ENGINEERING RESEARCH INSTITUTE
THE UNIVERSITY OF MICHIGAN
ANN ARBOR

Progress Report No. ~~45~~ 7

SHOCK ON ELECTRICAL COMPONENTS IN TRACK-LAYING AND WHEELED VEHICLES

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Project 2145

DEPARTMENT OF THE ARMY
DETROIT ARSENAL
CONTRACT NO. DA-20-089-ORD-36543

May 1957

FOREWORD

This is the seventh semiannual progress report on a research program being carried on in the Department of Electrical Engineering of The University of Michigan.

Most of the material reported here represents the endeavor of Harris Olson, who has devoted his full time to this program. The project has benefited from the counsel of Professor Jesse Ormondroyd of the Department of Engineering Mechanics.

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ABSTRACT

This is the seventh semiannual progress report for this project. This report, with the approval of the project's contracting officer at the Detroit Tank Arsenal, does not cover an exact time period, but summarizes the development of the rotary-drum impact tester for miniature incandescent lamps.

In addition to reviewing the background, the report contains a description of the tester and its principal accessories, and complete working drawings.

OBJECTIVE

The objectives of the research project are:

1. To design, study, and evaluate a new miniature lamp impact tester which may possibly supplant the impact testers now being used.

2. To study presently accepted methods of impact-testing vehicular lamps and to determine specifications for governing such tests.

3. To determine practicable means of increasing the operational life of incandescent lamps used in tactical military vehicles, particularly with reference to their resistance to mechanical shock and vibration.

CONCLUSIONS AND RECOMMENDATIONS

1. Experimental and theoretical evidence indicates the rotary-drum impact tester to be a simple, inexpensive, and reliable test instrument.

2. Working drawings are available for this rotary-drum tester to fabricate it for the impact testing of lamps having either an S-8 or G-6 bulb and a single contact bayonet candelabra base.

3. It is recommended that this machine be used for the impact testing or evaluation of miniature lamps in the two sizes for which lamp holders are now designed.

I. BACKGROUND OF THE ROTARY-DRUM TESTER DEVELOPMENT

A. BASIS FOR DESIGN

Several types of impact machines have been designed and built for lamp testing purposes by industrial concerns and test agencies. The one developed by Chrysler for testing miniature lamps, which has been described in previous reports under the heading of the Arsenal lamp impact-test machine, is one of the better known and widely used devices for impact testing. The erratic and inconsistent behavior initially observed in this tester has been largely eliminated by several modifications in the structure and in the operating specifications which resulted from studies carried out under this research project.[1]

With these modifications it has become a fairly reliable testing device, as shown by the results of two series of correlation tests conducted by several cooperating agencies.[2]

There are still a number of basic disadvantages; the replacement cost is high (estimated as high as $7000), it has a high noise level when operating, a large size and weight, and a need for frequent careful lubrication, cleaning, and routine maintenance. The noise is so disturbing that the majority of the installations are in sound-insulated cubicles. One further disadvantage this machine will have for some time is a lack of confidence in the test results by the operators. The modified machines will have to be operated for some time, and careful records kept, to build and maintain this confidence.

B. CONCEPTION OF A SIMPLIFIED IMPACT TESTER

It was pointed out in the theoretical analysis of the Arsenal tester that the necessary acceleration of the lamp filament could be attained by a simpler method than that employed in this machine; for example, dropping the bulbs themselves through a distance of 1/32 inch and letting them bounce would apply as much stress to the filament as was attained by the operation of the heavy tester.[3]

The analysis also indicated that the considerable mass of the machine's moving parts served as an elastic cushion between the anvil and the lamp filament. Consequently the strident fury of the machine led to a gentle result. The logical step in a new approach to an impact device involved the reduction of this cushioning to a minimum. It seemed likely that an arrangement could be made whereby the lamp would be dropped onto a relatively inelastic surface to excite the filament. This belief was confirmed by comparing relative vibrating amplitudes for a filament excited first on an Arsenal-type Tester and then by releasing the lamp from a distance

above a masonite surface equal to the drop.[4] The free drop gave consistently greater amplitude of vibration.

C. PILOT MODEL

A device was constructed to embody these ideas. This pilot model consisted of a cylindrical wooden drum turned by a motor and a lamp-holding device which supported the lamp envelope in a horizontal position on the upper surface of the drum. The drum had four uniformly spaced steps or offsets cut parallel to the axis of rotation. As the drum was rotated, the lamp was raised and dropped 3/32 inch as it encountered each step. The excitation of the lamp filament produced by this model proved to be more than ample for practical testing purposes. Reduction of the offset tended to produce lamp failures consistent with expectations.

II. DESCRIPTION OF THE ROTARY-DRUM TESTER

The present form of the rotary-drum tester has evolved from the pilot model previously described. The first enlarged model to embody the essential features of this design is illustrated in Fig. 1.[5] It could accommodate 10 B-12 lamps, but was also designed to test 20 G-6 lamps and proportionate numbers of other sizes. It is interesting to note that the only features of this tester which seemed to require any change after exhaustive tests were the lamp holders.

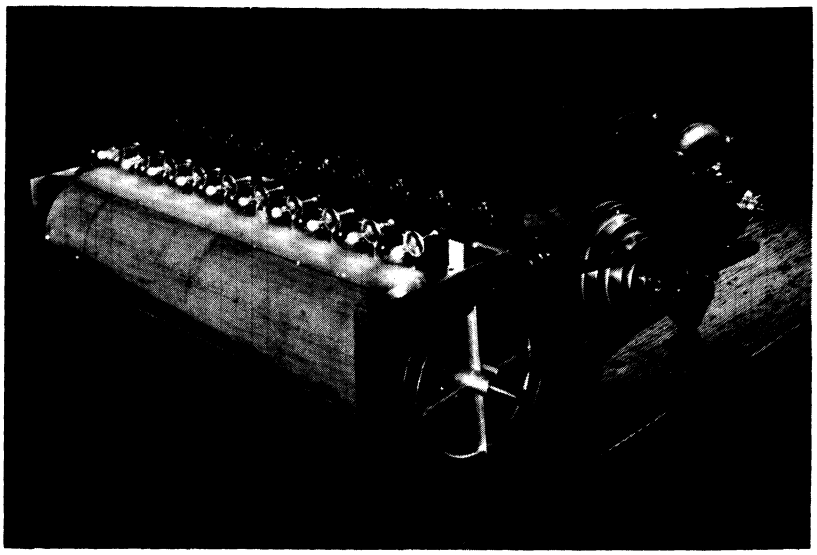


Fig. 1. Principal structural features of the first rotary-drum impact tester.

Figure 2 shows the rotary-drum tester in its present form with a rack of G-6 lamps mounted for testing. It is quite evident from this illustration that

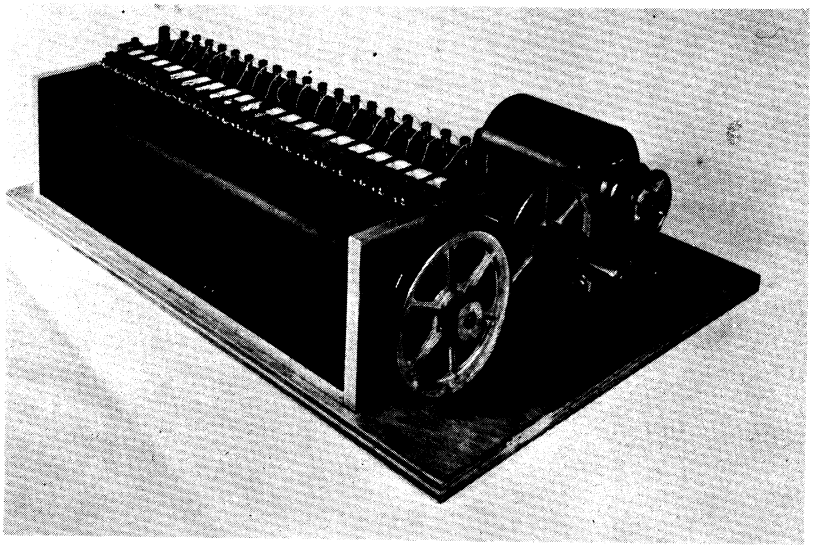


Fig. 2. The modified rotary-drum impact tester with a rack of G-6 lamps mounted for testing.

the tester components have only been changed slightly to take advantage of design improvements. The machine, which is 30 x 21 inches and weighs 80 pounds, can be easily handled and requires a relatively small bench space.

The basic machine, of which the rear quarter-view is shown in Fig. 3, is composed of three assemblies: the drive mechanism, the frame, and the cam. The purposes of the unit and the frame are self-explanatory, but it should be noted that each is composed of materials and parts that can be readily obtained, and can be fabricated with simple basic tools. The dimensional tolerances that are specified for most of the parts are readily obtainable.

The cam, partially disassembled and shown in Fig. 4, has 21-13/16 inches of test length and is unique in that the offset can be adjusted up to approximately 1/8 inch by a simple procedure to be explained later. The length of this cam is adequate to accommodate either 20 G-6 or S-8 lamps and proportionate numbers of larger lamps. The cam material is such that it can be operated in normal environments with little or no dimensional changes due to moisture or heat.

The operating principle of the tester can be explained quite readily. As the cam is rotated, the lamps are raised and dropped onto a relatively inelastic surface. This impact loading excites the filaments in a two-noded mode of free vibration with a large enough amplitude to cause ultimate failure. The two factors of the cam that govern the lamp's velocity of impact, which is the most important factor in producing filament deflection, are the cam's offset and speed of rotation. The theoretical relation of these two factors to the total relative velocity of impact was derived in a previous report.[6] This relationship is supported by experimental evidence, since it was found that by increasing the

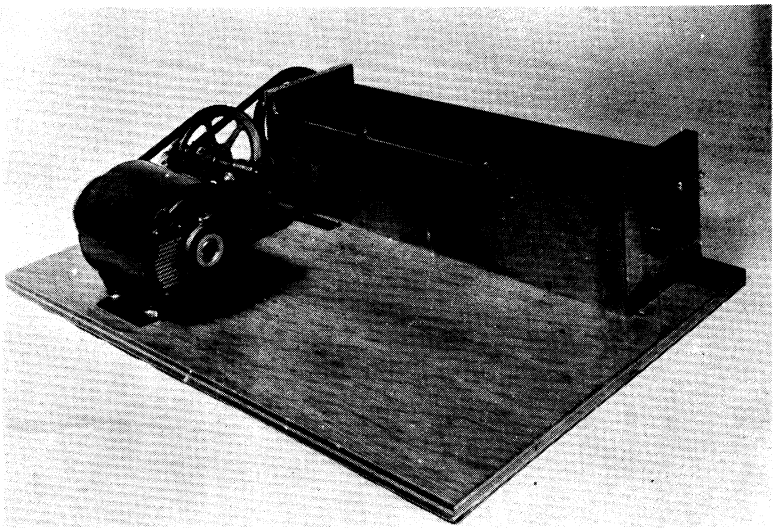


Fig. 3. The basic impact tester showing the drive mechanism, the frame, and the cam.

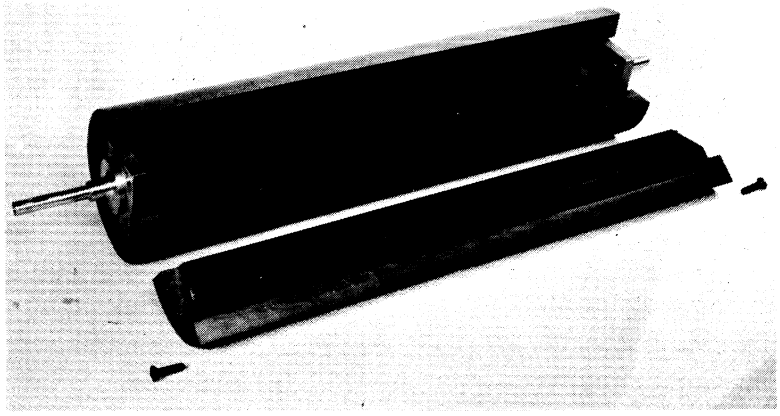


Fig. 4. The cam, partially disassembled, of the impact tester.

cam offset and/or the cam speed the velocity of impact was increased, the mortality rate increased, and the filaments tended to fail by plastic deformation instead of by fatigue. The borderline between these two types of failure is apparently at or near 8 inches per second.

The present type of lamp holder, shown with G-6 bulbs in Fig. 5, has evolved from the original model in which the lamps were soldered onto a pivoted brass arm.[7] The holders have been modified to permit quicker installation of lamps with either aluminum or brass bases into a spring clip unit, and a bulb-insertion tool that can be used for the G-6 or S-8 lamps simplifies the insertion or removal of lamps from the spring clips. Electrical contact is obtained through the steel clip on the base and a spring contact at the rear. Each lamp-holder unit can be removed from the tester frame quickly and easily, which also

permits the mounting of different lamp types.

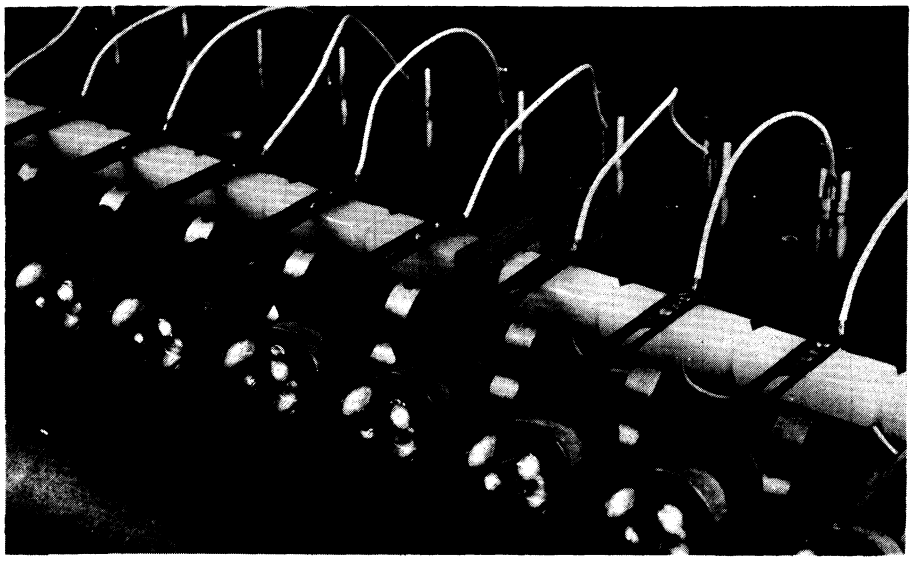


Fig. 5. Method of lamp attachment on the rotary-drum tester.

It was previously pointed out that the velocity of impact is the most important factor in producing filament deflection. The lamp holder, considered as a pendulum, which rotates around the pivot, also affects this velocity of impact. By experimental evidence and calculation it has been determined that the linear velocity is from 7.27 to 7.8 inches per second for a lamp holder of the type now used.[8] Each lamp type has a holder designed for it according to its physical size, i.e., the impact point on the envelope is always maintained at 2 inches from the pivot center.

III. OPERATING INSTRUCTIONS FOR THE ROTARY-DRUM TESTER

The rotary-drum impact tester for miniature lamps was designed to be a simple, inexpensive, and reliable testing device. The proper procedure for its installation and maintenance will now be discussed.

A. INSTALLATION

The rotary-drum tester can be installed in almost any environment. The ambient temperature must always be kept below 150°F, and the machine must be mounted on a fairly stable base that is reasonably level. This base could easily be a bench top or a movable laboratory table that has a reasonable degree of stability. It would be desirable to have a protected storage space nearly for lamp holders not in use, and a small work area for loading and unloading the test racks. It will be assumed that the necessary power and control units are nearby.

Adjustment of the cam's offset is effected by "cracking" or slightly

loosening the eight clamping screws (RD 3-16) with a hexagonal wrench through the frame as shown in Fig. 6. Once the cam plates are loosened, the four cam quarters may be moved by gently tapping with the palm of the hand or some other resilient material. The cam should be offset for counter-clockwise rotation when viewed from the driven end. As the offset is changed, it may be roughly checked with feeler gauges; final checks should be made with a dial indicator mounted on the frame in a manner similar to that shown in Fig. 7. Caution should be used to keep the periphery of the cam assembly true in addition to setting the offset accurately. When the adjustment is completed at one end, its cam plate is locked by the four screws and the procedure is repeated at the other end. The first end should be rechecked upon completing the setting at the second end, and the offset and rise for each quarter should be recorded for future reference and rechecks.

