

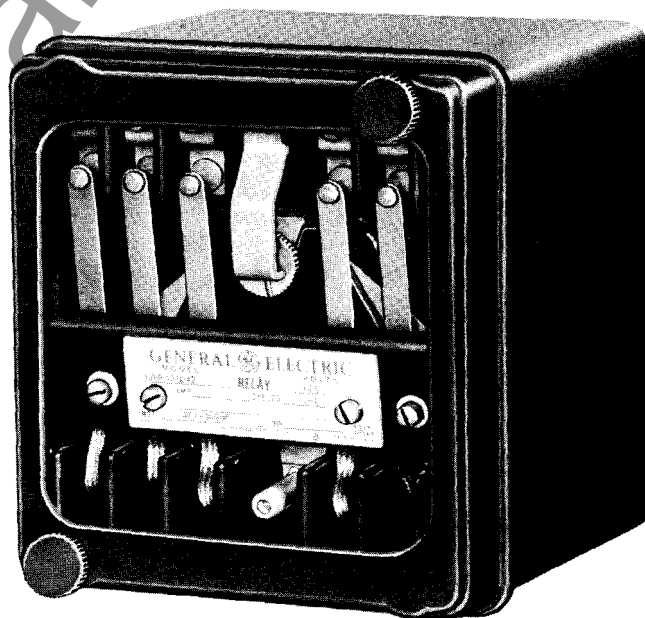
INSTRUCTIONS

Switchgear

MULTI-CONTACT AUXILIARY RELAYS

Types

HFA25B and HFA25C



GENERAL  ELECTRIC

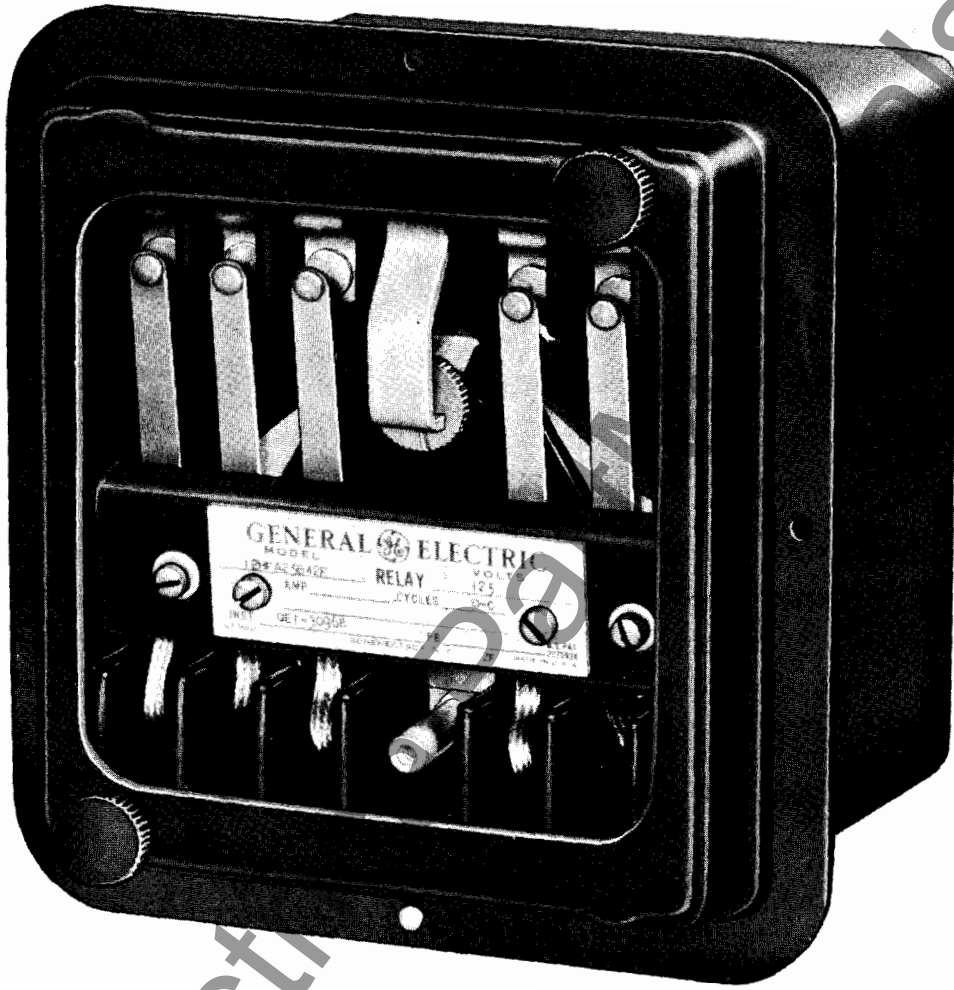


Fig. 1 Type HFA25B Relay in "F" Case

MULTI-CONTACT AUXILIARY RELAYS

TYPE HFA

INTRODUCTION

The Type HFA25B and HFA25C relays are time delay, multi-contact, self-resetting, hinged armature auxiliary relays designed for use where a number of operations must be performed simultaneously. They are available with six electrically separate contact circuits adaptable for either circuit-opening or circuit-closing applications. The moving contacts of the relay are operated by the hinged armature which is actuated by the operating coil and restrained by an adjustable control spring.

The time delay dropout is obtained by means of a copper damping ring around the upper branch of the pole piece, and by the special construction of the pole piece and armature. The armature is of high quality silicon-steel and is about 5/16 inch in thickness. The pole piece or magnet, is a silicon-steel casting of large cross section. The time delay dropout of the Type HFA25B is determined by the air gap between the upper pole face and the armature. This gap is controlled by the adjustable residual screw mounted in the armature. The time delay range is 0.25 second to 3.0 seconds. The Type HFA25C relay has a pick up time of 0.100 second with the control spring set for 0.6 X rated voltage pickup and rated voltage applied. The dropout time is 0.25 seconds.

The relays are mounted in a molded Textolite Case suitable for surface mounting only (See Fig. 7). The addition of a steel flange makes the case suitable for semi-flush mounting. There are two types of flanges available which allows mounting of the relay with its own cover (See Fig. 8), or with a cover that matches those used on the size S-1

