BELL SYSTEM PRACTICES
Outside Plant Construction and Maintenance

SECTION G92.330.1
Issue 1, November, 1953
AT&T Co Standard

POLE DERRICKS
T TYPE

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1. GENERAL

1.01 This section replaces Section J6.139.

1.02 This practice covers the procedures for erecting, dismantling and carrying pole derricks designated as T type derricks.

1.03 These derricks consist of a main leg or boom made up of two parts, a side leg, a front brace, and a prop with extension and spacers for supporting the derrick head. Derricks now in use have two types of front braces, (1) a spring loaded type which attaches to a bracket on the truck body floor and serves only as a safety leg to keep the derrick from swinging over the truck, and (2) a rigid type which attaches to the winch drive housing and serves as a safety leg and also as a push brace, when the collar is properly set.

1.04 The code letters of the T type derricks are T and T45. These derricks are similar. However, the upper section of the main leg or boom is two feet longer on the T45 derrick.

1.05 There are two positions in which the derrick may be operated, the **truck** position when the derrick is supported entirely from the truck and the **ground** position when the prop is attached to the derrick head and used as a stiff leg to support the derrick head instead of holding it with the boom line.

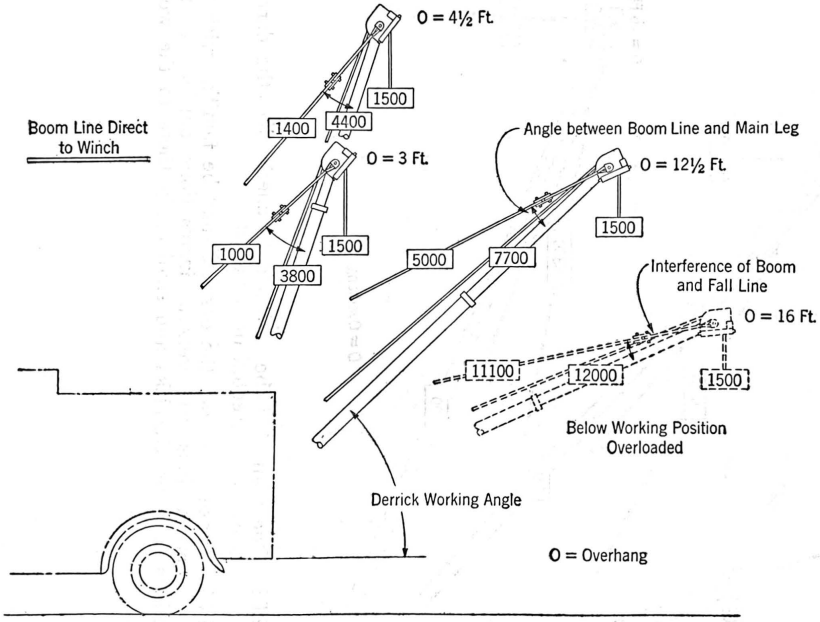
1.06 The derrick has a telescoping boom which can be adjusted to three different lengths. The derrick is raised and lowered by the line from the small drum of the winch, giving considerable variation in the overhang and height of the derrick.

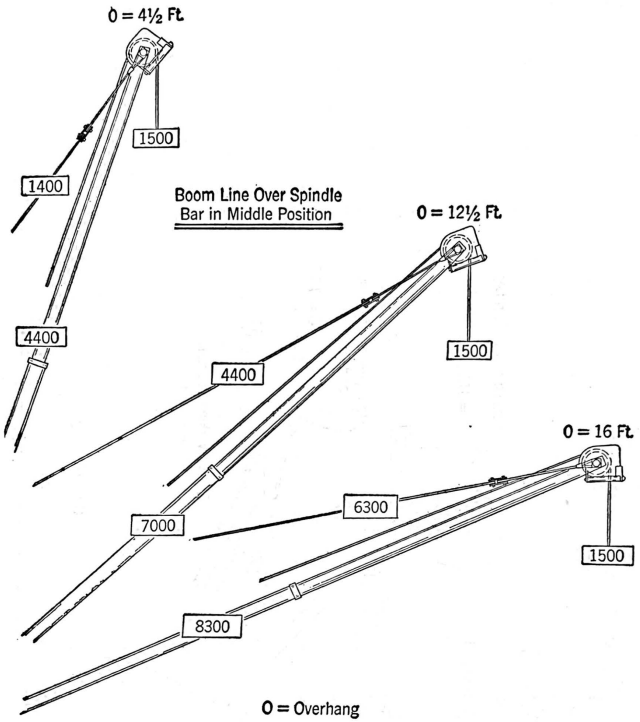
2. SAFETY PRECAUTIONS

2.01 Operate the derrick with the **minimum overhang** that is adaptable to the particular job with the **working angle as steep as practicable** so that the stress in the boom line, truck chassis and derrick members is at a minimum.