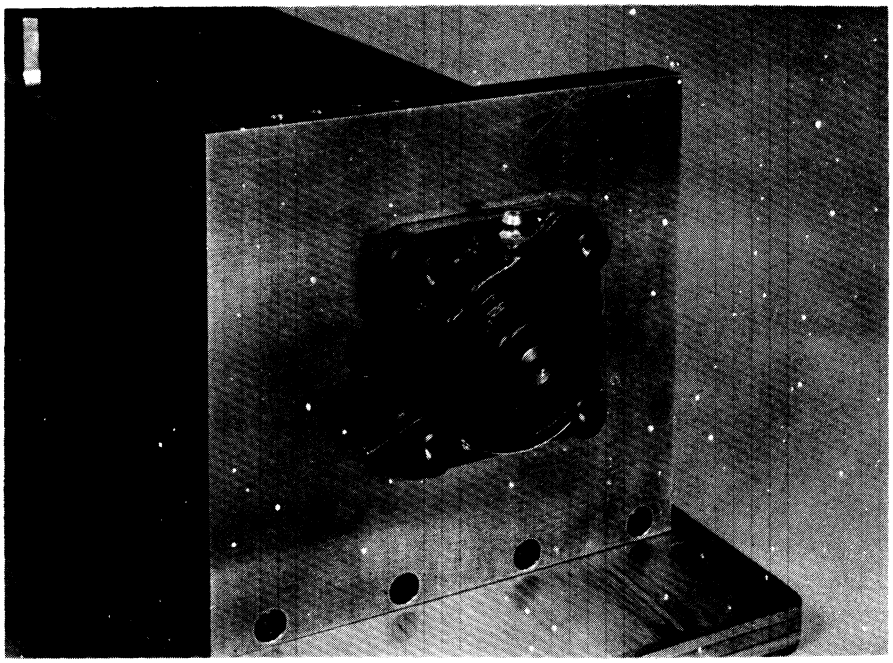


Fig. 6. Method used to loosen the clamping screws on the cam.

The driving unit consists of the motor, two belts, assorted pulleys, and a jack shaft. The tension of the belt from the drum to the jack shaft can be adjusted by moving either the tester frame and/or the jack shaft forward or backward to obtain about 1/4 inch deflection of the V-belt when moderately depressed at the midpoint. The second belt should be similarly adjusted for tension by moving the motor either forward or backward when the correct drum speed is obtained by adjusting the variable sheave on the motor shaft.

Included with the present design are lamp holders for the G-6 lamp (shown in Fig. 8) and for the S-8 lamp. Both lamp holders are basically the same except for the spring clips which position the lamp to locate the point of impact a prescribed distance from the pivot.

Before initial use of the lamp holder, the necessary fuses (RD 5-35)

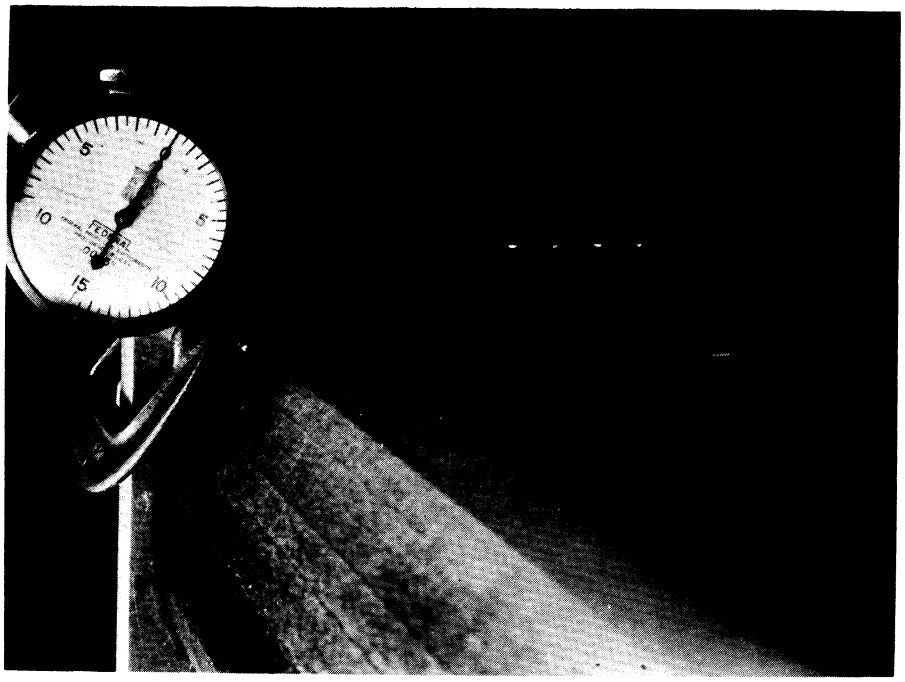


Fig. 7. Suggested method of checking the offset and the periphery of the cam.

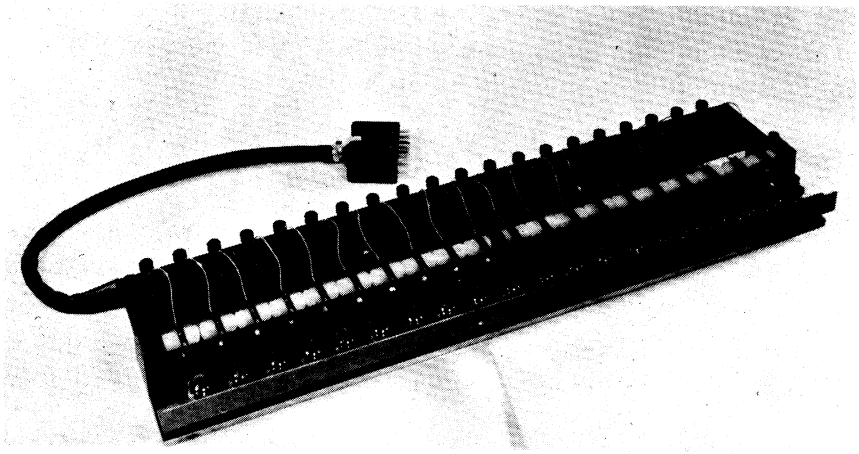


Fig. 8. G-6 lamp rack attached to its loading fixture.

should be installed underneath the plate, and the control cable (RD 5-23) connected to the terminals as shown in Fig. 9. Half of the connecting cables (RD 5-19) can be attached by soldering to the spring contact while the unit is in the inverted position. The remaining cables can be soldered to the clips in a similar manner when the holder is righted and attached to the mounting jig (RD 5-50 or RD 6-50).

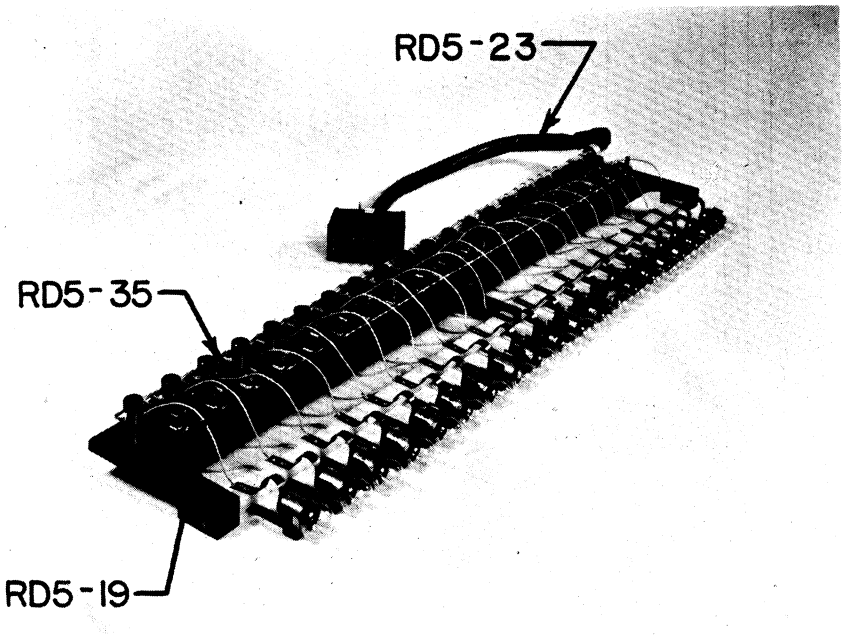


Fig. 9. Bottom view of the G-6 lamp holder for the impact tester.

Lamps are installed in the clips by the following procedure:

1. With the gauge RD 5-40, check the spring clip RD 5-17 or RD 6-17 to determine that the opening has not been sprung or become set beyond 9/32 inch. Replace the clip if needed.

2. Clean the spring contact if dirty or corroded.

3. Open the spring clip with the bulb-insertion tool as shown in Fig. 10, and slide the lamp into the clip from the front. Under no circumstances should the lamp be forced into the clip from the bottom. The lamp can now be adjusted for filament orientation, and moved forward in the clip until the envelope just strikes the front plate of the mounting jig. Repeat for each station.

Mounting the lamp holder on the tester is a simple and quick operation. After removal from the loading jig the lamp holder is placed on the tester frame and secured with the two screws (RD 5-25). All the connecting cables should then be arranged in neat order as shown in Fig. 2. After the electrical connections are established the machine is ready for operation.

B. MAINTENANCE OF THE ROTARY-DRUM TESTER

Maintenance of the rotary-drum tester is held to a minimum because of its simplicity. The maintenance that is required should be done faithfully as test results can be altered by some of these factors. The requirements for the drive mechanism, the lamp holders, and the cam will be discussed in that order.

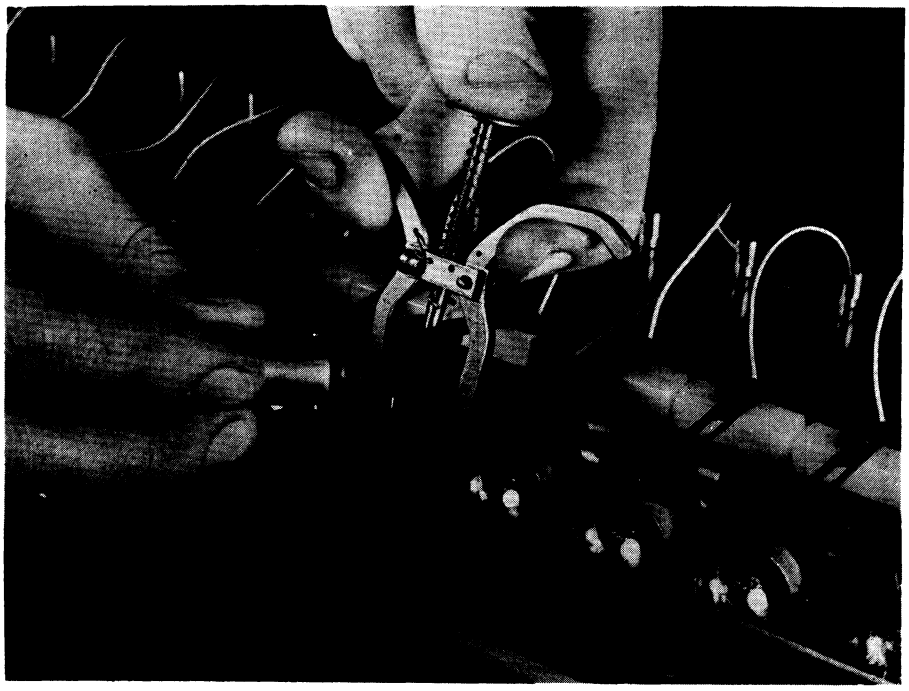


Fig. 10. Correct method of spreading the spring clip for the insertion of a G-6 lamp.

The drive mechanism has two sets of bearings that will need periodic attention. The Sealmaster flange units (RD 2-15) should be greased at a 6 to 12-month interval with a material that conforms to NLGI No. 2 consistency. The grease should be added slowly, with the shaft revolving, until a slight bead appears between the seals. Excess grease should be wiped away.

The bearings (RD 1-12) on the jack shaft should be oiled at periodic intervals consistent for a sleeve-type bearing. The operator should be cautioned not to use an excess amount of oil, since it will merely be sloughed off onto adjacent parts. Felt pads can be secured under the bearings to catch excess oil and to facilitate the cleaning around the bearing. The oil requirements for the motor are stated on its name plate. It has been noted the driving unit has a tendency to become oily and dirty unless a minimum amount of lubrication is used and surrounding areas are wiped periodically.

Several items on the lamp holders (e.g., the connecting cables, bearings, spring clips, and spring contacts) will require some attention. The connecting cables (RD 5-19, etc.) will need to be replaced when the individual strands of the cable start to break between the insulation and the tinned portion. These cables should serve many tests, but the handling of the lamp holder does seem to cause breaks. Group replacement is the most satisfactory method of maintaining the cables.

If the machine is operated in a humid area, the pivot rod (RD 5-20, etc.) has a tendency to rust, especially if any dirt is allowed to accumulate on the rod.

A very light film of oil rubbed onto the rod will eliminate this danger. The bearing (RD 5-15 and 16) occasionally will get a slight amount of dirt imbedded in the shaft hole which will retard the free movement of the pivoted unit. This can be corrected by running a No. 29 drill through the hole to enlarge it to the specified size.

The spring clips (RD 5-17 or RD 6-17) need little or no maintenance except for the removal of any rust which might occur on the base contact surfaces. The rust can be removed with a light abrasive material. If, for any reason, the clip needs replacement, it is suggested that the clip, bearing, contact spring, and connecting cables be replaced as a unit because of the close relationship of these components. The contact spring becomes corroded after use, and needs cleaning at periodic intervals. It is suggested that a typewriter eraser or some other mild abrasive be used for this cleaning.

The cam needs no attention, since the surface seems to wear well. If the edge of a cam quarter should become chipped or broken, it seems likely that the entire drum could be turned down to a smaller diameter. No information is available as to the effect of this operation, but the amount removed should be kept to a minimum, and careful checks made of the subsequent mortality rate.

IV. ACCESSORIES FOR USE WITH THE ROTARY-DRUM TESTER

One accessory that might easily prove its worth is an assembly of relays and neon glow lamps which can be arranged to give indication of lamp failures occurring during the "cold" or off portion of each testing cycle, as well as to time the cycling operation and shut down the tester at the conclusion of a predetermined testing period. Figure 11 shows one such device which has been in use by the project for an extended period. The circuit is shown in Fig. 12.

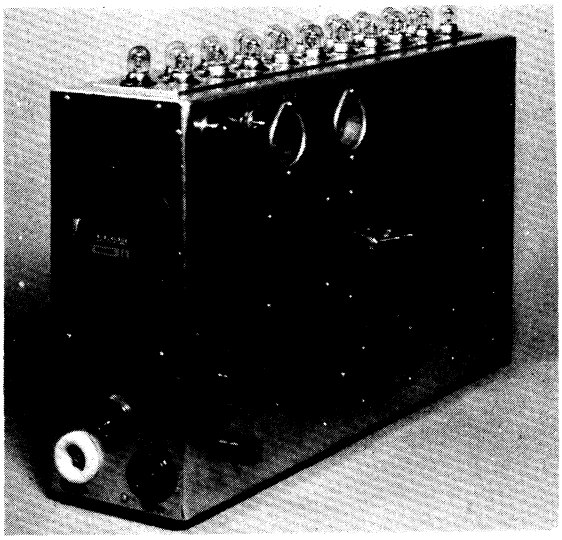


Fig. 11. The unit used by the project for the control and failure indication of impact tests.

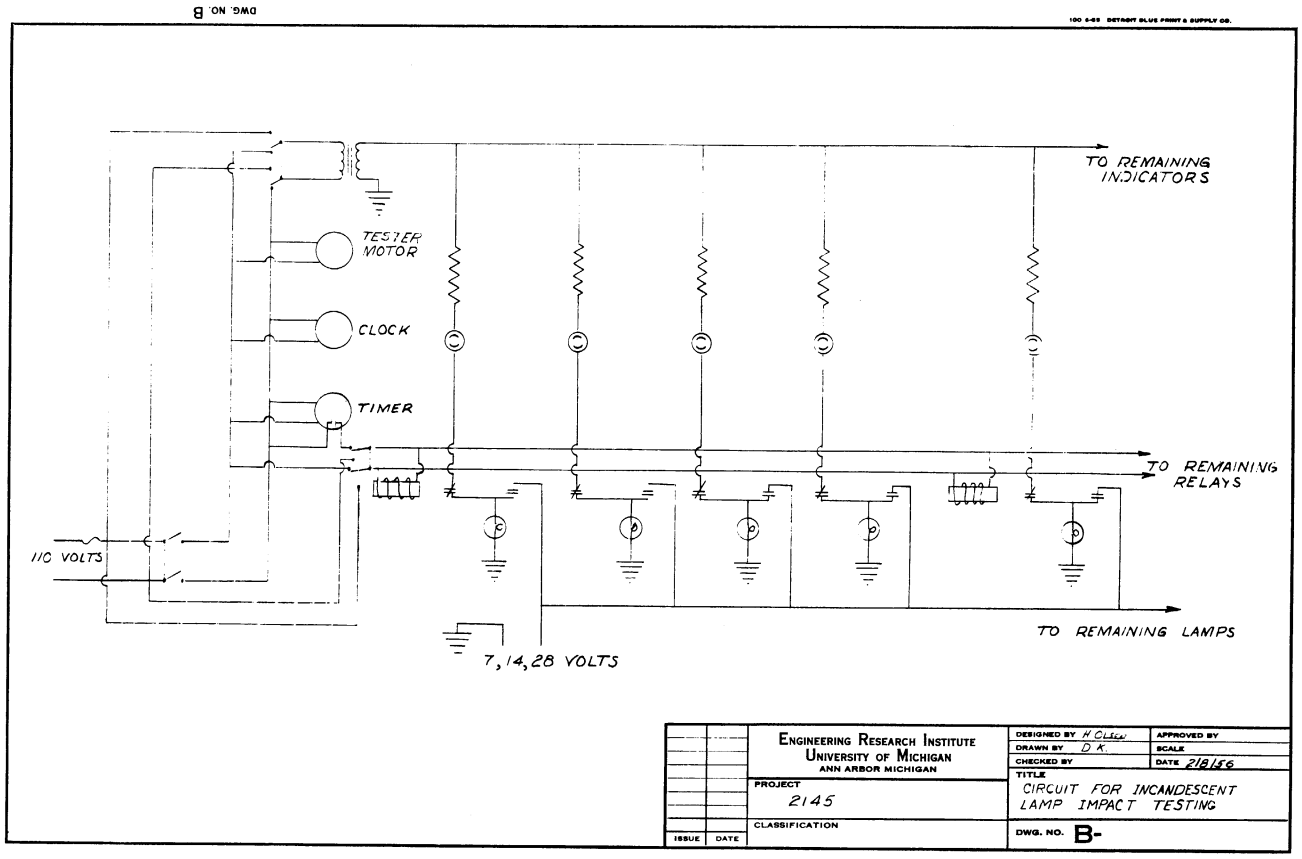


Fig. 12. The circuit used in the control unit for impact tests.

