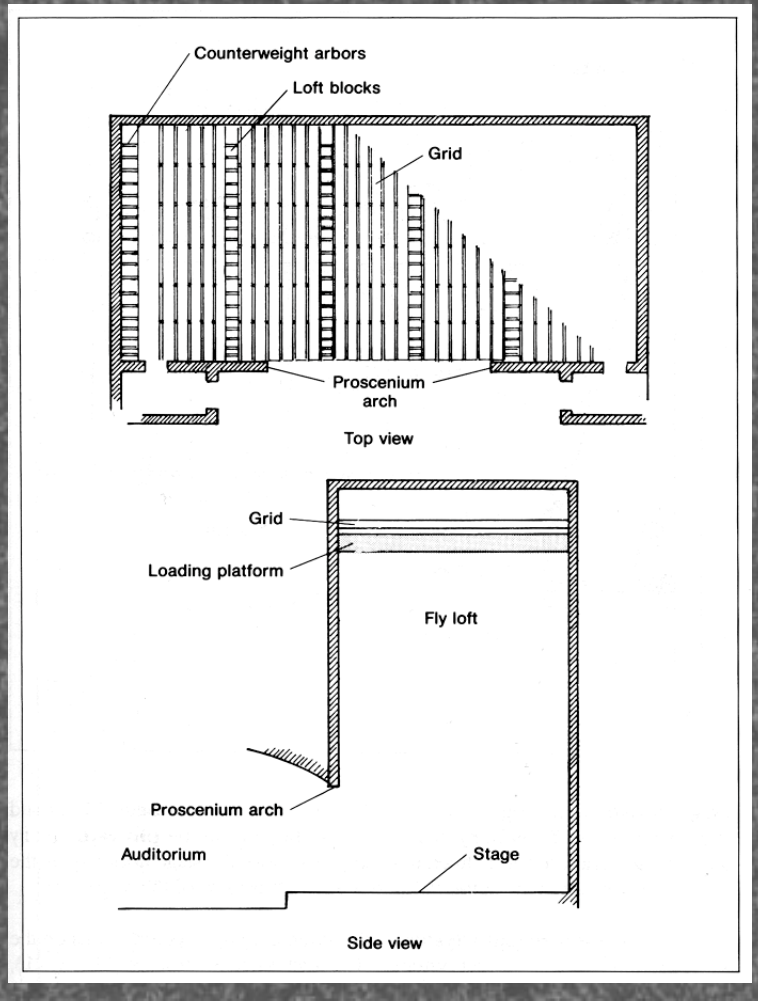
Elementary Stagecraft

Rigging Systems

Rigging Systems

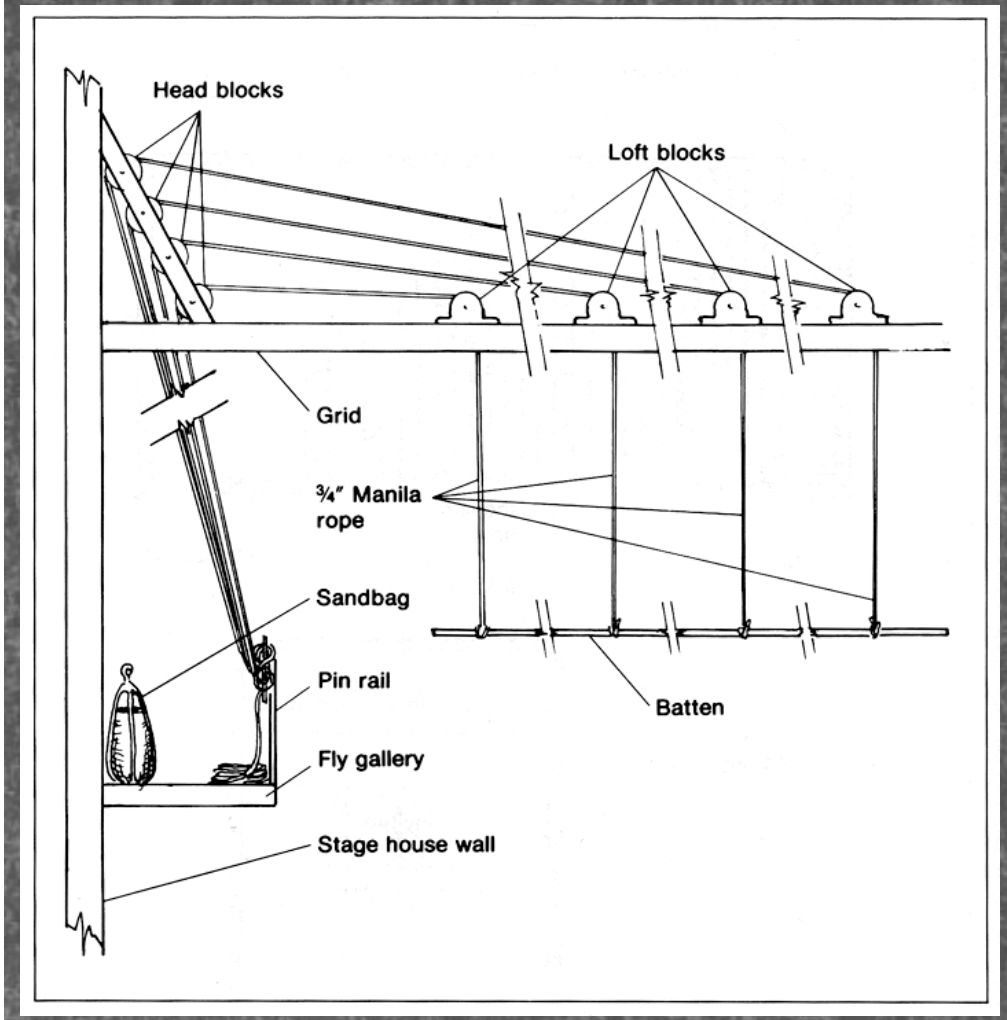
- Rigging systems are equipment used to ***fly*** or support scenery or drapes and create special effects
- Housed in the ***fly loft*** or ***fly tower***, supported by the ***grid***