2.02 When this derrick is used to suspend a small earth-boring machine such as a Tel-E-Lect or PE digger, run the boom line over the sheave on the spindle bar in the middle position to minimize the stress in the boom line.

2.03 The stress in the main leg of the derrick and in the boom line is affected considerably by the derrick working angle, which is the angle formed by the truck bed and the main leg, and also by the angle formed by the main leg and the boom line. As either, or both, of these angles is decreased, by extending the boom or by lowering the derrick, the stress in both the main leg and boom line is increased rapidly as shown in the following figure.


O = 4½ Ft.
1500
1400
4400
Boom Line Direct
to Winch
O = 3 Ft.
1000
1500
3800
Angle between Boom Line and Main Leg
O = 12½ Ft.
1500
5000
7700
Interference of Boom
and Fall Line
O = 16 Ft.
11100
12000
1500
Below Working Position
Overloaded
Derrick Working Angle
O = Overhang

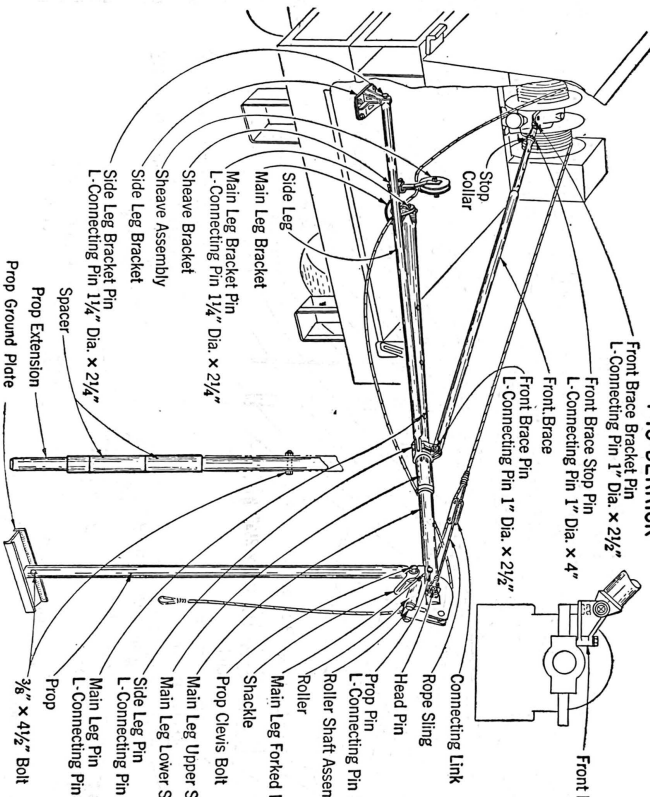


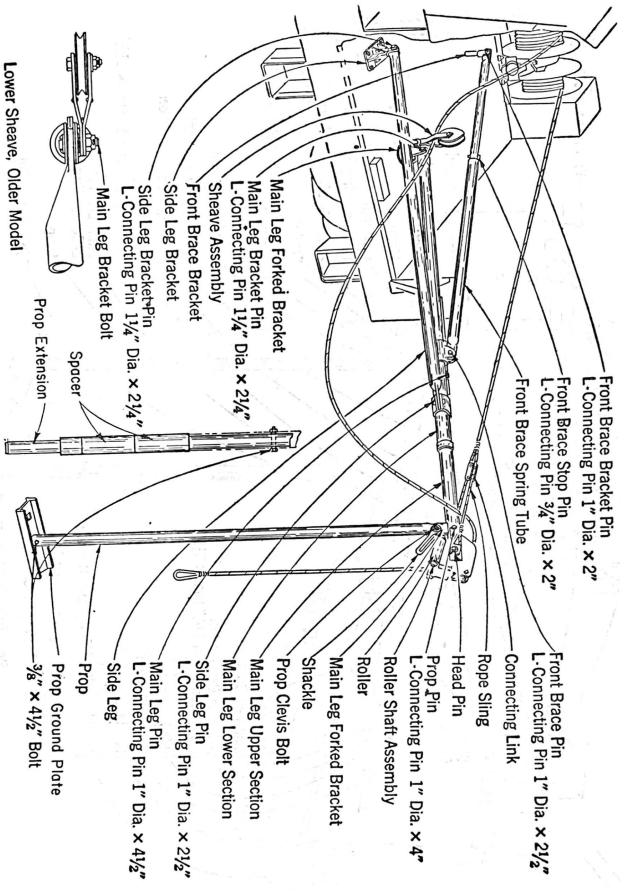
2.04 One man shall be assigned to check that the derrick is properly erected or installed.

2.05 Those operating the derrick shall be familiar with the precautions and general instructions outlined in the sections on Pole Derricks and shall apply them to the work.