REFERENCES

1. Shock on Electrical Components in Track-Laying and Wheeled Vehicles, The University of Michigan Engineering Research Institute Semiannual Progress Report No. 3 (Jan. 1, 1955, to June 30, 1955), pp. 4-9.

2. Semiannual Progress Report No. 5 (Dec. 2, 1955, to May 31, 1956), pp. 1-24.

3. Semiannual Progress Report No. 2 (July 1, 1954, to December 31, 1954), p. 25.

4. Ibid., pp. 37-38.

5. Semiannual Progress Report No. 3 (Jan. 1, 1955, to June 30, 1955), pp. 18-21.

6. Semiannual Progress Report No. 5 (Dec. 2, 1955, to May 31, 1956), p. 33.

7. Semiannual Progress Report No. 4 (July 1, 1955, to Dec. 1, 1955), pp. 10-14.

8. Ibid., p. 16.

APPENDIX

The tabulation which follows gives the part numbers, part titles, DTA drawing numbers, and the interchangeability of components for the following rotary-drum assemblies: RD 1-10, RD 2-10, RD 3-10, RD 5-10, RD 5-50, RD 5-60, RD 6-10, and RD 6-50. It should be noted that no parts, even though designated by a part number, that can be counted as a hardware item, are listed. The drawings for each assembly and component follow the tabulation in a numerical order of their part or assembly number.

Part No. or Assembly No.	Part Title	DTA Drawing No.	Part Interchangeable With
RD 1-10	Driver assembly, rotary-drum impact tester	17700	none
RD 1-13	Shaft	17701	none
RD 1-18	Base	17702	none
RD 2-10	Frame assembly	17703	none
RD 2-11	End plate	17704	RD 2-12 right end mirror opposite
RD 2-13	Frame base plate	17705	none
RD 2-14	Frame back plate	17706	none
RD 2-15	Bearing modification	17707	none
RD 3-10	Cam assembly	17708	none
RD 3-11	Cam quarter	17709	none
RD 3-12	Shaft right end	17710	none
RD 3-13	Cam plate	17711	none
RD 3-14	Shaft left end	17712	none
RD 5-10	G-6 lamp-holder assembly	17713	none
RD 5-11	Plate	17714	RD 6-11
RD 5-12	Clamp, upper	17715	RD 6-12
RD 5-13	Clamp, lower	17716	none
RD 5-14	Bracket	17717	none
RD 5-15	Bearing, pivot	17718	RD 6-15
RD 5-16	Bearing, pivot center	17719	RD 6-16
RD 5-17	Clip, pivot arm	17720	none
RD 5-17A	Clip, pivot arm	17721	RD 6-17
RD 5-18	Spring contact	17722	none
RD 5-19	Cable, connecting	17723	RD 6-19
RD 5-20	Rod, pivot	17724	RD 6-20
RD 5-21	Cable holder	17725	RD 6-21
RD 5-22	Ground strip	17726	RD 6-22
RD 5-23	Cable assembly	17727	RD 6-23
RD 5-40	Gage RD 5-17	17749	Use also on clip RD 6-17

Part No. or Assembly No.	Part Title	DTA Drawing No.	Part Interchangeable With
RD 5-50	Loading fixture assembly G-6 lamp holder	17728	none
RD 5-51	Base	17729	RD 6-51
RD 5-52	Block	17730	RD 6-52
RD 5-53	Stop	17731	RD 6-53
RD 5-54	Spacer	17732	RD 6-54
RD 5-55	Support	17733	RD 6-55
RD 5-56	Plate	17734	none
RD 5-60	Lamp insertion tool assembly	17735	Use on any lamp held by a clip similar to RD 5-17
RD 5-61	Arm	17736	none
RD 5-62	Pivot bar	17737	none
RD 5-63	Disk	17738	none
RD 5-64	Rod	17739	none
RD 5-65	Spring, compression	17740	none
RD 5-66	Spring, torsion	17741	none
RD 6-10	S-8 lamp holder assembly	17742	none
RD 6-11	Plate	17714	RD 5-11
RD 6-12	Clamp, upper	17715	RD 5-12
RD 6-13	Clamp, lower	17743	none
RD 6-14	Bracket	17744	none
RD 6-15	Bearing, pivot	17718	RD 5-15
RD 6-16	Bearing, pivot center	17719	RD 5-16
RD 6-17	Clip, pivot arm	17745	none
RD 6-17A	Clip, pivot arm	17721	RD 5-17A
RD 6-18	Spring contact	17746	none
RD 6-19	Cable connecting	17723	RD 5-19
RD 6-20	Rod, pivot	17724	RD 5-20
RD 6-21	Cable holder	17725	RD 5-21
RD 6-22	Ground strip	17726	RD 5-22
RD 6-23	Cable assembly	17727	RD 5-23
RD 6-50	Loading fixture assembly, S-8 lamp holder	17747	none
RD 6-51	Base	17729	RD 5-51
RD 6-52	Block	17730	RD 5-52
RD 6-53	Stop	17731	RD 5-53
RD 6-54	Spacer	17732	RD 6-54
RD 6-55	Support	17733	RD 6-55
RD 6-56	Plate	17748	none

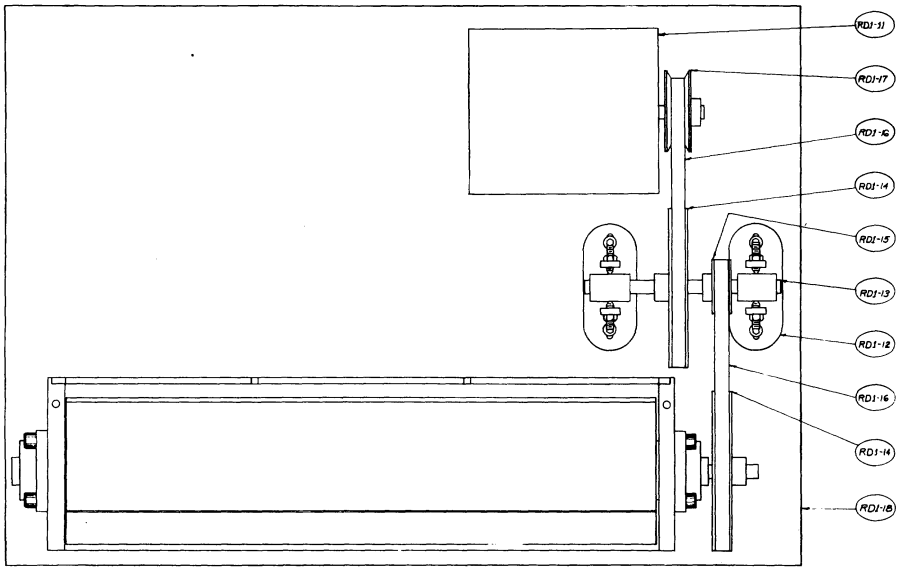
SOURCES OF SUPPLIES AND MATERIALS FOR THE ROTARY-DRUM TESTER

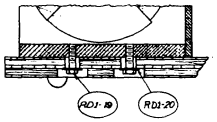
A limited number of the components of this tester are made of materials and supplies that are not necessarily readily available. To aid in the duplication of future machines the sources of these materials are enumerated.

Part No.	Part Title	Component of Assembly	Part Description	Source
RD 2-15	Bearing	RD 2-10	Sealmaster SF-8 1/2-in.-shaft dia.	Michigan Bearing Co. 85 Oakman Boulevard Detroit 3, Michigan
RD 3-11	Cam quarter	RD 3-10	Masonite die stock	Masonite Corporation 111 West Washington Street Chicago 2, Illinois (The local distributor's name may be secured from this office.)
RD 3-17	Insert	RD 3-10	Ros'an R106 SB-8	Ros'an, Inc. 2901 West Coast Highway Newport Beach, Calif.
RD 3-18	Lock Ring	RD 3-10	Ros'an RL28 SB-8	
RD 5-17	Clip, pivot arm	RD 5-10		Barnes, Gibson, and Raymond Plymouth, Michigan
RD 5-18	Spring contact	RD 5-10		
RD 6-17	Clip, pivot arm	RD 6-10		
RD 6-18	Spring contact	RD 6-10		
RD 5-19	Cable, connecting	RD 5-10	4/16/002 stranded	Gavitt Wire and Cable Co. Brookfield, Mass.
RD 6-19	Cable, connecting	RD 6-10	Wire type 26 R	
RD 5-32	Binding post	RD 5-10	Eby No 60 M	Eby Sales Company 130 Layfayette St. New York 13, N. Y.
RD 6-32	Binding post	RD 6-10		

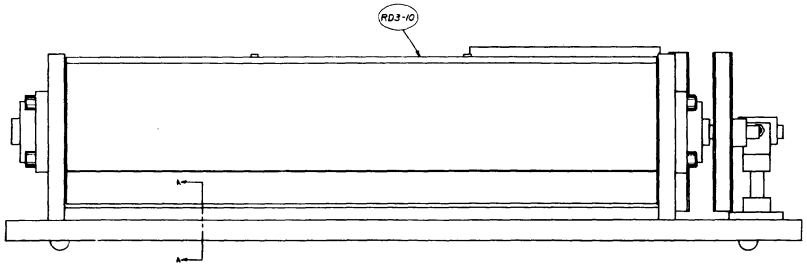
DTA 17700

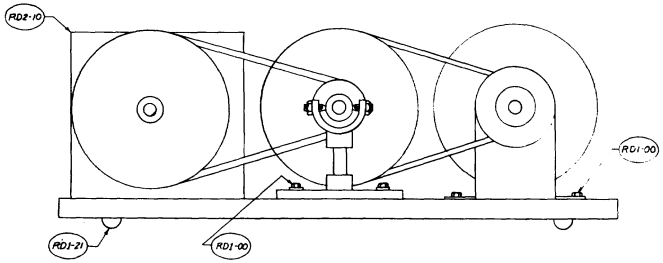
PART NO.	NAME	REQ'D	DESCRIPTION	SIZE
RD1-11	MOTOR RESILIENT MOUNT	1	½ H.P. SPLIT PHASE	1750 RPM
RD1-12	SHAFT SUPPORT	2	BOSTON TYPE SAP 82	½" BORE
RD1-13	SHAFT	1	DRILL ROD	½ D. 17½
RD1-14	PULLEY - V GROOVE	2		6" O.D. ½ BORE
RD1-15	PULLEY - V GROOVE	1		2" O.D. ½ BORE
RD1-16	V - BELT	2		A 27 - 1
RD1-17	SHEAVE VARIABLE PITCH	1	CONGRESS DWP 330	MIN 1.9" MAX 2.3" ½" BORE
RD1-18	BASE PLATE	1	PLYWOOD	¾ - 21 - 30
RD1-19	CAP SCREW	4	STEEL	1/4 - 20 - 1½
RD1-20	WASHERS	4	STEEL	#10 #30
RD1-21	FEET	4	RUBBER	¾ D.
RD1-00	FASTNER	6	AS REQ'D.	
RD1-10	FRAME ASSY.	1	-	
RD3-10	CAM ASSY.	1		





SECTION A-A





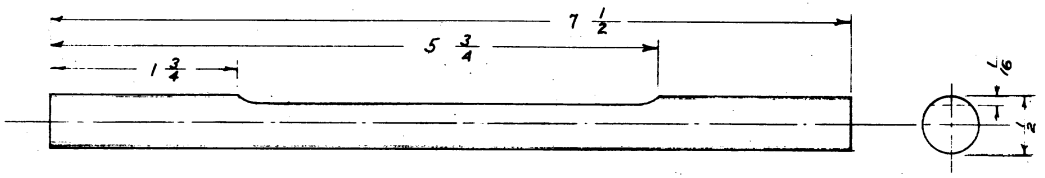
ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED MUST BE HELD TO A TOLERANCE - FRACTIONAL ± 1/64" DECIMAL ± .015" ANGULAR ± 1°

ENGINEERING RESEARCH INSTITUTE UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	DESIGNED BY DRAWN BY CHECKED BY APPROVED BY SCALE 1/2 DATE 3-1-57
PROJECT 2145	TITLE DRIVER ASSEMBLY - RD1-10 ROTARY DRUM IMPACT TESTER
CLASSIFICATION	DWG. NO. D- DTA 17700
ISSUE DATE	

DWG. NO. B

100 6-56 DETROIT BLUE PRINT & SUPPLY CO.

DTA 17701



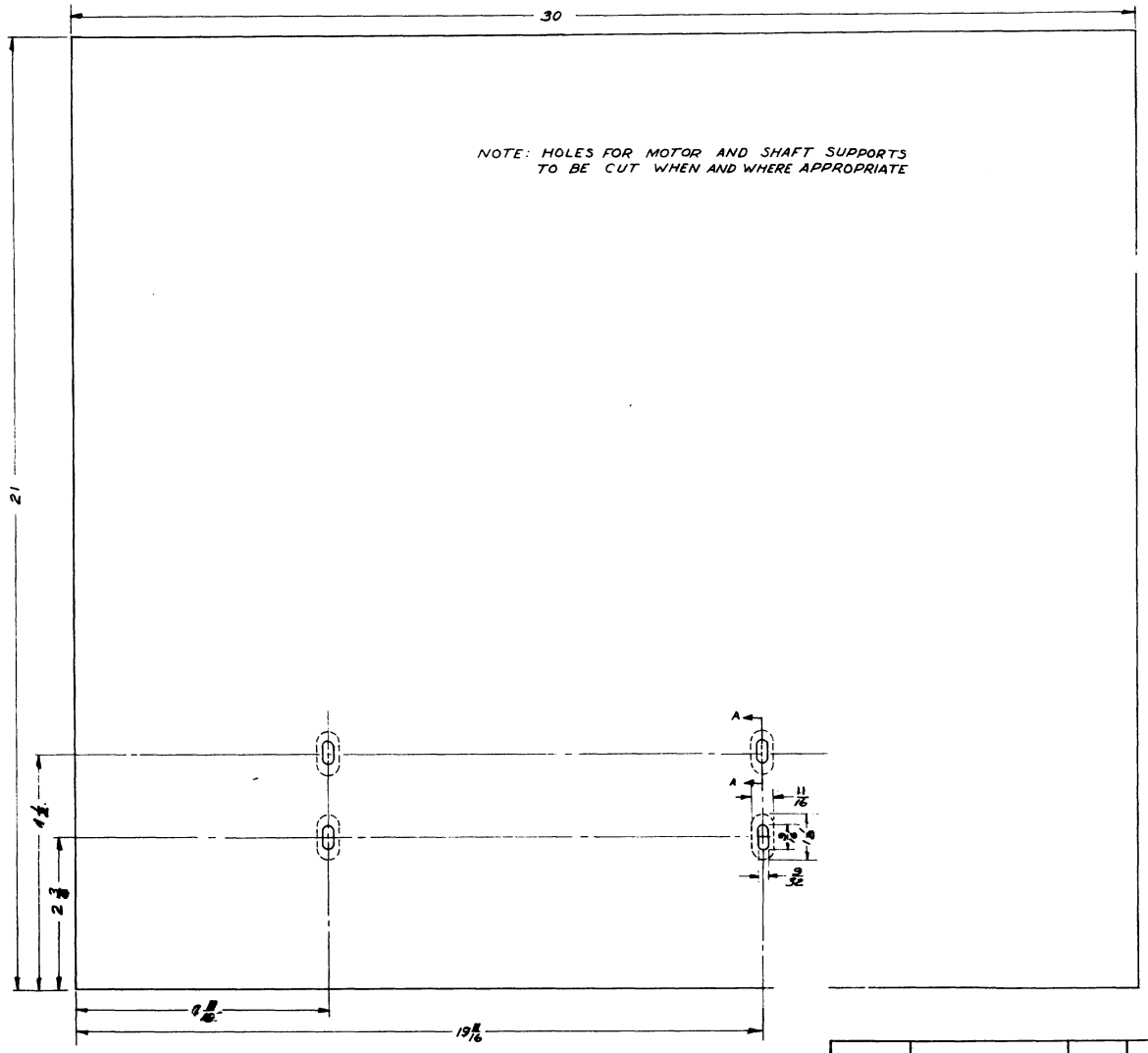
RD1 - 13	SHAFT	1	DRILL ROD	½ x 7½
PART NO.	NAME	REQ'D	MATERIAL	SIZE