Hemp System

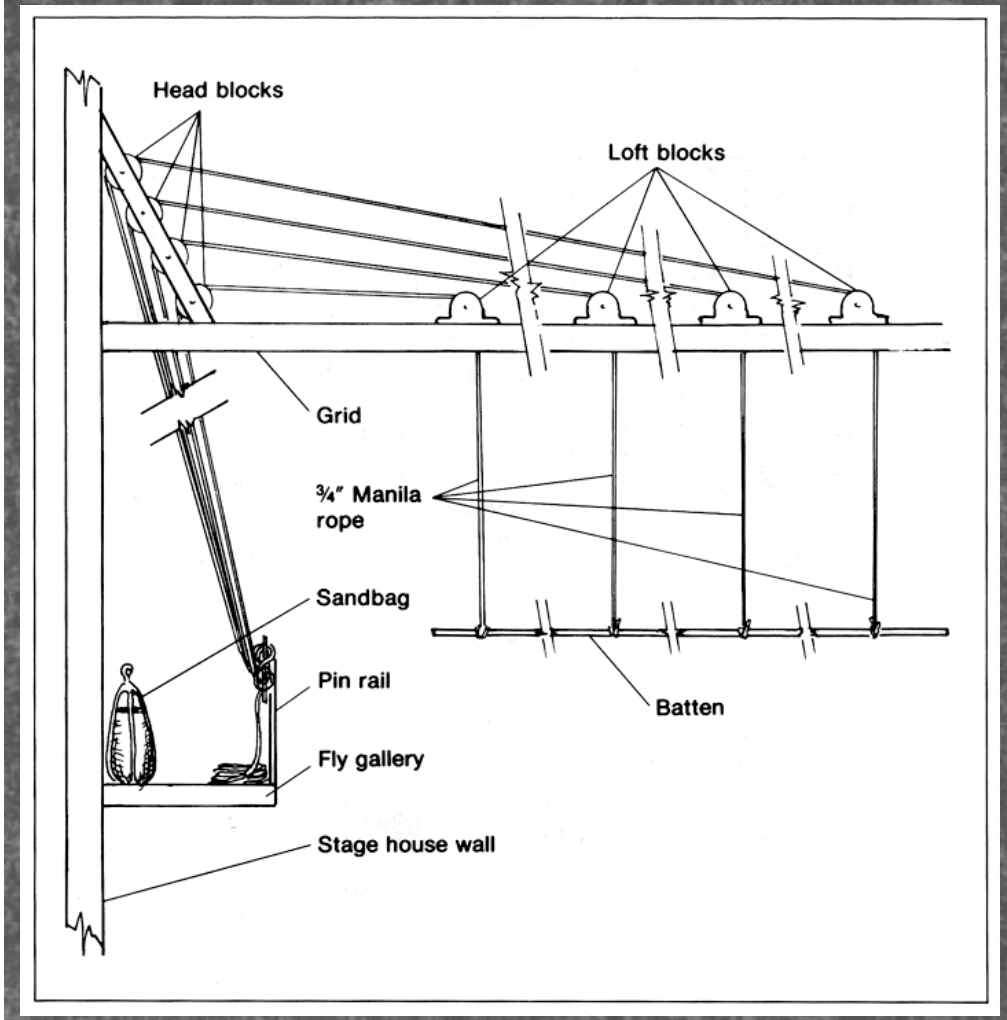
- Also called a ***rope set***, oldest rigging system, still in use today
- All other systems build upon these basic principles:
  - traditionally uses natural fiber rope, typically ¾" Manila (not Hemp), modern systems use synthetic rope

Hemp System



- Rope is attached to a ***load***, if a single line is used it's called a ***spot line***
- Multiple lines can be used to support a wooden rail or pipe called a ***batten***
- The ***loft block*** or ***spot block*** is a pulley that sits on the grid and changes the direction of the rope offstage
- The ***head block*** changes the rope direction down towards the ***fly gallery*** where the operator is, head block can have multiple ***sheaves*** to accommodate lines to hang battens

