DIAPHRAGM RELIEF DEVICE FOR SEALDAIRE TRANSFORMERS
INSTRUCTIONS

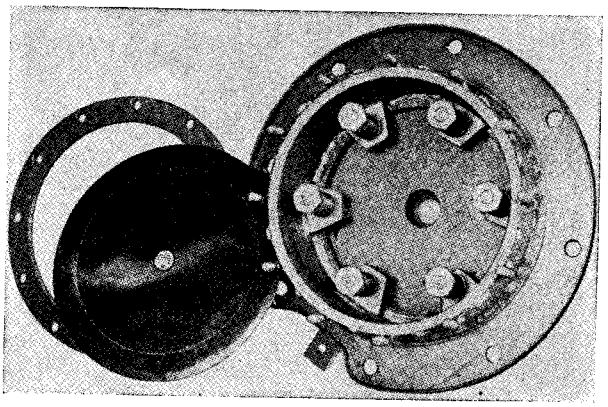

FIG. 1—DIAPHRAGM RELIEF DEVICE

GENERAL

The Westinghouse diaphragm relief device for Sealdaire transformers consists of a thin sheet of Micarta, mounted in a special manhole cover on the top of the transformer case. The diaphragm ruptures at dangerous pressures, which are relieved by the opening of a weatherproof cover above the diaphragm, the cover being reclosed by springs after the pressure has been reduced. Except for the replacing of a ruptured diaphragm it is only necessary to inspect the diaphragm occasionally through an inspection opening in the relief device cover.

CONSTRUCTION

The relief device is of all welded construction. The cover, which is provided with protecting flanges and barriers, rests upon smoothly machined surfaces to prevent the entrance of rain. An annular channel directly below these surfaces on the inside of the device is provided for catching and draining to the outside any moisture that might possibly enter. Rain tests have shown conclusively that this device is virtually rain proof. In the center of the relief cover, a two inch pipe opening with a screw cap is provided for inspecting the condition of the relief diaphragm.

The selection of a suitable material for the diaphragm is a matter of some importance. In order to be reliable it must have a uniform rupturing characteristic, under the conditions presented, in relieving abnormal pressures. It must, at the same time, be a material of sufficiently substantial nature to be handled easily without danger of accidental breakage. Of the three principal materials available for the purpose—sheet Micarta, glass and thin metals—sheet Micarta has been proven to be the most satisfactory. It is a laminated fibrous material which is bonded with cement under heat and pressure. It is unaffected by oil, gas or water. It has strength, toughness and flexibility and yet when subjected to a shock, in the form of a thin sheet securely clamped around its edges, it has an almost brittle characteristic not unlike glass, which causes it to shatter with a very fair degree of uniformity in its performance. The Micarta diaphragms used in the relief device have a reinforced rim. This heavier rim section acts to prevent buckling of the thin Micarta sheet when it is clamped into place. The diaphragm ruptures at 10 to 14 lbs./sq. in. pressure.

The patented relief devices shown in Figs. 1 and 2 fit into the manhole opening in the cover, acting both as relief device and manhole cover.

INSTALLATION

The relief device is usually shipped mounted on the transformer. It is shown at the center in Fig. 3.