RECEIVING, HANDLING AND STORAGE

These relays, when not included as a part of a control-panel, will be shipped in cartons designed to protect them against damage. Immediately upon receipt of the relay, an examination should be made for any damage sustained during shipment. If injury or damage resulting from rough handling is evident, file a damage claim at once with the transportation company and promptly notify the nearest General Electric Apparatus Sales Office.

INSTALLATION

LOCATION

The location should be clean and dry, free from dust and excessive vibration, and well lighted to facilitate inspection and testing.

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the General Electric Company.

case for drawout relays (See Fig. 9).

RATINGS

The relays are available with coil ratings of 115 or 230 volts a-c and up to 250 volts d-c. The a-c coils require external rectifiers and can therefore be used for frequencies from 25 cycles to 5000 cycles. No series resistors are required unless specified on the nameplate.

The current closing rating of the contact is 12 amperes. The current carrying rating is 12 amperes continuously or 30 amperes for one minute. The interrupting ratings (non-inductive circuits) for the various voltages are as follows.

| D-C | | A-C | |
|-------|------|-------|------|
| Volts | Amps | Volts | Amps |
| 12 | 30 | 115 | 30 |
| 24 | 15 | 230 | 20 |
| 32 | 10 | 460 | 15 |
| 48 | 8 | 575 | 10 |
| 125 | 3 | | |
| 250 | 1 | | |

BURDENS

The burden of the d-c coils is approximately 13 watts when cold and 10 watts when hot. The burden of the a-c coils, including rectifiers, is approximately 30 volts amperes with 20 watts.

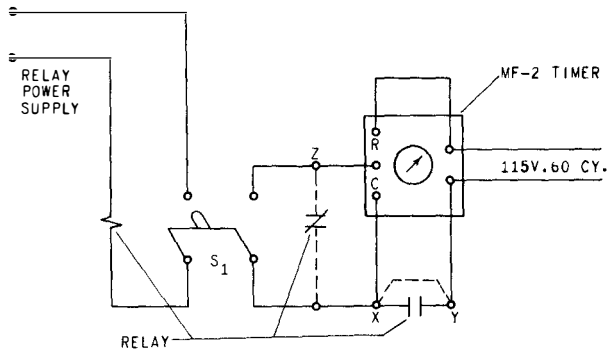
Reasonable care should be exercised in unpacking the relay in order that none of the parts are injured or the adjustments disturbed.