Hemp System



- The ***head block*** changes the rope direction down towards the ***fly gallery*** where the operator is, head block can have multiple ***sheaves*** to accommodate lines to hang battens
- The rope is tied off to the ***pin rail***, originally wooden pins set into holes on a rail, can be welded cross pieces
- If the load weight is more than a couple of stagehands can handle, ***sandbags*** can be attached to the line to balance the system

Hemp System

Battens (University Theatre)

Hemp System

Grided Battens (University Theatre)

Hemp System

Loft Blocks (University Theatre)

Hemp System

Loft Blocks and Head Blocks (University Theatre)

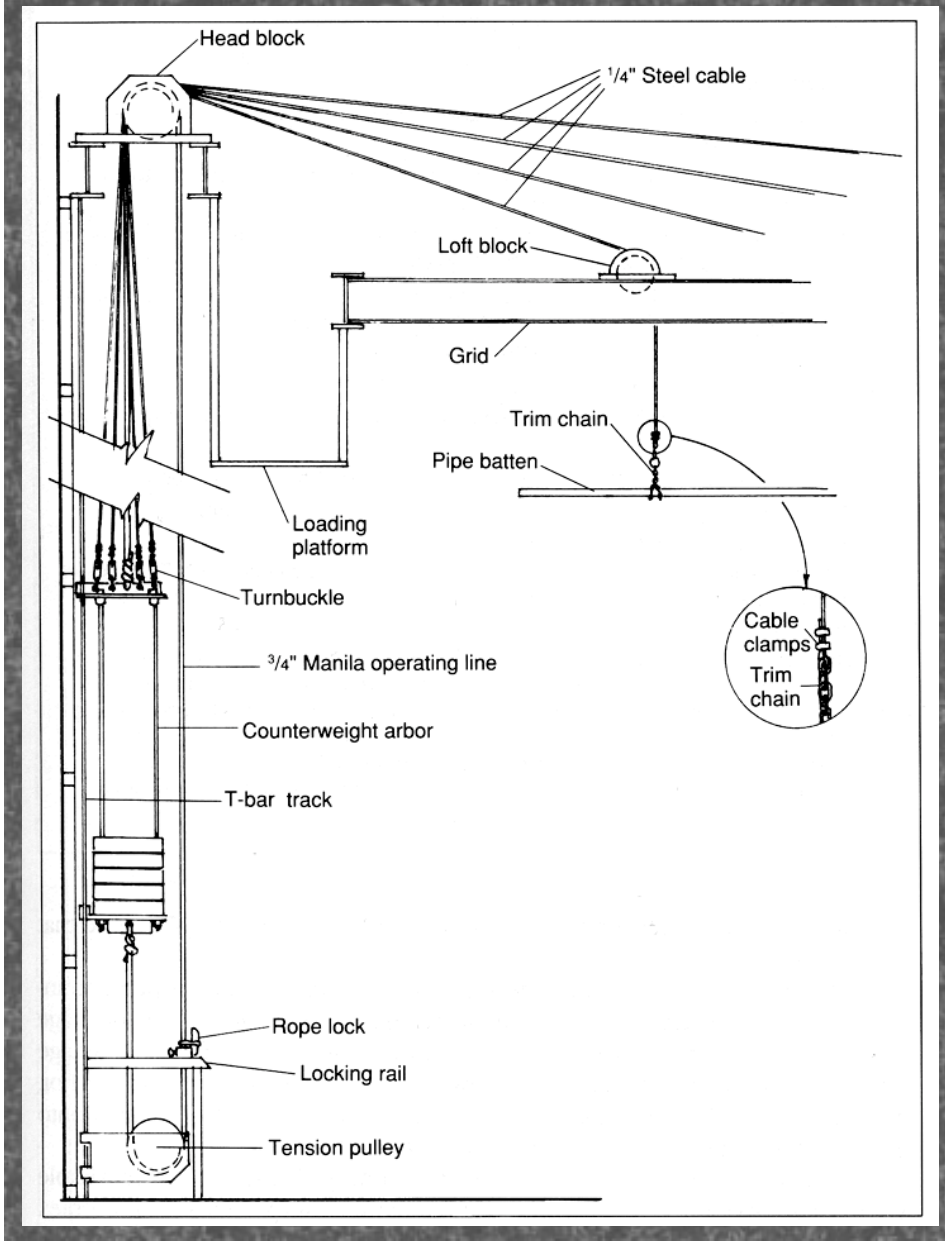
Hemp System

Pin Rail (Eisenhower Theatre, Kennedy Center)

