July 7, 1953 L. S. JOHNSON 2,644,666

GIN POLE AND UNIVERSAL TOP ASSEMBLY THEREFOR

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Fig. 1.

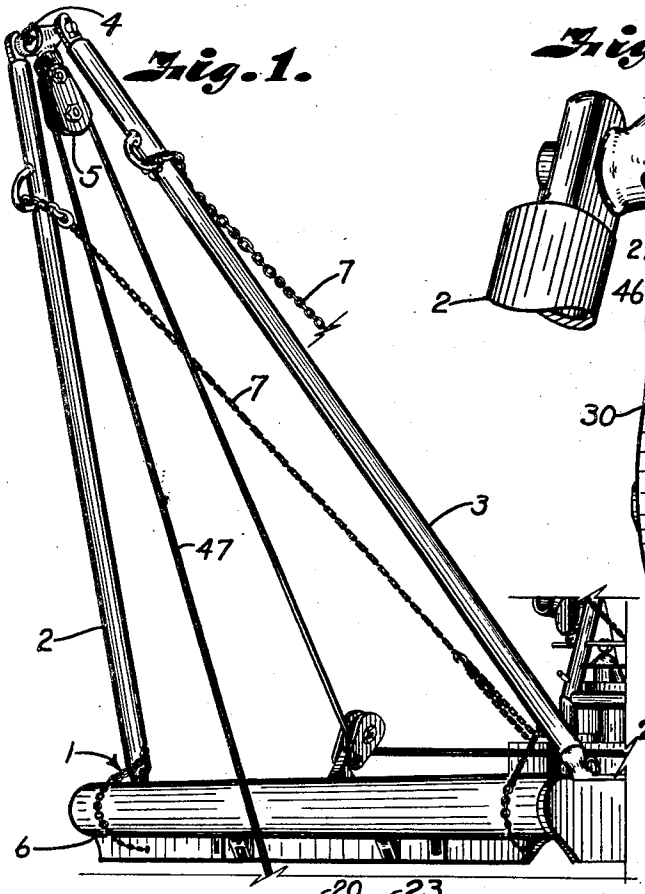


Fig. 2.

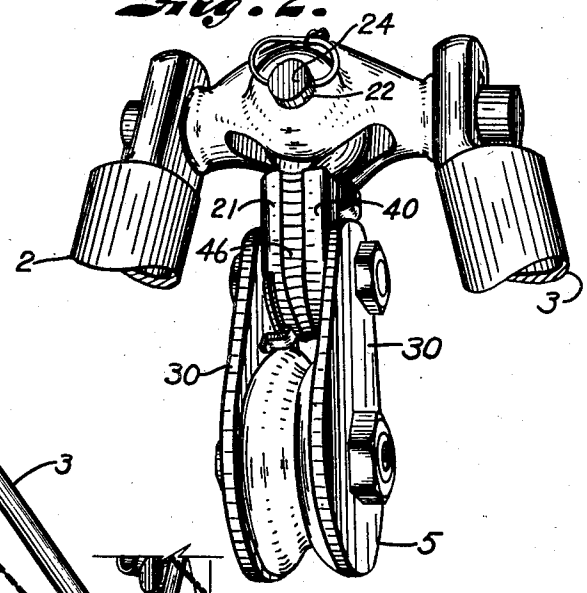


Fig. 4.

