

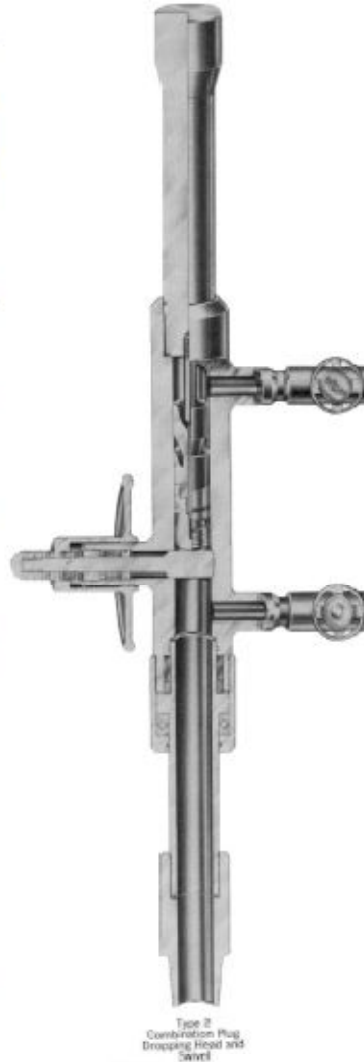
LINER EQUIPMENT

COMBINATION PLUG DROPPING HEAD AND SWIVEL

THE TYPE 2 PLUG DROPPING HEAD IS MADE UP IN THE TOP JOINT OF THE LINER RUNNING-IN STRING IN ANY LINER CEMENTING OPERATION. IT IS EQUIPPED WITH AN ELEVATOR LIFTING NECK AND HAS A HEAVY DUTY SWIVEL AT ITS LOWER END TO PERMIT EASY ROTATION OF THE RUNNING-IN STRING. THIS TYPE DROPPING HEAD IS USED FOR 4", 4-1/2", AND 5" DRILL PIPE AND 4-1/2" O.D. TUBING.

THE PUMP DOWN PLUG IS CONTAINED ABOVE A SCREW OPERATED RAM RUNNING ACROSS THE BODY OF THE DROPPING HEAD. CIRCULATION PORTS ABOVE AND BELOW THIS RAM MAKE IT POSSIBLE TO DIRECT THE FLUID FIRST BELOW THE RAM AND THEN, WITH THE RAM RETRACTED, TO THE UPPER END OF THE PUMP DOWN PLUG. AN EXTERNAL MANIFOLD EQUIPPED WITH TWO FULL OPENING PLUG VALVES IS NORMALLY STANDARD EQUIPMENT FOR DIRECTING THE FLOW OF CURRENT OF DRILLING MUD.

TYPE 1 PLUG DROPPING HEAD AND SWIVEL IS AVAILABLE FOR SIMILAR USE FOR SMALLER SIZES OF DRILL PIPE AND TUBING.



Type 2
Combination Plug
Dropping Head and
Swivel



Flag Sub

FLAG SUB

FLAG SUB IS PLACED IN THE LINER DRILL PIPE IMMEDIATELY BELOW THE PLUG DROPPING HEAD AND SWIVEL. THE POSITION OF A FLAG PROVES THAT THE PUMP DOWN PLUG HAS BEEN RELEASED FROM THE HEAD TO MOVE DOWN THE DRILL PIPE.