

6/120
MÄRKLIN



Signal
Manual
0361

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MÄRKLIN

MÄRKLIN H0 Signals

a plus

for every railroad fan

There are many reasons why railroad fans ask for MÄRKLIN Signals and buy them.

There are also many reasons why signals are appreciated and popular by a larger growing circle of railroad fans.

But — the technical development continues.

The changing of the signal system of the German Federal Railways is going with their electrification. The former signals are being changed to the new light signals, which give a better safety operation, and less maintenance.

The station area of the prototype is therefore much more dominated by light signals, which control the whole system.

Rather than provide a detailed instruction sheet for the installation and operation of our signals with each set, we have decided to issue this signal manual. In this manual we can describe in much greater detail the many uses and make it easier for you to understand the entire system.

Gebr. Märklin & Cie. GmbH · 732 Göppingen/Württ.

The purposes of the signals

Just as the signals of the German Federal Railways control the many movements of the trains, the MÄRKLIN Signals provide you with many special operating functions.

Three groups of signals are used:

- I Home signals (Hp)
- II Distant signals (Vr)
- III Dwarf siding signals (Sh)

I Home signals

The home signals (Fig. 1) show if the track section ahead can be used by a train.

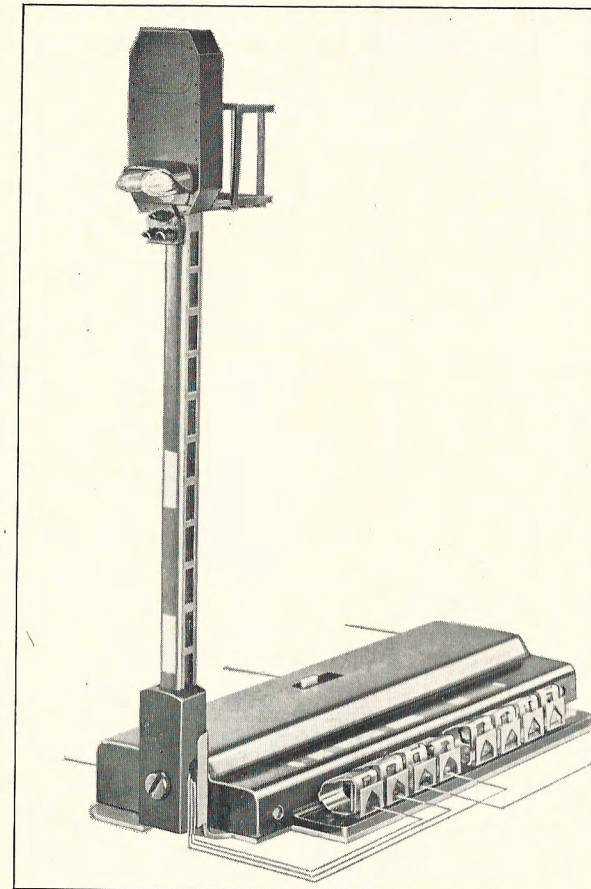
II Distant signals

The distant signals (Fig. 2) show the indication of the next home signal.

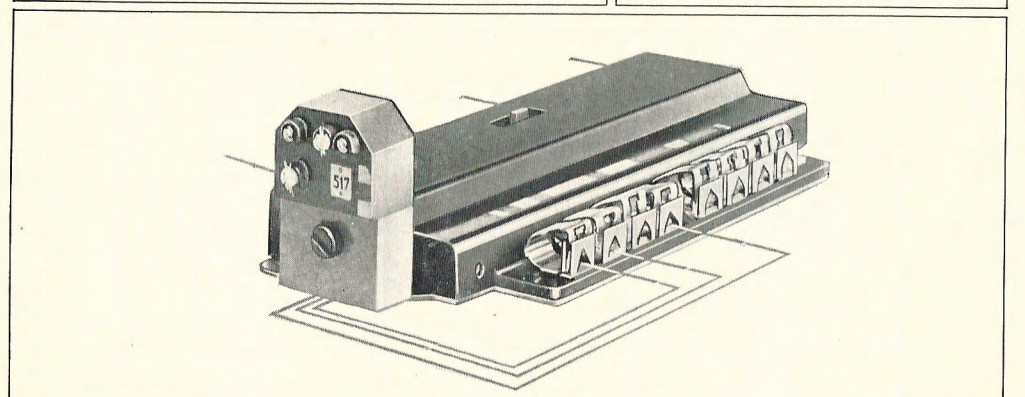
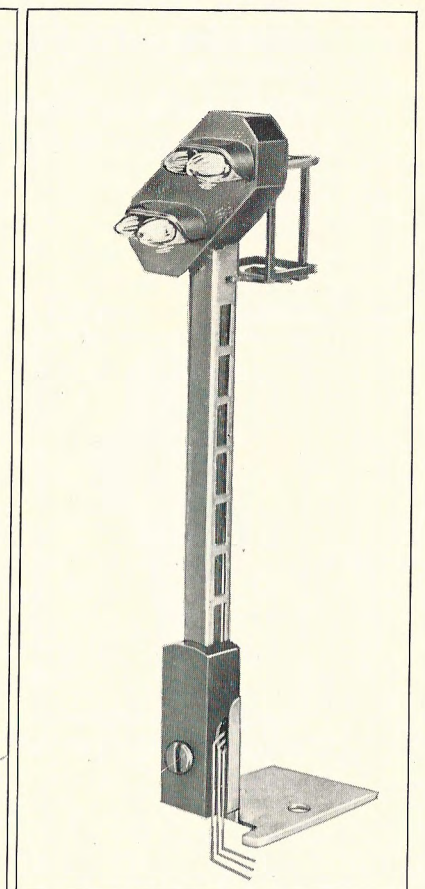
III Dwarf siding signals

The dwarf siding signals (Fig. 3) are used to protect the main line against trains upon sidings.

Home signal Fig. 1



Distant signal Fig. 2



Dwarf siding signal

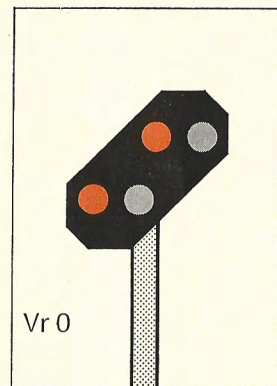
Fig. 3

The uses of the various signals and their indications

1. Distant signal 7236 and home signal 7239

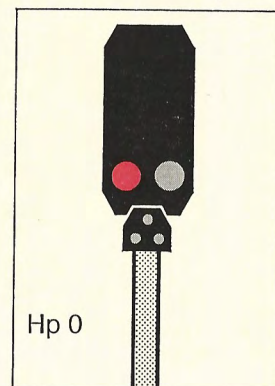
These signals are installed on the track if there are no turnouts ahead. The possible signal indications are shown on the following figures.

7236 Fig. 4 a



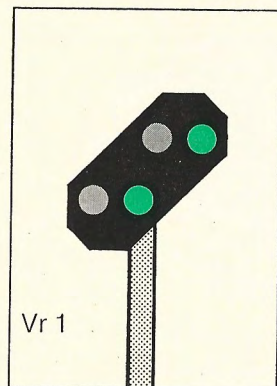
"Caution, red signal ahead"

7239 Fig. 4 b



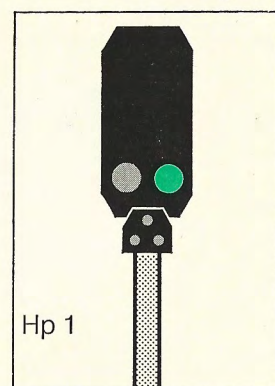
"Stop"

Fig. 4 c



"Proceed, signal ahead"

Fig. 4 d

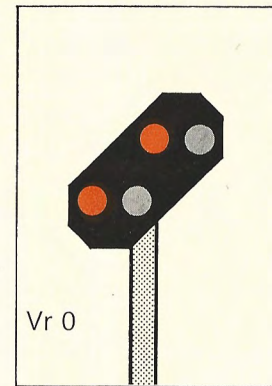


"Proceed"

2. Distant signal 7237 and home signal 7240

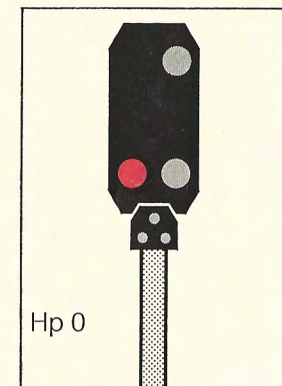
In instances where there is a turnout in the main line and the train must slow down, the home signal 7240 and the distant signal 7237 must be installed. The possible indications of these signals are shown on the Figures 5 a – 5 d. If a straight ahead course would be possible on the track behind these signals, these signals can not be used. In this case the signals 7238 and 7241 must be installed.