DIMENSIONAL TOLERANCE - FRACTIONAL ± 1/64

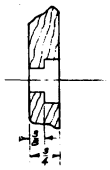
ENGINEERING RESEARCH INSTITUTE UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN		DESIGNED BY N OLSEN	APPROVED BY
		DRAWN BY	SCALE 1:1
		CHECKED BY	DATE 3-15-57
PROJECT 2145		TITLE SHAFT	
ISSUE	DATE	CLASSIFICATION	DWG. NO. B- DTA 17701

DWG. NO. C

FREDERICK POST CO. 17994 100 3-58+



DTA 17702



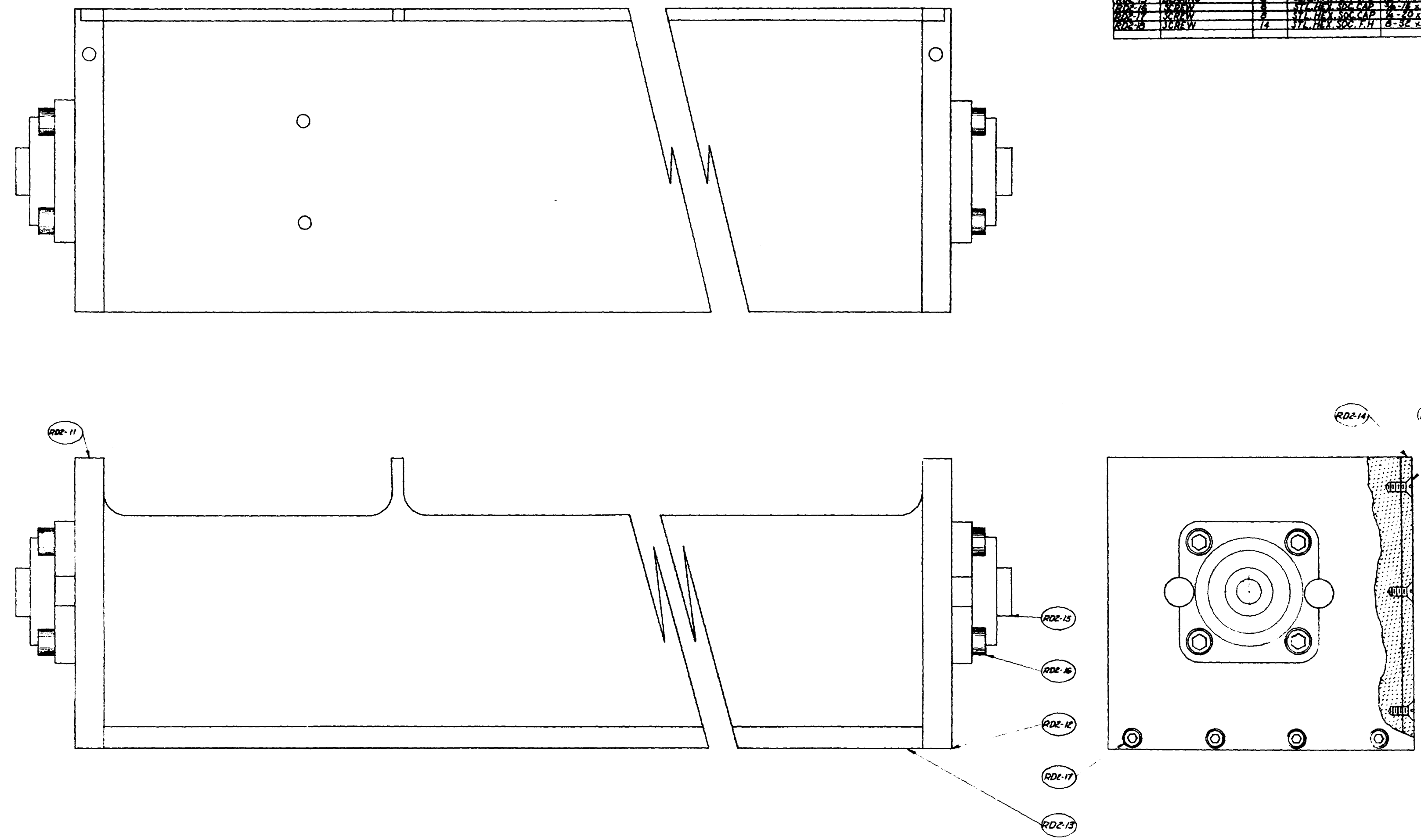
SECTION A-A

PART NO.	NAME	REQ'D	MAT'L	SIZE
RDI-18	BASE	1	PLYWOOD	3/4 x 21 x 30

ENGINEERING RESEARCH INSTITUTE UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	DESIGNED BY N OLSEN	APPROVED BY
	DRAWN BY D. Kay	SCALE 1:2
	CHECKED BY N. OLSen	DATE 8/25/56
PROJECT 2145	TITLE BASE	
CLASSIFICATION	DWG. NO. C-DTA 17702	

ISSUE | DATE

DTA 17703				
PART NO.	NAME	REQ'D	MAT'L	SIZE
RDZ-11	LEFT END PLATE	1	ALUMINUM	5/8 x 6 1/4 x 6 1/4
RDZ-12	RIGHT END PLATE	1	ALUMINUM	5/8 x 6 1/4 x 6 1/4
RDZ-13	FRAME BASE PLATE	1	ALUMINUM	1/2 x 6 1/4 x 22 3/16
RDZ-14	FRAME BACK PLATE	1	ALUMINUM	1/4 x 6 1/4 x 23 3/16
RDZ-15	BEARING	2	SEALMASTER SF8	1/2 SHAFT DIA.
RDZ-16	SCREW	8	STL. HEX. SOC. CAP	5/16-18 x 1
RDZ-17	SCREW	8	STL. HEX. SOC. CAP	1/4-20 x 3/4
RDZ-18	SCREW	14	STL. HEX. SOC. F.H	8-32 x 1/2



Engineering Research Institute
University of Michigan
Ann Arbor Michigan

Project: 2145

Classification:

Designed by N. Coon
Drawn by D. K.
Checked by N. Blau
Approved by
Scale 1:1
Date 6/3/56

Title: FRAME ASS'Y RDZ-10

Dwg. No. D-DTA 17703

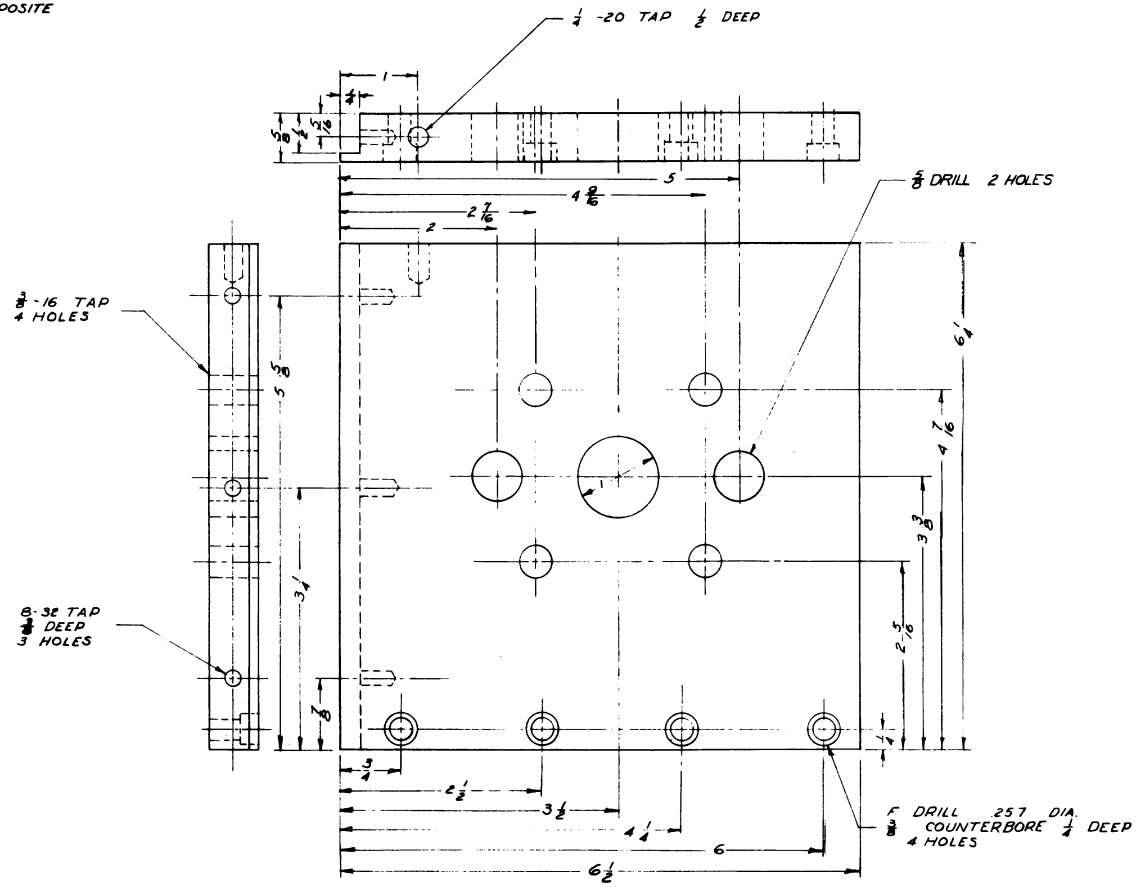
Revised 3-1-57 R.G.

Issue	Date

DWG. NO. C

FREDERICK POST CO. 17744 100 2-59

NOTE: LEFT END SHOWN
RDE-12 RIGHT END MIRROR OPPOSITE



DTA 17704

PART NO.	NAME	REQ'D	MAT'L	SIZE
RD2-12	RIGHT END PLATE	1	ALUMINUM	3/8 x 6 1/8 x 6 1/4
RD2-11	LEFT END PLATE	1	ALUMINUM	3/8 x 6 1/8 x 6 1/4

DIMENSION TOLERANCE - FRACTIONAL ± 1/64" - DECIMAL ± .005"

ENGINEERING RESEARCH INSTITUTE
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ANN ARBOR MICHIGAN

DESIGNED BY W. Cress — APPROVED BY
DRAWN BY D.K. — SCALE 1:1
CHECKED BY W. Cress — DATE 2/26/58

PROJECT 2145

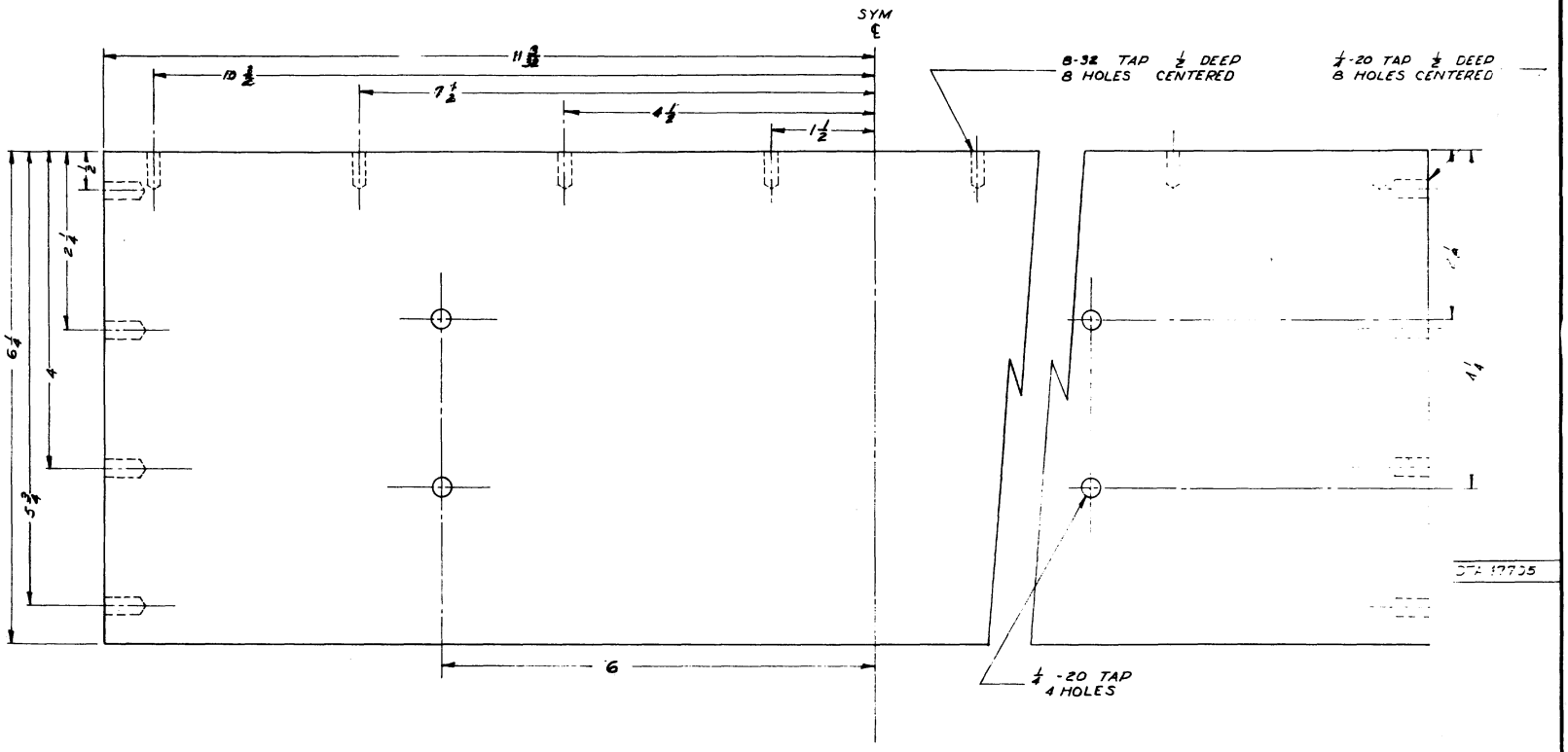
TITLE LEFT END PLATE

CLASSIFICATION

DWG. NO. C-DTA-17708

ISSUE | DATE

FREDERICK POST CO. 17PH 100 5-55



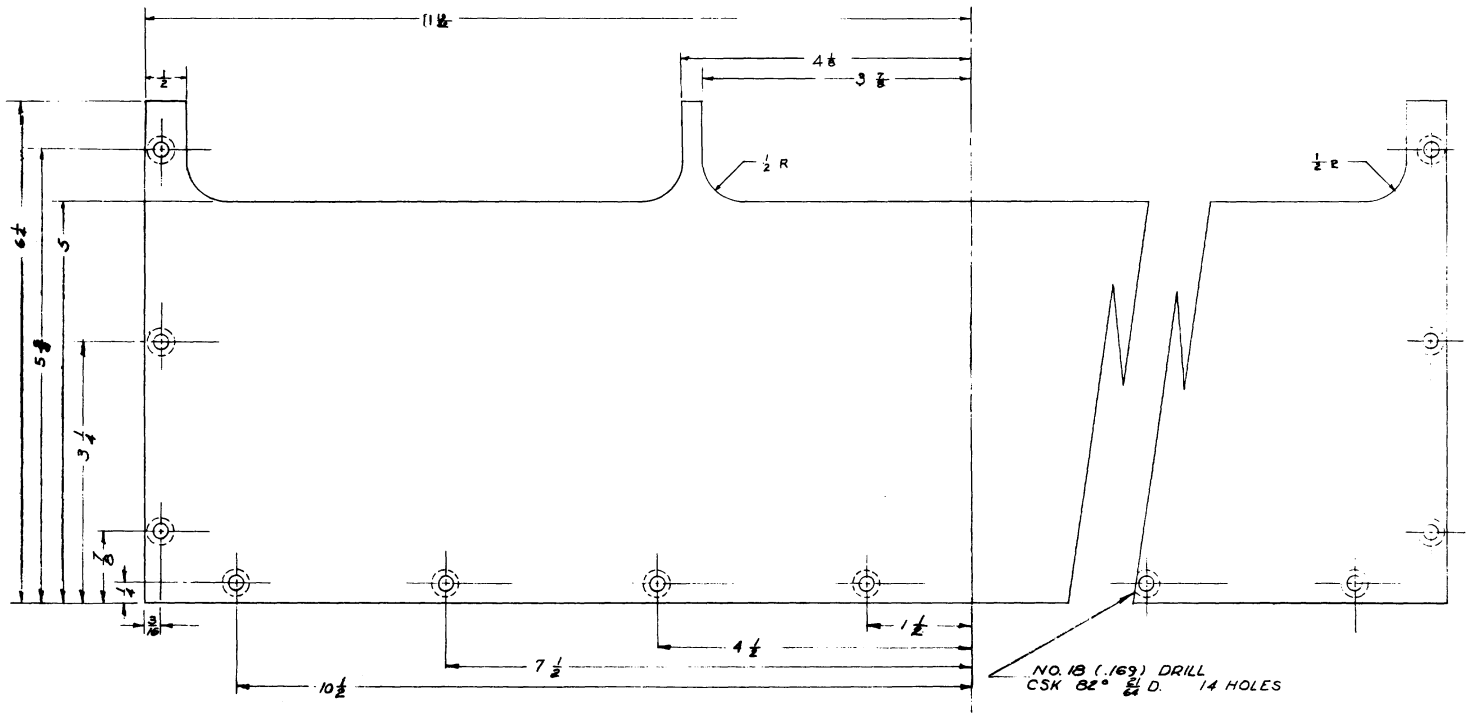
RD2-13	FRAME BASE PLATE	1	ALUMINUM	4 x 6 1/2 x 1 3/32
PART NO.	NAME	REQ'D	MAT'L	SIZE

