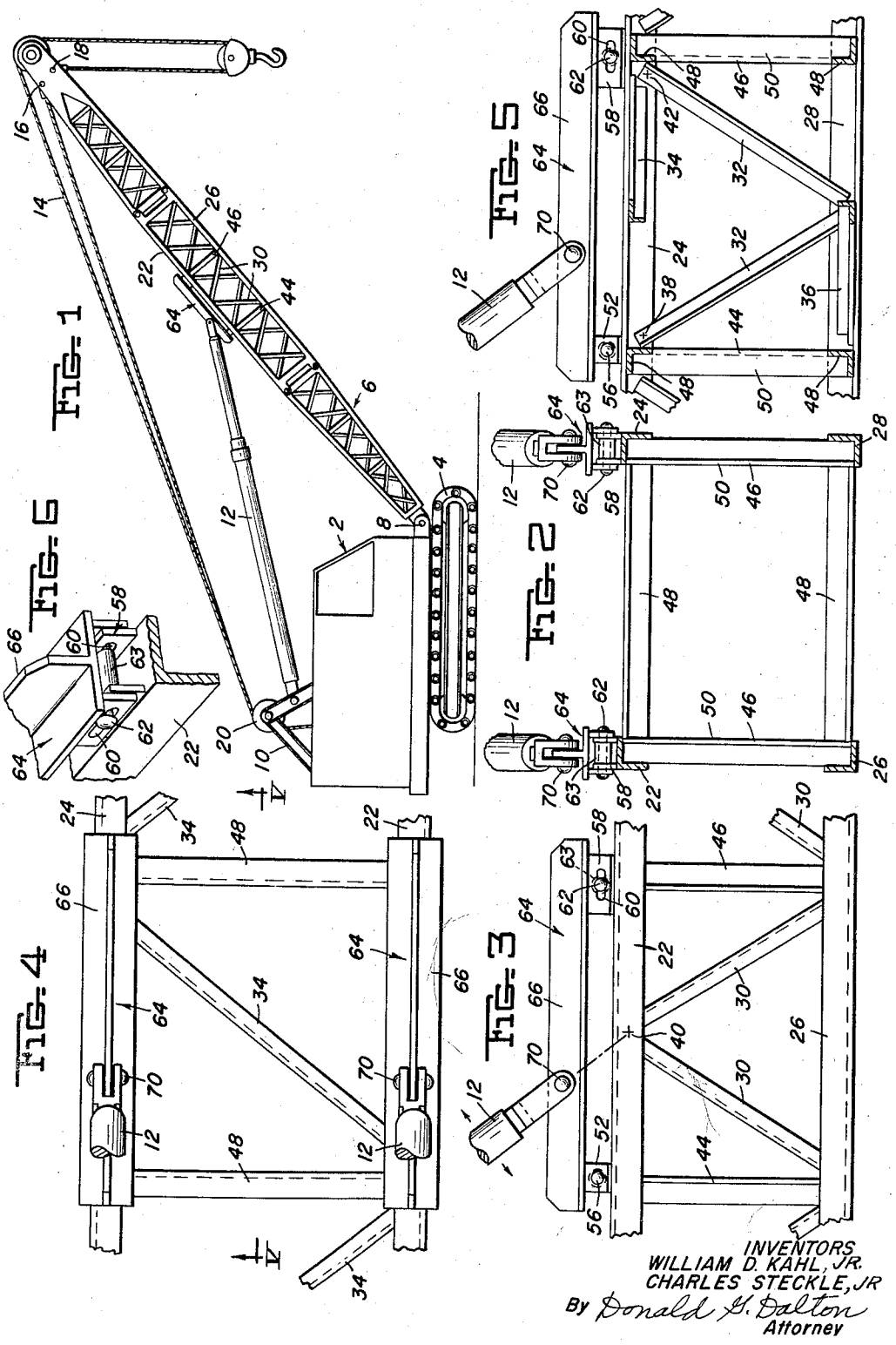
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SNUBBER CONNECTION

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SNUBBER CONNECTION

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This invention relates to a snubber connection and more particularly to a crane boom snubber connection which transmits force from the snubber to the boom. In the operation of cranes without boom snubbers, breakage of the cable or tackle when lifting heavy loads causes the boom to recoil and snap back over the crane cab. This may damage the boom or the crane and possibly injure or kill the crane operator. To prevent this from happening, boom snubbers such as shown in Sathre et al. Patent No. 2,627,985, dated February 10, 1953, have been provided which permit the boom to be raised or lowered in normal operation but which, in the event of sudden release of load, prevents the boom from recoiling or snapping back over the crane cab. The boom is a column-like member which is normally made up of four longitudinal corner angles and diagonally extending connecting members connected to said corner members at panel points. The application of the load from the snubber to the corner angles in the patent is such that failure of the boom may result due to buckling of the longitudinal angles at the snubber connection. Strengthening of the longitudinal corner angles at the connection is undesirable due to resultant stress concentrations which will cause structural failures.

It is therefore an object of our invention to provide a snubber connection which will transmit loads from both snubbers to the panel points on crane booms and the like without appreciable strengthening of any individual section of the boom.

Another object is to provide such a connection which will permit the crane boom to flex without any restraint from the snubber connection.

These and other objects will be more apparent after referring to the following specification and attached drawings, in which:

Figure 1 is a view of a crane with our invention incorporated therein;

Figure 2 is an enlarged transverse view of the boom at the snubber connection;

Figure 3 is a view looking toward the left of Figure 2;

Figure 4 is a top plan view of Figure 3;

Figure 5 is a view taken on the line IV—IV of Figure 4; and

Figure 6 is an enlarged perspective view of a detail.