If the relays are not to be installed immediately, they should be stored in their original cartons in a place that is free from moisture, dust, and metallic chips. Foreign matter collected on the outside of the case may find its way inside when the cover is removed and cause trouble in the operation of the relay.

MOUNTING

The relays should be mounted on a vertical surface. Surface mounting on steel panels require an insulating bushing for each terminal. These

Multi-Contact Auxiliary Relays Type HFA



NOTE:--IF NO NORMALLY OPEN CONTACTS ARE AVAILABLE PLACE JUMPER BETWEEN POINTS X AND Y, AND CONNECT NORMALLY CLOSED CONTACT BETWEEN X AND Z AS SHOWN BY DOTTED CONNECTIONS.

Fig. 2 Test Connections for Checking Drop-out Time of Type HFA Relays

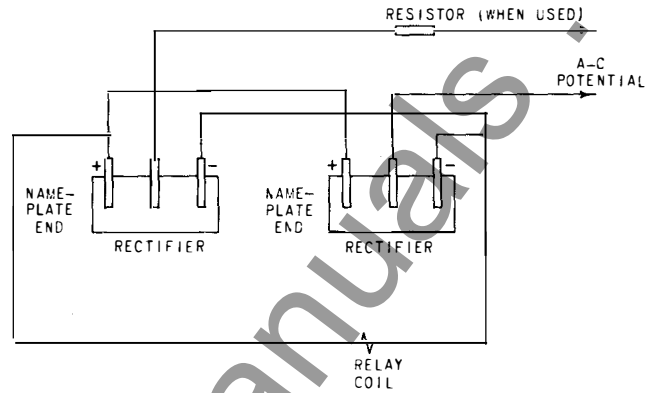


Fig. 3 Typical Connections Showing Method of Connecting Resistor and Rectifiers

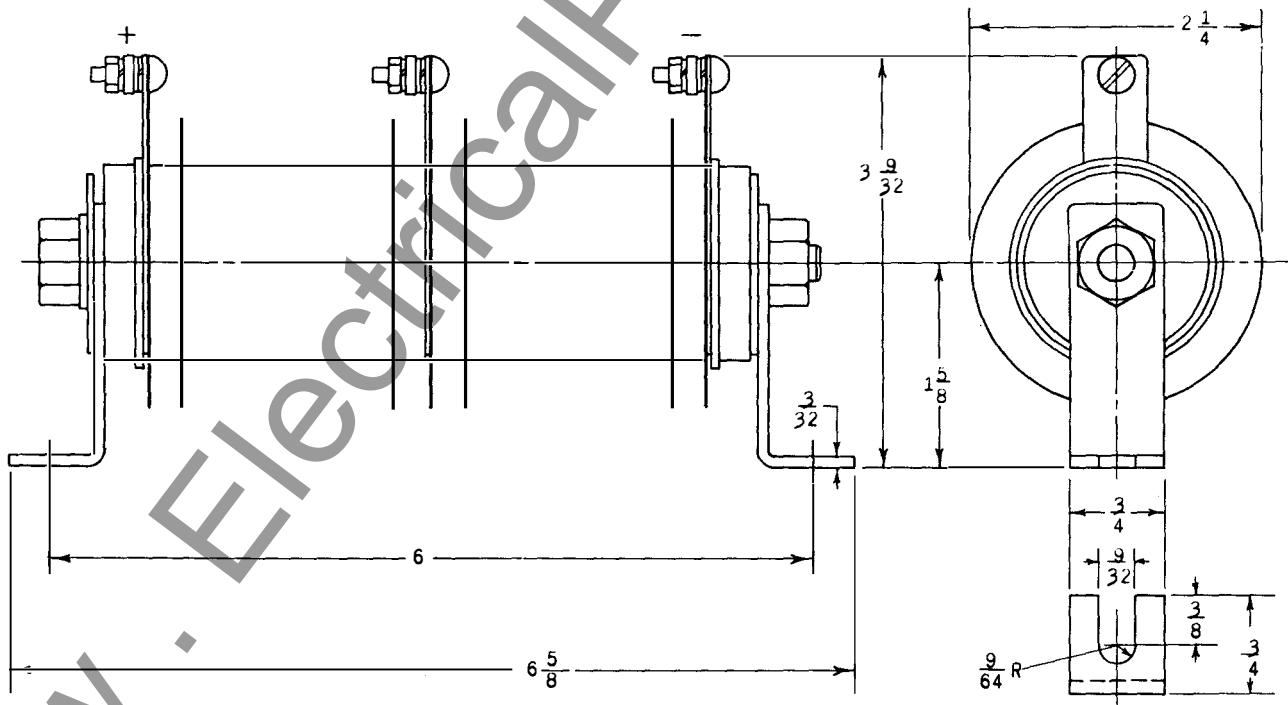
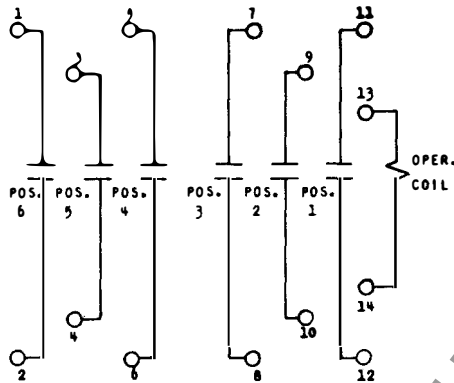


