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NAVY DEPARTMENT

BUREAU OF ENGINEERING

FR-1142

Report of

Test on Incandescent Lamps 6-8 volt, G-4-1/2 Clear Bulb (Mazda 55).

General Electric Company
Exhibitor

NAVAL RESEARCH LABORATORY
ANACOSTIA STATION
WASHINGTON, D.C.

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Date of Test: February - March 1935.

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Bueng. (5)

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AUTHORIZATION FOR TEST

1. This test was authorized by reference (a).

References: (a) BuEng. ltr. S64-1/L5(11-21-Ds)
of 27 November 1934.

OBJECT OF TEST

2. The object of this test was to determine the suitability of the lamps, as indicator lights for submarines in the Naval Service, as determined by life tests and their ability to withstand shock and vibration.

ABSTRACT OF TEST

3. The sample lamps were set up at this Laboratory in two groups; five being tested for shock integrity and five for their life while under continuous vibration and illumination. Prior to the shock and vibration tests, five of the lamps, selected at random, were tested for their C.P. rating and current consumption while supplied with a potential of 6 volts.

CONCLUSIONS

(a) These lamps, as manufactured and submitted by the General Electric Company, proved to be very rugged when subjected to shock and to have a long life while under test for vibration with continuous illumination.

RECOMMENDATION

(b) In view of the favorable results obtained from these tests, it is recommended that the subject material be approved for use as indicator lamps on submarines in the Naval Service.

DESCRIPTION OF MATERIAL UNDER TEST

4. Ten lamps, known as "Mazda 55" 6-8 volts, 1.5 C.P., S-4-1/2 clear bulb, single contact, bayonet base were submitted for test. For further description, see plate 3.

METHOD OF TEST

5. In order to conduct the tests, it was necessary to make a base for accomodating the lamps as no sockets were available. The sockets used on all tests held the lamps firmly.

6. First their candle power was determined by using a photronic illumination meter and applying a potential of 6 volts to the lamps.

7. Next, the current consumption of the lamps was obtained at a potential of 6 volts.

8. Five of the lamps were then placed on a Bureau of Engineering shock stand and shocks, varying from 25 foot pounds to 200 foot pounds were applied until failure of all the lamps had occurred. During this test the potential at the lamps was held constant at 6 volts. The interval between shocks was 3 seconds.

9. The remaining five lamps were then placed on a vibrating lamp-testing machine and subjected to vibrations of 300 V.P.M. at an amplitude of 0".062. During this test all lamps were illuminated and supplied with a constant potential of 6 volts. This test was continued until all of the lamps had failed (99¼ hours).

RESULTS OF TESTS

10. Average current consumption of 10 lamps 0.31 amperes at 6 volts.

11. Average candle power of 10 lamps, 1.45 at 6 volts.

12. Shock tests.

Continuous illumination at 6 volts.

Lamp No	100 Blows each							
	25 Ft.Lbs.	50 Ft.Lbs	75 Ft.Lbs	100 Ft.Lbs	125 Ft.Lbs	150 Ft.Lbs	175 Ft.Lbs	200 Ft.Lbs
1	----------*							
2	----------*							
3	----------*							
4	----------*							
5	----------*							

*Denotes failure.

Lamps mounted vertically, bulb down. (See Plate 1)

13. Vibration Test.

Continuous vibrations of 300 V.P.M. at an amplitude of 0"062 with lamps illuminated at 6 volts.

Lamp No	Hours of operation before failure						Failed at
	500 Hrs	600 Hrs	700 Hrs	800 Hrs	900 Hrs	1000 Hrs	
1	----------	----------	----------	*			698 Hours
2	----------	----------	----------	----------	----------	*	994 Hours
3	----------	----------	----------	----------	*		798 Hours
4	----------	----------	----------	----------	*		788 Hours
5	----------	----------	----------	----------	*		792 Hours
Average	----------	----------	----------	----------	*		814 Hours

COMMENTS

14. All tests were made with a potential of 6 volts applied to the lamps. Should this potential be increased, the life of the lamps would be materially reduced. With the filaments illuminated intermittently, the life of the lamps, under shock and vibration, would probably be shorter. These statements are based on the results of previous tests.

