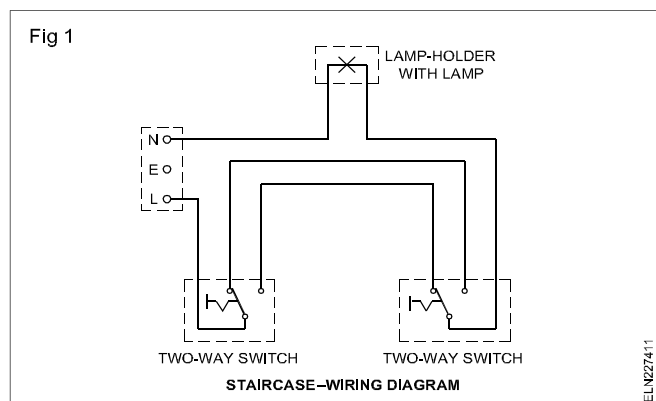


Special wiring circuits - Tunnel, corridor, godown and hostel wiring

Objectives: At the end of this lesson you shall be able to

- state the difference between godown, tunnel and corridor, bank/hostel wirings
- draw the tunnel lighting / corridor / bank / hostel circuits
- prepare the mode chart for the above circuits.

Staircase wiring: In wiring one lamp controlled with one switch in a simple wiring circuit to begin with. However, one lamp controlled with two switches from two different places, known as staircase wiring in the very basic wiring. Fig 1 shows such a wiring where two double pole switches are used to control one lamp individually.



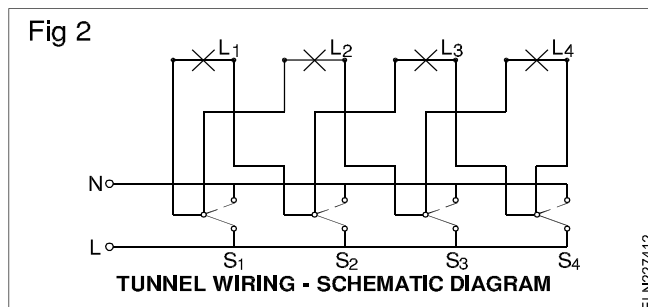
In the case of godown wiring we have seen that as you move inside the godown, you can switch on a lamp ahead of you while the light behind you is put off. The same process in the reverse order takes place while moving out of the godown.

But one light will not be sufficient to give enough illumination in the case of tunnels where darkness is more. Hence, the wiring circuit for a tunnel needs at least two lights to be 'ON' at a time while a person moves inside a tunnel and goes out.

Whereas in the case of corridor wiring the corridor may have a number of rooms occupied by different persons. When one moves toward his room, he needs a forward light to do so. The moment he finds the room and opens it, he may not need the corridor light. Then there should be an arrangement to switch off the light left behind the forward moving person and at the same time there should be a provision to switch off the light in front of his room. Such an arrangement is incorporated in corridor wiring.

On the other hand in bank/jail/hostel, there may be a number of lights having individual controls. There should be a provision for the security staff/warden to switch ON all the lights where they are all OFF. Such a provision is incorporated in the bank / jail / hostel wiring.

Tunnel lighting circuit (Fig 2)



In tunnel wiring a person walking along the tunnel can successively light behind two lamps ahead and put off a lamp behind with one switch.

All switches are two-way switches.

Caution: This circuit is not in accordance with IE rules as the phase and neutral come in the same switch. So care should be taken while connecting the wires.

The mode of operation of the switches and the consequent lighting position are shown below.

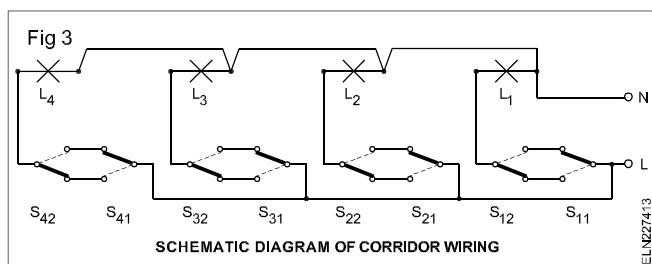
Mode chart for tunnel wiring

SWITCHES				LIGHTS			
S ₁	S ₂	S ₃	S ₄	L ₁	L ₂	L ₃	L ₄
✓	×	×	×	✓	✓	×	×
✓	✓	×	×	×	✓	✓	×
✓	✓	✓	×	×	×	✓	✓
✓	✓	✓	✓	×	×	×	×

MODE CHART FOR TUNNEL WIRING

Corridor wiring (Fig 3)

In this circuit, operating the first switch in one set makes the first light to switch on while operating the 2nd switch in the first set switches off the first light. This sequence goes on as explained in the mode chart.