Referring more particularly to the drawings, reference numeral 2 indicates a crane cab which is mounted on the usual tracks 4. Boom 6 of the crane is pivotally mounted to the crane cab 2 by means of a pivot connection 8. An A-frame 10 is mounted on the cab 2. A pair of snubbers 12, such as shown in the above mentioned Sathre patent, extend between and are connected to the cab 2 and the boom 6. The upper end of the boom 6 is supported by a cable 14 having one end connected to boom 6 at 16 and the other end connected to boom 6 at point 18. The cable 14 is threaded about a sheave 20 mounted on A-frame 10 and passes downwardly to hoisting drums, not shown. The boom 6 consists of longitudinal corner angles 22, 24, 26 and 28, diagonally extending angles 30 extending between and connected to angles 22 and 26, diagonally extending angles 32 extending between and connected to angles 24 and 28, diagonally extending angles 34 extending between and fastened to angles 22 and 24 and diagonally extending angles 36 extending between and fastened to angles 26 and 28. The parts of the boom are connected by means of welding or riveting. The points of connection of the diagonal members with the longitudinal members such as points 38, 40 and 42 are called panel points. The parts so far described are conventional. Diaphragms 44 and 46 are fastened to the boom at panel points 38 and 42. As shown, each of the diaphragms consists of four angles 48, 48, 50 and 50 welded together and to the angles 22, 24, 26 and 28. A bracket 52 is welded to each of the angles 22 and 24 adjacent the diaphragm 44. Each of the brackets 52 has an opening therein for receiving a pin 56. A bracket 58 is welded to each of the angles 22 and 24 adjacent the diaphragm 46. Each of the brackets 58 has a slotted hole 60 therein for receiving a pin 62. A sleeve 63 may surround the pin 62 to help keep the pin from binding. Longitudinal supports 64, each of which consists of a T 66, are connected to the brackets 52 and 58 by means of the pins 56 and 62, as shown. One end of each snubber 12 is connected to one of the supports 64 by means of a pivot pin 70. For best results the connection should be such that the longitudinal axis of the snubber will be in general alignment with the panel point 40 when the boom 6 is positioned midway of its working range. Since the pins 62 are free to slide longitudinally in the slots 60 the boom 6 can flex without restraint from the snubber connection. It is seen that this connection utilizes the maximum length of boom section to resist the snubbing forces and at the same time overcomes the objections to the strengthening small portions of the boom which create harmful stress concentration.

While one embodiment of our invention has been shown and described it will be apparent that other adaptations and modifications may be made without departing from the scope of the following claims.

We claim:

1. In a structure having a column-like member, said column-like member including longitudinal corner members and diagonally extending connecting members connected to said corner members at panel points, a pair of snubbers each having one end connected to said column-like member, and an anchor for the other end of each of said snubbers; the improvement comprising a pair of diaphragms connected to said corner members at spaced panel points, a pair of longitudinal supports one associated with each of the corner members facing toward said body, a bracket attached to each of the last named corner members adjacent each of said diaphragms, a connection between each of said brackets and the ends of the associated supports, one of said connections for each snubber permitting movement between the snubber and corner member, means connecting one of said snubbers to one of said supports, and means connecting the other of said snubbers to the other of said supports.

2. In a structure having a column-like member, said column-like member including longitudinal corner members and diagonally extending connecting members connected to said corner members at panel points, a pair of snubbers each having one end connected to said column-like member, and an anchor for the other end of each of said snubbers; the improvement comprising a pair of diaphragms connected to said corner members at spaced panel points, a pair of longitudinal supports one associated with each of the corner members facing toward said body, a bracket attached to each of the last named corner members adjacent each of said diaphragms, a pin

connection between each of said brackets and the ends of the associated supports, one of said brackets for each of said supports having a slot therein for receiving its associated pin, means connecting one of said snubbers to one of said supports, and means connecting the other of said snubbers to the other of said supports.

3. In a crane having a boom, said boom including four longitudinal corner members and diagonally extending connecting members connected to said corner members at panel points, a body and a pair of boom snubbers extending between said body and said boom intermediate the ends thereof; the improvement comprising a pair of diaphragms connected to said boom at spaced panel points, a pair of longitudinal supports one associated with each of the corner members facing toward said body, a bracket attached to each of the last named corner members adjacent each of said diaphragms, a connection between each of said brackets and the ends of the associated supports, one of said connections for each snubber permitting movement between the snubber and corner member, means connecting one of said snubbers to one of said supports, and means connecting the other of said snubbers to the other of said supports.

4. In a crane having a boom, said boom including four longitudinal corner members and diagonally extending connecting members connected to said corner members at panel points, a cable supported adjacent the free end of

said boom, a body and a pair of boom snubbers extending between said body and said boom intermediate the ends thereof; the improvement comprising a pair of diaphragms connected to said boom at spaced panel points with a panel point between the spaced panel points, each of said diaphragms including four angles connected to said corner members, a pair of longitudinal supports one associated with each of the corner members facing toward said body, a bracket attached to each of the last named corner members adjacent each of said diaphragms, a pin connection between each of said brackets and the ends of the associated supports, one of said brackets for each of said supports having a slot therein for receiving its associated pin, means connecting one of said snubbers to one of said supports, and means connecting the other of said snubbers to the other of said supports, the longitudinal axes of said snubbers being in general alignment with the panel point between the diaphragms.

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