3. NAMES OF DERRICK PARTS

3.01 The following figure shows the names of the derrick parts which may be required as replacement parts.



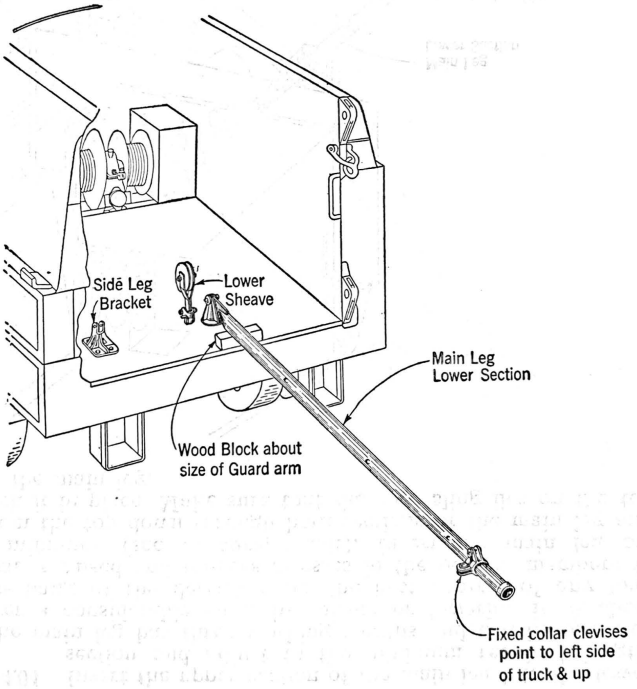


4. ERECTING THE DERRICK. TRUCK POSITION

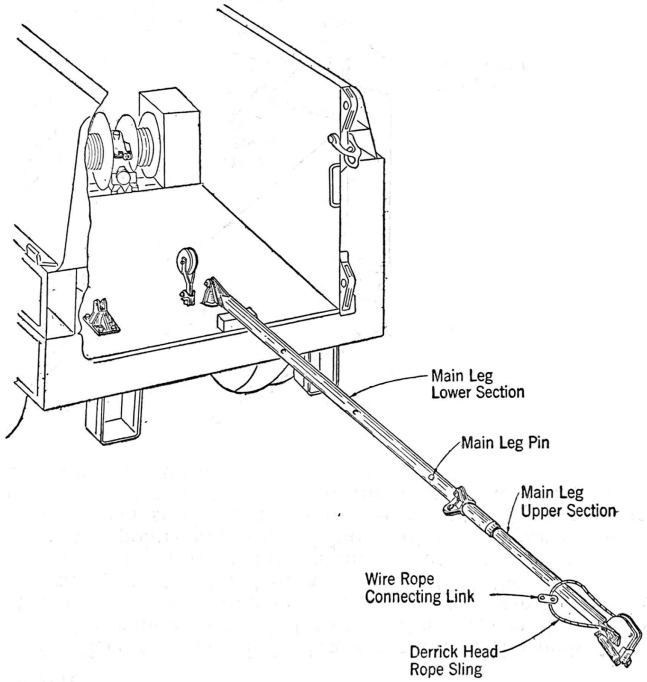
4.01 To erect the derrick in the truck position remove the derrick members from the carrying position on the truck and lay them out on the ground behind the truck. Inspect the members as outlined in the section on Pole Derricks, General to see that they are in good working condition.

4.02 If the main leg bracket and the sheave bracket have been removed from their mounting structure, take them from their carrying position on the truck and insert them in their respective places in the truck platform. Each bracket is secured by turning it 90° to lock it into the mounting structure.

4.03 Place the end of the lower section of the main leg in the mounting bracket so that the holes in the leg and in the bracket are in alignment and place the main leg bracket pin securely in the bracket. Make sure that the fixed collar clevis for the side leg points to the left and the clevis for the front brace points up. A wood block, of the proper height to hold the lower section horizontal, placed under the derrick leg on the platform at the rear of the truck will assist in the assembling operation.

