TYPE TG ESCAPEMENT TIME RELAY

INSTRUCTIONS

Application

The Type TG Escapement Time Relay is a magnet operated definite time relay which will make or break a controlled circuit a definite number of seconds after the relay magnet is energized. The relay is available in two forms having different escapement devices to give adjustable timing ranges from 1 to 6 seconds for the "short-time" relay and from 3 to 17 seconds for the "long time" relay.

The relay is commonly applied to time the transfer of a reduced voltage A C. motor starter from the low voltage starting position to the full voltage running position but may be applied in many other ways as a general purpose timing relay. The relay **cannot** be used to give time delay after the coil is **deenergized** as the timing apparatus resets instantly when power is removed. For convenience in application a transfer contact is provided which operates as soon as the coil is energized and may be connected to make or break an auxiliary circuit at the beginning of the time cycle.

Shunt coils rated for continuous duty are available for all standard A-C. voltages, and coils for standard D-C. voltages are also available, but for D-C. continuous duty it is necessary to use an external resistance which is connected in series with the coil by operation of the instantaneous interlock just as the magnet closes.

All contacts will carry 5 amperes continuously or 10 amperes intermittently. They will make or break 10 amperes at any voltage up to 550 volts A-C. and will make 10 amperes D-C. but the breaking capacity on D-C. is dependent on the voltage as follows:

At 115 Volts D-C.—1.2 Amperes
At 230 Volts D-C.— .5 Ampere
At 550 Volts D-C.— .14 Ampere

All parts are insulated for 600 volts maximum.

Description

The relay comprises a magnet and timing mechanism and two sets of contacts which are mounted in one self contained unit on a moulded insulating base, which also carries terminal strips for front connection of all circuits.

The magnet is a laminated A-C. solenoid with a vertically moving plunger which is pulled upward by the coil and returns by gravity. The plunger pulls directly on the "plunger lever" and carries the latter to the end of its upward stroke instantly whenever the coil is energized. The lower lever known as the "rack lever" is flexibly linked to the "plunger lever" by means of a tension spring but is restrained from following it instantly by the mechanical resistance of the escapement device which is transmitted to the rack lever through the rack, pinned to the movable end. The plunger lever thus stores energy in the spring and the spring causes the rack lever to follow according to the speed allowed by the timing mechanism.

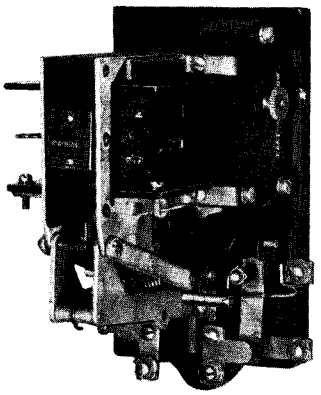

FIG. 1—TYPE TG ESCAPEMENT TIME RELAY

The plunger lever carries an operating pin extending to the left which engages with a moulded interlock lever near the end of the plunger stroke and operates the "instantaneous" transfer interlock on the lower left side of the base. The rack lever carries an operating pin extending to the right which acts in the same way to operate the "time" transfer interlock on the lower right side of the base. The rack is provided with teeth for a length which will allow the rack lever pin to travel slowly to a point immediately below the time interlock lever and then the last rack tooth slips off the ratchet pinion of the timer. The rack lever is then free and transfers the time interlock with a rapid motion. The rack and pinion have ratchet-type teeth so that there is no restraint to downward motion of the rack and the plunger and both levers fall to the lower position instantly when the coil circuit is opened.

Time Delay Mechanisms

The principle of the timing action depends on the retardation of the motion of a fixed spring force by a fixed inertia and is entirely free from errors due to variable voltage, temperature and viscosity changes, etc. Two time mechanisms are available. In the "short time" timer for 1 to 6 seconds, a toothed escapement wheel directly on the driven pinion shaft oscillates a double toothed pallet which in turn oscillates a balance wheel. The balance wheel is adjustably mounted on the front cover so that the time can be reduced from 6 seconds at "Slow" setting to 3 seconds at "Fast" setting. The time can be still further reduced by shortening the stroke of the rack which is accomplished by raising the stop on which the rack lever rests in the off position. The "long time" timer for 3 to 17 seconds is of similar construction except that it makes use of an intermediate gear reduction which increases the time. The two time mechanisms are interchangeable but it is necessary to change the rack when the timer is changed.

Maintenance

No maintenance is required except reasonable attention to the condition of the contacts and avoidance of dirt which would interfere with action of the moving parts. In case it is necessary to replace the coil, first unhook the tension spring. The hinge pin of the operating levers may then be removed and the plunger can then be withdrawn. The coil is then removable by removing two screws. In case of trouble with the timing mechanism itself the whole timing device should be replaced.

OPERATING COIL DATA

A-C. Coil Style Numbers			
Volts	60 Cycles	50 Cycles	25 Cycles
110	793685	793688	793692
220	783140	793689	793693
440	793686	793690	783167
550	793687	793691	793694

D-C. Coils Intermittent and Resistors		
Volts	Coil Style Number	Resistor and Mounting Style Number
115	793700	792929
230	793701	792930
600	757461	792931

*To be filed as an Instruction Leaflet and as Renewal Parts Data; for Renewal Parts, see reverse side of this sheet.