15. Socket base constructed for this test is forwarded to the Bureau under separate cover for its information.

CONCLUSIONS

16. These lamps, as manufactured and submitted by the General Electric Company, proved to be very rugged when subjected to shock and to have a long life while under test for vibration with continuous illumination.

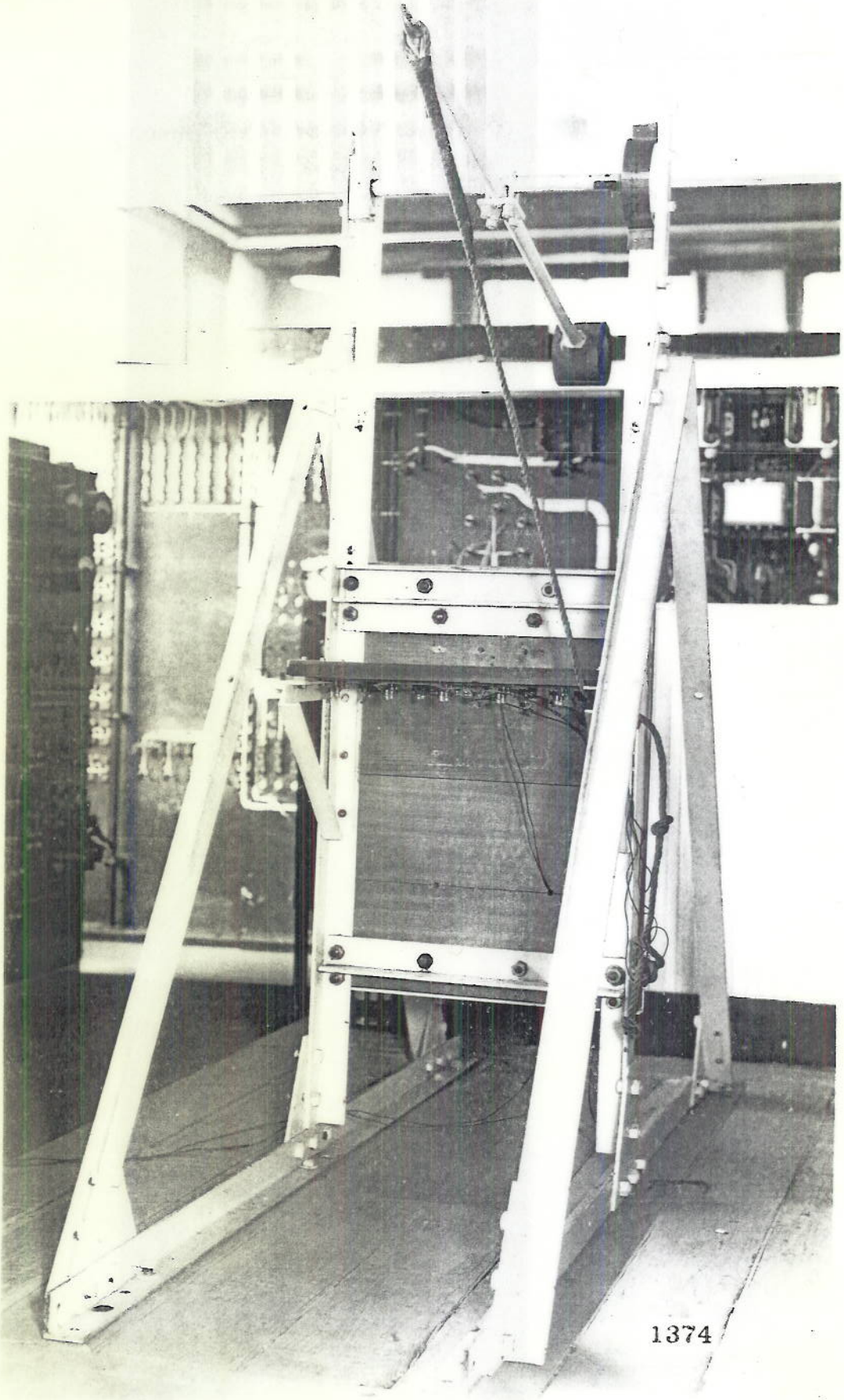