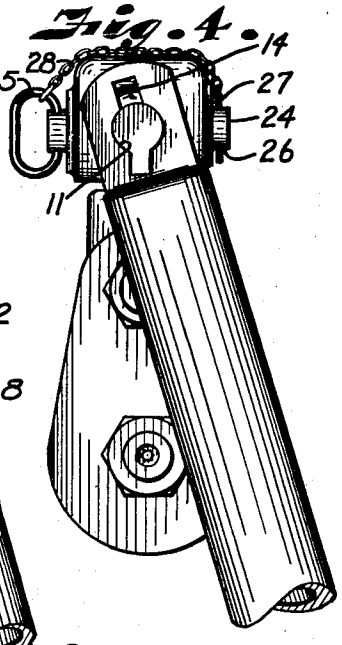
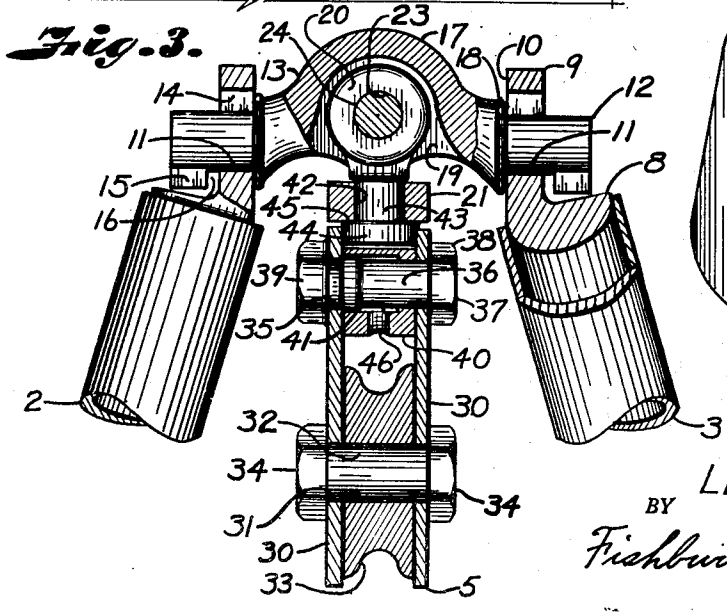


Fig. 3.



INVENTOR.
LEE S. JOHNSON
BY
Fishburn & Mullendore
ATTORNEYS

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Fig. 5.

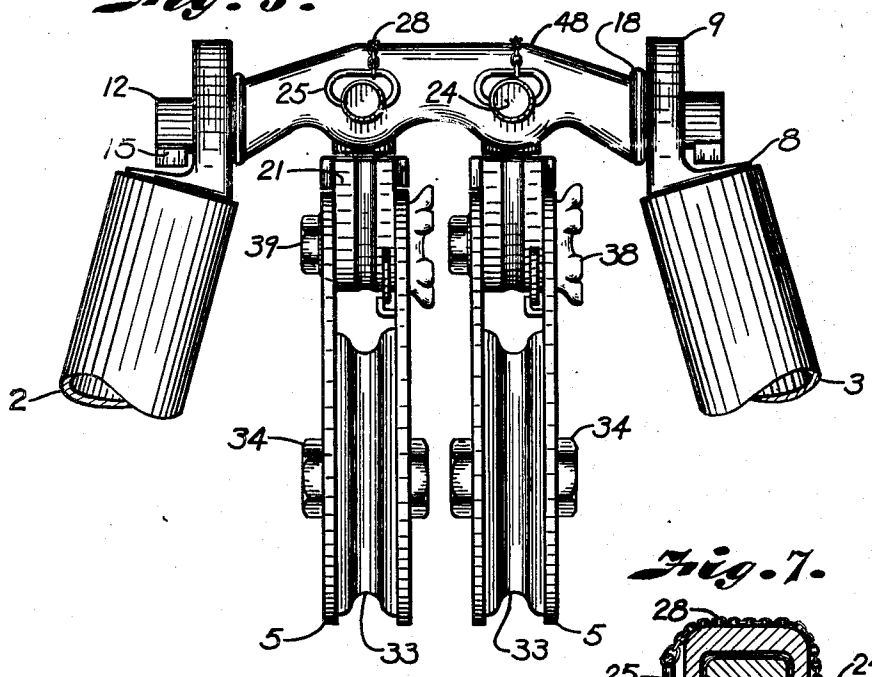


Fig. 7.