DIMENSIONAL TOLERANCE FRACTIONAL ± 1/64 DECIMAL ± .005

ISSUE / DATE	ENGINEERING RESEARCH INSTITUTE UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	DESIGNED BY R. Olson	APPROVED BY
		DRAWN BY R.C.	SCALE 1:1
		CHECKED BY R. Olson	DATE 8/31/56
	PROJECT 2145	TITLE FRAME BASE PLATE	
	CLASSIFICATION	DWG. NO. C- DTA 17708	

DWG. NO. C

FREDERICK POST CO. 17711 100 2-58



DTA 17706

PART NO.	NAME	REQ'D	MAT'L	SIZE
RD2-14	FRAME BACK PLATE	1	ALUMINUM	1/4 x 6 1/4 x 23 3/16

DIMENSIONAL TOLERANCE - FRACTIONAL ± 1/64 DECIMAL ± .005

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ANN ARBOR MICHIGAN

PROJECT 2145

CLASSIFICATION

DESIGNED BY H. Olsen
DRAWN BY D.K.
CHECKED BY H. Olsen
APPROVED BY
SCALE 1:1
DATE 8/3/56

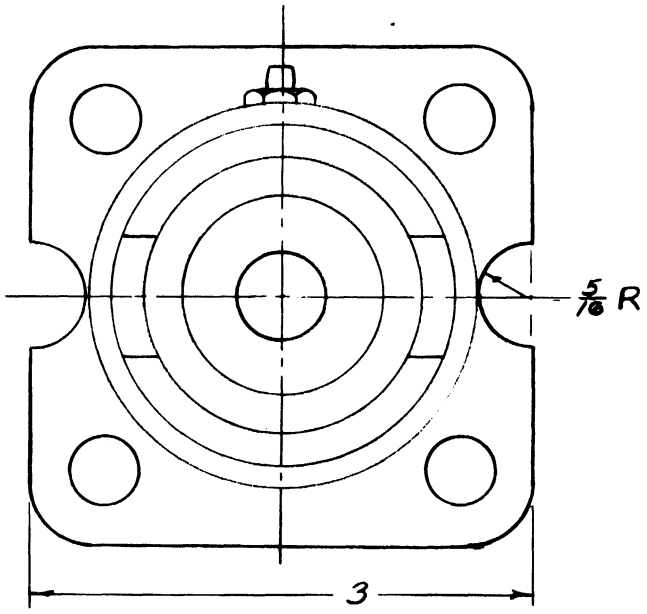
TITLE FRAME BACK PLATE

DWG. NO. C- DTA-17706

ISSUE | DATE

DTA 17707

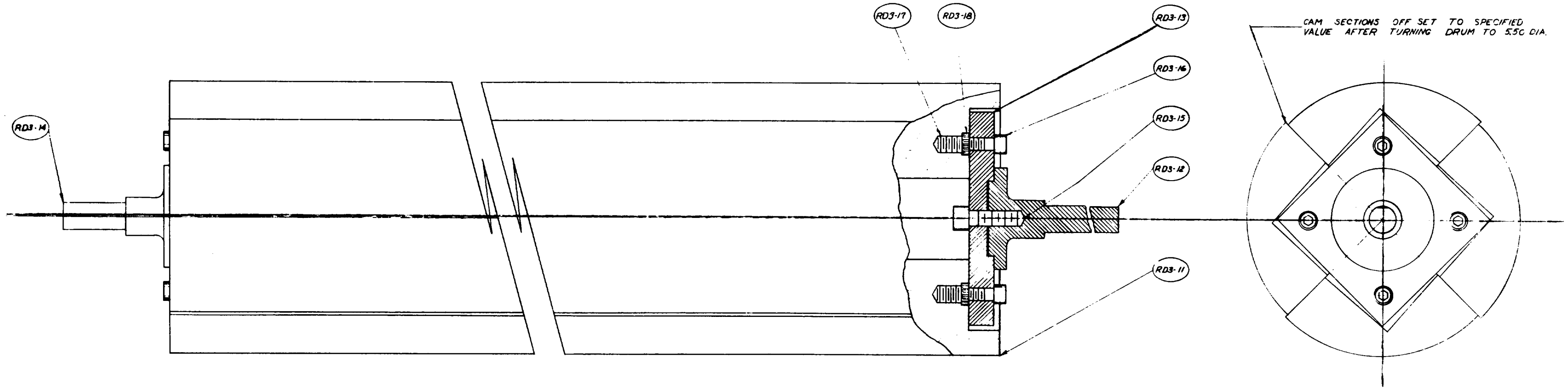
DWG. NO. A



RD 2 - 15	BEARING	2	SEALMASTER SF-8	STANDARD DUTY
PART NO.	NAME	REQ'D	MAT'L.	SIZE

ENGINEERING RESEARCH INSTITUTE UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN		DESIGNED BY H. Olsen	APPROVED BY
		DRAWN BY	SCALE 1-1
		CHECKED BY	DATE 3-4-57
PROJECT 2145		TITLE BEARING MODIFICATION	
CLASSIFICATION		DWG. NO. A- DTA 17707	
ISSUE	DATE		

	PART NO.	NAME	REQ'D	MAT'L	SIZE
DTA 17708	RD3-11	CAM QUARTER	4	MASONITE	[illegible]
	RD3-12	SHAFT RIGHT END	1	C.R.S.	2 DIA. x 5 [illegible]
	RD3-13	CAM PLATE	2	C.R.S.	½ x 3 x 3
	RD3-14	SHAFT LEFT END	1	C.R.S.	2 DIA x 2 [illegible]
	RD3-15	HEX SOCKET CAP SCR.	2		[illegible]-24 x 1
	RD3-16	HEX SOCKET CAP SCR	8		¼-20 x 1
	RD3-17	INSERT	8	ROS'AN R1065B-8	¼-20 INTERNAL THD.
	RD3-18	LOCK RING	8	ROS'AN RL265B-8	



REVISED 8-27-56
REVISED 3-5-57

ENGINEERING RESEARCH INSTITUTE
UNIVERSITY OF MICHIGAN
ANN ARBOR MICHIGAN

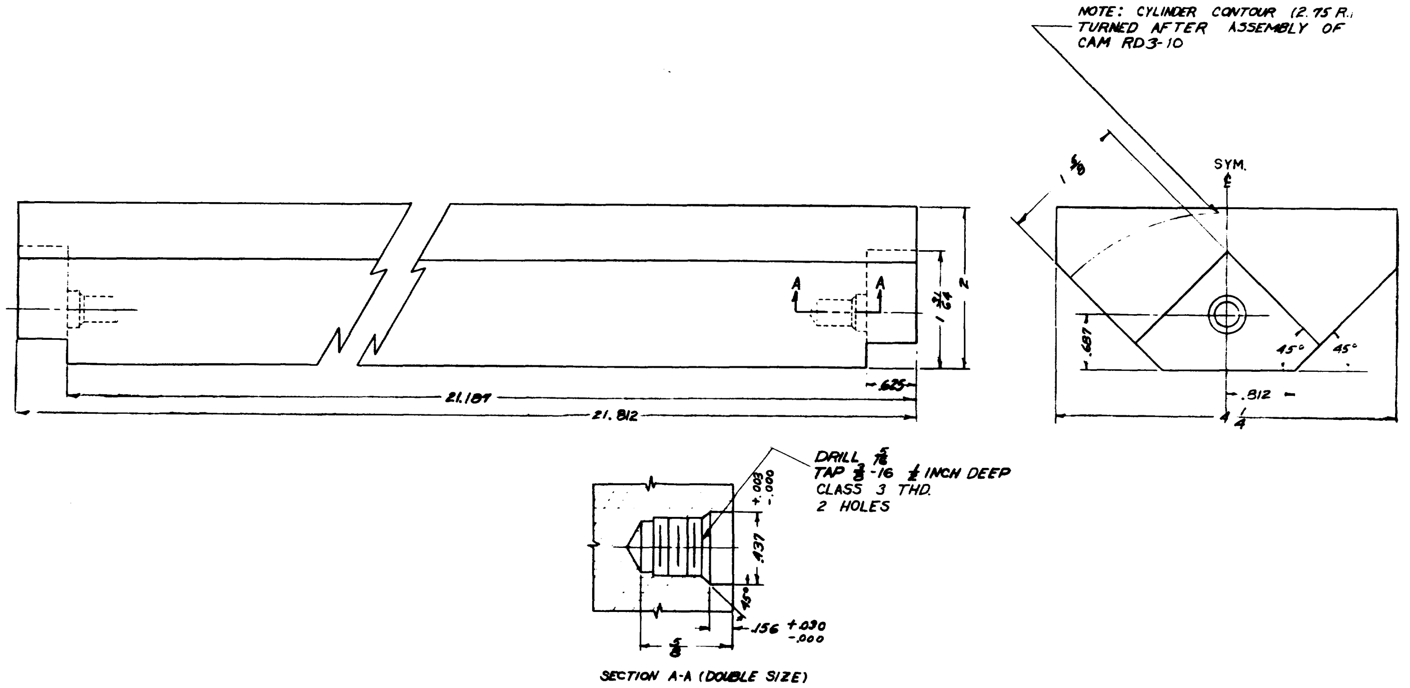
PROJECT 2145

CLASSIFICATION

DESIGNED BY H. OLSON
DRAWN BY O.K.
CHECKED BY H. OLSON
APPROVED BY
SCALE 1:1
DATE [illegible]

TITLE: CAM ASSEMBLY RD3-10

DWG. NO. D- DTA 17708



RD3-11	CAM QUARTER	4	MASONITE DIE STOCK	2 × 4 1/4 × 22
PART NO.	NAME	REQ'D	MAT'L.	SIZE

DIMENSIONAL TOLERANCE FRACTIONAL ± 1/64 DECIMAL ±.005

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PROJECT 2145

CLASSIFICATION

DESIGNED BY H. C. ... DRAWN BY CHECKED BY APPROVED BY SCALE 1:1 DATE

TITLE CAM QUARTER

DWG. NO. C-DTA 17709

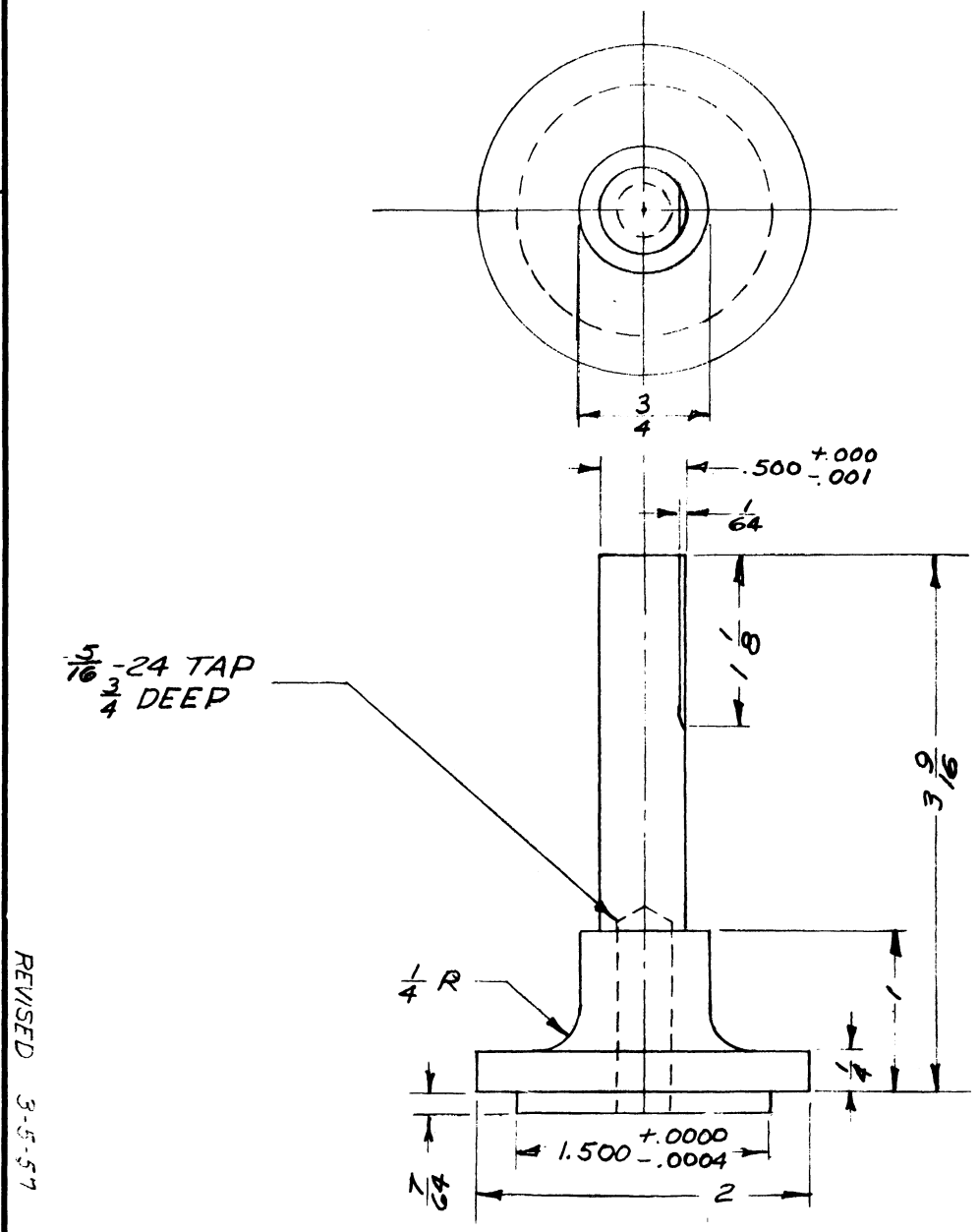
ISSUE DATE

REVISED 8-27-56
REDRAWN 10-25-56

DWG. NO. C

DTA 17710

DWG. NO. A



REVISED 3-5-57

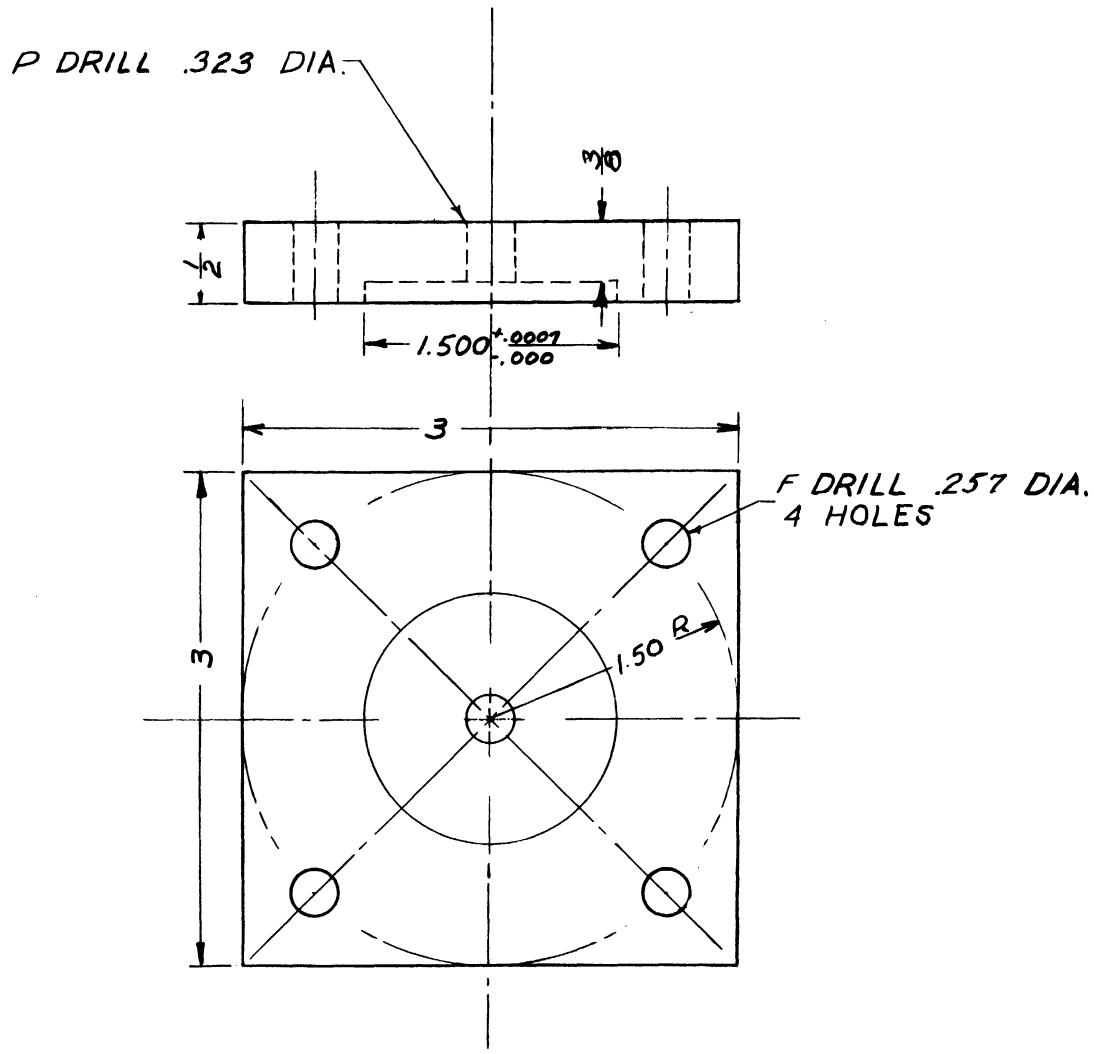
RD3-12	SHAFT RIGHT END	1	C.R.S.	2 DIA. x 3 9/16
PART NO	NAME	REQ'D	MAT'L	SIZE