Counterweight Systems

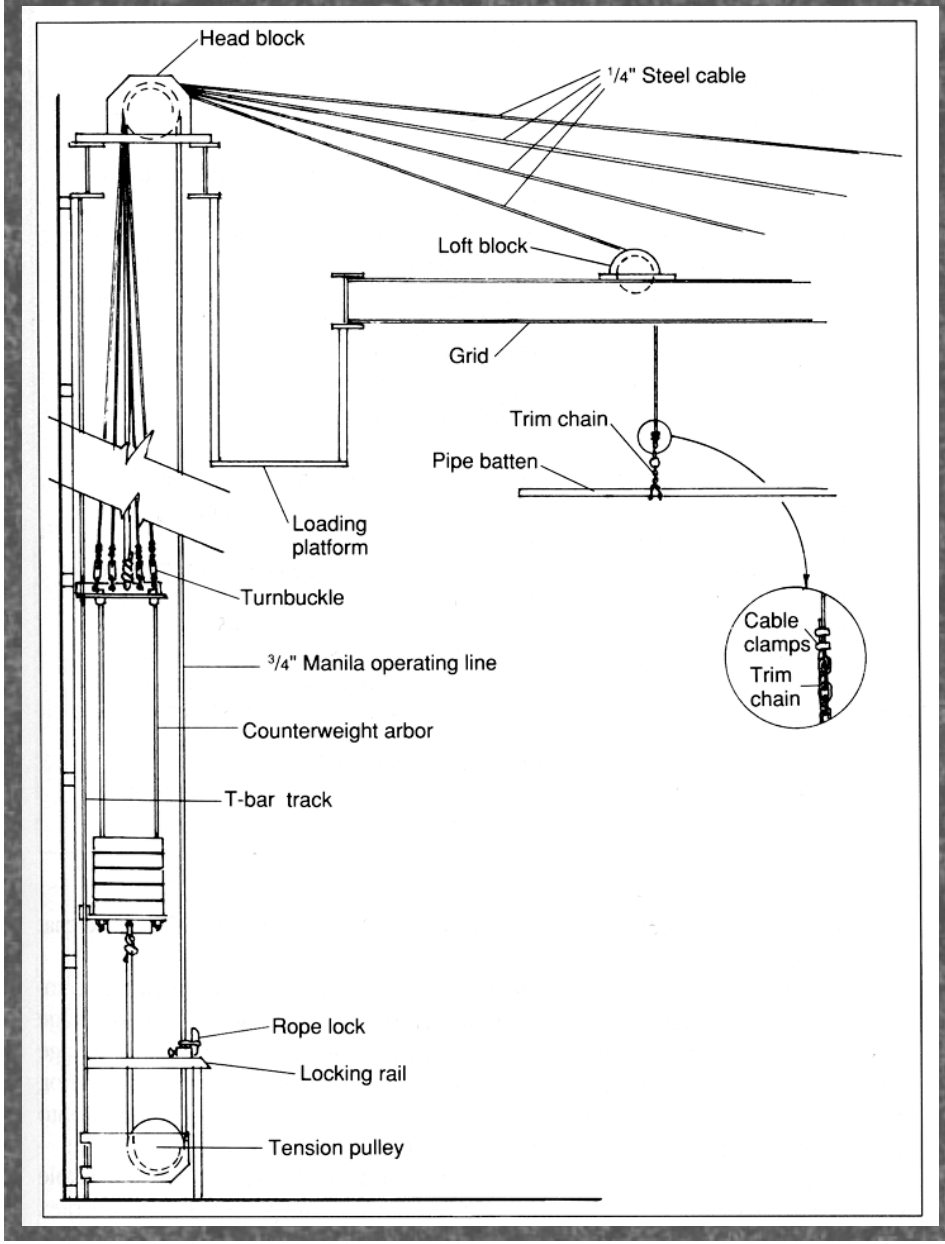
- Works on the same principles as the rope set but much safer
- Several different versions based on the size of the fly loft
  - ***Single Purchase Counterweight System*** – for fly lofts at least twice the height of the proscenium (University Theatre)
  - ***Double Purchase Counterweight System*** – for smaller fly lofts less than twice the proscenium height (Studio Theatre)
  - ***Motorized Fly System*** – replaces the operator with a motor, can be computer controlled