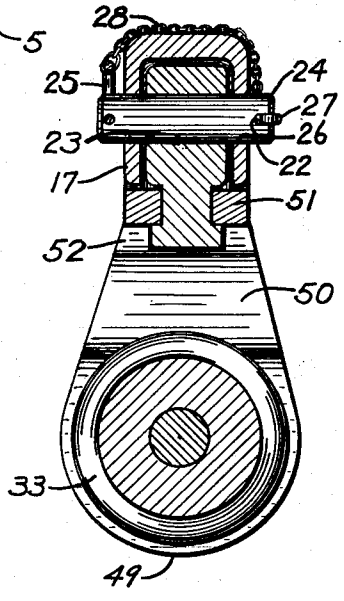
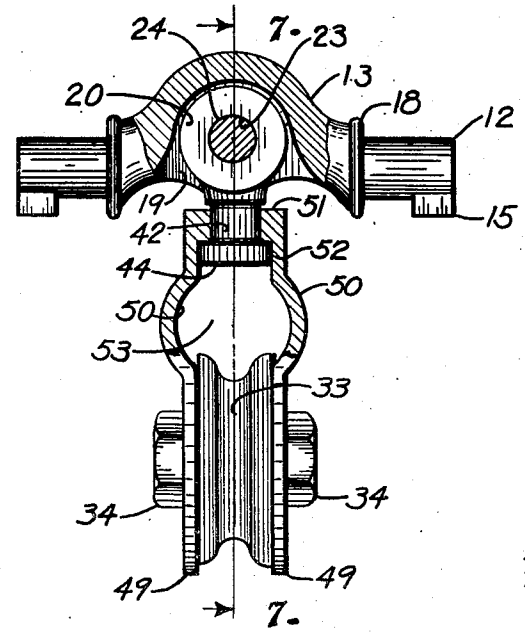


Fig. 6.



INVENTOR.
LEE S. Johnson.
BY
Fishburn & Mullendore
ATTORNEYS

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2,644,666

GIN POLE AND UNIVERSAL TOP ASSEMBLY THEREFOR

Lee S. Johnson, Tulsa, Okla.

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9 Claims. (Cl. 254—139)

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This invention relates to gin poles and like apparatus for lifting heavy objects, and more particularly to gin poles and a universal top assembly therefor.

Gin poles usually consist of two or more rigid poles pivoted and braced on a suitable support and connected at the upper ends thereof by suitable top irons which include U-shaped hangers or yokes which swing between the upper ends of the poles and depend from the axis of such swinging movement. A conventional snatch block having a hook on the upper end thereof is usually engaged with a hanger or yoke to suspend the snatch block therefrom. In many instances the location limits the height of the gin poles and the over-all length of the hanger or yoke, hook and snatch block which depend from the pivotal axis of the hanger limit the height to which a load may be hoisted for a given length of gin pole. Also when the load to be hoisted is off to one side, the snatch block is pulled at an angle wherein the line of the application of force to the hanger is below the pivotal axis thereof providing a leverage on the pole. This leverage tends to twist or bend the poles and reduces the permissible load that may be hoisted or moved under such conditions.

The objects of the present invention are to provide a gin pole and universal top assembly therefor which is more compact with an application of forces to the members thereof whereby heavier loads may be lifted without distortion of the gin poles; to provide a universal top assembly with a snatch block for gin poles which has a short over-all length of unit to increase the hoisting lift within the limitation of gin pole length; to provide such a top assembly which gives maximum flexibility for better distribution of load under the extreme conditions regardless of the angle of the line of force application; to provide a top assembly for gin poles wherein an eye swivelled on a snatch block is pivotally mounted for rocking movement about an axis perpendicular to and above the axis of the trunnions rotatably mounted at the upper ends of the gin poles; to provide a top assembly for gin poles with a plurality of snatch blocks attached for multiple ropes and/or universal action in two directions of operation at the same time; and to provide a universal top assembly for gin poles that is safe, durable and efficient in use with greater lift and hoisting ability for any given size of gin pole.

In accomplishing these and other objects of the present invention, I have provided improved

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details of structure, the preferred forms of which are illustrated in the accompanying drawings, wherein:

Fig. 1 is a perspective view of a gin pole and universal top assembly therefor embodying the features of the present invention and shown applied to a support such as the rear portion of a truck.