7237 Fig. 5 a



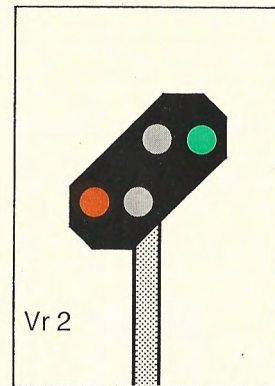
"Caution, red signal ahead"

7240 Fig. 5 b



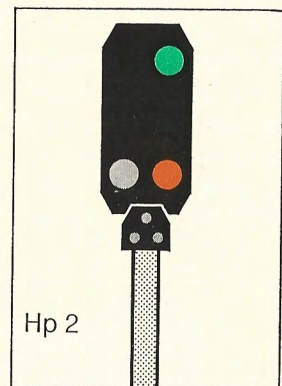
"Stop"

Fig. 5 c



"Slow, signal ahead"

Fig. 5 d

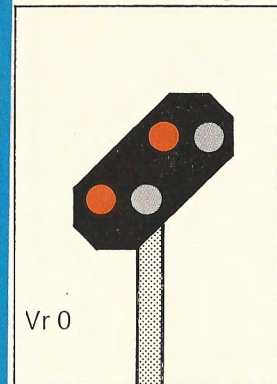


"Slow"

3. Distant signal 7238 and home signal 7241

These signals can indicate three various positions. They are always installed where a turnout and a straight ahead course is possible.

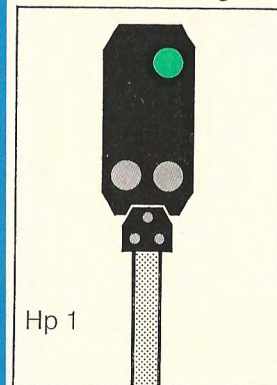
7238 Fig. 6 a



Vr 0

"Caution, red signal ahead"

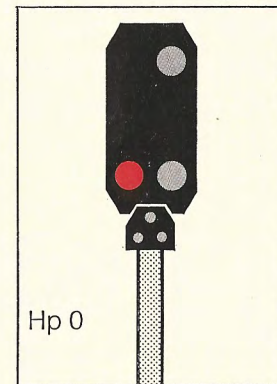
Fig. 6 d



Hp 1

"Proceed"

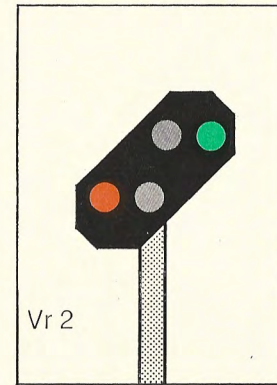
7241 Fig. 6 b



Hp 0

"Stop"

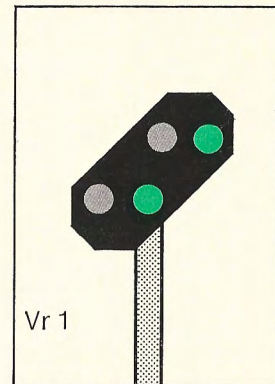
Fig. 6 e



Vr 2

"Slow, signal ahead"

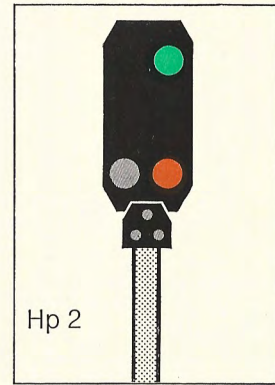
Fig. 6 c



Vr 1

"Proceed, signal ahead"

Fig. 6 f



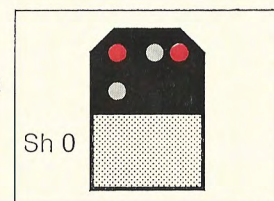
Hp 2

"Slow"

4. Dwarf siding signal 7242

This signal is used for controlling switching movements in a yard or siding. Like all other signals it can be positioned alongside the track by itself, or it can be used along with a home signal. The possible indications with this dwarf siding signal are shown in Figs. 7 a and 7 b.

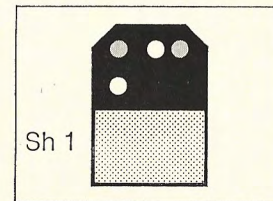
Fig. 7 a



Sh 0

"Stop"

7242



Sh 1

"Proceed"

Fig. 7 b

The construction of the MÄRKLIN Light Signals

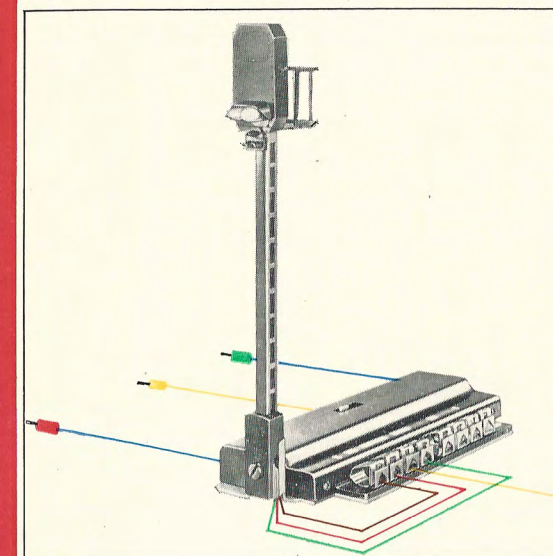
The **Home signals** 7239 (Fig. 8), 7240 (Fig. 9) and 7241 (Fig. 10) consist basically of two parts:

- the signal solenoid control unit (Fig. 11 a and 11 b) and
- the signal mast (Fig. 12 a and 12 b).

The **signal solenoid control unit** is necessary on all signals with train control, also on signal 7239, 7240, 7241 and 7242, and on the distant signal 7238 (because there are three various signal indications). The solenoid control unit consists of the mounting plate, the operation part and the cover case. The electrical operating current runs through the coils (wires with plug).

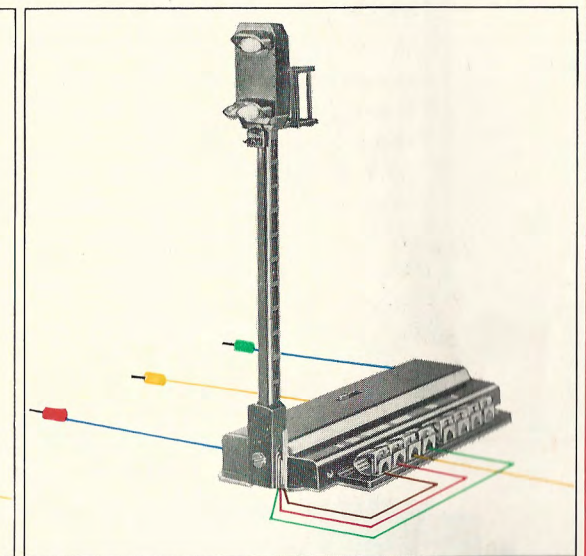
Fig. 8

Home signal 7239



Home signal 7240

Fig. 9



Home signal 7241

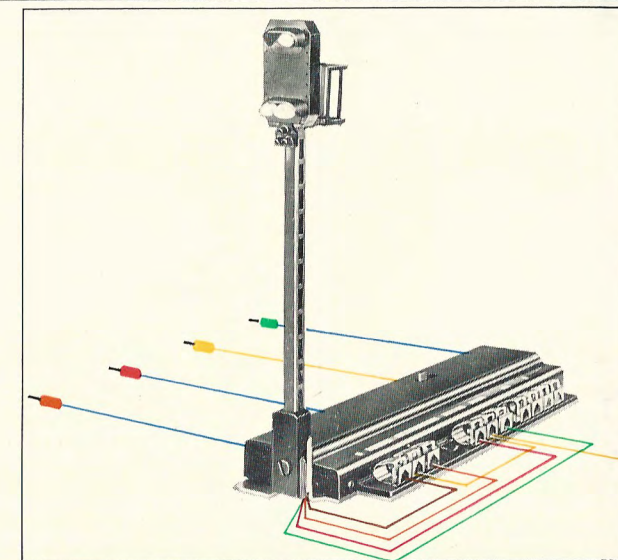


Fig. 10

The movable armature is magnetized by the electrical current and it is moved to various positions. This armature is connected with the operation plate of the operation part. The electrical current is fed through the current contact points into the track or into the overhead wires. The current for the signal lights is also fed through these contact points (wire terminals).

The current connection is easy and it is identified by the color strip on the cover case (Fig. 11 b).

The **signal mast** (Figs. 12 a and 12 b) is connected to the signal solenoid control unit with a screw. The bulbs, which are mounted on the top of the signal mast, can be replaced when the platform of the mast is removed and the contact plate is lifted up (Fig. 12 b). The various colored wires are soldered on the contact plate. These wires can be connected to the terminals of the solenoid control unit.

The mast of **the distant signals** 7236 and 7237 (Figs. 13 and 14) is connected with a screw to the mounting plate 7230. The construction of this mast is the same as of the home signal, but the lights are installed in a different position — from the left to the right side — .

The **distant signal** 7238 (Fig. 15) is equipped with a special solenoid control unit in order to correspond to the home signal 7241. The solenoid control unit and the mast of this signal is the same as the other signals.