Single Purchase



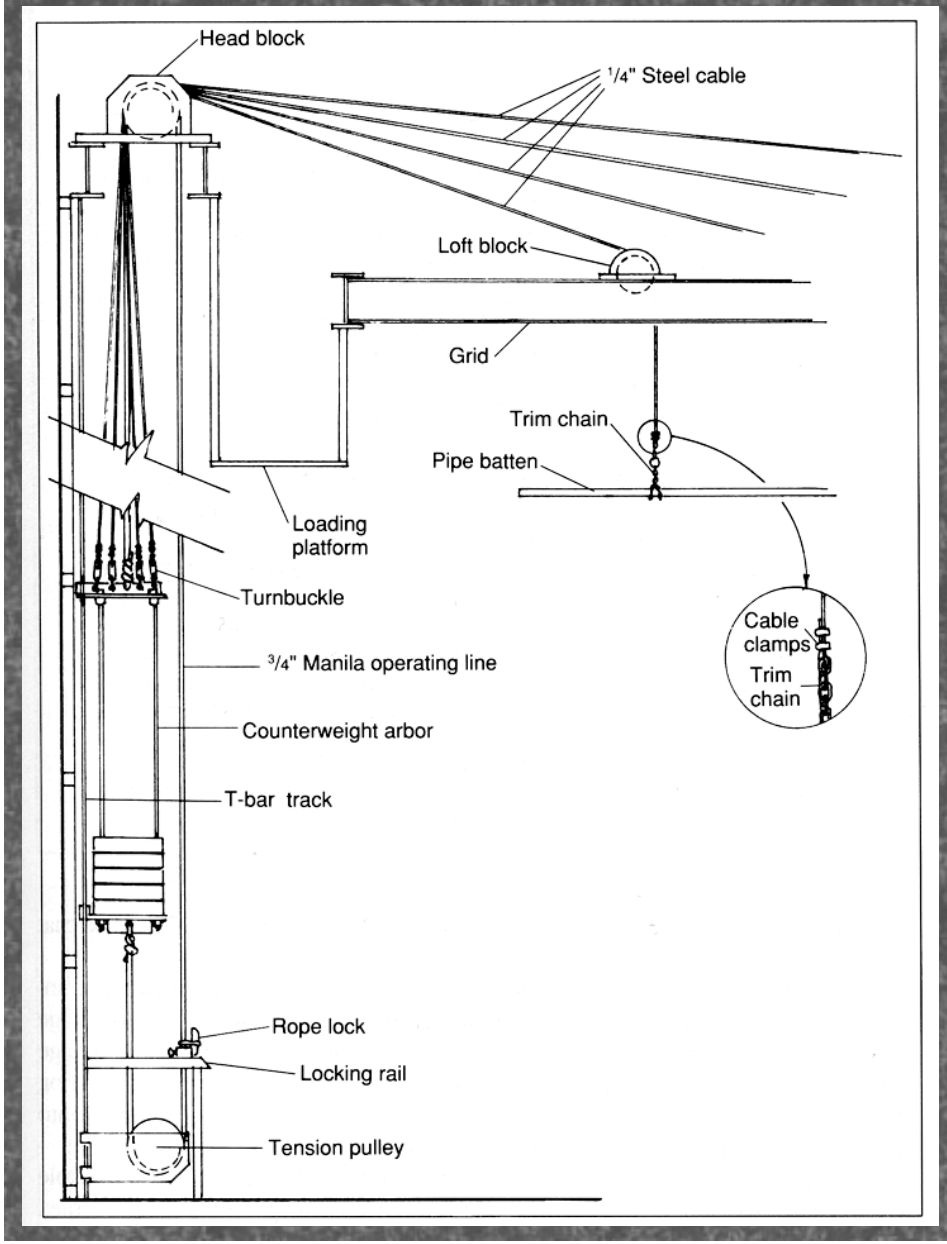
- The lift lines attached to the batten are replaced with steel wire rope
- The steel cables are secured to the top of an ***counterweight arbor*** which replaces the sandbags
- The arbor holds a stack of metal weights called ***bricks*** or ***pigs*** used to balance the load, a typical full brick weighs ~20 lbs
- The arbor's travel is guided by T-bar guide rails
- The ***operating line*** or ***hand line*** is tied to the top and bottom of the arbor, passes over the head block and under the ***tension block***

Single Purchase



- The ***operating line*** or ***hand line*** is tied to the top and bottom of the arbor, passes over the head block and under the ***tension block***
- The operating line passes through the ***rope lock*** on the ***locking rail*** which replaces the pin rail to secure the load when not in operation, lock is secured by a ***locking ring***
- The ***loading platform*** allows the arbor to be loaded when the batten is lowered to stage level
- A theatre will have a number of such ***linesets*** permanently installed at 6" to 12" intervals, the linesets are operated at the ***fly rail*** or the ***rail***

Single Purchase



- A theatre will have a number of such ***linesets*** permanently installed at 6" to 12" intervals, the linesets are operated at the ***fly rail*** or the ***rail***
- The rail may be a ***deck rail***, or a ***mid rail*** if it is located between the deck and the loading platform, the mid rail may also be a pin rail in addition to the deck rail
- Stagehands hired to operate the the rail are called ***flymen***