Fig. 2 is a detail perspective view of the upper portion of the gin pole and top assembly therefor.

Fig. 3 is an elevational view of the upper portion of the gin pole with portions of the top assembly and snatch block therefor broken away to better illustrate the structure thereof.

Fig. 4 is a side elevational view of the upper portion of the gin pole.

Fig. 5 is a front elevational view of the upper portion of the gin pole having a modified form of top assembly with a plurality of snatch blocks thereon.

Fig. 6 is an elevational view of a modified form of snatch block and trunnion housing, with portions broken away to better illustrate the structure thereof.

Fig. 7 is a vertical sectional view through the snatch block and trunnion housing on the line 7—7, Fig. 6.

Referring more in detail to the drawings:

1 designates a gin pole arrangement embodying the features of the present invention, and generally consisting of spaced upwardly converging pole members 2 and 3 with the upper ends connected by a top assembly 4 which includes a snatch block 5. The gin pole may be mounted on any suitable structure as, for example, on the rear end 6 of a truck, as illustrated in Fig. 1, wherein the lower ends of the pole members 2 and 3 are suitably mounted on the truck and chains or other brace members 7 connect the upper portion of the pole members to a suitable mechanism on said truck to support the pole members at a desired angular relation with the horizontal.

In the form of gin pole illustrated, the pole members 2 and 3 are metal tubes with pole caps 8 suitably secured as by welding in the upper ends thereof. The caps 8 in the respective pole members have upstanding bearing members or ears 9, said ears on the respective cap members preferably having substantially parallel inner faces 10 when the upper ends of the pole members are suitably spaced. The pole cap ears 9 have aligned bores 11 for receiving and rotatably mounting trunnions 12 of a top member 13. Slots 14 are arranged in the respective ears 9 and intersect the upper portion of the bores 11

whereby the bores and slots form keyhole openings. The trunnions 12 are substantially longer than the thickness of the ears 9 and lugs 15 are arranged on the end portions of said trunnions whereby the inner ends of the lugs normally are spaced slightly as at 16 from the outer faces of the ears 9, said lugs normally extending downwardly from the trunnions out of alignment with the slots 14 whereby the lugs serve as keepers which prevent the trunnions being pulled from the bores 11 except when the top member is rotated to align the lugs 15 with the slots 14.

The top member 13 includes an enlarged portion or housing 17 between the ears 9, said enlarged portion adjacent the inner ends of the trunnions 12 forming shoulders 18 adapted to engage the inner faces 10 of the ears 9 to maintain the upper ends of the pole members separated. The housing 17 of the top member is offset upwardly from the axis of the trunnions 12 or substantially diametrically opposite the lugs 15 and has a central recess 19 opening from the bottom of the housing for receiving an eye 20 of a swivel T assembly 21 of the snatch block 5. Bores 22 extend through the sides of the housing 17 in alignment with the opening 23 in the eye 20 for receiving a lock bolt 24 for pivotally mounting the eye on the top member for rocking movement about an axis transversely of the axis through the trunnions 12, the axis of the bolt 24 being above the axis of the trunnions, as illustrated in Fig. 3. One end of the bolt 24 is preferably provided with a ring 25 and the other end with an opening 26 for receiving a pin 27, the pin 27 preferably being connected to the ring 25 by means of a chain 28.

The snatch block 5 connected to the swivel T assembly 21 preferably consists of spaced side plates 30 having aligned bores 31 for mounting a spindle 32 on which is rotatably mounted a sheave 33 between the side plates. The spindle 32 is preferably provided with heads and nuts 34 to secure same in place. Aligned bores 35 are arranged in the side plates 30 in spaced relation to the bores 31 to receive the shank 36 of a bolt 37 having a head 38 normally engaging one of the plates 30. A nut 39 is secured as by welding to the other plate whereby the bolt may be unscrewed from the nut 39 and retracted sufficiently for one of the plates to be swung on the spindle 32 to permit a wire line or the like to be reeved around the groove in the sheave 33.