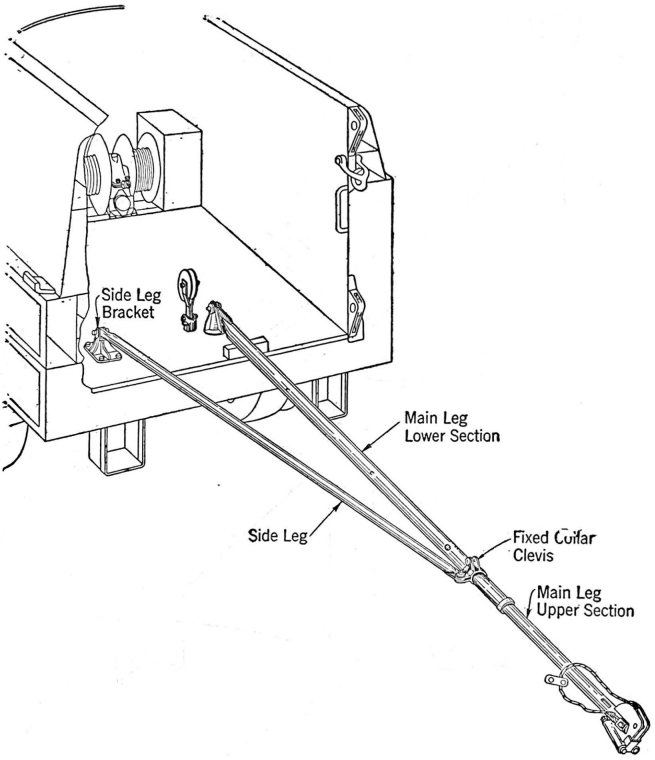


4.04 Insert the upper section of the main leg into the lower section and adjust to the minimum required length. The main leg has three working lengths and can be operated over a considerable angle by raising or lowering it. A short overhang of the derrick gives the best control of any load that is raised and reduces stresses in the derrick members to a minimum (see Paragraph 2.01). Insert the main leg pin from the top down through both sections of the main leg and lock it in place. Make sure that the rope sling lies on the top of the main leg.



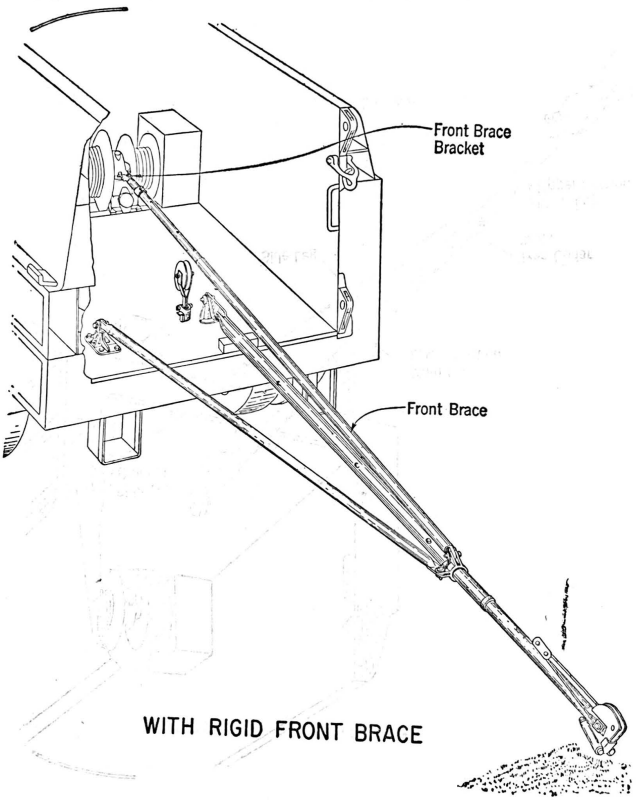
4.05 Place the lower end of the side leg in its mounting bracket at the left side of the truck platform and insert the side leg bracket connecting pin in the bracket with the head toward the center of the truck. Lock the pin in place.

4.06 Attach the upper end of the side leg to the clevis with the side leg connecting pin so that the head of the pin is up. Lock the pin in place.

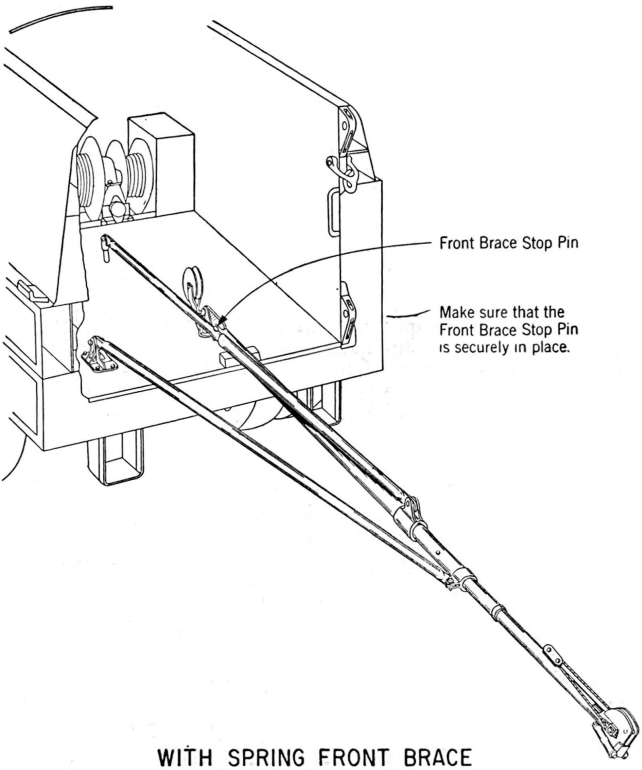


4.07 Attach the upper end of the front brace to the clevis with the front brace connecting pin. Insert this pin with the head toward the left and lock the pin.