Fig. 4 Outline Dimensions for External Rectifier.

are supplied with the relay on request. The outline and panel drilling dimensions are shown in Fig. 7 to Fig. 9 inclusive. The outline diagram of the rectifiers, for use with the a-c relays, is shown in Fig. 4.

CONNECTIONS

The internal connection diagram is shown in Fig. 5. The external wiring diagram, for the a-c relays with rectifiers, is shown in Fig. 3. It should be noted that the contact which de-energizes the relay coil must be connected on the a-c side of the rectifier.



EACH CONTACT CONVERTIBLE ONLY
ACCORDING TO CONTACT ARRANGEMENT
CODES FOR MODELS LISTED.

Fig. 5 Type HFA25 Relays, Internal Connections
(Back View)

ADJUSTMENTS

The relays are adjusted at the factory to pick-up at less than 60 percent of rated voltages and to dropout within 10 percent of the specified time delay. It should not be necessary to disturb these adjustments unless the contact arrangement or time setting is changed.

CONTACTS

Any contact circuit can be changed from normally open to normally closed, or vice versa, to provide any of the combination shown in Fig. 6, by removing the fixed contact arm, turning it over, and replacing it. However, it is not recommended that the relays be operated with fewer than two normally open contacts. After a change in contact circuit it will be necessary to readjust the moving

arms of the affected circuits. These arms should be adjusted by bending so that all normally open contacts make simultaneously when the relay is operated, and all normally closed contacts make simultaneously when the relay drops out. Any change in the number of normally open contacts will disturb the time adjustment. The normally open contacts should have no less than 1/32 inch wipe.

| RELAY TYPE | C O D E † | CONTACT ARRANGEMENT | | | | | |
|------------------|--------------------|---------------------|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 |
| HFA25B HFA25C | 60 | a | a | a | a | a | a |
| | 51 | a | a | a | b | a | a |
| | 42 | a | a | b | b | a | a |
| | 33 | a | a | b | b | b | a |
| | 24 | a | b | b | b | b | a |

a = NORMALLY OPEN CONTACT
b = NORMALLY CLOSED CONTACT
† = EACH RELAY IS AVAILABLE ONLY WITH THE CONTACT CODES SPECIFIED.

Fig. 6 Contact Arrangement Codes

DROPOUT TIME

For dropout times of 0.25 to 1.5 seconds, the factory set calibrations can be varied by turning the residual screw clockwise to decrease the time delay and counterclockwise to increase the time delay. The longer time delays ranging from 1.5 to 3 seconds require more careful adjustment, and might require an adjustment of the control spring tension.