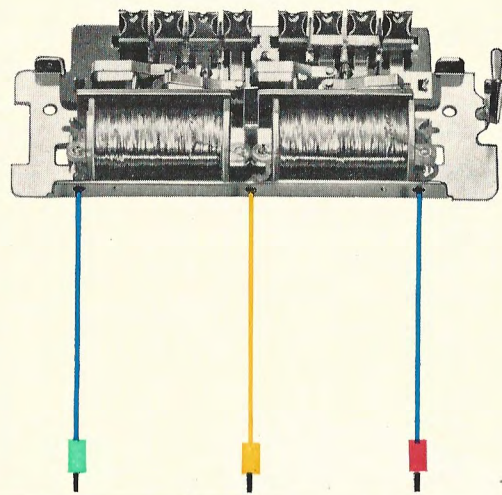
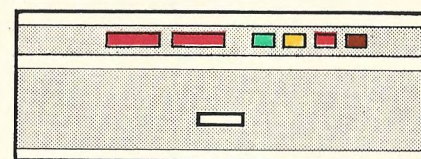


Fig. 11 a Solenoid control unit



Cover case Fig. 11 b

Fig. 12 a
Signal mast

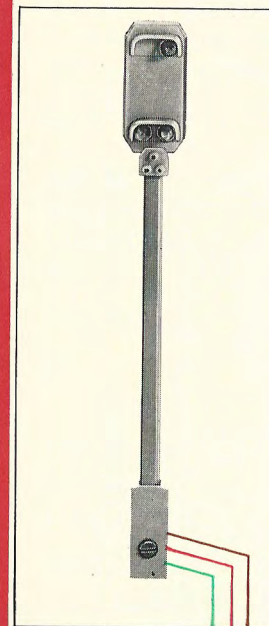


Fig. 12 b

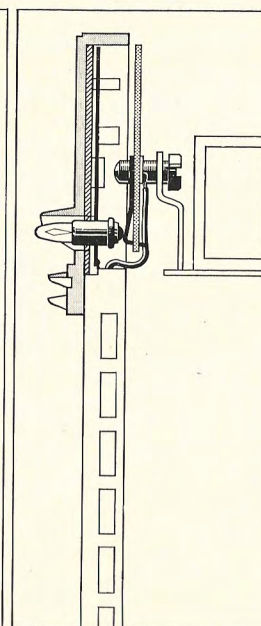


Fig. 13
Distant signal 7236

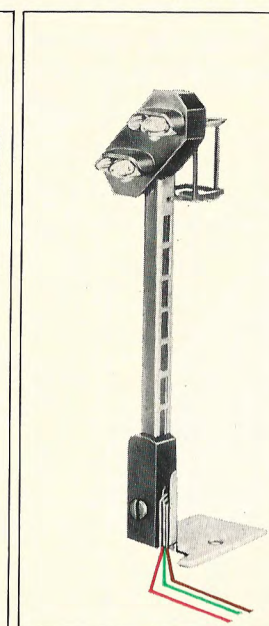


Fig. 14
Distant signal 7237

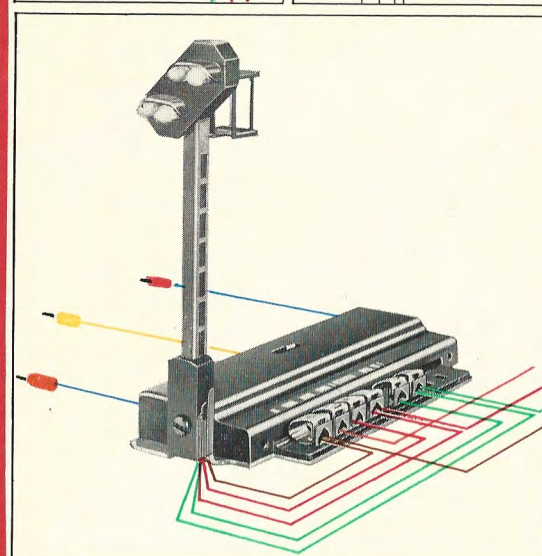
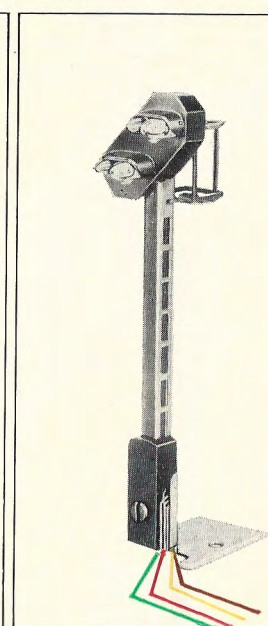
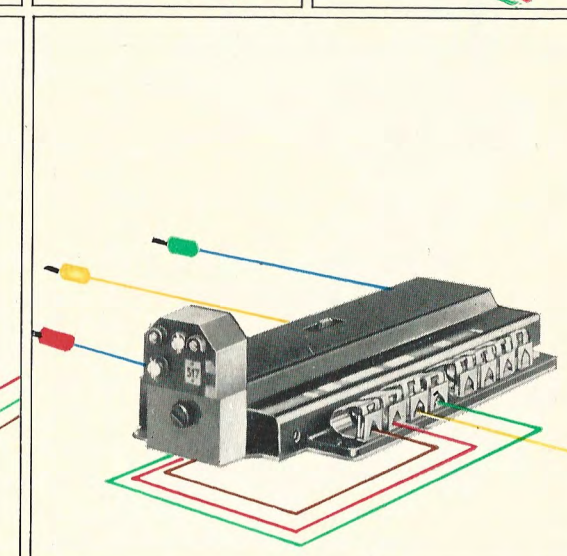


Fig. 15 Distant signal 7238



Dwarf siding signal 7242 Fig. 16

The **dwarf siding signal** 7242 (Fig. 16) has the same solenoid control unit, but no mast.

Two light bulbs are therefore installed in the housing in order to give the signal indication with white and red lights. It is

very easy to remove the backside of the housing in order to change the bulbs.

The installation of the signals

The signal 7236 and all others can be installed anywhere on the layout — on straight as well as on curved track sections. They can be fastened securely by pressing the track down into the signal mounting plate. If the signals are to be screwed to a wooden base next to the track, the signal cover case must be removed first. The wood screws pass through the two holes in the mounting plate. If you prefer left hand traffic, as may be the usual traffic of a country, you can install the signals on the left side of the track. Be sure when installing the signal into the mounting plate that you install it from the correct side.

Fig. 17 Left hand traffic

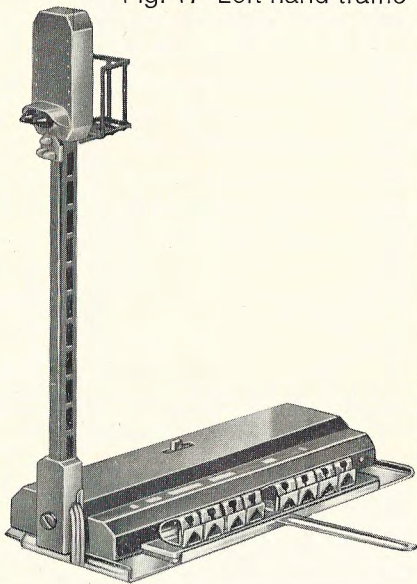


Fig. 18 Right hand traffic

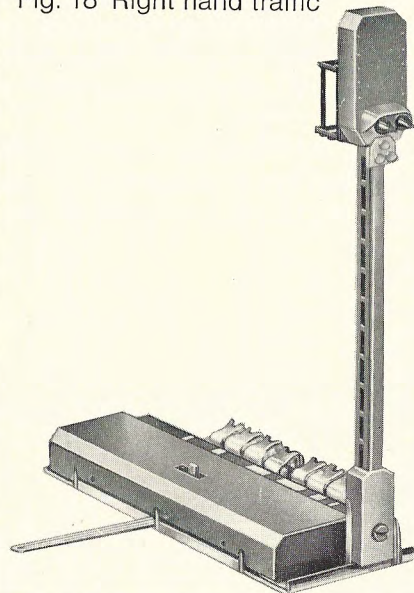
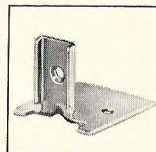


Fig. 19
Mounting
plate
7230



The distant signals 7236 and 7237 are supplied without the solenoid control unit. The distant signal 7238, the home signals 7239, 7240 and 7241 and the dwarf siding signal 7242 are equipped with the solenoid control unit. The mast of these signals can be installed on the layout separately from the solenoid control unit. In this case, the mounting plate 7230 (Fig. 19) is required to mount the mast by the track. The solenoid control unit can be installed wherever you desire. Signals without the solenoid control unit (7236/7237) must be installed with the mounting plate 7531 (Fig. 20), signals with a small solenoid control unit (7238/7239/7240/7242) on the mounting plate 7532 (Fig. 21) and the signal with the large solenoid control unit (7241) on the mounting plate 7533 (Fig. 22) when using it with 2100 Series Track (Figs. 23–25).