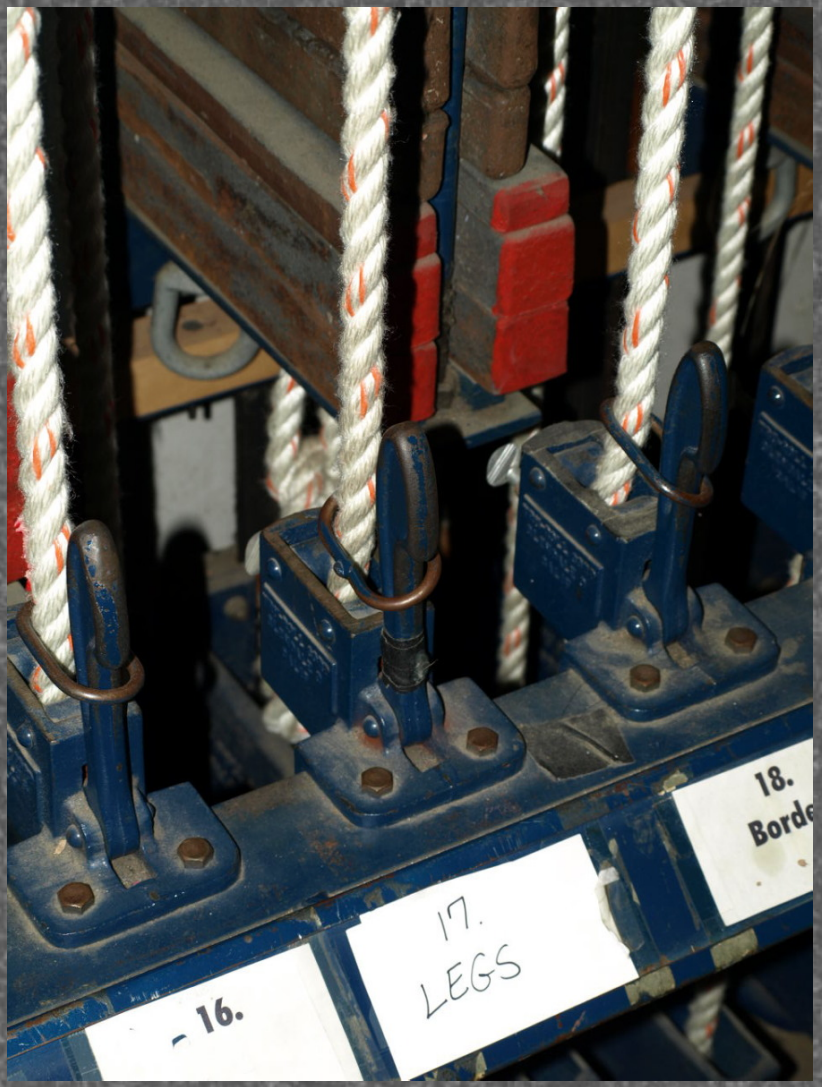
Single Purchase

Head Block (University Theatre)

Single Purchase

Top of an Arbor (not under load)

Single Purchase



Rope Lock (University Theatre)

Single Purchase

Locking Rail (University Theatre)

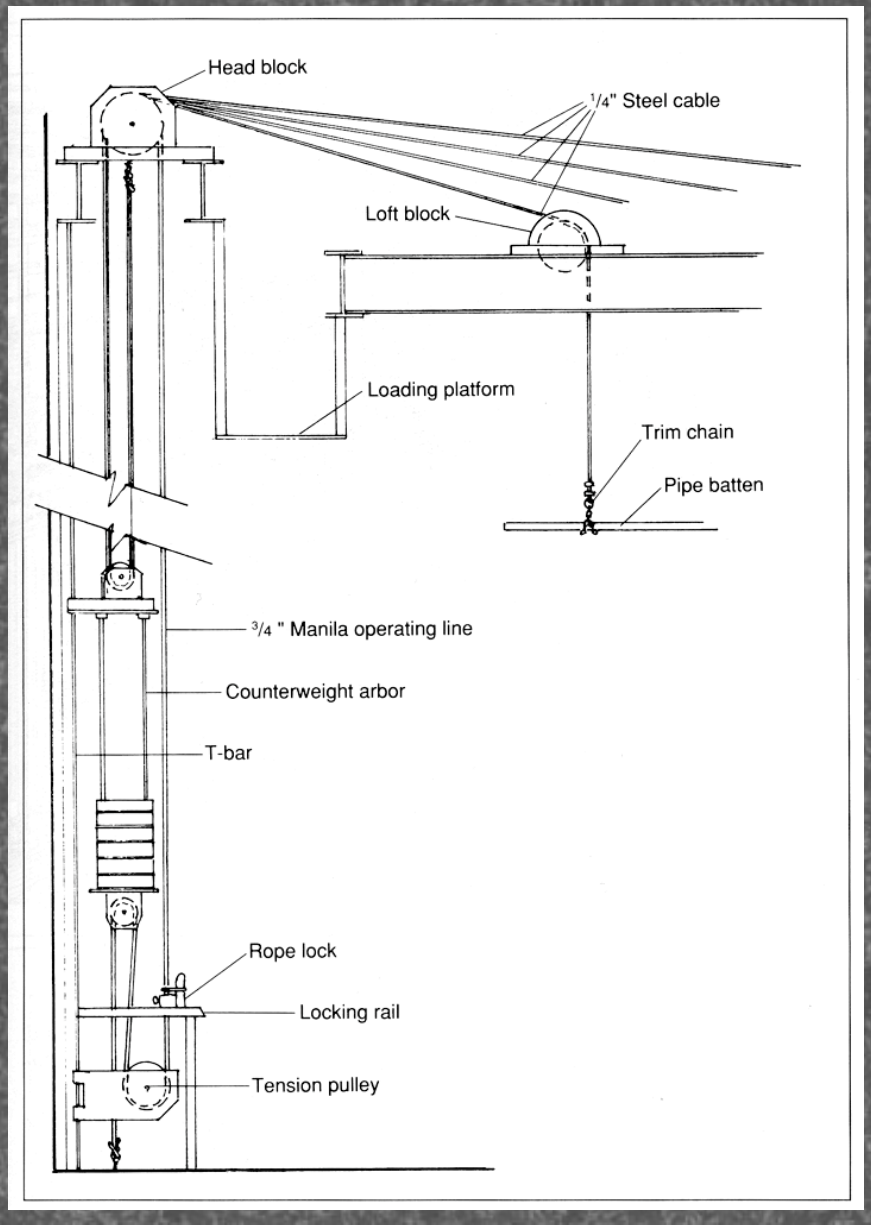
Single Purchase

Loading Platform (University Theatre)