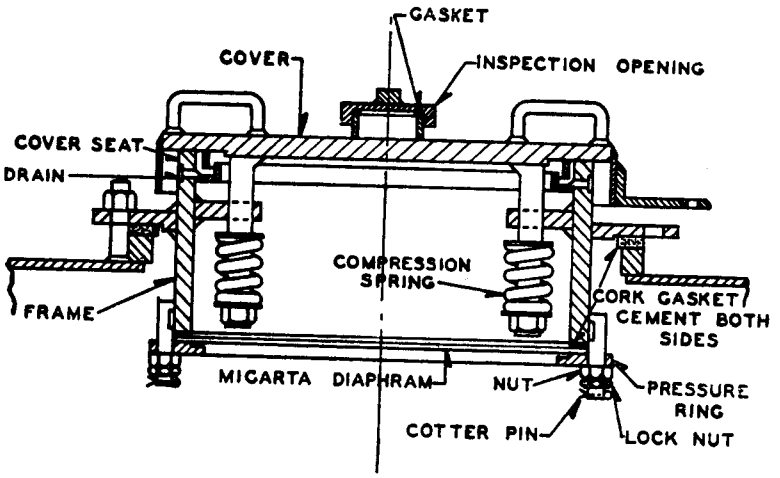

FIG. 2—SHOWING CONSTRUCTION OF RELIEF DEVICE

FIG. 2—SHOWING CONSTRUCTION OF RELIEF DEVICE

Diaphragm Relief Device for Sealdaire Transformers—Continued

INSTRUCTIONS—Continued

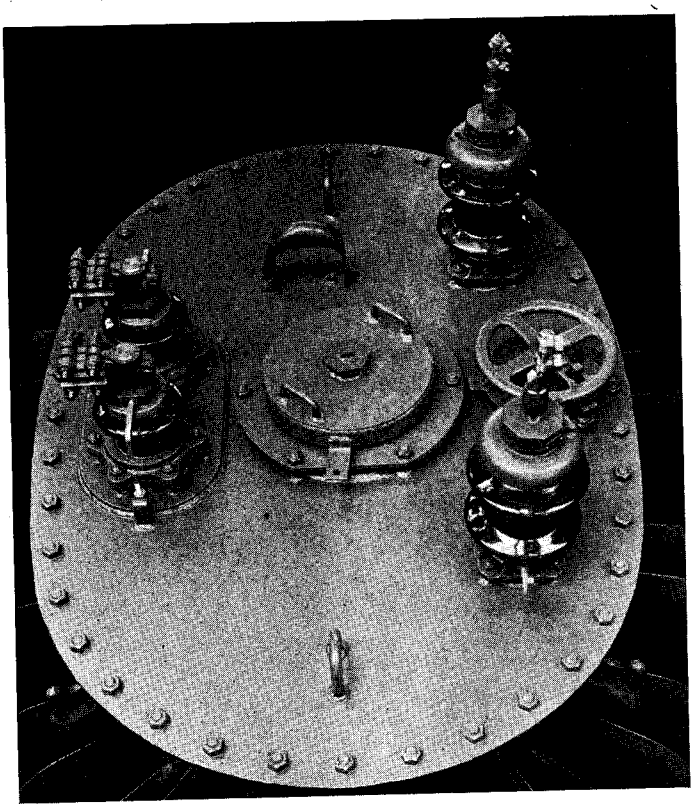

FIG. 3—RELIEF DEVICE MOUNTED ON COVER OF TRANSFORMER

OPERATION

When the pressure in the tank rises above normal the diaphragm bursts and the manhole cover rises, thereby relieving the pressure. The spring assembly is provided for arresting the motion of the cover after such an occurrence. After the pressure is relieved the spring tension and gravity act to return the cover to the closed position, preventing the entrance of dirt or rain.

When the manhole opening is to be used for entrance into the transformer case, the outer row of bolts is removed and the complete assembly withdrawn, leaving a full-size opening in the cover.

MAINTENANCE

The diaphragm can be inspected by removing the screw cap over the inspection opening. If for any reason the diaphragm ruptures it should be replaced at once.

In replacing Micarta diaphragms, place the side of the diaphragm with the reinforcing rim toward the atmospheric pressure, i.e., place the reinforcing rim against the gasket. See Fig. 1. Both sides and the outside edges of the gasket should be coated with red lead gasket cement #7386 and let dry 15 minutes. Apply second coat and assemble, wiping excess cement off the edges of the gasket. Excess cement should be kept off the diaphragms as it will affect their breaking strength. Tighten nuts on the clamping ring uniformly against the gasket stop.

RENEWAL PARTS

Spare diaphragms, gaskets and cement should be kept on hand. A limited supply is furnished with the transformer. For additional parts, order from the Sharon Works, giving serial and stock order number of the complete transformer as stamped on the name plate.

Westinghouse Electric Corporation

Sharon, Pa.

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INSTRUCTIONS FOR CHECKING OPERATION OF TYPE RB INERTAIRE EQUIPMENT

k operation of Inertaire Equipment, proceed as follows:

lucing Valve

ose shut-off valve "B" (clockwise limit).

nove cap of blow-out fitting "B".

ogen gas exhausting fr om blow- fitting indicates red ucing valve perating.

check pressure se g valve connect cting of reduc- eter to blow-out a water mano- " by means fitting on valve enty-eight inc of rubber tube. pound pre nes of water equals d exhaust essure. Regulator re or fou at one-half pound valve rteen inches of water. c "B" to operating ounter-clockwise to

p.

adjustments of reducing IL-3632.

y Breather Regulator

shut-off valve "B" (clockwise mit).

each source of 15# pressure of y air or dry nitrogen to blow out tting of valve "B".