Fig. 20
Mounting
plate 7531

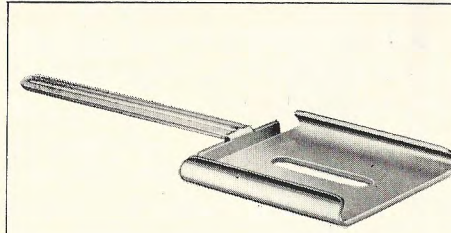


Fig. 21
Mounting
plate 7532

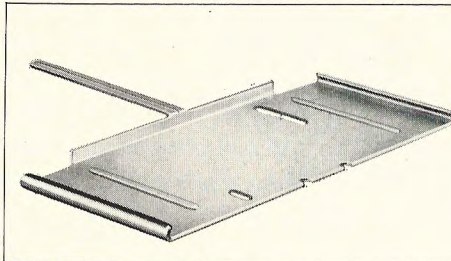


Fig. 22
Mounting
plate 7533

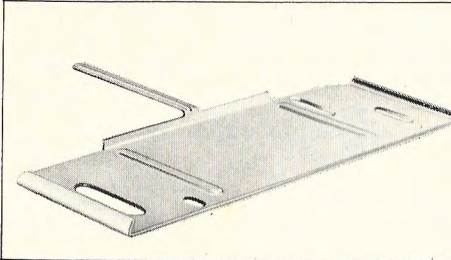


Fig. 23
Distant signal
mounted
on 7531

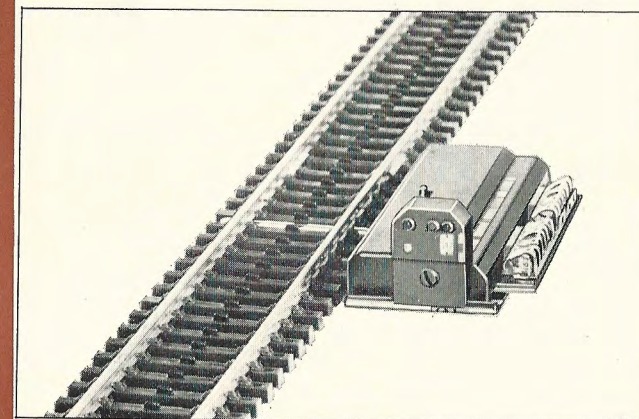
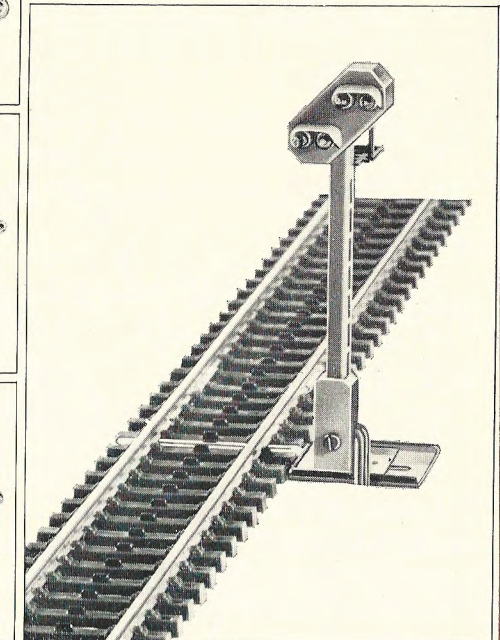


Fig. 24
Dwarf siding
signal
connected
with 7532

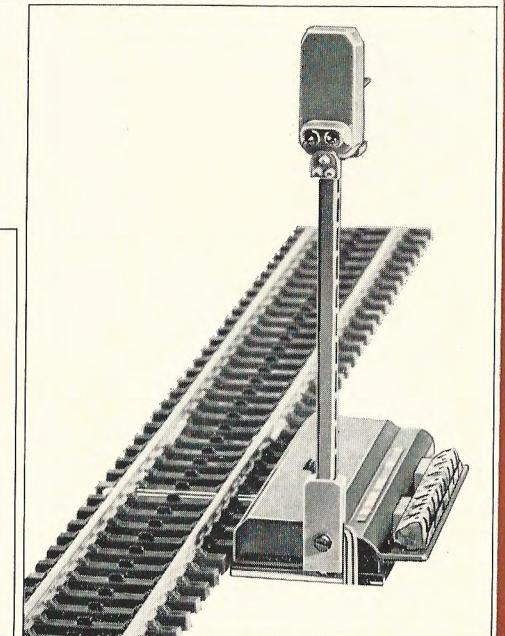


Fig. 25
Home
signal
mounted
on 7532

When mounting the signal mast without the solenoid control unit on 2100 Series Track, the mounting plate 7531 must be used, the same as with signals 7236 and 7237 (Figs. 26–28).

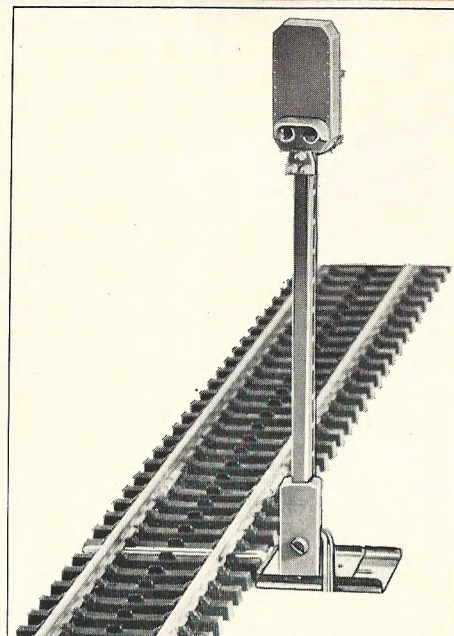


Fig. 26
Home signal without a solenoid control unit, mounted on 7230 and 7531

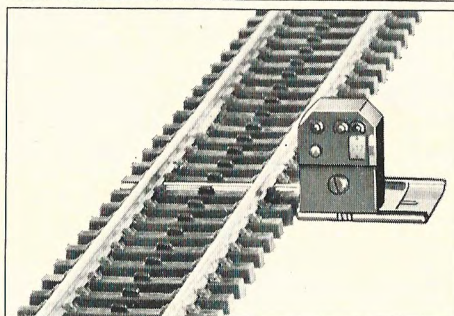


Fig. 27
Dwarf siding signal without a solenoid control unit, mounted on 7230 and 7531

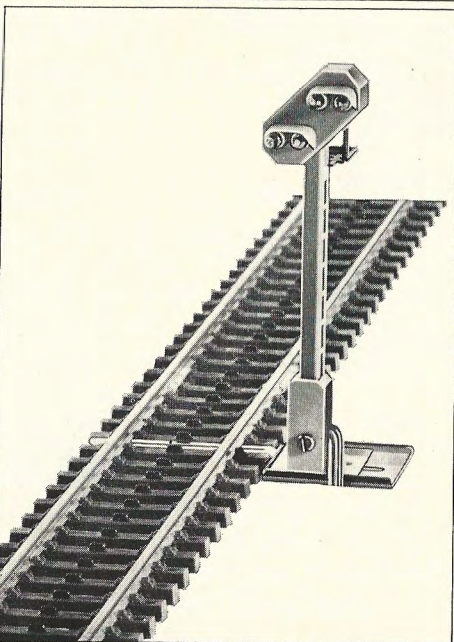


Fig. 28
Distant signal 7238 without a solenoid unit mounted on 7230 and 7531

The automatic control of the trains by the signals

For automatic control of the trains a small section of the layout in front of the home signal must be electrically insulated from the rest of the track circuit.

The same principle of insulation can be used for the surface contacts and the overhead catenary system.

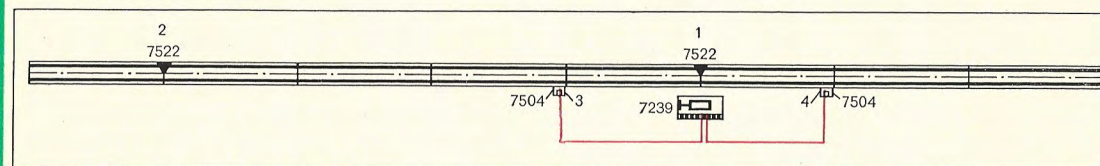
1. Surface contact train operation

Fig. 29 shows the insulated track section in front of the signal. As a rule, its length is that of four track sections. A center tongue insulator 7522 is inserted between the contact tongues of the track joints (Point 1) next to the signal.

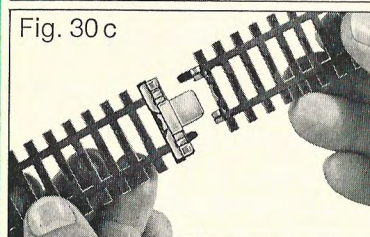
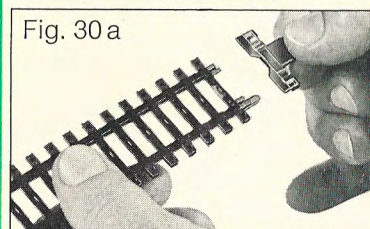
The same is done at Point 2.

For attaching the center tongue insulator see the signal instruction.

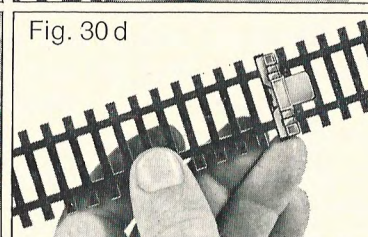
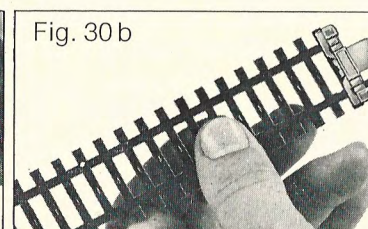
Fig. 29: This shows the insulator 7522 installed at points 1 and 2, with the terminals 7504 installed at points 3 and 4 to provide electrical current.