The swivel T assembly 21 includes a split housing 40 having a bore 41 through which the shank 36 extends to rotatably mount the housing. The housing also has a bore 42 extending perpendicular to the bore 41 and adapted to rotatably mount the housing on a spindle 43 which extends from the eye 20, said spindle having a head 44 arranged in a recessed portion 45 of the housing to retain the housing on the spindle. For simplicity of manufacture, the two pieces of the housing 40 are secured together and machined and then separated and arranged on the spindle whereby the spindle extends through the bore 42, then the two halves of the housing are welded as at 46 to form the complete swivel T assembly 21, which when mounted on the shank 36 and with the eye 20 rotatably mounted on the bolt 24 permits the swivel and snatch block to swing about the bolt 24, the snatch block to rotate about the spindle 43 and the lower portion of the snatch block to swing about the shank 36. Also the entire snatch block and top member 13 may swing about the axis of the trunnions 12 to provide a universal action in the top assembly of the gin pole.

When the gin pole and top assembly therefor are constructed and assembled as described and with a wire line or the like reeved through the snatch block and operating over the sheave 33, as illustrated in Fig. 1, one end of the wire line 47 may be connected to a suitable winch or the like and the other end to a load to be lifted, and pull on the wire line will then lift the load until upward movement is limited by the connection of the load engaging the lower end of the snatch block, this upper limit being greater than is possible with ordinary conventional structure having the same length gin poles due to the shortened distance between the lower end of the snatch block and the axis of the trunnions 11 made possible by the elimination of the conventional yoke on the top iron and hook on the snatch block. Also, when the load is to one side and the wire line connected thereto, the snatch block will tend to be pulled to one side, swinging about the bolt 24. The force for moving the load is applied in a line defined by the snatch block and extending through the bolt 24, but due to the axis of the bolt 24 being above the axis of the trunnions 12, the line of force applied will be closer to the pole cap members than is possible with a yoke and hook arrangement on conventional gin pole assemblies, and this reduced distance reduces the leverage applied to the top assembly by the forces acting on the load, thereby reducing the strain on the gin pole.

When it is desired to disassemble the top assembly from the pole members, the top member 13 is rotated to align the lugs 15 with the slots 14 in the ears 9 and the upper ends of the pole members separated to move the trunnions and lugs through the keyhole opening to completely remove the top member and snatch block from the upper end of the gin pole.

In the form of the invention illustrated in Fig. 5, the pole members 2 and 3 and pole caps 8 are of the same construction as described relative to the structure shown in Figs. 1 to 4 inclusive. The top member 48 is preferably longer between the trunnions 12 whereby the upper ends of the pole members 2 and 3 are spaced apart sufficiently to accommodate two snatch block structures 5 on the top member 48. The snatch blocks, swivel T assembly and the mounting thereof on the top member are substantially the same as in the structure shown in Fig. 3. This arrangement of a plurality of snatch blocks on the top member 48 provides a universal action for each of the snatch blocks whereby said universal action may be in two directions at the same time. A single line may be reeved through both of the snatch blocks whereby they act together with other multiple sheaves to provide a form of block and tackle, or different wire lines may be reeved on the respective snatch block sheaves to provide a variety of lifting and moving actions.

In the form of the invention illustrated in Figs. 6 and 7, the top member 13 and trunnions thereon and the eye 20, spindle 42 and head 44 are constructed and assembled in the same manner as illustrated and described in connection with the form of the invention shown in Figs. 1 to 4 inclusive. The over-all length of the top assembly is shortened by the elimination of the bolt 37. In this form of the invention, the side plates 49 have parallel portions between which

the sheave 33 is rotatably mounted. The upper portion of the plates 49 is curved outwardly and inwardly as at 50, terminating in upwardly extending portions 51 having an inner shank to engage around the spindle 42 and form a shoulder 52 engaging the head 44. The upper portions 51 are arranged around the spindle and then said portions welded together to form a swivel housing whereby the plates and sheave carried thereby are rotatable on the spindle 42. The outwardly and inwardly curved portions 50 provide an enlarged passage 53 between the sheave and spindle head 44 of suitable size whereby chains and the like on a hoisting line may be inserted therethrough in reeving the line on the sheave. This structure provides the universal action in the gin pole top assembly with a minimum of over-all length for maximum lift of load.