DIMENSIONAL TOLERANCE FRACTIONAL ± 1/64 DECIMAL ±.005

ISSUE	DATE			
		ENGINEERING RESEARCH INSTITUTE UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	DESIGNED BY H. OLSON	APPROVED BY
			DRAWN BY D. K.	SCALE 1:1
			CHECKED BY H. OLSON	DATE 2/3/56
		PROJECT 2145	TITLE SHAFT RIGHT END	
		CLASSIFICATION	DWG. NO. A- DTA-17710	

DTA 17711

DWG. NO. A



REVISED 3-5-57

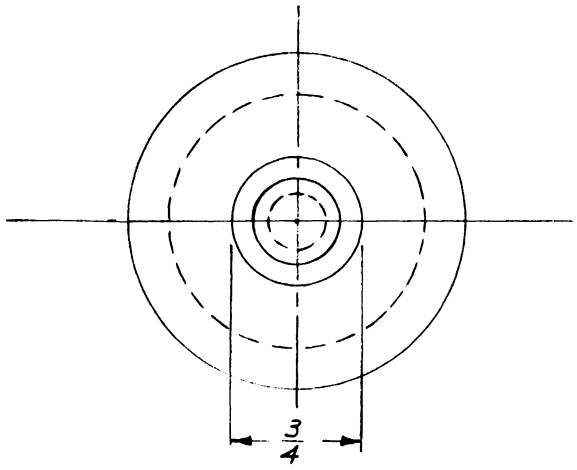
RD3-13	CAM PLATE	2	C.R.S	½ x 3 x 3
PART NO.	NAME	REQ'D	MAT'L	SIZE

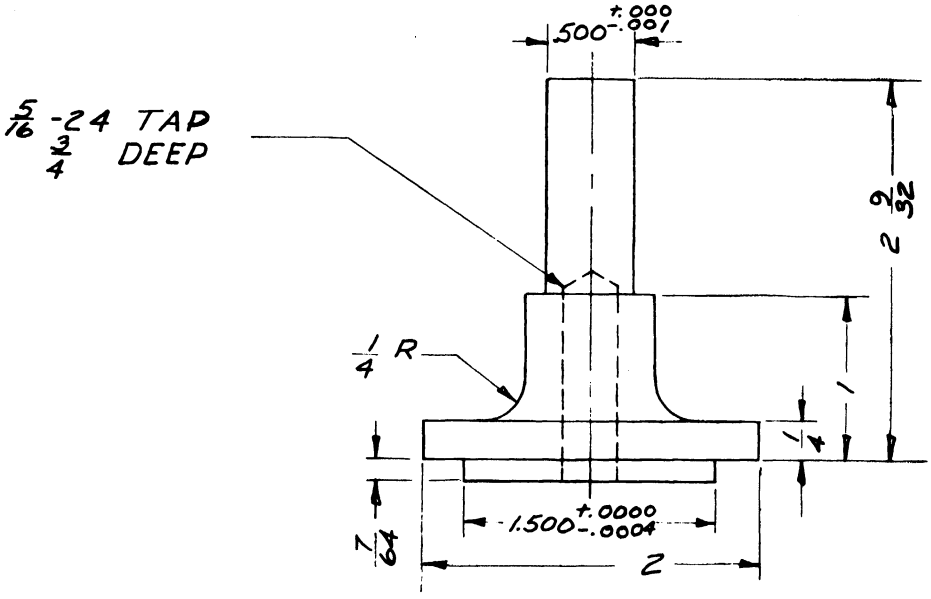
ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED MUST BE HELD TO A TOLERANCE - FRACTIONAL ± 1/64," DECIMAL ± .005," ANGULAR ± ½°

ISSUE	DATE			
		ENGINEERING RESEARCH INSTITUTE UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	DESIGNED BY H. OLSON DRAWN BY D.K CHECKED BY H. OLSON	APPROVED BY SCALE 1 : 1 DATE 2/3/56
		PROJECT 2145	TITLE CAM PLATE	
		CLASSIFICATION	DWG. NO. A- DTA-17711	

DTA 17712

DWG. NO. A



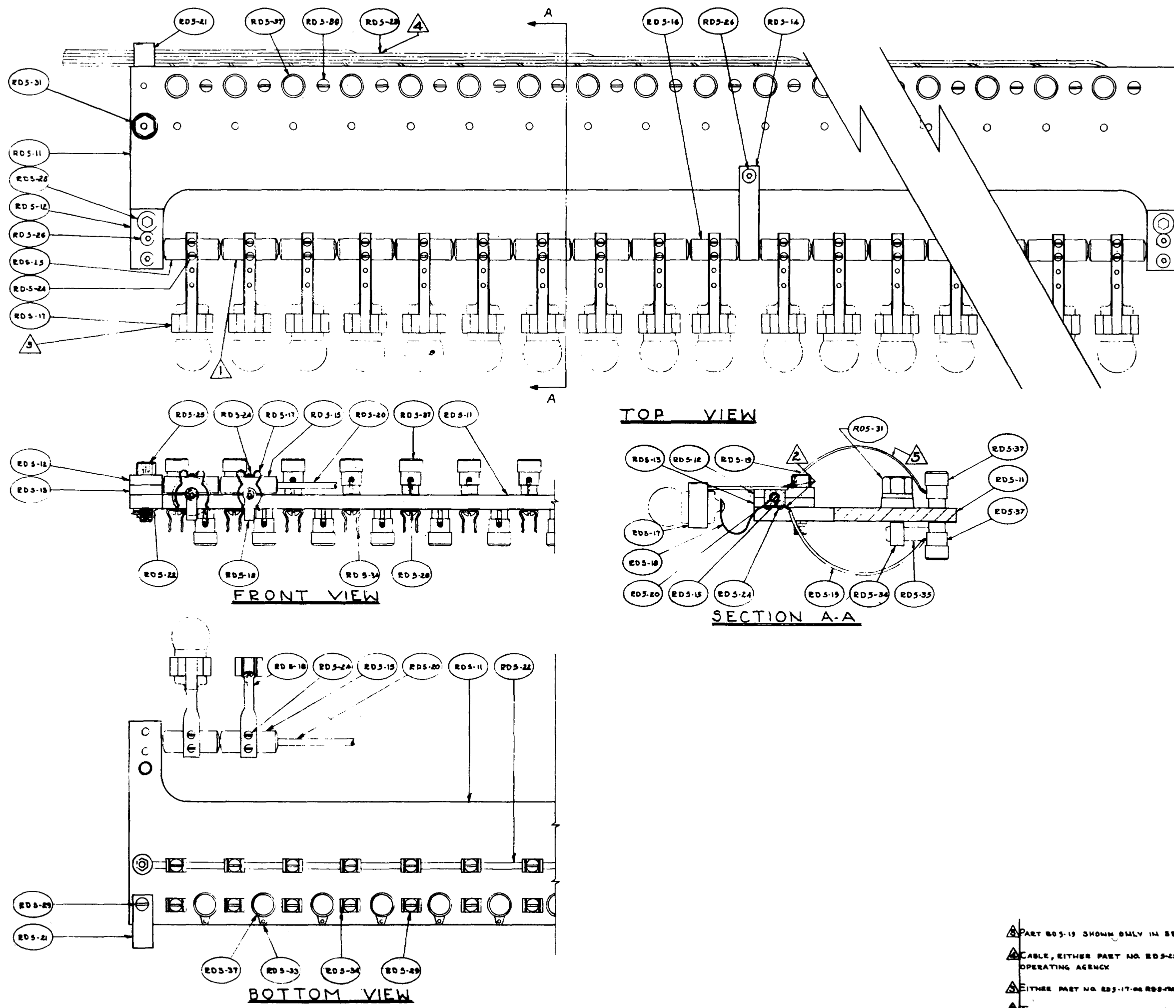


REVISED 3-4-57

RD3-14	SHAFT LEFT END	1	C.R.S.	2 DIA. X 2 9/32
PART NO.	NAME	REQ'D	MAT'L	SIZE

ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED MUST BE HELD TO A TOLERANCE - FRACTIONAL ± 1/64" DECIMAL ± .005," ANGULAR ± 1/2°

ISSUE	DATE			
		ENGINEERING RESEARCH INSTITUTE UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	DESIGNED BY H Olson	APPROVED BY
			DRAWN BY D.K	SCALE 1:1
			CHECKED BY H Olson	DATE 2/3/56
		PROJECT 2145	TITLE SHAFT LEFT END	
		CLASSIFICATION	DWG. NO. A- DTA 17712	



DTA 17713

PART NO.	NAME	REQ'D	MATERIAL	SIZE
RD 5-11	PLATE	1	LINEN BAKELITE	1/4 x 3 3/8 x 23 7/8
RD 5-12	CLAMP, UPPER	2	LINEN BAKELITE	3/16 x 3/8 x 1 3/8
RD 5-13	CLAMP, LOWER	2	LINEN BAKELITE	3/16 x 3/8 x 1 3/8
RD 5-14	BRACKET	1	LINEN BAKELITE	3/8 x 3/8 x 1 3/8
RD 5-15	BEARING, PIVOT	18	NYLON - FM-10001	13/32 x 5/16 x 1 5/16
RD 5-16	BEARING, CENTER	2	NYLON FM-10001	13/32 x 5/16 x 13/32
RD 5-17	CLIP, PIVOT ARM	20	SEE PRINT	
RD 5-18	SPRING, CONTACT	20	SEE PRINT	
RD 5-19	CABLE, CONNECTING	40	SEE PRINT	
RD 5-20	ROD, PIVOT	1	DRILL ROD	3/16 x 23 7/16
RD 5-21	CABLE, HOLDER	1	ALUMINUM	3/16 x 3/8 x 2 5/16
RD 5-22	GROUND STRIP or EQUIV.	1	COPPER	.018 x 3/16 x 22 3/16
RD 5-23	CABLE ASSEMBLY	1		
RD 5-24	SELF-TAPPING SCREW	80	PARKER-KALON TYPE F	2-56 x 1/8 Rd. Hd.
RD 5-25	SCREW, HEXOGONAL SOCKET CAP	2	STEEL	1/4-20 x 3/4
RD 5-26	HEX. SOCKET F. Hd. MACH. SC.	3	STEEL	6-32 x 5/8
RD 5-27	SC. HEX. SOCKET F.Hd. MACH	2	STEEL	6-32 x 1/2
RD 5-28	SCREW, Rd.Hd. MACH	20	BRASS	6-32 x 1/2
RD 5-29	SCREW, Rd.Hd. MACH	21	BRASS	6-32 x 3/8
RD 5-30	SCREW, F.Hd. MACH	20	BRASS	6-32 x 3/8
RD 5-31	BINDING POST	1	5-WAY SUPERIOR	TYPE DF3CPC
RD 5-32	BINDING POST	40		EBY NO. 60M
RD 5-33	LUG, TERMINAL	20	WALDON # AT-154 or Equiv.	#6 HOLE
RD 5-34	FUSE CLIP (BUSS No. 4546)	40	NICKEL PLATED SPRING BRONZE	FOR 1/4" FUSE
RD 5-35	FUSE	20		1/4 x 1", 1/2 to 3 amp as req'd

⚠3 PART RD5-19 SHOWN ONLY IN SECTION A-A

⚠4 CABLE, EITHER PART NO. RD5-23 OR AS DESIRED BY OPERATING AGENCY

⚠5 EITHER PART NO. RD5-17 or RD5-18 MAY BE USED AS DESIRED.

⚠2 TIN END FOR SOLDERING CABLE RD5-19.

⚠1 TEN BEARING BLOCKS ON EACH SIDE SHOULD HAVE A TOTAL OF 1/8" ± 1/32" CLEARANCE. ADJUST AS NECESSARY.

SYM	DESCRIPTION	DATE	CHK.
A	PARTS REMOVED	3-26-57	

REVISIONS

ENGINEERING RESEARCH INSTITUTE
UNIVERSITY OF MICHIGAN
ANN ARBOR MICHIGAN

PROJECT 2145

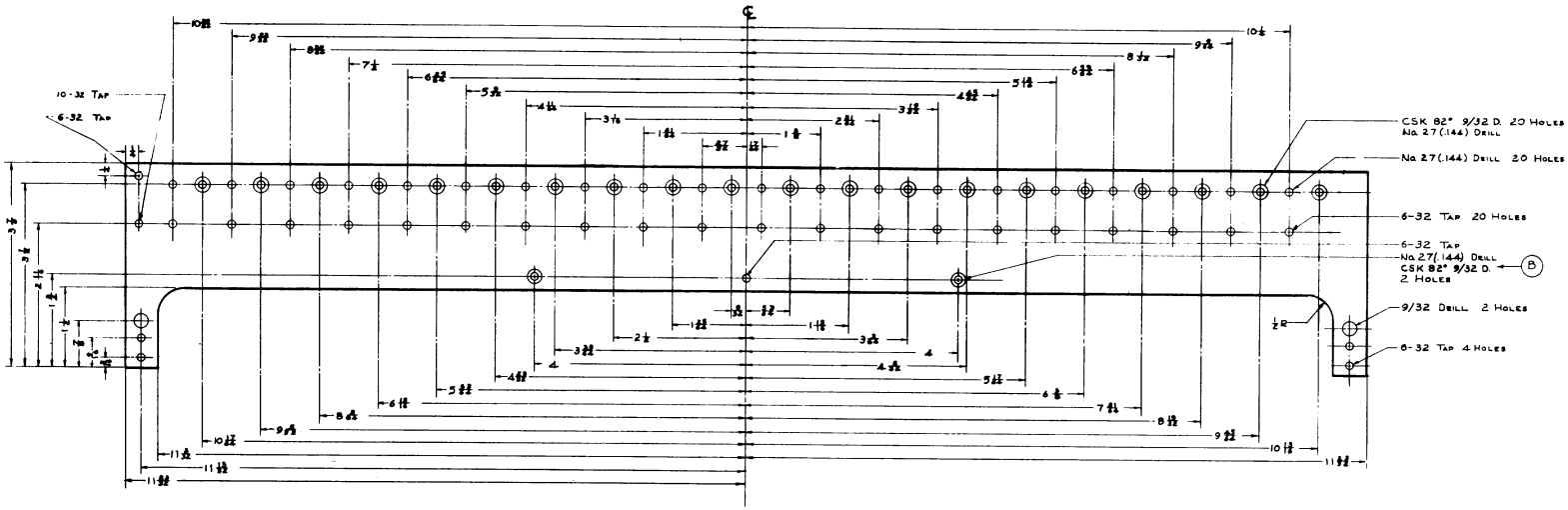
CLASSIFICATION

DESIGNED BY H. CARR
DRAWN BY PJM
CHECKED BY
APPROVED BY
SCALE 1:1
DATE 2/27/57

TITLE G-6 LAMP HOLDER ASSY. (RD5-10)

DWG. NO. D-DTA-17713

DTA 17714



205-11	PLATE	1	LINEN BAKELITE	4 × 3 3/8 × .23 7/16
PART NO.	NAME	REQ'D	MATERIAL	SIZE

A

B	TWO HOLES REMOVED	9.26.57	
A	REDRAWN	1.29.57	PTH
SYM	DESCRIPTION	DATE	CHK

REVISIONS

ENGINEERING RESEARCH INSTITUTE
UNIVERSITY OF MICHIGAN
ANN ARBOR MICHIGAN

PROJECT 2145

CLASSIFICATION

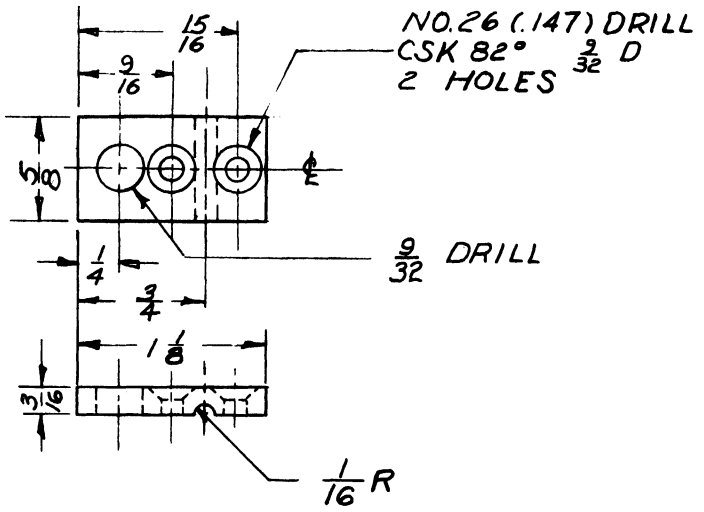
DESIGNED BY W. Ackerman — APPROVED BY
DRAWN BY W.J.R. — SCALE 1/1
CHECKED BY — DATE 1-29-57