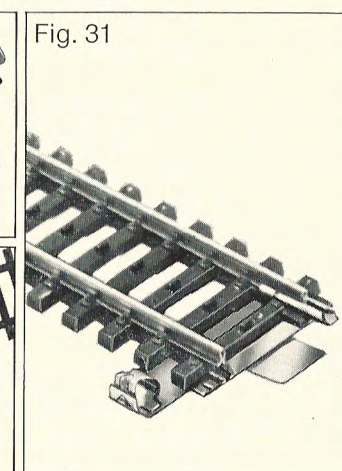
When the signal indicates "Stop", the track section between point 1 and 2 is without any current. When the signal shows "Proceed" the current is fed



Figs. 30 a – 30 d



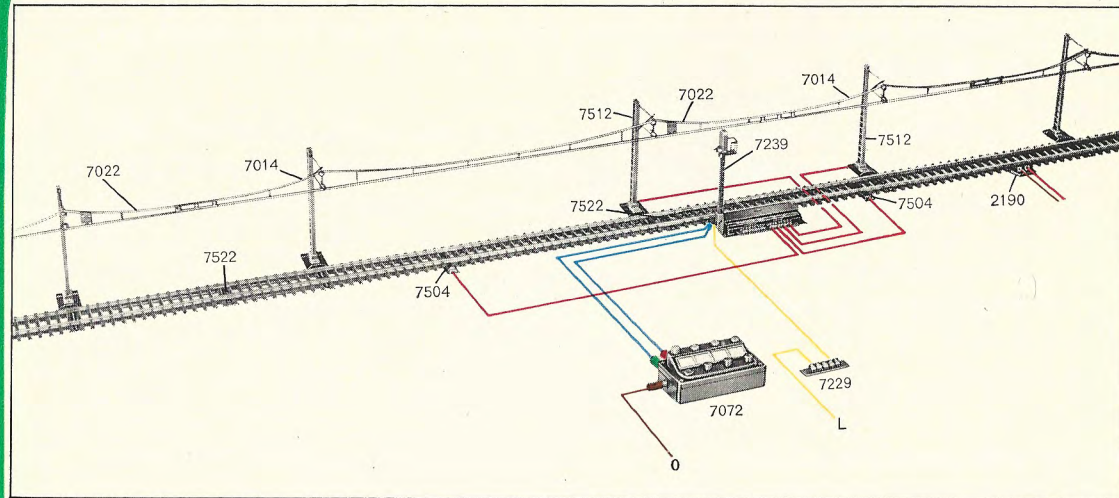
Installation of center track tongue insulator 7522



Terminal 7504 for center stud contacts

from point 4 through the signal to point 3. By this operation, the track section between point 1 and 2 is supplied with power.

Current supply by surface contact and overhead catenary system
Fig. 32



2. Overhead catenary when using catenary mast 7509

When the overhead catenary system is used for the automatic train control, the catenary signal set 7505 is necessary. The supplied insulator sections for interrupting current 7022 must be connected in the catenary system on point 1 and 2 (Fig. 29). The current for the insulated part of the track section between point 1 and 2 is supplied via the catenary masts. Their red wires have to be connected to the red terminals of the signals.

3. Overhead catenary system when using the tower mast

Fig. 33 shows the overhead wire current supply by using two cross span insulators 7006 to hold the catenary wires. Also the insulator section for interrupting current 7022 can be used for this purpose. In this case, the catenary signal set 7505 is not necessary.

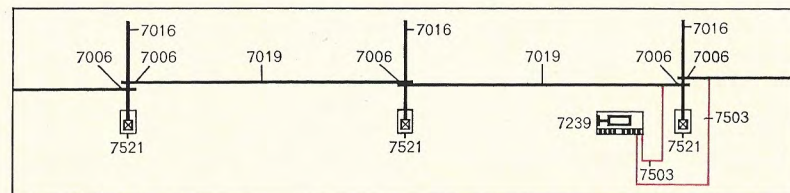


Fig. 33

Overhead wire current interruption by using two cross span insulators 7006 for overhead wire insulation.

Two catenary signal connecting wires 7503 are necessary instead of the catenary signal set 7505. Fig. 34 shows their connection with the catenary system. The current feeder wires (1) must first be connected to the last two red terminals of the signal (see also Fig. 25). These wires are then fed up through the mast (2) and along the cross span (3). The connecting wires are then connected to the wire clips on either side of the insulated catenary sections.

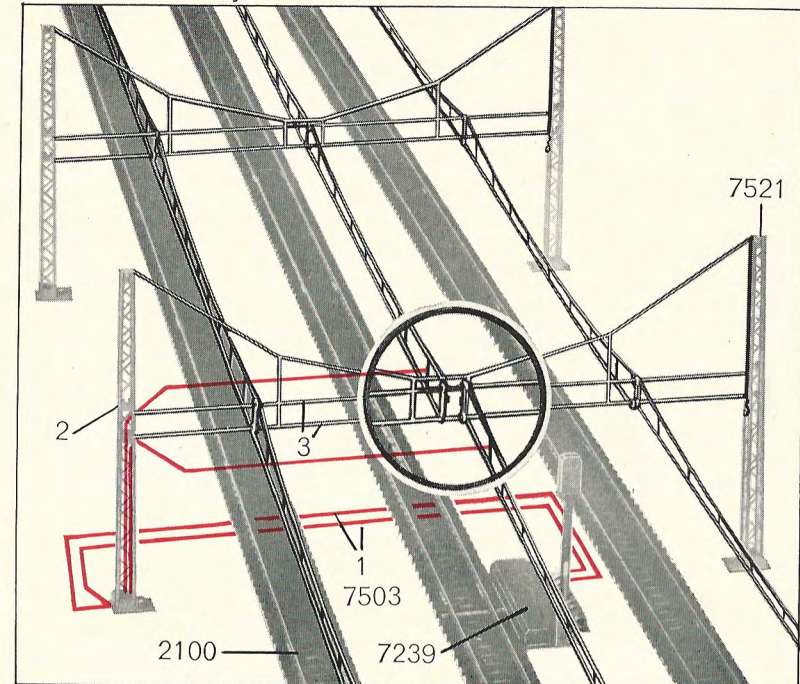


Fig. 34 The connection of the catenary signal feeder wire 7503

The wires and terminals of the signals

On every signal there are three distinct types of electric current: The current for operating the electric solenoid, the current for running the train and the current for the lights. The corresponding connections are demonstrated for signal 7239 in Fig. 8, for signal 7240 in Fig. 9 and for signal 7241 in Fig. 10.

The current for the solenoids is supplied by the wire with the plugs. The current for the train operation and for the signal lights is supplied through the terminals on the side.

The current for the solenoids is fed through the yellow socket of the transformer through the yellow cable, over to the distributor panel and then through the yellow signal wire to the solenoid control unit of the signal. From the signal the current is fed back through a blue cable with a red, green or sometime orange plug to the switch panel. From the switch panel the "ground" current is supplied by a brown cable via the distributor panel to the brown socket of the transformer. The purpose of this current source is to operate the electric solenoid and thereby change the functions of the signal.

Fig. 35 a Path of current when signal set for "Stop"