In making any time adjustment, the control spring should first be set at its maximum tension. Then the proper notch on the calibrating screw should be selected by turning it to obtain the desired time delay. It is recommended that when setting for 3 second time delays, the closest adjustment obtained with the residual screw setting be selected without decreasing the spring tension. The maximum setting should be 3 seconds or less. For example, if a counterclockwise rotation of the residual screw increases the time delay from 2.85 seconds to 3.2 seconds, the preferable setting is the shorter time delay. If a more accurate setting is required, the increase is obtained by decreasing the control spring tension which is a finer adjustment.

(K-6375768) Fig. 5

(K-6375888) Fig. 6

Multi-Contact Auxiliary Relays Type HFA

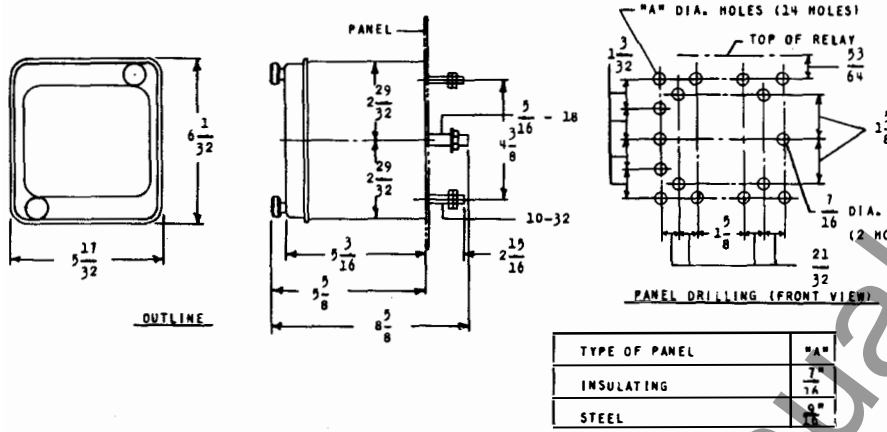


Fig. 7 Outline and Panel Drilling Dimensions for Type HFA Relays in Standard Case