It is believed obvious that I have provided a gin pole and top assembly therefor which provides a universal action for reduced stress on the pole members and also permits a relatively high lift, particularly where there are limitations on the pole lengths.

What I claim and desire to secure by Letters Patent is:

1. In a gin pole structure having spaced upwardly converging pole members with aligned bearing members adjacent the upper ends thereof, a top member arranged between the upper ends of the pole members, oppositely extending trunnions on the top member and rotatably mounted in the bearing members, means on the trunnions normally retaining the trunnions in the bearing members, a depending spindle swingingly mounted on the top member between the pole members with the axis of the swinging movement of said spindle above the axis of the trunnions, a snatch block having a sheave rotatably mounted at one end thereof, and means on the other end of the snatch block rotatably mounted on the spindle to form a swivel connection between the snatch block and spindle with the axis of rotation of the snatch block perpendicular to the axis of swinging movement of the spindle.

2. In a gin pole structure having spaced upwardly converging pole members with upstanding ears on the upper ends thereof and aligned bearing openings in said ears, a top member arranged between the ears of the pole members and having portions engaging said ears to maintain the spaced relation of the upper ends of the pole members, oppositely extending trunnions on the top member and rotatably mounted in the bearing openings, means on the trunnions normally retaining the trunnions in the bearing openings, a depending spindle swingingly mounted on the top member between the pole members with the axis of the swinging movement of said spindle above the axis of the trunnions, a snatch block having a sheave rotatably mounted at one end thereof, and means rotatably mounted on the snatch block adjacent the other end thereof and swivelled on the spindle with the axis of the swivelling of the snatch block perpendicular to the axis of swinging movement of the spindle.

3. In a gin pole structure having spaced upwardly converging pole members with upstanding ears on the pole members having aligned bearing openings therein, a top member arranged between said ears and having portions engaging same to maintain the spaced relation of the upper ends of the pole members, oppositely extending trunnions on the top member rotatably mounted in the bearing openings, said top member having a downwardly opening recess therein between the pole members and a transverse bore intersecting said recess with the axis of said bore perpendicular to and above the axis of the trunnions, a bolt extending through the bore and secured therein, a depending spindle swingingly mounted on the bolt, a snatch block having a sheave rotatably mounted at one end thereof, and means on the other end of said snatch block rotatably mounted on the spindle to form swivel connection therewith whereby the axis of rotation of the snatch block is perpendicular to the bolt.

4. In a gin pole structure having spaced upwardly converging pole members with upstanding ears on the pole members having aligned key-shaped bearing openings therein, a top member arranged between said ears and having portions engaging same to maintain the spaced relation of the upper ends of the pole members, oppositely extending trunnions on the top member rotatably mounted in the bearing openings, lugs adjacent the outer ends of the trunnions adapted to pass through the key-shaped openings and normally out of registry with the slotted portion thereof to retain the trunnions in the bearing openings, said top member having a downwardly opening recess therein between the pole members and a transverse bore intersecting said recess with the axis of said bore perpendicular to and above the axis of the trunnions, a bolt extending through the bore and secured therein, a depending spindle swingingly mounted on the bolt, a snatch block having a sheave rotatably mounted at one end thereof, and means on the other end of said snatch block rotatably mounted on the spindle to form swivel connection therewith whereby the axis of rotation of the snatch block is perpendicular to the bolt.