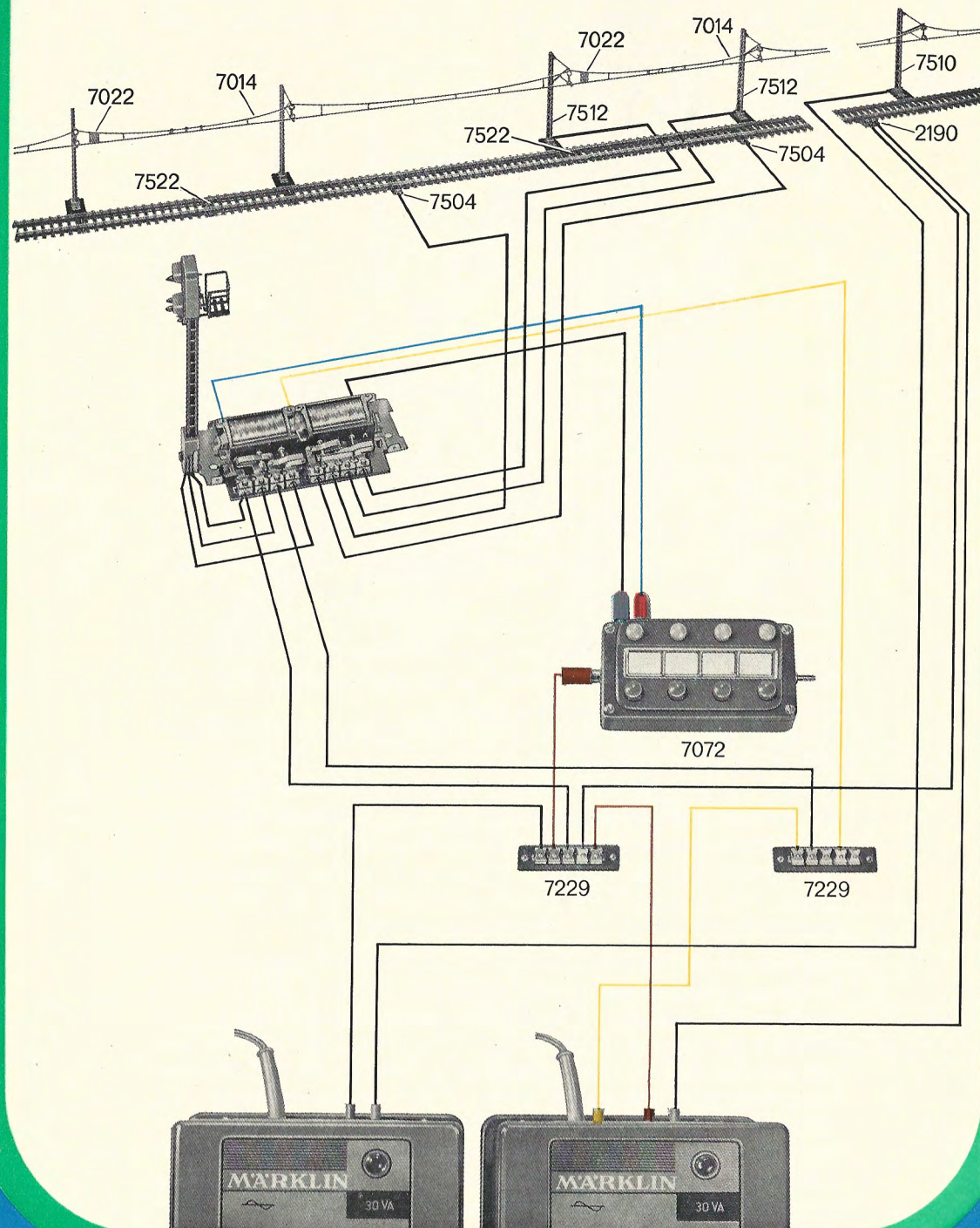
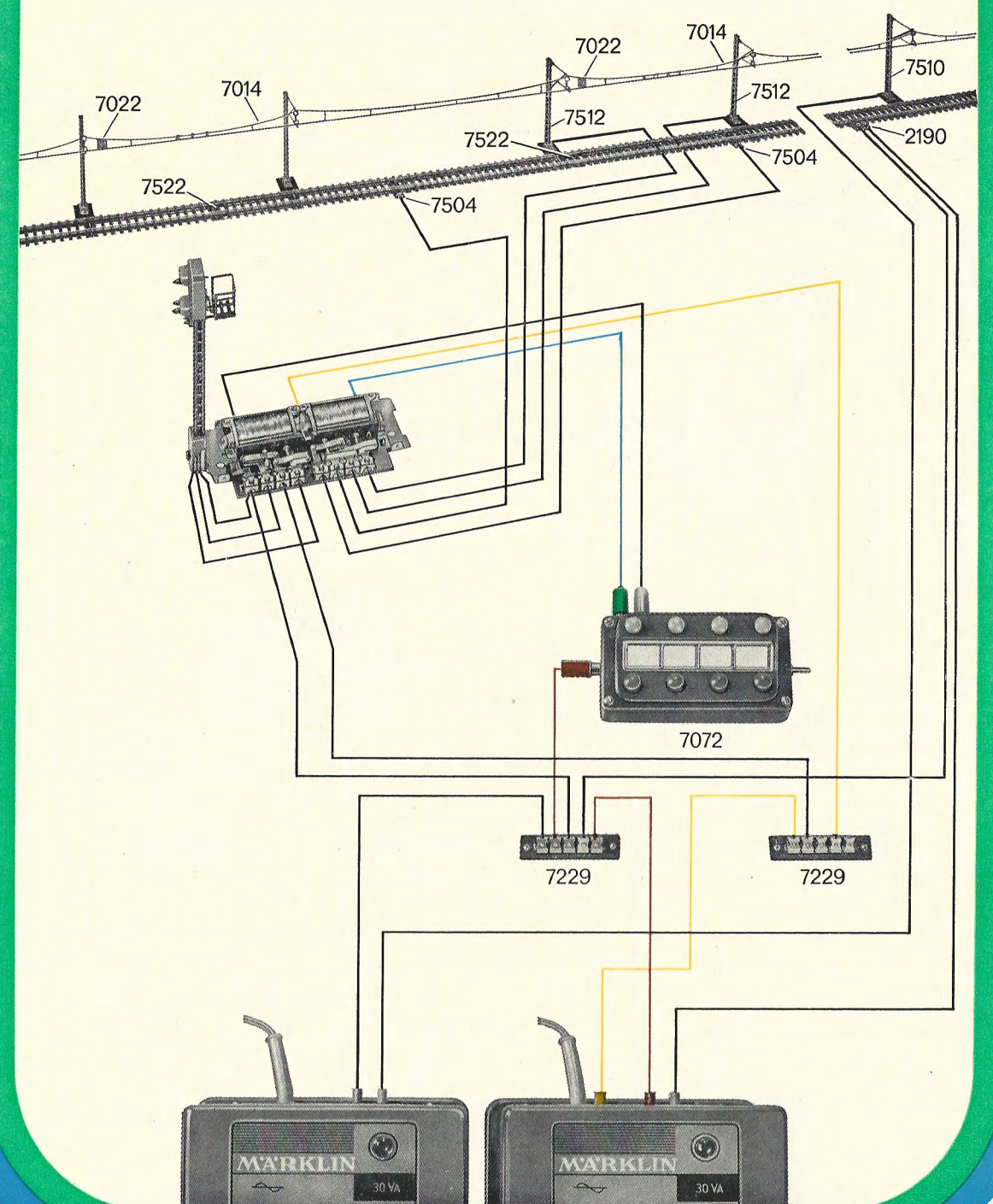


Fig. 35 b Path of current when signal set for "Proceed"



The current for running the trains is supplied by the red socket on the transformer. When used for surface contact through the studs the current is fed from the transformer via a red feeder cable to the red terminal of the feeder track, and from there to the stud contacts in the center of the track. The current is then fed via another red cable to the terminals of the signal. The current is then fed through the signal to still another red cable and

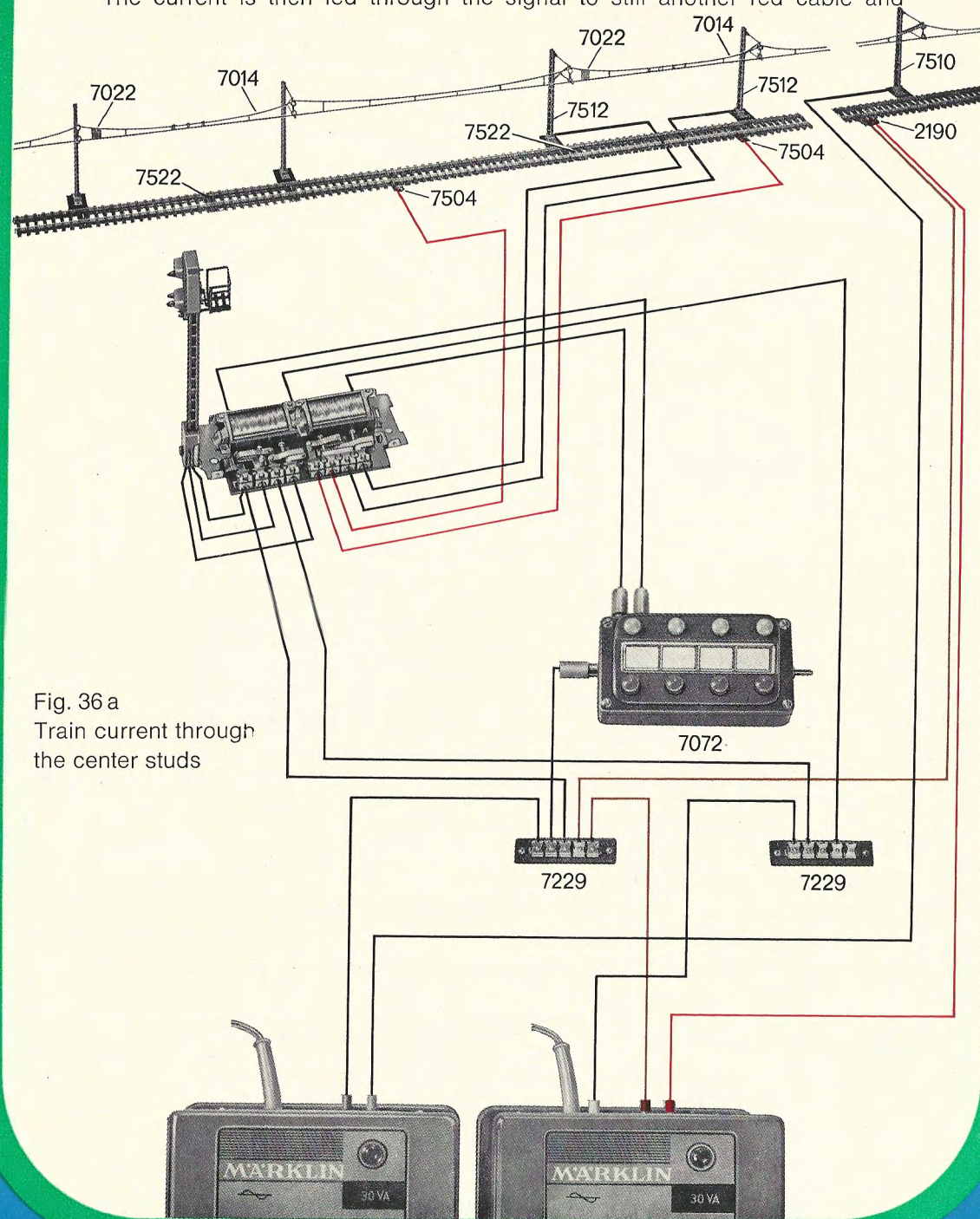


Fig. 36 a
Train current through
the center studs

back to the second track terminal in the insulated section of the track and then to the stud contacts in the center of the track. The stud contacts then feed the current to the pick up shoe on the bottom of the locomotive. The current is then fed through the wheels of the locomotive of the running rails and finally back through the brown wire to the brown socket of the transformer. When using the overhead catenary system, the path of the current is similar to that described before.