Single Purchase

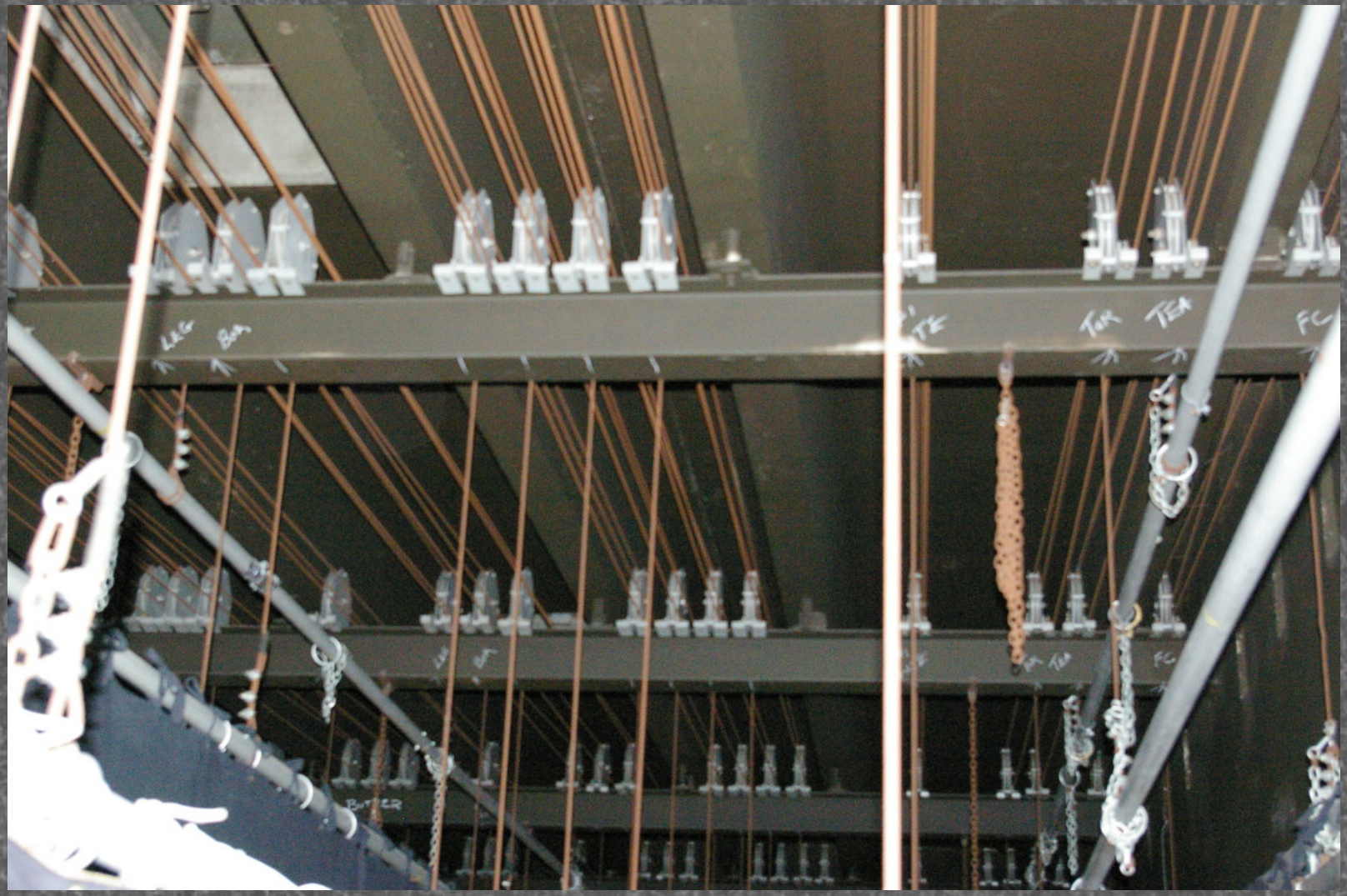
Fly Rail (University Theatre)

Double Purchase



- This system adds pulleys to the top and bottom of the arbor, operating line passes through these pulleys and is fixed to the ground and just below the head block
- Creates a ***mechanical advantage*** of 2 to 1 where the batten travels twice the distance that the arbor does, however arbor must carry twice the weight of the load

Double Purchase



Loft Blocks (Studio Theatre)

Double Purchase

Head Blocks (Studio Theatre)

Double Purchase

Top Arbor Block (Studio Theatre)