TITLE PLATE, G-6

DWG. NO. D-DTA 17714

DTA 17715

DWG. NO. A



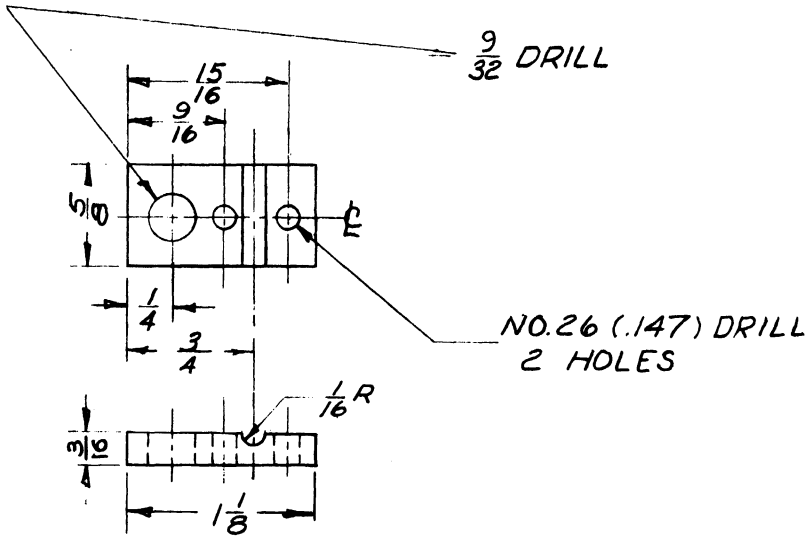
RD5-12	CLAMP, UPPER	2	LINEN, BAKELITE	3/16 × 5/8 × 1 1/8
PART NO.	NAME	REQ'D	MAT'L	SIZE

ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED MUST BE HELD TO A TOLERANCE - FRACTIONAL ± 1/64." DECIMAL ± .005." ANGULAR ± 1/2°

		ENGINEERING RESEARCH INSTITUTE UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	DESIGNED BY H.O.	APPROVED BY
			DRAWN BY DK	SCALE 1:1
			CHECKED BY H.O.	DATE 8/15/56
		PROJECT 2145	TITLE CLAMP, UPPER	
ISSUE	DATE	CLASSIFICATION	DWG. NO. A - DTA 17715	

DTA 17716

DWG. NO. A



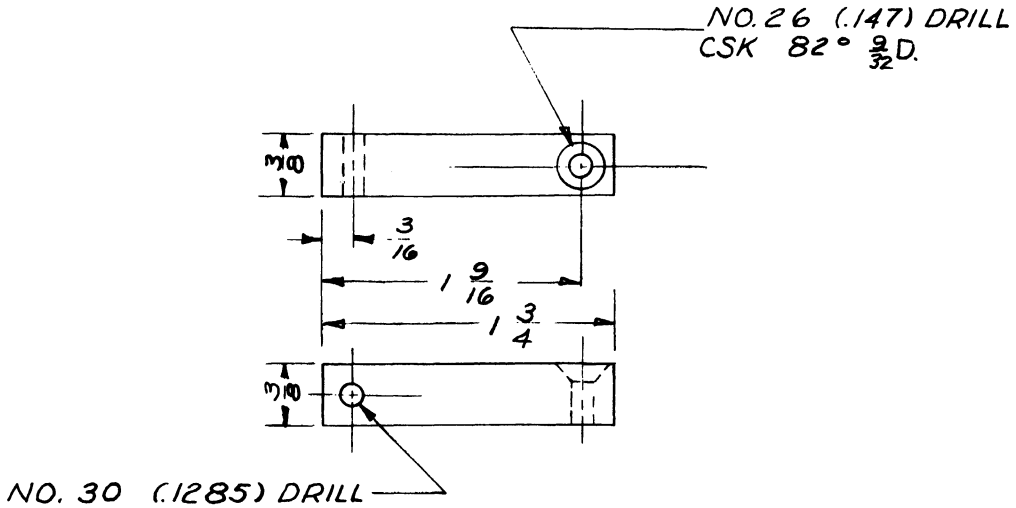
RD5-13	CLAMP, LOWER	2	LINEN BAKELITE	3/16 x 5/8 x 1 1/8
PART NO.	NAME	REQ'D	MAT'L	SIZE

ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED MUST BE HELD TO A TOLERANCE - FRACTIONAL ± 1/64." DECIMAL ± .005." ANGULAR ± 1/2°

ISSUE	DATE			
		ENGINEERING RESEARCH INSTITUTE UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	DESIGNED BY HO	APPROVED BY
			DRAWN BY DK	SCALE 1:1
			CHECKED BY H.O.	DATE 8/15/56
		PROJECT 2145	TITLE CLAMP, LOWER	
		CLASSIFICATION	DWG. NO. A- DTA 17716	

DTA 17717

DWG. NO. A



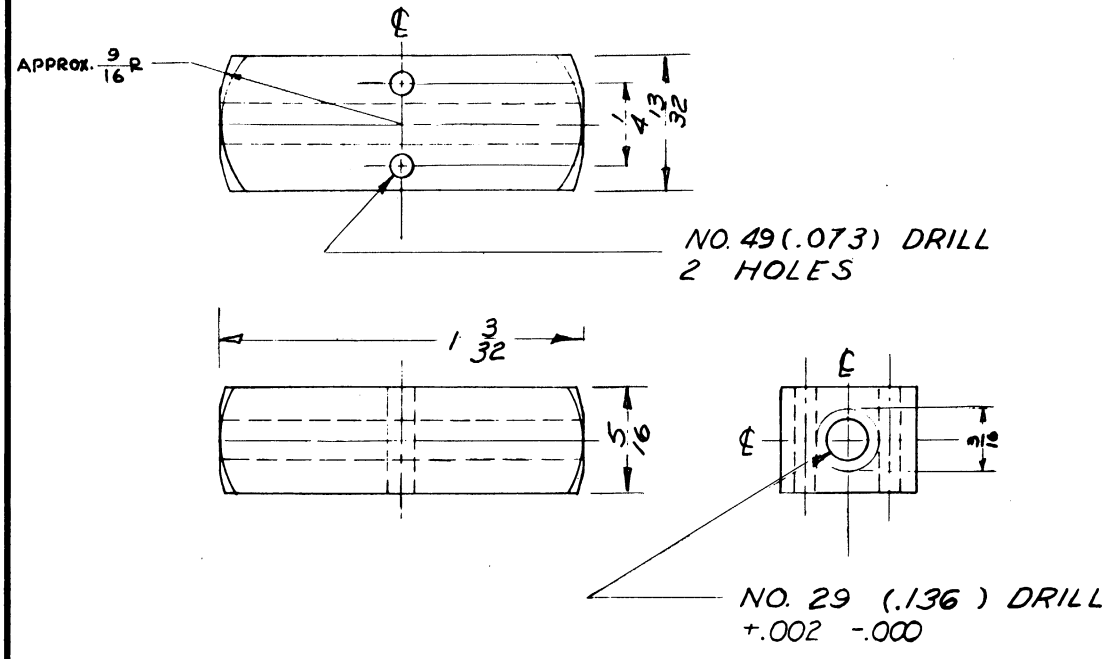
RD5 - 14	BRACKET	1	LINEN BAKELITE	3/8 x 3/8 x 1 3/4
PART NO.	NAME	REQ'D	MAT'L	SIZE

ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED MUST BE HELD TO A TOLERANCE - FRACTIONAL ± 1/64," DECIMAL ± .005," ANGULAR ± 1/2°

ISSUE	DATE			
		ENGINEERING RESEARCH INSTITUTE UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	DESIGNED BY H.O.	APPROVED BY
			DRAWN BY D.K.	SCALE 1:1
			CHECKED BY H.O.	DATE 8/15/56
		PROJECT 2145	TITLE BRACKET	
		CLASSIFICATION	DWG. NO. A - DTA 17717	

DTA 17718

DWG. NO. A



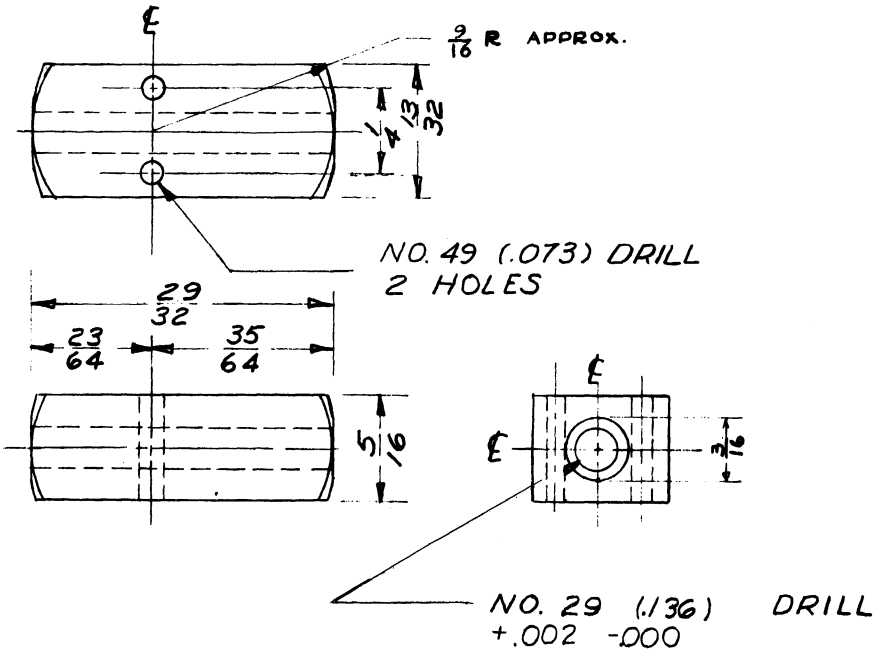
RD5 - 15	PIVOT BRG.	18	NYLON	13/32 x 5/16 x 1 3/32
			FM-10001	
PART NO.	NAME	REQ'D	MAT'L	SIZE

ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED MUST BE HELD TO A TOLERANCE - FRACTIONAL ± 1/64," DECIMAL ± .005," ANGULAR ± 1/2°

ISSUE	DATE			
		ENGINEERING RESEARCH INSTITUTE UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	DESIGNED BY N.O.	APPROVED BY
			DRAWN BY O.K	SCALE 2:1
			CHECKED BY N.O.	DATE 8/15/56
		PROJECT 2145	TITLE PIVOT BRG.	
		CLASSIFICATION	DWG. NO. A- DTA 17718	

DTA 17719

DWG. NO. A



REVISED 2-1-57 P.J.M.

PART NO.	NAME	REQ'D	MAT'L	SIZE
RD5-16	PIVOT BRG., CENTER	2	NYLON FM-10001	13/32 x 5/16 x 29/32

ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED MUST BE HELD TO A TOLERANCE - FRACTIONAL ± 1/64." DECIMAL ± .005." ANGULAR ± 1/2°

ISSUE	DATE

ENGINEERING RESEARCH INSTITUTE
UNIVERSITY OF MICHIGAN
ANN ARBOR MICHIGAN

PROJECT 2145

CLASSIFICATION

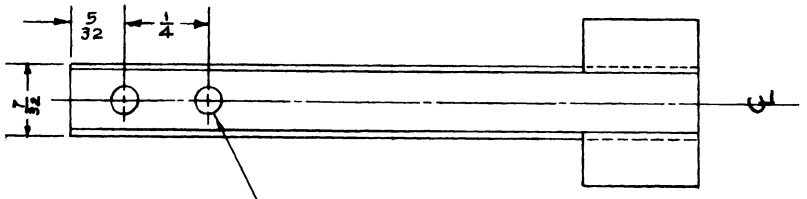
DESIGNED BY H.O.	APPROVED BY
DRAWN BY D.K.	SCALE 2:1
CHECKED BY H.O.	DATE 8-15-56

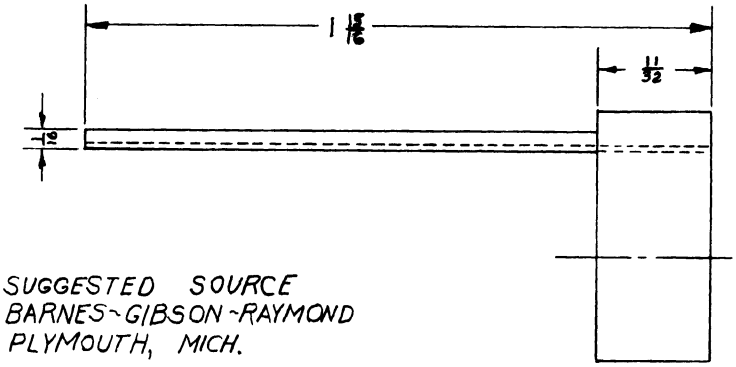
TITLE PIVOT BRG. CENTER

DWG. NO. A-DTA 17719

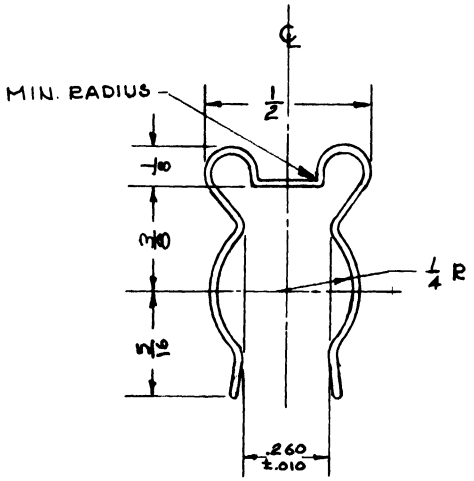
DTA 17720

DWG. NO. A





SUGGESTED SOURCE
BARNES-GIBSON-RAYMOND
PLYMOUTH, MICH.



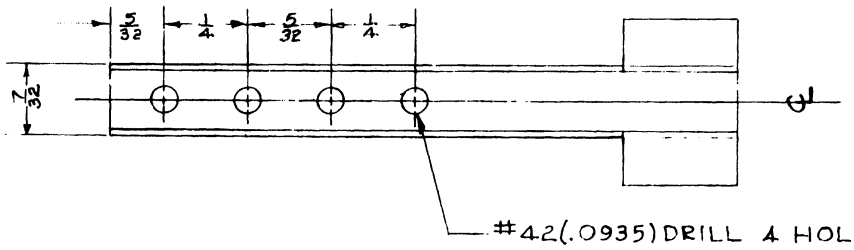
RD5 - 17	CLIP	20	SAE 1074 ANN	$1\frac{15}{16} \times 2\frac{1}{2} \times .020$
			ROCKWELL C-43-46	
PART NO.	NAME	REQ'D	MATERIAL	SIZE

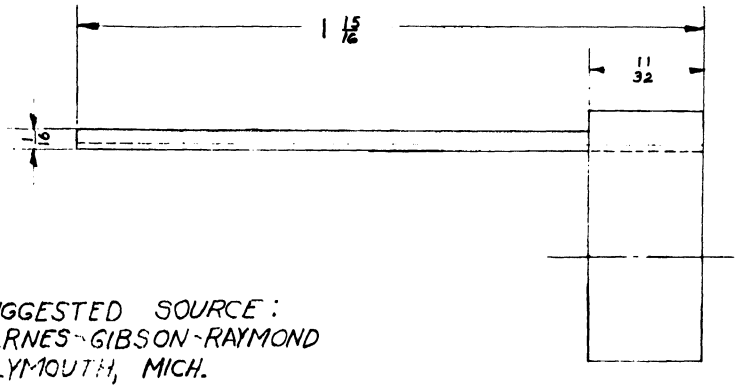
ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED MUST BE HELD TO A TOLERANCE - FRACTIONAL ± 1/64," DECIMAL ± .005," ANGULAR ± ½°

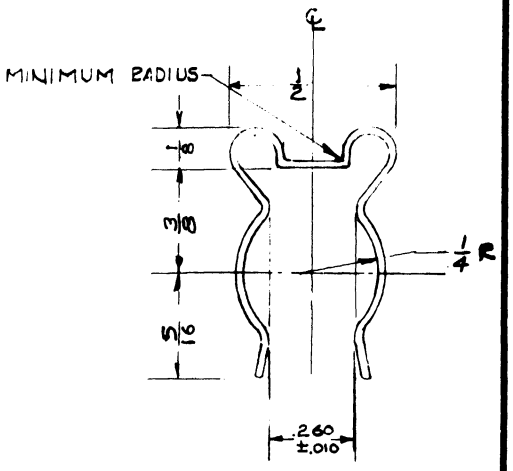
ISSUE	DATE			
		ENGINEERING RESEARCH INSTITUTE UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	DESIGNED BY H. Olsen	APPROVED BY
			DRAWN BY PJM	SCALE 2:1
			CHECKED BY	DATE 2-8-57
		PROJECT 2145	TITLE CLIP	
		CLASSIFICATION	DWG. NO. A- DTA 17720	

DTA 17721

DWG. NO. A







SUGGESTED SOURCE:
BARNES-GIBSON-RAYMOND
PLYMOUTH, MICH.