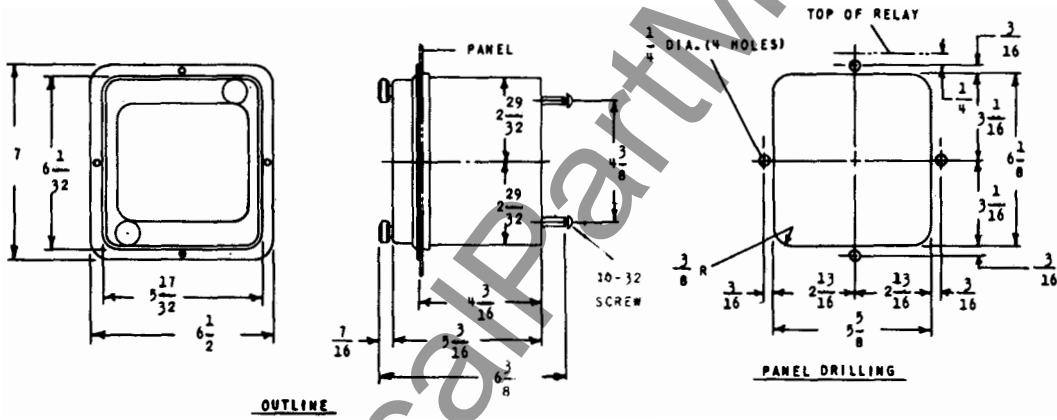


Fig. 8 Outline and Panel Drilling Dimensions for Type HFA Relays in "F" Case

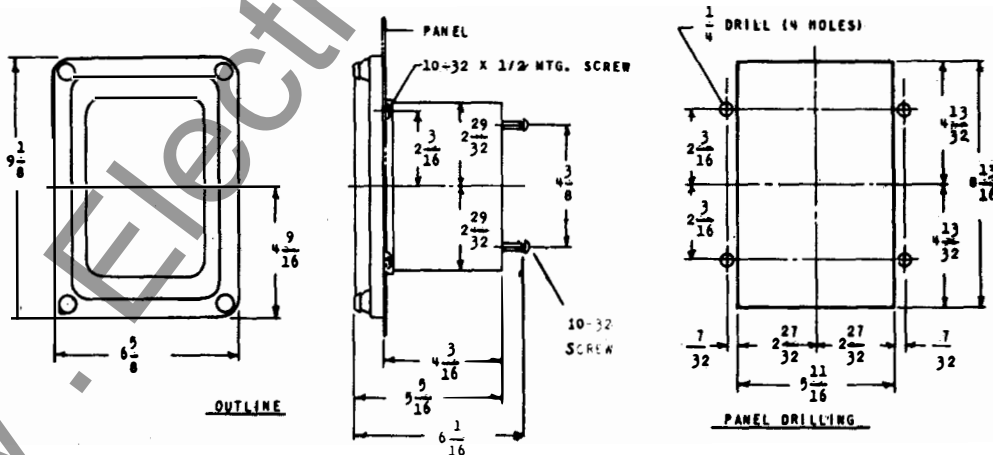


Fig. 9 Outline and Panel Drilling Dimensions for Type HFA Relays in "E" Case

When making adjustments for 0.2 second dropout, the normally open contacts should be checked for the minimum of 3/64 inch contact wipe. The moving contact should be bent to obtain this if necessary.

PICKUP

After the time adjustments are completed, the D-C relay should pickup at 60% or less and A-C relays should pickup at 80% or less. If it is necessary to lower the pickup, the knurled adjusting

nut should be lifted 1/16 inch, turned counter-clockwise and then resealed in the hexagonal groove in the tail piece. If the time adjustments have been made per instructions, it should not be necessary to increase the pickup voltage. Any change in spring tension requires a recheck on the dropout time since it will be affected. If a reduction in contact gap could be tolerated, it is recommended that a decrease in pickup voltage, if necessary, be obtained by bending the back stop forward to reduce the armature gap, and maintaining the control spring pressure at a maximum. This adjustment will not affect the dropout time.

MAINTENANCE

CONTACT CLEANING

In cleaning fine silver contacts, a flexible burnishing tool should be used. This consists of a flexible strip of metal with an etched roughened surface, resembling in effect a superfine file.

The polishing action is so delicate that no scratches are left, yet corroded material will be removed rapidly and thoroughly.

The burnishing tool described is included in the standard relay tool kit obtainable from the factory.

RENEWAL PARTS

It is recommended that sufficient quantities of renewal parts be carried in stock to enable the prompt replacement of any that are worn, broken, or damaged.

When ordering renewal parts, address the near-

est Sales Office of the General Electric Company, specify quantity required, name of part wanted, and give complete nameplate data, including serial number. If possible, give the General Electric Company requisition number on which the relay was furnished.

WHEN YOU NEED SERVICE

IF YOU NEED TO REPAIR, recondition, or rebuild any electric apparatus, a G-E service shop near you is available day and night, seven days a week, for work in the shops or on your premises. Latest factory methods and genuine G-E renewal parts are used to maintain the original performance of your G-E equipment. For full information about these services, contact the nearest service shop or sales office listed below:

APPARATUS SERVICE SHOPS

*Denotes Aircraft Service Shops

Albany, N. Y. 1097 Central Ave.
Allentown, Pa. 668 E. Highland St.
Appleton, Wisc. Midway Industrial Area,
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Atlanta—Chamblee, Ga. 4639 Peachtree
Indus. Blvd.
*Arkansas City, Kan. P.O. Box 526
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*Cincinnati 3, Ohio 956 E. Court St.
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Ft. Wayne, Ind. 606 W. Superior St.
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Indianapolis 22, Ind. 1740 W. Vermont St.
Johnstown, Pa. 841 Oak St.
Kansas City 20, Mo. 3525 Gardner Ave.
Los Angeles 1, Calif. 6900 Stanford Ave.
Louisville, Ky. 2014 New Main St.
Midland, Tex. 3404 Bankhead Hwy.
Milwaukee 3, Wisc. 940 W. St. Paul Ave.
Minneapolis 12, Minn. 2025 49th Ave., N.
New Orleans, La. 2815 N. Robertson St.
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*Seattle 4, Wash. 3422 First Ave., S.
Southington, Conn. 53 Railroad Ave.
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