting upward to a level above the top of the shovel frame; a pair of spaced elongated platform type steel springs arranged side by side in a common horizontal plane, each having an end rigidly secured to the upper end of said pedestal, the remaining otherwise unsupported portions of said springs projecting toward and overlying the upper end of the shovel frame, said springs being capable of independent flexing movement with respect to the pedestal; and an operator's seat spanning the space between said springs, the two sides of said seat being secured to the respective upper surfaces of said springs with the seat facing toward the pedestal.

2. The seat structure described in claim 1 in which the springs are of such lateral dimensions that a portion of each spring projects laterally from its respective side of the seat to provide foot rest surfaces for the operator.

3. The seat structure described in claim 1 in which the pedestal is of channel cross section with a portion of the upper end of the web being removed to provide the

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flanges thereof with laterally spaced free upper ends, and in which those ends of the springs which are attached to the pedestal are rigidly welded to the respective free upper ends of the pedestal flanges.

4. A seat assembly for a mechanical shovel comprising, in combination; a vertical generally planar supporting frame, a swivel post journaled in said frame for movement about a vertical axis, an upright pedestal rigidly connected to the swivel post and extending upwardly along one side thereof, means including a rearwardly extending cantilever support in the form of a substantially flat spring lying in a horizontal plane, the forward end of the cantilever support being secured to the upper end of the pedestal, an operator's seat having a frame and facing toward said pedestal, the frame of said seat being secured to said cantilever support at a region spaced rearwardly from the forward end of the support for cantilevered springing of said seat, said pedestal having sufficient height so that it extends upwardly clear of said frame with the cantilever support rearwardly overhanging said frame, said swivel post being spaced outwardly from the plane of the frame and said pedestal having a relatively narrow cross section for unrestricted lateral swinging movement of said seat, support and associated swivel post through an angle of substantially 180°.

5. In a seat construction for a mechanical shovel, the combination comprising, a vertical generally planar supporting frame, a vertical swivel post journaled in said frame, a boom secured to said swivel post, said swivel post being so mounted that its axis is offset forwardly from said frame so that said boom is free to swing substantially 180° from a right hand position in which it lies flatly adjacent said frame to a left hand position in which it lies flatly adjacent said frame in the opposite direction, a vertical pedestal on said swivel post, a seat assembly on said pedestal, said seat assembly having a seat portion which extends rearwardly and laterally from the swivel post axis and arranged with respect to the swivel post axis so that the axis extends through the space occupied by the body of the operator when seated thereon, said seat assembly further having a foot supporting portion positioned to be engaged by and to support the feet of the operator when seated on said seat, said pedestal being extended upwardly from said frame so that the seat assembly including the foot-supporting portion thereof is upraised clear of the upper edge of said frame so that the boom may swing through its entire range of swinging movement free of interference between said seat assembly and said frame and with the operator maintained at all times facing said boom.

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