4.08 Attach the lower end of the brace to its mounting bracket with the front brace bracket connecting pin. Insert the pin with the head toward the left and lock it in place.



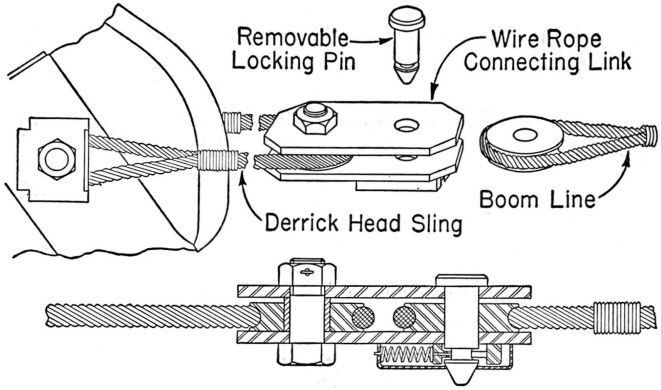
WITH RIGID FRONT BRACE



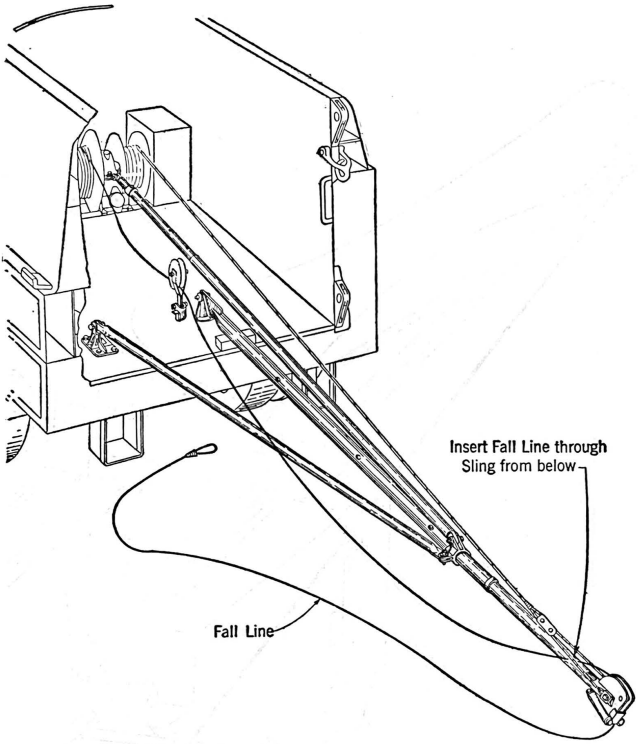
WITH SPRING FRONT BRACE

4.09 Do not remove the stop pin of the spring type front brace. This pin prevents the derrick from being pulled past the vertical position toward the truck cab when raising a load and must always be in place when lifting a load.

4.10 Remove the locking pin from the wire rope connecting link of the rope sling and take out the roller. Place the roller inside the eye of the boom line and place the roller and eye between the plates of the connecting link. Replace the locking pin. Make sure the pin is thrust entirely in and locked in position.



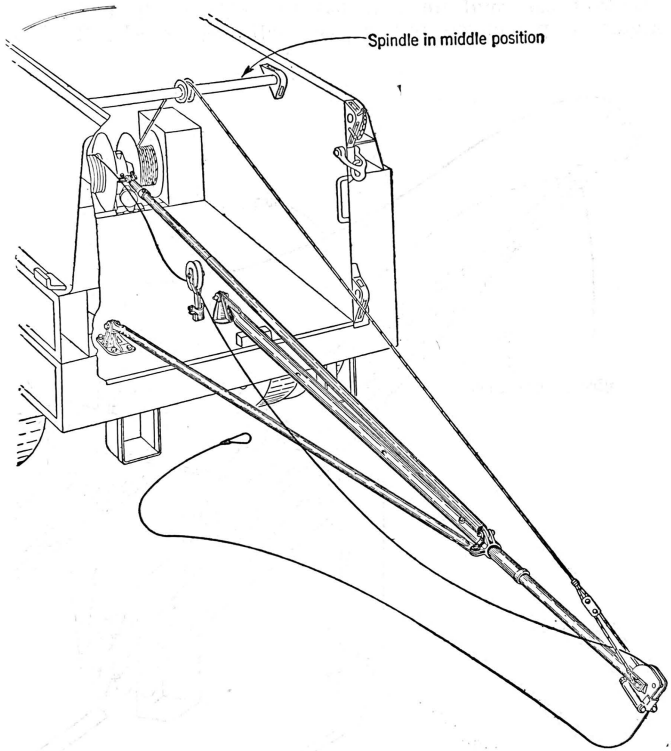
4.11 Pass the fall line, which is the winch line from the large drum, through the lower sheave near the front end of the main leg. Then pass it through the rope sling from the under side and over the derrick sheave from the top down. Pull fall line slack through the head sheave.