5. In a gin pole structure having spaced upwardly converging pole members with upstanding ears on the pole members having aligned bearing openings therein, a top member arranged between said ears and having portions engaging same to maintain the spaced relation of the upper ends of the pole members, oppositely extending trunnions on the top member rotatably mounted in the bearing openings, means on the outer ends of the trunnions to retain the trunnions in the bearing openings, said top member having downwardly opening recesses therein between the pole members and transverse bores intersecting said recesses with the axes of said bores perpendicular to and above the axis of the trunnions, bolts extending through the bores and secured therein, depending spindles swingingly mounted on the bolts, snatch blocks each having sheaves rotatably mounted at one end thereof, and means on the other ends of said snatch blocks rotatably mounted on the respective spindles to form swivel connections therewith whereby the axis of rotation of the snatch blocks is perpendicular to the respective bolts.

6. In a gin pole structure having spaced upwardly converging pole members, pole caps secured to the upper ends of the pole members, upstanding ears on the pole caps and having aligned key-shaped bearing openings therein, a top member arranged between said ears and having portions engaging same to maintain the spaced relation of the upper ends of the pole members, oppositely extending trunnions on the

top member rotatably mounted in the bearing openings, lugs adjacent the outer ends of the trunnions adapted to pass through the key-shaped openings and normally out of registry with the slotted portion thereof to retain the trunnions in the bearing openings, said top member having downwardly opening recesses therein between the pole members and transverse bores intersecting said recesses with the axes of said bores perpendicular to and above the axis of the trunnions, bolts extending through the bores and secured therein, depending spindles swingingly mounted on the bolts, snatch blocks each having sheaves rotatably mounted at one end thereof, and means on the other ends of said snatch blocks rotatably mounted on the respective spindles to form swivel connections therewith whereby the axis of rotation of the snatch blocks is perpendicular to the respective bolts.

7. A gin pole structure comprising, a support, spaced upwardly converging pole members mounted on said support, upstanding ears on the pole members and having aligned bearing opening therein, a top member arranged between said ears and having portions engaging same to maintain the spaced relation of the upper ends of the pole members, oppositely extending trunnions on the top member rotatably mounted in the bearing openings, said top member having a downwardly opening recess therein between the pole members and a transverse bore intersecting said recess with the axis of said bore perpendicular to and above the axis of the trunnions, a bolt extending through the bore and secured therein, a snatch block having a sheave rotatably mounted at one end thereof, and means swivelled on the other end of said snatch block and rotatably mounted on the bolt.

8. A gin pole structure comprising, a support, spaced upwardly converging pole members mounted on said support, pole caps secured to the upper ends of the pole members, upstanding ears on the pole caps and having aligned key-shaped bearing openings therein, a top member arranged between said ears and having portions engaging same to maintain the spaced relation of the upper ends of the pole members, oppositely extending trunnions on the top member rotatably mounted in the bearing openings, lugs adjacent the outer ends of the trunnions adapted to pass through the key-shaped openings and normally out of registry with the slotted portions thereof to retain the trunnions in the bearing openings, said top member having downwardly opening recesses therein between the pole members and transverse bores intersecting said recesses with the axes of said bores perpendicular to and above the axis of the trunnions, bolts extending through the bores and secured therein, depending spindles swingingly mounted on the bolts, snatch blocks each having sheaves rotatably mounted at one end thereof, and means on the other ends of said snatch blocks rotatably mounted on the respective spindles to form swivel connections therewith whereby the axis of rotation of the snatch blocks is perpendicular to the respective bolts.

9. In a gin pole structure having spaced upwardly converging pole members with aligned bearing members adjacent the upper ends thereof, a top member between the upper ends of the pole members, oppositely extending trunnions on the top member and rotatably mounted in the bearing members, a depending spindle swingingly mounted on the top member between the pole members with the axis of the swinging movement of said spindle above the axis of the trunnions, a snatch block having a sheave rotatably mounted at one end thereof, and means rotatably mounted on the snatch block adjacent the other end thereof and swivelled on the spindle with the axis of the swivelling of the snatch block perpendicular to the axis of the swinging movement of the spindle.

LEE S. JOHNSON.

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