

A-84-019
41-19

4 Jan
W.S.P.

Parrott please
discuss with
Brode

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WASHINGTON, D. C.

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December 29, 1943

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IRVIN STEWART, Executive Secretary

~~**SECRET**~~

FROM: B. Arthur Breslow
TO: Capt. W. S. Parsons
SUBJECT: Time delay mechanism
ENCLOSURE: (a) Inertia switch drawing
(b) Delco motor specs.
(c) Performance curves of Delco motor
(d) Efficiency curves of Delco motor

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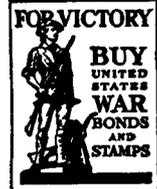
FINAL DETERMINATION
UNCLAS
L. M. Red. on
FEB 5, 1981

1. Dr. L. G. Parrott indicated when he was here that you are interested in a timer which will be triggered by an inertia switch and will have a one minute delay.

2. For the inertia switch, I recommend the "Detonator Inertia Trip Assembly Drawing Number 11-B-1421", made by Westinghouse Electric and Manufacturing Co. Inc. of Sharon, Pa. This switch, see enclosure (a), was developed for torpedoes. The switch operates on from 5 to 15 g accelerations in any direction depending upon the springs used. For any particular spring, the operation is within 20 percent for all directions. There is one electrical contact.

3. The problem of the time delay is one of the most difficult the Navy has, in its requirements. In order to anticipate the possible needs I have inquired into a time delay which can be set for the interval between 30 seconds and 180 seconds, the accuracy need not be better than 10 percent, the certainty of operation must be 100 percent. The unit must stand 500 g.

4. The Navy has lots of timers, but its best ones are for shorter or longer periods of time. The TD mechanisms, time delay mechanisms, are no more than modified automobile clocks. They do not offer more than an 80 percent return on certainty of operation. The SS mechanisms are stepping switches assembled to operate on the copper slug time delay in the armature of a telephone relay



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which is in the circuit of a 25 step Automatic Electric Co. relay. The time delay of the single unit is about 1/4 sec. It takes a complicated set up of relays to obtain a one minute delay. If you desire I shall forward to you the summary of TD and SS mechanisms.

5. There is a part of one of the mine mechanisms which I am recommending for the timer. It is the SE-4 mechanism. The unit which I am forwarding under separate cover has to be returned to ~~Per~~8b in sixty days. To examine the mechanism, remove the eight corner screws and the three bottom screws. The mechanism consists of an Oster permanent field d.c. electric motor designed to operate on 6 volts at 6,000 rpm. This motor drives a telechron gear reduction of 3600/1. The telechron operates, through the selected coupling gear, the cams on the switch control. By proper selection of reduction box, for example a 20/1, the output of the gear box is 1 rps. If the coupling be made 4 or 5 to 1, the settings obtained by the selector on the face will be 0 to 160 sec. or 200 sec. as there are 40 settings obtainable. By using, in place of the Oster motor, a Delco motor, see enclosure (b), which can be had to operate on 27 1/2 volts, 12 v or 6 v direct current, and a governor set for 6,000 rpm, the speed and hence the timing can be held to 3 percent and is independent of position. There are several improvements available in the SE-4 in production, due in 90 days. I am enclosing the performance and efficiency curves for the Delco motors that have been recommended. See enclosures (c) and (d).

Brode
} *noted*
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B. Arthur Breslow
B. Arthur Breslow

Enclosures - 4

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