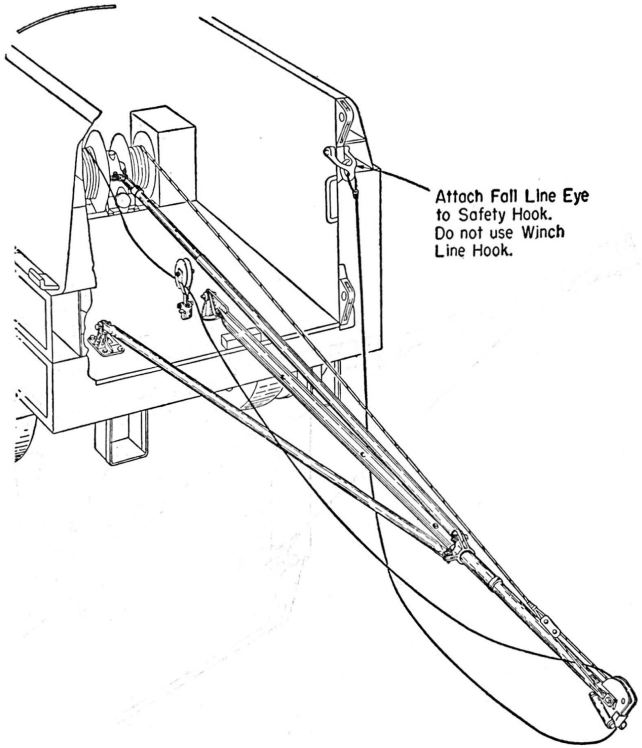
4.12 Before raising the derrick the completed assembly shall be checked to see that all pins are properly placed and locked.

4.13 There are two methods of raising the derrick as shown in the following paragraphs, "boom line over middle spindle" and "fall line and boom line."

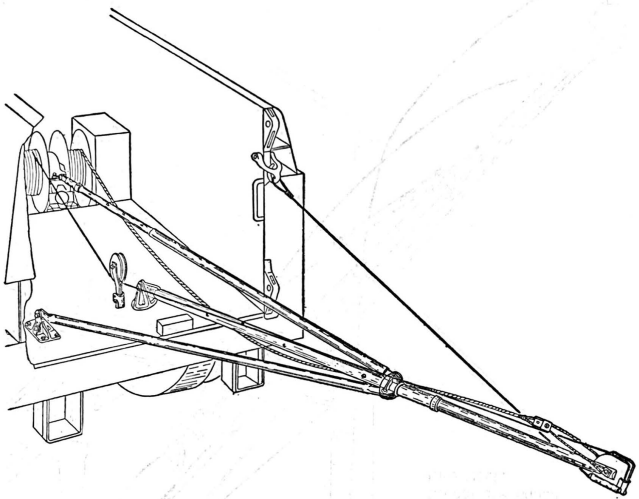
4.14 **Boom Line over Middle Spindle Method:** On a truck equipped with a middle spindle position pass the boom line over the sheave on the spindle as shown in the following figure and raise the derrick slowly using the boom line only. The spindle need not be removed to operate the derrick except for very short overhang positions where the spindle bar would interfere with the front brace.



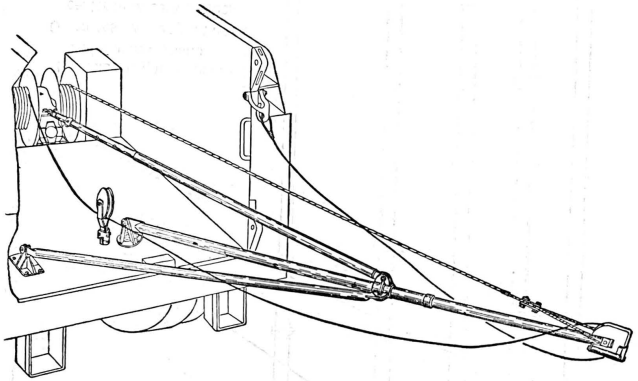
4.15 **Fall Line and Boom Line Method:** Attach the eye of the fall line to the safety hook on the rear of the truck body. Do not use the winch line hook.



4.16 Raise the derrick by taking up slowly on the fall line until the derrick head is about two feet above the level of the truck floor. Watch the derrick to be sure that the fall line does not catch on the pins or other projections on the derrick and that the fall line runs freely in the lower sheave. Do not raise the derrick any further in this manner, since further raising with the fall line would tend to pull the derrick sideways.