PLATE I

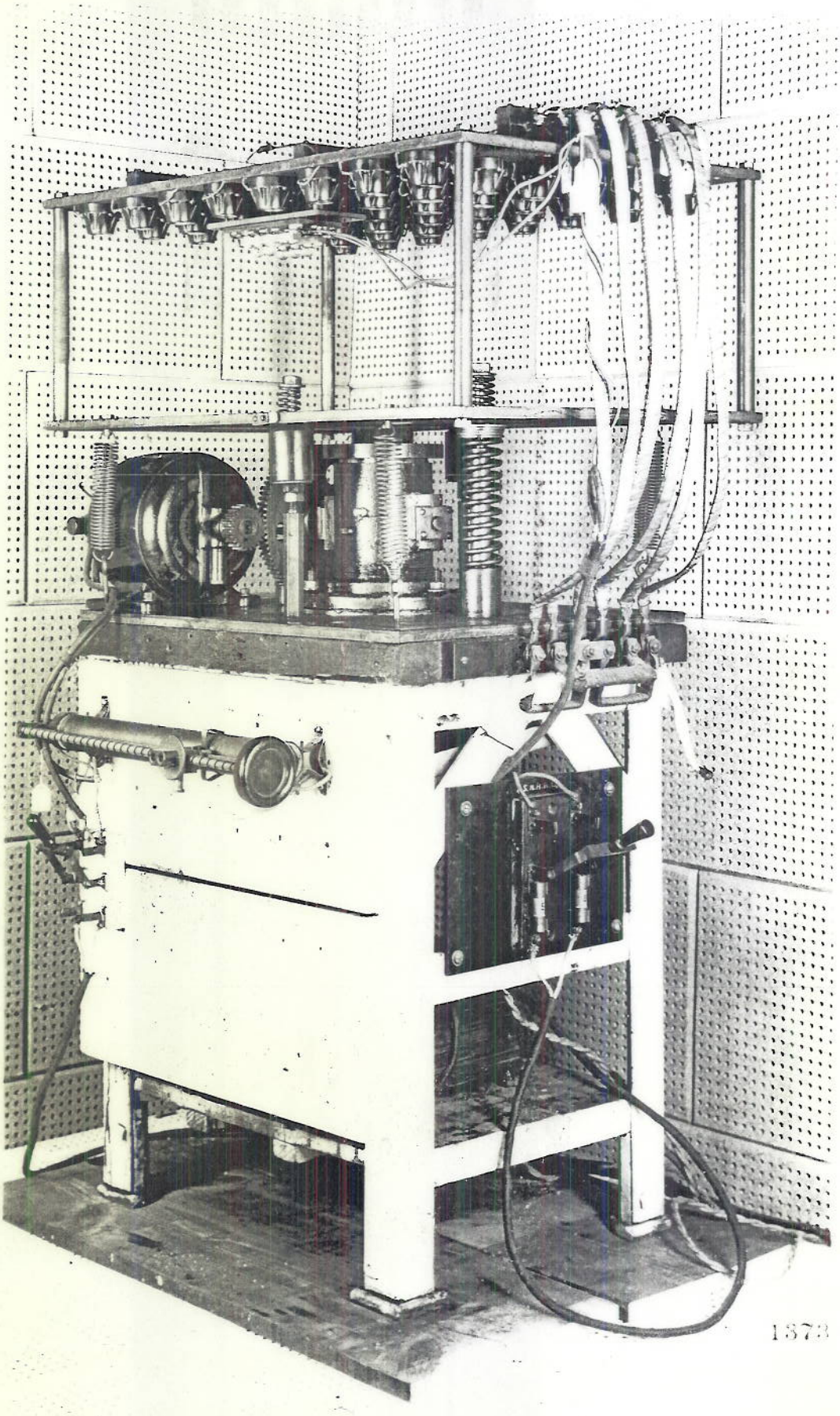

PLATE 2

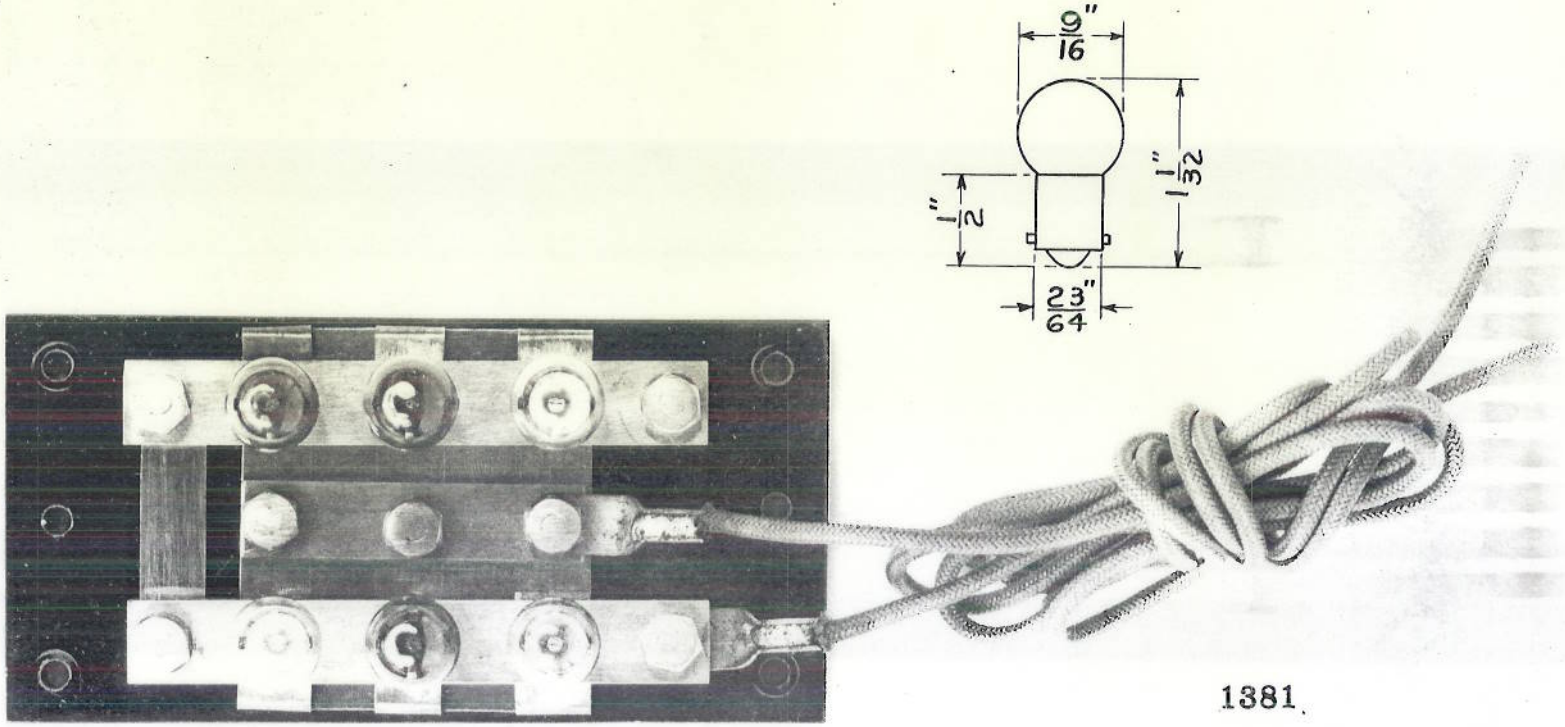

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PLATE 3