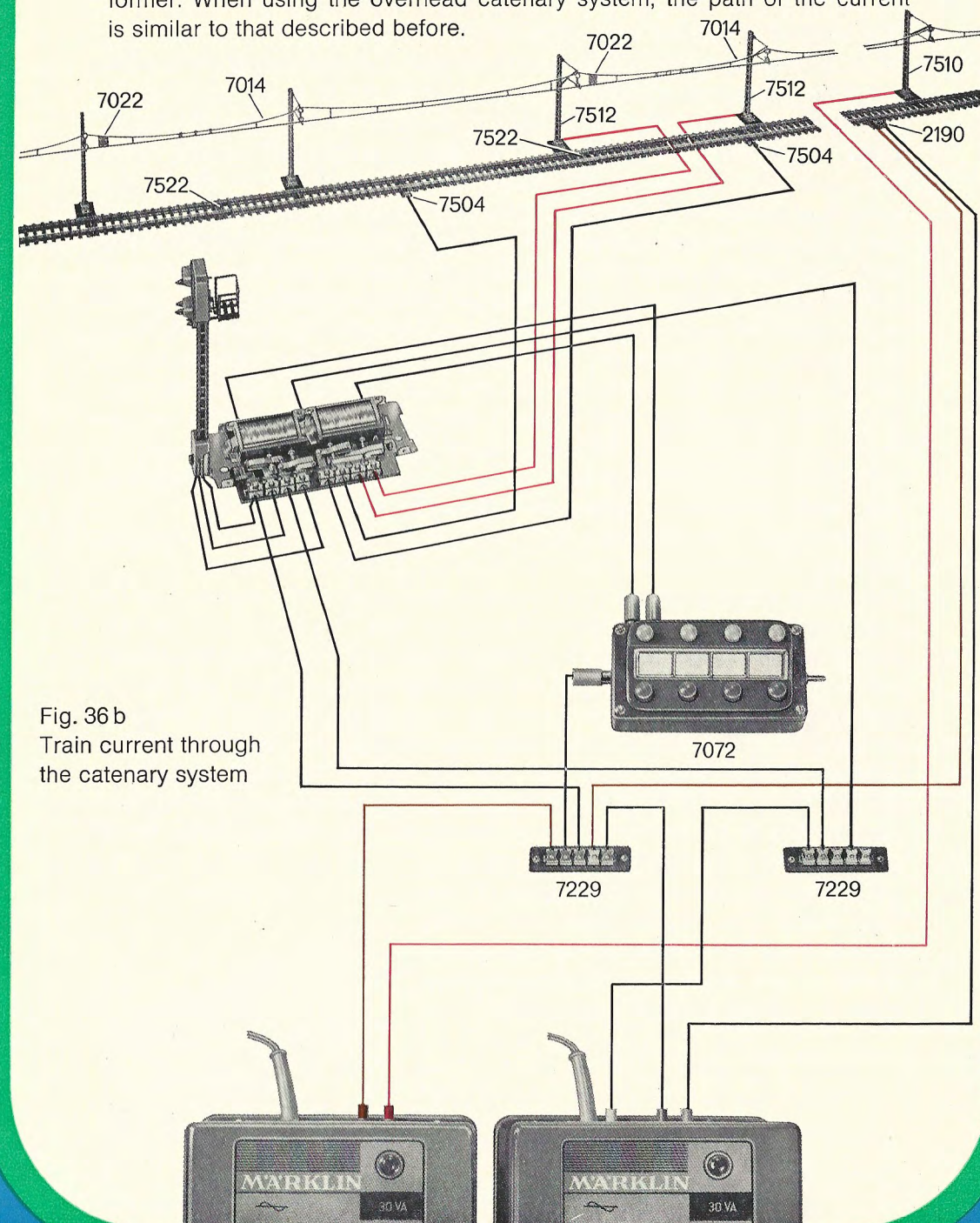


Fig. 36 b
Train current through
the catenary system

The red cable is supplied with a special metal connector for use with 5100 and 5200 Series Track. When used with 2100 Series Track this metal clip must be cut off and the insulation removed from the end of the wire.

The current for the signal lights is supplied by the yellow socket of the transformer, running through the yellow cable via the distributor panel and the yellow signal cable to the terminal of the signal solenoid control unit. This terminal is marked with yellow color. Depending on the various light indications of the signal, the current is fed from the signal solenoid control unit to the green, red or orange terminal, from here over to the cable, which is corresponding in color with the color of the bulbs on the top of the signal mast. From the signal the current is fed back to a "ground" contact plate, from here through the brown "ground" cable and finally to the brown terminal of the signal solenoid control unit. When the signal solenoid control unit is mounted to the track section by a mounting plate, the current is fed back over this mounting plate, the track section and a brown "ground" cable to the brown socket of the transformer. If the signal solenoid control unit is mounted separately from the signal, a special "ground" wire must be installed. In this case, the brown cable terminal of the signal solenoid control unit has to be connected with the brown socket of the transformer, or via the "ground" terminal (Fig. 37) with the track section. The various indications of the signal bulbs are operated from this signal light current.

If the three different types of current are connected as per these diagrams, you should encounter no difficulties installing the light home signals.

To summarize, the following rules should be followed when installing your signals:

The yellow wire with yellow plug, which is connected to the signal, must be connected to the yellow socket of the transformer. The blue cable with the various colored plugs (red, green, orange) must be connected to the control panel 7072. These wires operate the signal solenoids. The two red pair of terminals are used to provide current for running the trains. One pair may be used for the surface stud contacts and the other pair for the overhead catenary system. When using the catenary system, you must use either the red cable on the 7512 signal mast, or the signal feeder wire 7503 and connect this to the red terminals, on the signal. The contact points, which are attached to the yellow, green or orange cable terminals, are used for operation of the light bulbs. The yellow cable with yellow socket must be connected to the yellow socket of the transformer. This can also be done by using a distributor panel 7229.

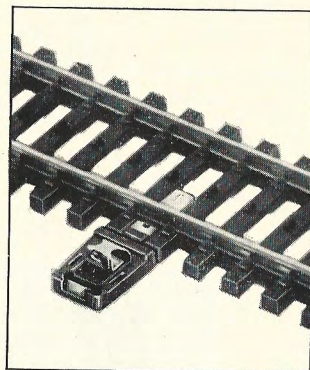


Fig. 37 Ground terminal 7500 ►

The colored cable, which comes from the signal mast, must be connected to the like colored terminals of the signal control unit. If you mount the signal control unit away from the track, the brown wire must be connected to a "ground" terminal.

Fig. 38 a Signal indicating "Stop"