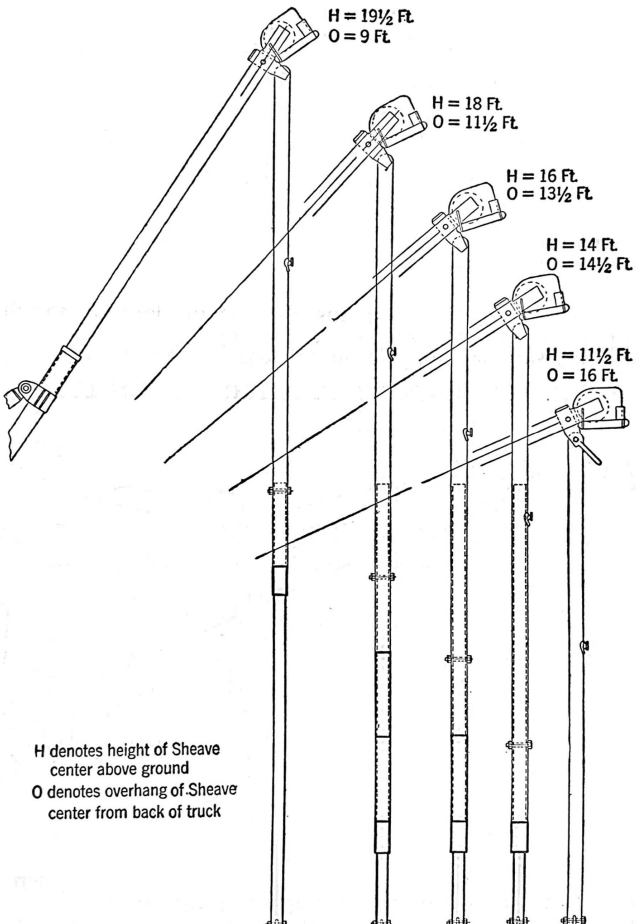
4.17 Raise the derrick a few feet further by taking up slowly on the boom line which will release the strain on the fall line.



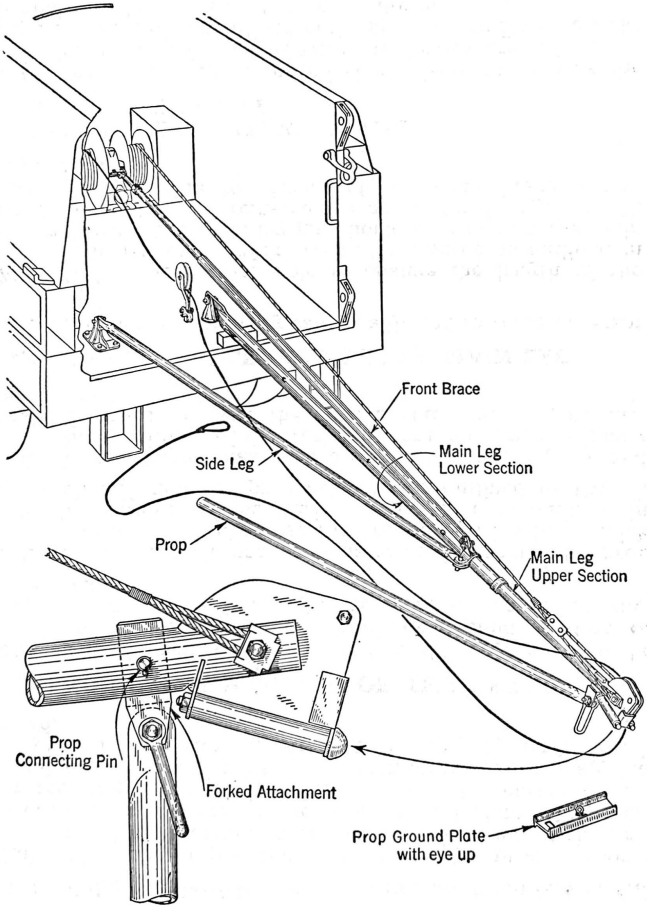
5. ERECTING THE DERRICK. GROUND POSITION

5.01 The derrick in the ground position requires the same assembly as for the truck position and in addition requires the prop for use as a stiff leg.

5.02 Assemble the prop using the extension and spacers to secure the height desired.



5.03 Before the derrick is raised, attach the prop to the main leg just below the derrick head by means of the forked attachment, which is normally left attached to the prop by the prop connecting pin. Make sure that the pin is securely through the forked attachment and the main leg and is locked in position.



5.04 Raise the derrick as outlined in Paragraph 4.14 or 4.15.

5.05 Place the prop ground plate under the prop and lower the derrick making sure that the lower end of the prop fits down over the eye on the prop ground plate. Make sure that the prop ground plate rests level and securely on the ground so that it will not shift its position as a load is applied. The ground plate may be attached to the prop by a bolt if desired.

6. CHANGING THE POSITION OF THE DERRICK

6.01 The derrick when equipped with the prop can be operated in either the truck or ground position or changed from one position to the other by raising or lowering the derrick.