Partially open valve to source of r or dry nitrogen and increase ire until breathing regulator sts at breathing plug. Pres- t which gas flows from breath- egulator is the breathing out ure. The vacuum at which in- hing occurs is numerically one- the out-breathing pressure. out-breathing pressure may be ged by changing the amount of ury in the regulator. Adding ury increases the breathing-out sure and removing mercury de- ses the pressure. The mercury dded by pouring it in the filing w and tapping lightly so mer- will flow thru glass wool. The cury is removed at the mercury n.

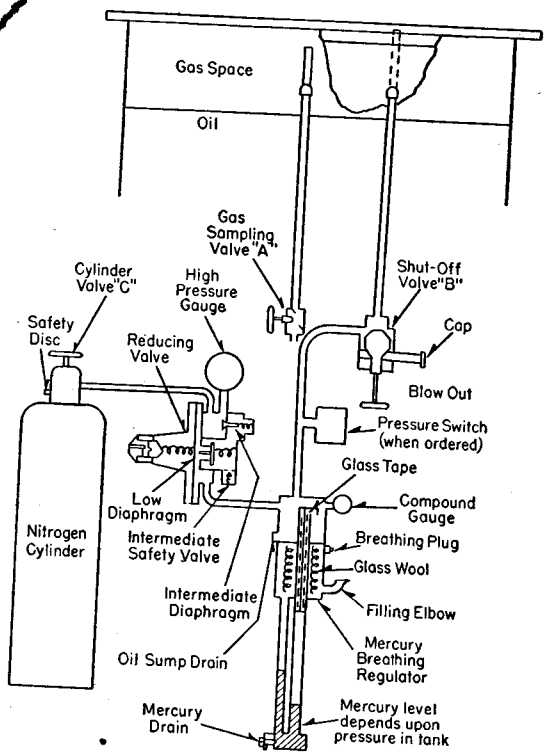
not check breathing out pressure h breather plug removed.

move testing pressure.

turn valve "B" to operating posi- n (counter-clockwise to limit).

place blow out cap.

en oil sump drain and drain off y oil in sump.



8. Close oil sump drain..
   Poor or erratic operation of the breathing regulator may be caused by contamination of the mercury by oil causing an oil-mercury emulsion. If this occurs refer to I.L. 3632 for instruction regarding cleaning the breathing regulator.

(c) Pressure Alarm Switches (When Used)

1. Close shut-off valve "B" (clockwise to limit).
2. Close nitrogen cylinder valve.
3. Attach source of 15 P.s.i. of dry air or dry nitrogen to blow-out fitting on valve "B".
4. Partially open valve to source of dry air or dry nitrogen and increase pressure until a faint click, made by micro-switch in pressure switch is heard. This click should occur at slightly over 10 P.s.i. and indicates the operating point of the upper pressure switch. Pressures in excess of normal breathing out pressure may be obtained by holding a finger over the breathing out plug. Do not let the pressure exceed 12 P.s.i. as relay diaphragm might be damaged.
5. Remove source of 15 P.s.i. pressure and slowly decrease pressure by throttling the gas exhausting from the blow-out fitting on valve "B". At about ¼ P.s.i. pressure a click should be heard indicating the operating point of the lower pressure switch.

Note: These switches have about a 2 P.s.i. pressure differential so that a click also occurs when the switches reset, i.e., approximately 2 P.s.i. below operating point of upper pressure switch when pressure is falling past the operating point and 2 P.s.i. above operating point of lower pressure switch when pressure is rising past the operating point. A signal lamp may be connected to the switch contacts if difficulty is experienced in hearing the clicks when the switches operate.

(d) Shut-Off Valve "B"

1. With valve "B" in operating position, remove cap from blow-out fitting.
2. Wet finger and place over blow-out fitting. Remove finger slowly and if no bubbles form, valve may be considered gas tight.
3. Remove cap on blow-out fitting.

(e) Sampling Valve "A"

1. With valve "A" screwed in, remove cap from sampling valve.
2. Wet finger and place over fitting. Remove finger slowly and if no bubbles form, valve may be considered gas tight.
3. Replace cap on sampling valve.

(f) Fittings

The fittings should not be tightened unless it is definitely known that the connection is not gas tight. A plastic cement is used on the threads which will usually permit some tightening when necessary. If slight tightening does not make the connection gas tight, the connection should be opened, cleaned and re-cemented.

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Sharon, Pa.

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