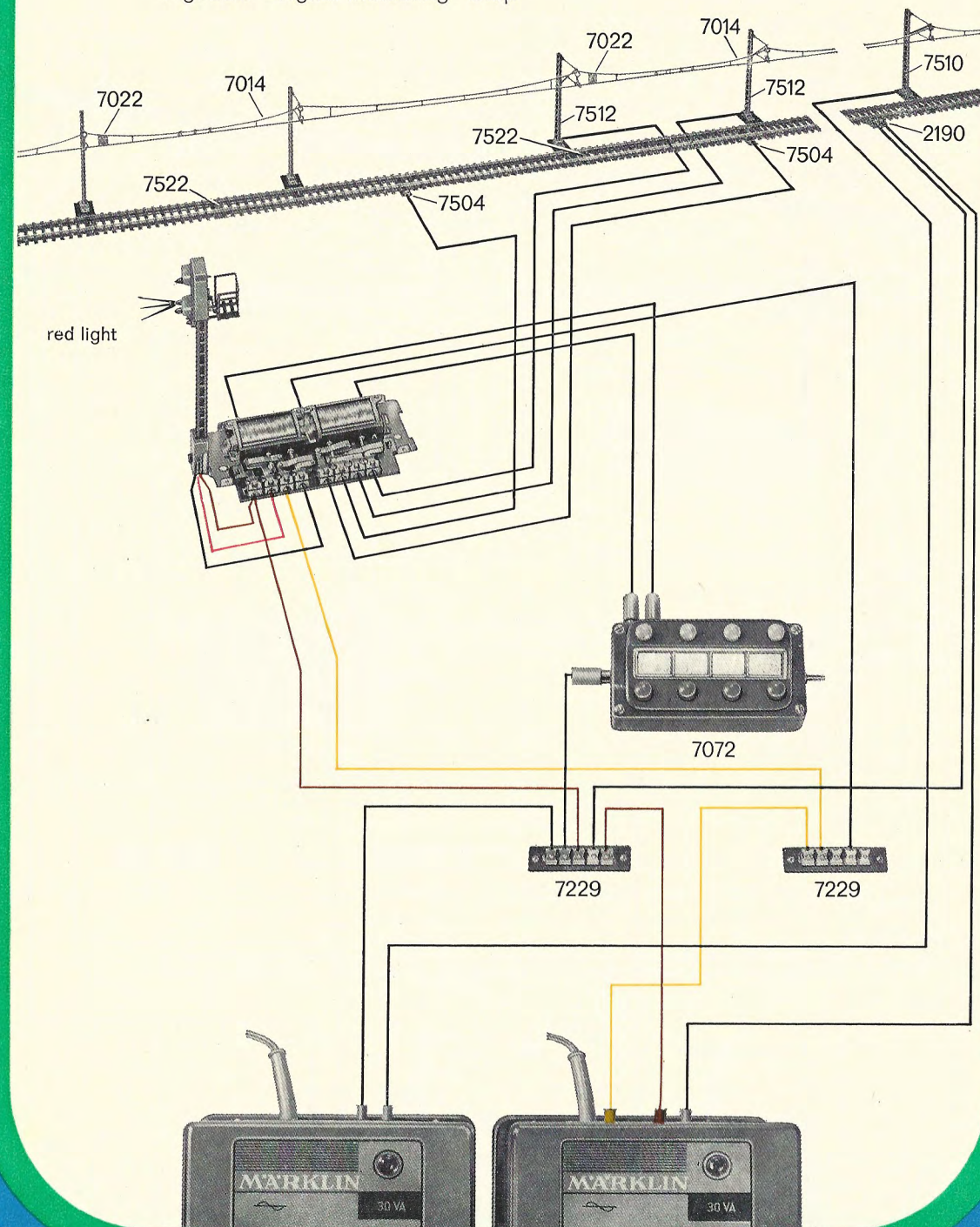
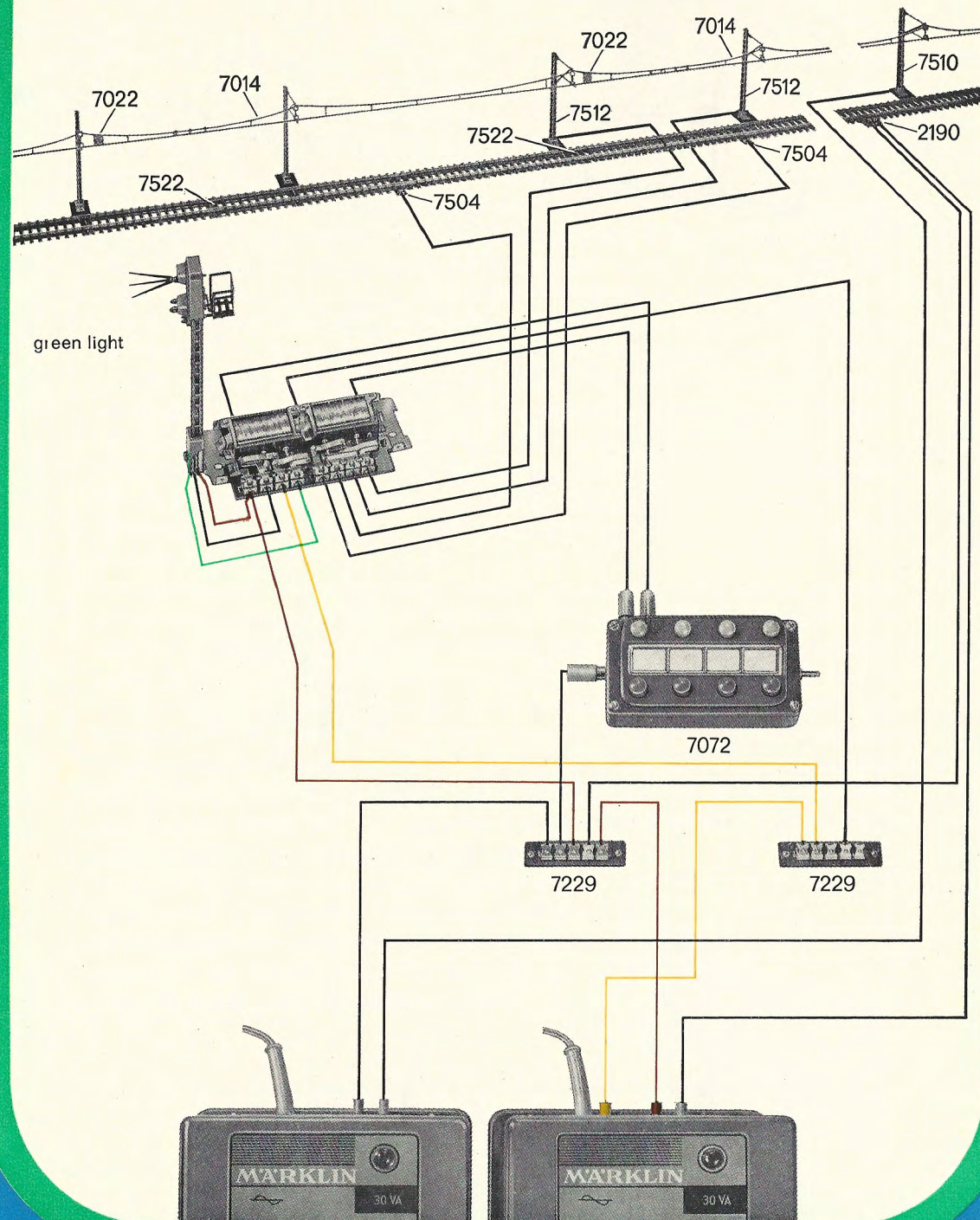


Fig. 38 b Signal indicating "Proceed"



The operation of the home signal

The signals can be operated with either the control panel 7072, or the contact track 2129/2139 and 2199. They can be connected for hand operation (Fig. 39), hand and automatic operation (Fig. 40) or fully automatic operation (Fig. 41). The control panels are used for operation by hand. The semi automatic, which is a very interesting operation, is done by using the control panels along with contact tracks. The contact tracks are necessary for the automatic operation of a signal. One of these contact tracks must be installed behind a signal. The actual position of a contact track depends upon the design of your layout. In all cases the contact track, which is installed in front

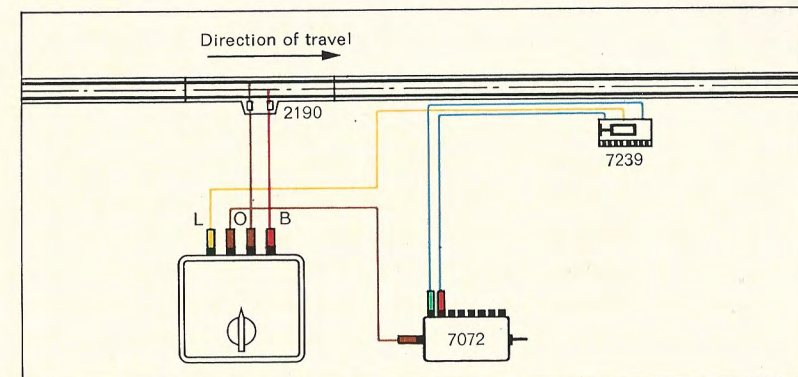


Fig. 39
Operation
by hand

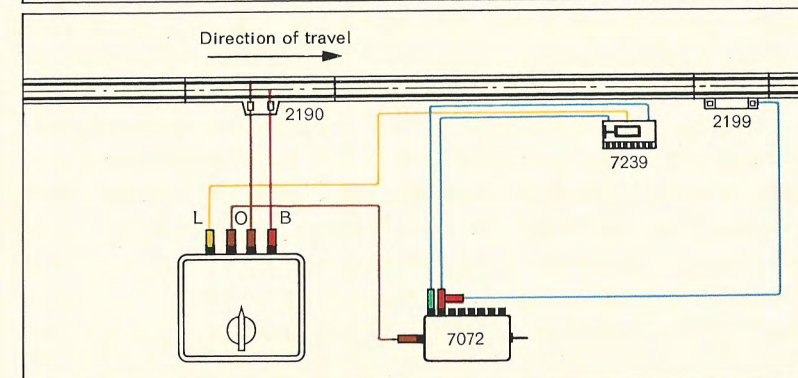


Fig. 40
Semi
automatic
operation

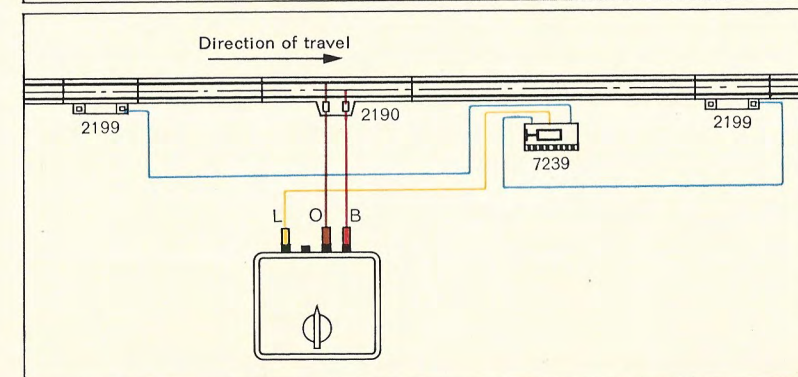


Fig. 41
Automatic
operation