6.02 If the derrick has been assembled without the prop and it is desired to use the ground position the derrick should be lowered to the horizontal position as outlined in Paragraph 9.01 and the prop attached as outlined in Part 5.

6.03 If the derrick has been assembled with the prop, and the remainder of the work will not require its use it may be advantageous to lower the derrick and remove it, as outlined in Part 10.

7. ADJUSTING THE LENGTH OF THE MAIN LEG

7.01 The derrick main leg can be adjusted to three different lengths.

7.02 If it is found desirable to change the length of the main leg the derrick should be lowered as outlined in Paragraph 9.01. The main leg pin should be removed, the main leg adjusted and the pin reinserted as outlined in Paragraph 4.04. It may be desirable to disconnect the front brace during this procedure.

8. MOVING THE TRUCK WITH THE DERRICK ERECTED

8.01 The truck may be moved short distances such as the length of a few spans with the derrick erected. All of the special precautions outlined in the practices on Pole Derricks that apply to this work shall be carefully observed.

8.02 When in the truck position the derrick should be at the maximum working angle and lowered only as necessary to clear overhead structures. If it is found necessary to move the truck with the derrick suspended below the normal working angle, the movement should be very slow so that no

excessive stresses in the winch or derrick will develop due to shock load from uneven ground conditions. These stresses may be excessive even though the derrick is carrying no load other than its own weight. Attach a red flag or light to the derrick as required by highway regulations.

8.03 When the derrick is erected for use in the ground position it will be necessary to raise the derrick so that the prop will clear the ground. The prop should be supported by a rope attached to its lower end and tied to the main leg.

9. DISMANTLING THE DERRICK. TRUCK POSITION

9.01 Before lowering the derrick from the truck position make sure that no person or property is under the derrick. The method of lowering should be the reverse of the method used in raising the derrick. (See Paragraphs 4.14 to 4.17)

9.02 When the derrick has been lowered, dismantle the members by detaching them in the following order:

Fall Line
Boom Line
Front Brace
Upper Section Main Leg
Side Brace
Lower Section Main Leg

10. DISMANTLING THE DERRICK. GROUND POSITION

10.01 To take the derrick down when erected for use in the ground position tie a rope to the lower end of the prop and tie the other end of the rope to the side leg of the derrick.

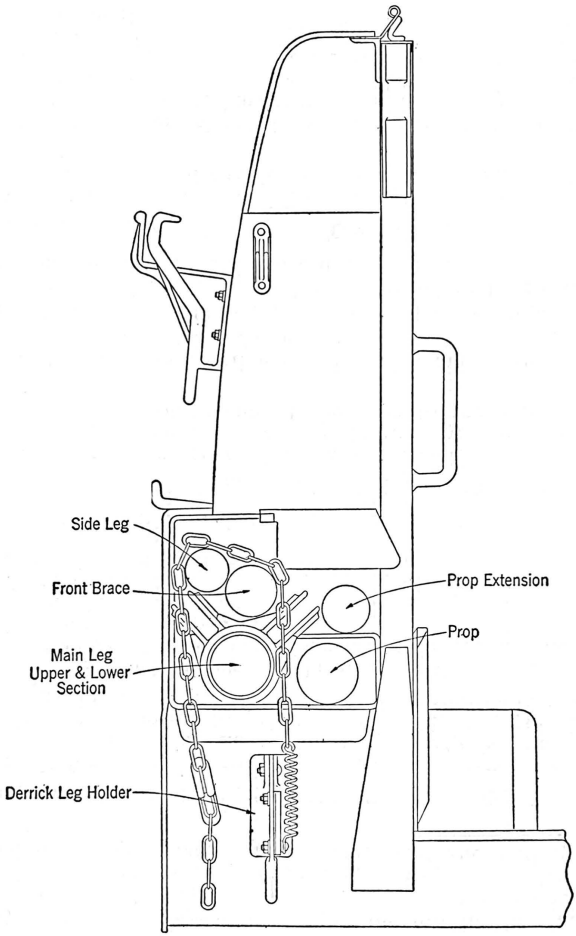
10.02 The procedure outlined in Part 9 should then be followed in lowering the derrick.

10.03 The prop should be removed from the derrick assembly before the lines have been removed and before the other members of the derrick are disassembled.

11. CARRYING THE DERRICK ON THE TRUCK

11.01 For carrying the derrick on most construction trucks it will be found desirable to store the main leg assembled but fully telescoped.

11.02 The members should be placed in the proper carrying position. A typical arangement is shown in the following figure. The main derrick members may be placed in the truck from the rear or front as desired. Protect the rear end of the projecting derrick legs with a red flag or light as required by highway regulations.



11.03 After all derrick members have been properly placed on the truck they should be fastened in position with the pole derrick leg holders which are parts of the truck.