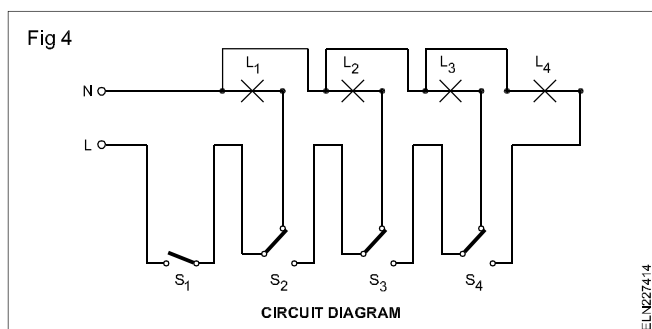
Switch lamps chart

SWITCHES								LAMPS			
1st SET		2nd SET		3rd SET		4th SET		L ₁	L ₂	L ₃	L ₄
S ₁₁	S ₁₂	S ₂₁	S ₂₂	S ₃₁	S ₃₂	S ₄₁	S ₄₂				
ON	-	-	-	-	-	-	-	✓	✗	✗	✗
ON	OFF	-	-	-	-	-	-	✗	✗	✗	✗
ON	OFF	ON	-	-	-	-	-	✗	✓	✗	✗
ON	OFF	ON	OFF	-	-	-	-	✗	✗	✗	✗
ON	OFF	ON	OFF	ON	-	-	-	✗	✗	✓	✗
ON	OFF	ON	OFF	ON	OFF	-	-	✗	✗	✗	✗
ON	OFF	ON	OFF	ON	OFF	ON	-	✗	✗	✗	✓
ON	OFF	ON	OFF	ON	OFF	ON	OFF	✗	✗	✗	✗

MODE CHART FOR CORRIDOR WIRING

Godown lighting circuit

Let us consider a godown lighting circuit (Fig 4) having three lamps L_1 , L_2 , L_3 and L_4 which are to be controlled such that if one moves in a godown in either direction he can switch ON one light after the other in the forward direction while the lamp which was lighted earlier gets switched OFF. In an arrangement. S_1 is a one way switch, S_2 , S_3 and S_4 are two-way switches.



Intermediate switch - specification and application in lighting circuit

Objectives: At the end of this lesson you shall be able to

- identify the features and specify an intermediate switch
- draw diagrams of a lighting circuit using intermediate switches.

An intermediate switch is a special type of switch having four terminals for connection. This switch is commonly used to control a lamp or load from three or more positions as encountered in the lighting of staircases, corridors, bedrooms.

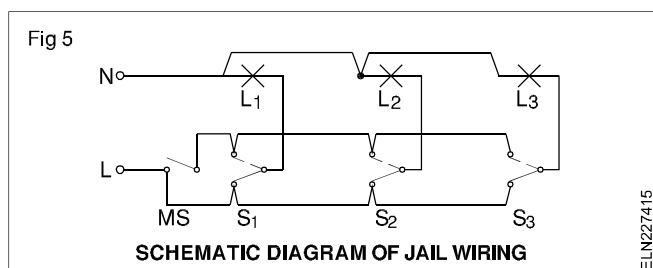
While coming back from the godown when the person switches off the light 4, then the light 3 will be on and give light for his return movement. When he leaves the godown all the lights could be switched 'off' by operating switch S_1 .

The following chart gives the mode of operation of the switches and lights. Trainees are advised to make the return mode chart.

Mode chart for godown wiring

Switches				Lights			
S_1	S_2	S_3	S_4	L_1	L_2	L_3	L_4
ON	OFF	OFF	OFF	ON	-	-	-
ON	ON	OFF	OFF	-	ON	-	-
ON	ON	ON	OFF	-	-	ON	-
ON	ON	ON	ON	-	-	-	ON

Bank / jail / hostel wiring (Fig 5)



The master switch (MS) could be operated by the warden to make all the lights ON when they are all OFF.