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RENEWAL PARTS DATA

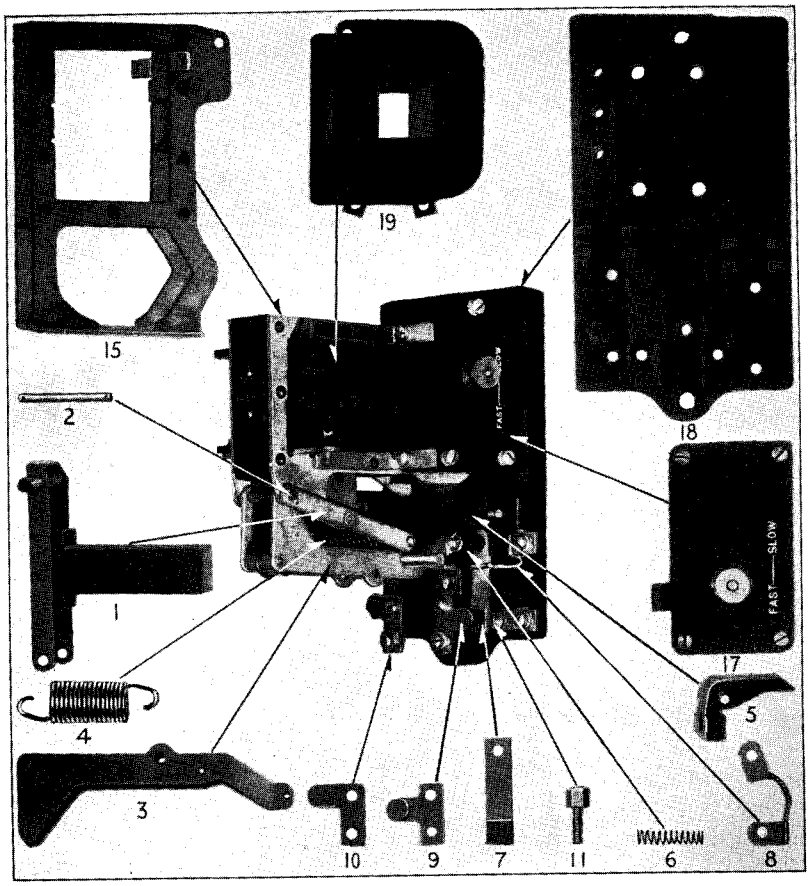

FIG. 2—RENEWAL PARTS FOR TYPE TG ESCAPEMENT TIME RELAY

This is a list of the Renewal Parts and the quantities of each that we recommend should be stocked by the user of this apparatus to minimize service interruptions caused by breakdowns. The parts recommended are those most subject to wear in normal operation, or to damage or breakage due to possible abnormal conditions.

This list of Renewal Parts is given only as a guide. When continuous operation is a primary consideration, additional insurance against shutdowns is desirable. Under such conditions more renewal parts stock should be carried, considering the severity of the service and the time required to secure replacements.

ORDERING INSTRUCTIONS

Name the part and give its style number. Give the complete name plate reading. State whether shipment is desired by express, freight or by parcel post. Send all orders or correspondence to nearest Sales Office of the Company. Small orders should be combined so as to amount to a value of at least $1.00 net; where the total of the sale is less than this, the material will be invoiced at $1.00.

RECOMMENDED STOCK OF RENEWAL PARTS

					Time Delay	1–6″	3–17″	1–6″	3–17″
					Cycles	25/40/DC	25/40/DC	50/60/DC	50/60/DC
							790600-D		792933-E
	Style Number of Relay					790599-E	859929	792932-D	859928
	For Relays in use up to and including			1	5				
REF. NO.	NAME OF PART	NO. PER RELAY	RECOMMENDED FOR STOCK			STYLE NUMBER OF PART			
1	Plunger Lever with Plunger	1	0	0		829744	829744	829744	829744
2	Hinge Pin for Plunger Lever	1	0	0		85770	85770	85770	85770
3	Rack Lever	1	0	0		829745	829745	829745	829745
4	Spring for Rack Lever	1	0	1		842243	842243	842243	842243
5	Operating Levers for Moving Contact Finger	2	0	0		859925	859925	859925	859925
6	Spring for Moving Contact Finger	2	0	2		779124	779124	779124	779124
7	Moving Contact Finger with Contact	2	2	4		778750	778750	778750	778750
8	Shunt for Moving Contact Finger	2	0	2		594931	594931	594931	594931
9	Stationary Contact with Support—T Shape	1	1	2		816996	816996	816996	816996
10	Stationary Contact with Support—L Shape	1	1	2		816997	816997	816997	816997
11	Stationary Contact with Stud	2	2	4		816995	816995	816995	816995
§12	Hinge Pin for Rack	1	0	0		759942-A	759942	759942	759942
§13	Rack	1	0	0		759961-A	759976	759961	759976
§14	Spring for Rack	1	0	1		759971	759971	759971	759971
15	Magnet Frame	1	0	0		809418	809418	809419	809419
§16	Shading Coil	1	0	1		759940	759940	759941	759941
17	Timing Mechanism	1	0	0		760658-C	859926	760658	859926
18	Base	1	0	0		759938	759938	759938	759938
‡19	Operating Coil	1	0	1		‡	‡	‡	‡

Parts indented are included in the part under which they are indented.

‡When ordering coils, give the identification number stamped on the old coil. For table of commonly used operating coils, see reverse side of this sheet.

§Not listed on illustration.

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