Double Purchase

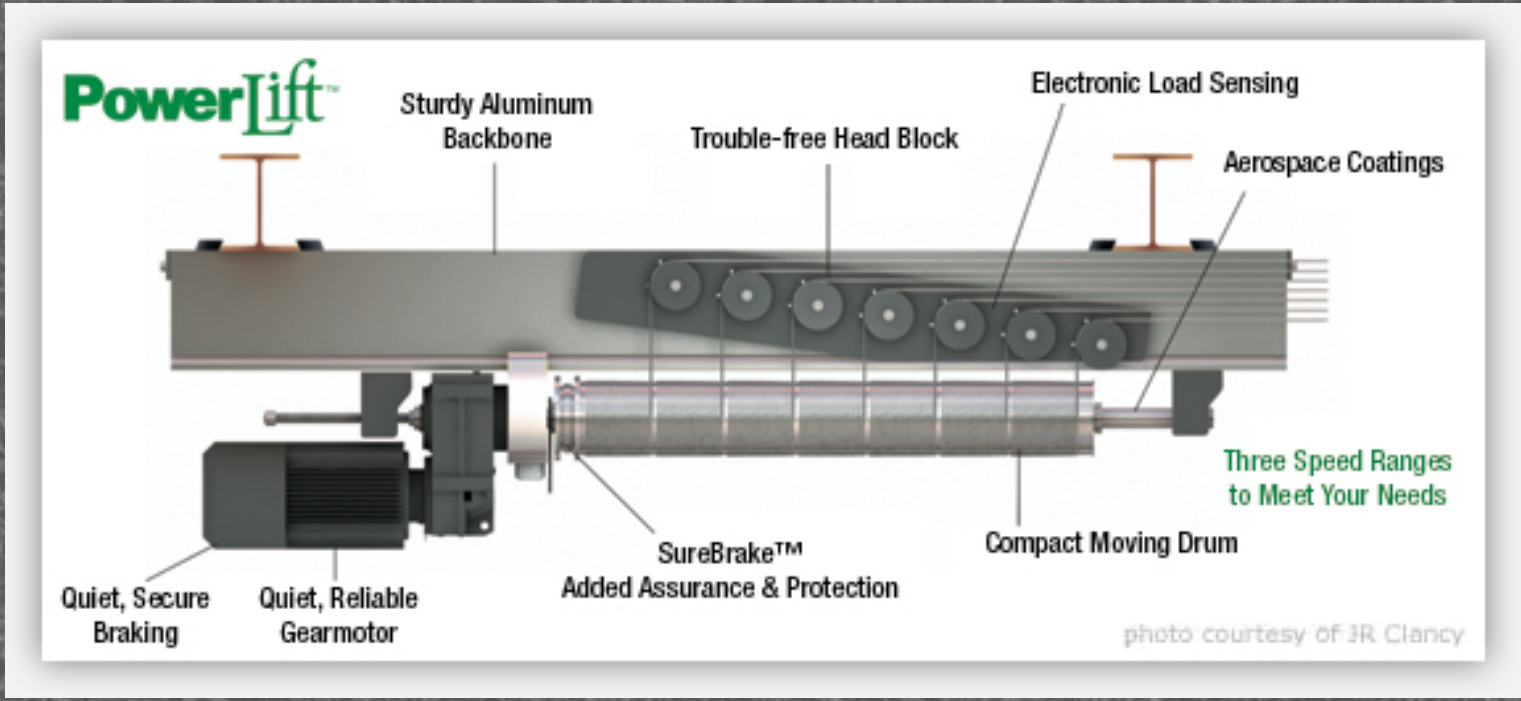
Bottom Arbor Block (Studio Theatre)

Double Purchase

Locking Rail (Studio Theatre)

Motorized Fly Systems

- Two different types
  - Motor and winch can replace the operating line and pull the arbor, still a counterweigh system, motor is called a ***mule***
  - Motor and winch can pull the load directly, called a ***Dead Lift System***



Counterweight Fly Systems

- OPERATION AND SAFETY (Handout available on Beachboard)
  - **Balance Check**
    - Visual Check – arbor weight is equal to the batten weight
    - Rope Tension Check – rope tension on both sides of the rope lock should be equal
  - **Warn everyone on stage that something will be moving**
    - Call out "LINESET COMING IN (OR GOING OUT)" and identify the area that will be affects "LINESET COMING IN DOWNSTAGE"
    - People onstage should exit the affected area and reply with "THANK YOU", do not proceed until you hear acknowledgement
  - **Unlock Operating Lines**
    - Remove locking ring and SLOWLY release the rope lock
    - If line moves on its own, quickly relock the line, if this doesn't stop movement, tie a snub line
    - If lineset is totally out of control, scream a warning and exit the stage quickly

Counterweight Fly Systems

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  - **Unlock Operating Lines**
    - Remove locking ring and SLOWLY release the rope lock
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    - If lineset is totally out of control, scream a warning and exit the stage quickly.
  - **Move the Lineset**
    - The batten moves in the same direction as the line closest to you
    - Pull down on the front rope and the batten moves down, pull up and the batten moves up
    - Watch the batten and it's load while moving the lineset
  - **Relock**
    - Once the scenery has been moved, lock the rope lock and replace the locking ring, never leave a lineset unlocked or without a locking ring