REVISED 2-8-57 PJM

PART NO.	NAME	REQ'D	MATERIAL	SIZE
RD5-17A	CLIP	20	SAE 1074 ANN	1 15/16 x 2 1/2 x .020
			ROCKWELL C-43-46	

ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED MUST BE HELD TO A TOLERANCE - FRACTIONAL ± 1/64" DECIMAL ± .005" ANGULAR ± 1/2°

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PROJECT 2145

CLASSIFICATION

ISSUE	DATE

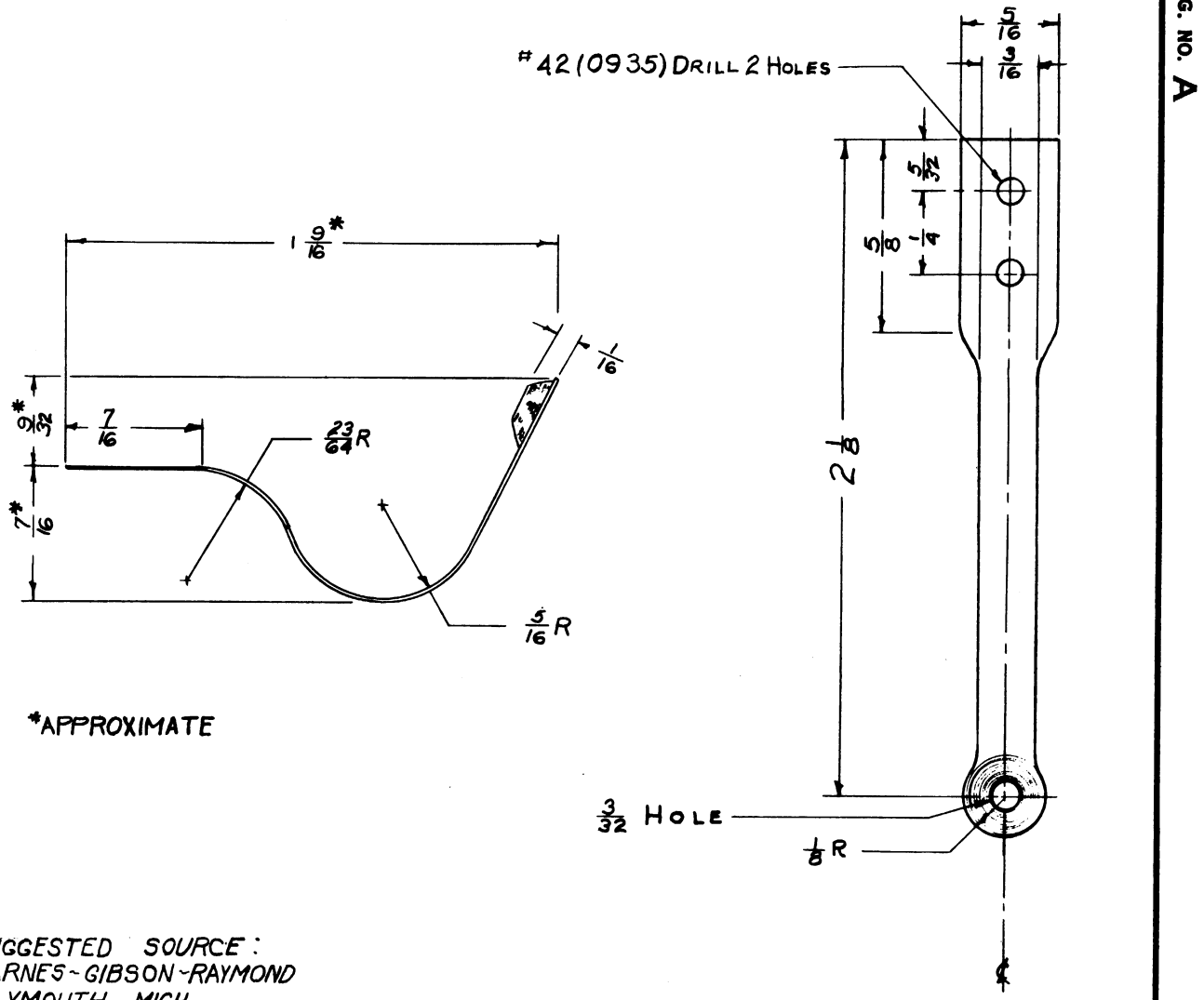
DESIGNED BY H. Olsen	APPROVED BY
DRAWN BY PJM	SCALE 2:1
CHECKED BY	DATE 2-4-57

TITLE: CLIP

DWG. NO. A- DTA 17721

DTA 17722

DWG. NO. A



*APPROXIMATE

SUGGESTED SOURCE:
BARNES-GIBSON-RAYMOND
PLYMOUTH, MICH.

PART NO.	NAME	REQ'D	MATERIAL	SIZE
RDS-18	SPRING CONTACT-G-6	20	BERYLLIUM COPPER SPRING TEMP.	.010 x 5/16 x 2 1/2

ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED MUST BE HELD TO A TOLERANCE - FRACTIONAL ± 1/64," DECIMAL ± .005," ANGULAR ± 1/2°

ISSUE	DATE

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PROJECT 2145

CLASSIFICATION

DESIGNED BY H. OLsen	APPROVED BY
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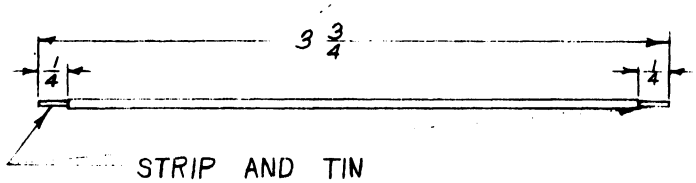
CHECKED BY	DATE 3-6-57

TITLE: SPRING CONTACT

DWG. NO. A- DTA 17722

DTA 17723

DWG. NO. A



PART NO.	NAME	REQ'D.	MATERIAL	SIZE
RD5-19	CABLE, CONNECTING	40	TYPE 26 R GAVITT WIRE & CABLE CO.	4-16-002 STRANDED

ISSUE	DATE			
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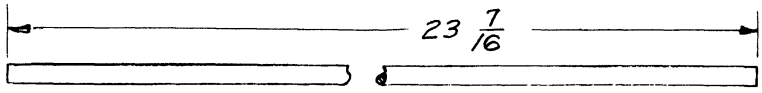
			DRAWN BY	SCALE 1:1
			CHECKED BY	DATE 3-6-57
		PROJECT 2145	TITLE CABLE, CONNECTING	
		CLASSIFICATION	DWG. NO. A- DTA 17723	

DTA 17724

DWG. NO. A



PART NO.	NAME	REQ'D	MAT'L	SIZE
RDS -20	ROD	1	DRILL ROD - 1/8"	1/8 x 23 7/16

ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED MUST BE HELD TO A TOLERANCE - FRACTIONAL ± 1/64." DECIMAL ± .005." ANGULAR ± 1/2°

ISSUE	DATE

ENGINEERING RESEARCH INSTITUTE
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PROJECT 2145

CLASSIFICATION

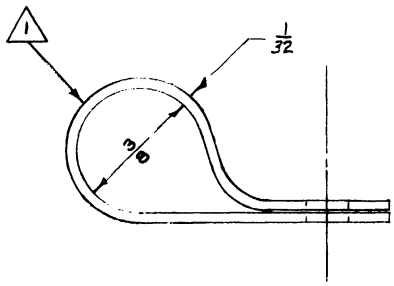
DESIGNED BY N. Olson	APPROVED BY
DRAWN BY	SCALE 1:1
CHECKED BY	DATE 8/15/56

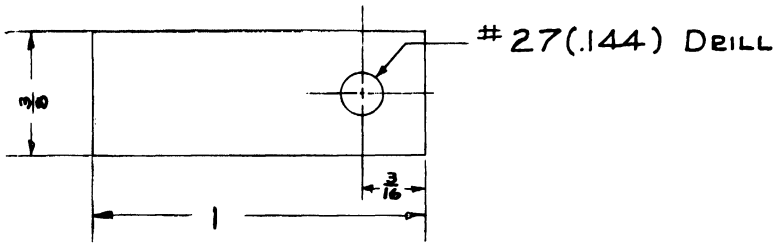
TITLE ROD

DWG. NO. A- DTA 17724

DTA 17725

DWG. NO. A





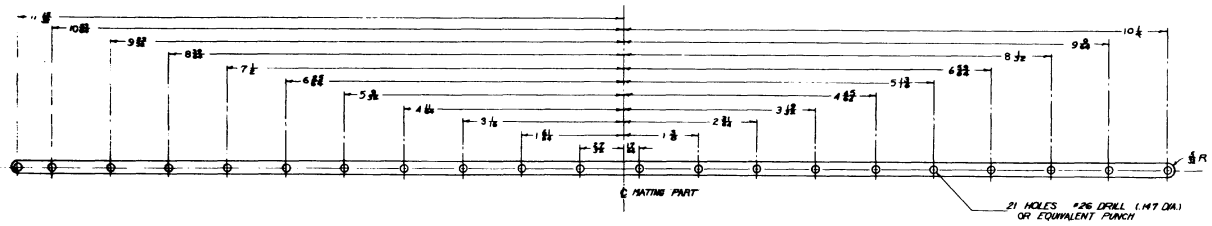
⚠1 AN EQUIVALENT COMMERCIAL PART MAY BE SUBSTITUTED

RD5-21	CABLE HOLDER	1	ALUMINUM	2 1/2 x 3/8 x 1/32
PART NO.	NAME	REQ'D	MAT'L.	SIZE

ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED MUST BE HELD TO A TOLERANCE - FRACTIONAL ± 1/64," DECIMAL ± .005," ANGULAR ± 1/2°

ISSUE	DATE			
		ENGINEERING RESEARCH INSTITUTE UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	DESIGNED BY	APPROVED BY
			DRAWN BY PJM	SCALE 2:1
			CHECKED BY	DATE 2-1-57
		PROJECT 2145	TITLE CABLE HOLDER	
		CLASSIFICATION	DWG. NO. A- DTA 17725	

DTA 17726



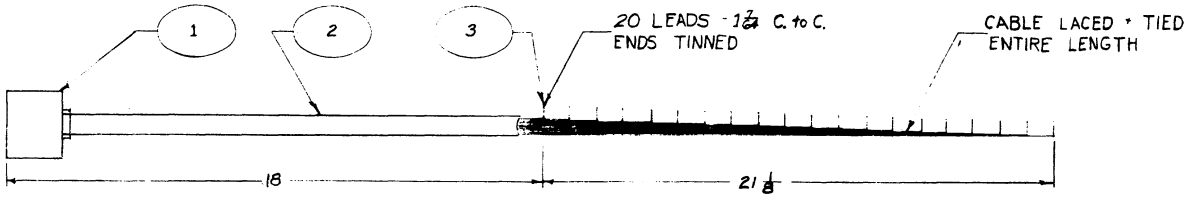
R05-22	GROUND STRIP	1	COPPER	DIA ⅛ - 22⅝
PART NO.	NAME	REQ'D	MATERIAL	SIZE

ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED MUST BE HELD TO A TOLERANCE OF FRACTIONAL ± 1/64", DECIMAL ± .015", ANGULAR ± 1°

ENGINEERING RESEARCH INSTITUTE UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	DESIGNED BY H. DOLP	APPROVED BY	
	DRAWN BY	SCALE 1/1	
	CHECKED BY	DATE 3-6-59	
PROJECT 2145	TITLE GROUND STRIP		
CLASSIFICATION	DWG. NO. D- DTA 17726		
ISSUE DATE			

DWG. NO. B

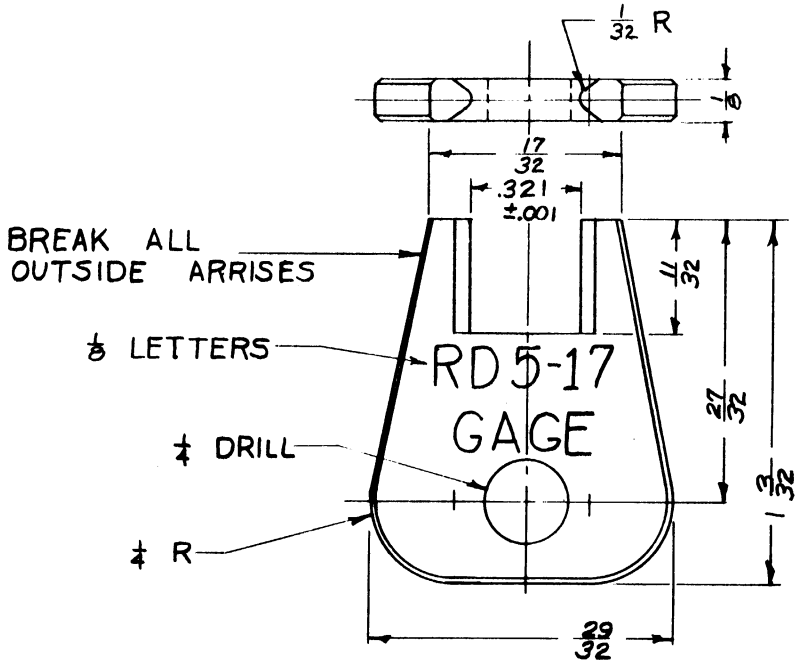
DTA 17727	PART NO.	NAME	REQ'D	MAT'L.	SIZE
	1	CONNECTOR	1	CINCH-JONES	P-321-CCT
	2	WIRE, STRANDED	70 FT.	THERMOPLASTIC-HOOK-UP	#20 AWG
	3	VINYL INSULATION TUBE	18 IN.		3/8 x 18
	-	LACING CORD		LINEN	



ISSUE	DATE	ENGINEERING RESEARCH INSTITUTE UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	DESIGNED BY H.S.	APPROVED BY
			DRAWN BY	SCALE 1:4
			CHECKED BY	DATE 4-22-57
		PROJECT 2145	TITLE CABLE ASSEMBLY RD5-23	
		CLASSIFICATION	DWG. NO. B- DTA 17727	

DTA 17749

DWG. NO. A



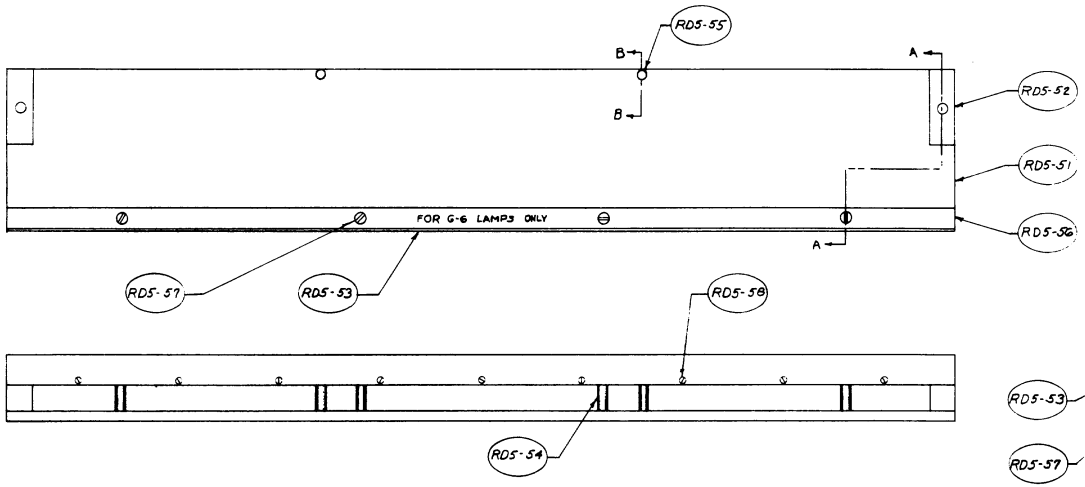
RD5-40	GAGE, RD5-17	1	C.R.S.	1/8 × 1 × 1 1/2
PART NO.	NAME	REQ'D	MAT'L.	SIZE

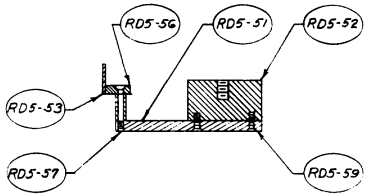
ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED MUST BE HELD TO A TOLERANCE - FRACTIONAL ± 1/64," DECIMAL ± .005," ANGULAR ± ½°

ENGINEERING RESEARCH INSTITUTE UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN		DESIGNED BY H. Olsen	APPROVED BY
		DRAWN BY	SCALE 2:1
		CHECKED BY	DATE 5-22-57
PROJECT 2145		TITLE GAGE, RD5-17	
CLASSIFICATION		DWG. NO. A- DTA-17749	
ISSUE	DATE		

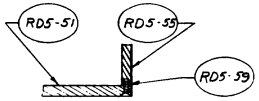
DWG. NO. C

PART NO.	NAME	REQ'D	MATERIAL	SIZE
RD5 -51	BASE	1	LINEN BAKELITE	$\frac{1}{4} \times 3\frac{5}{8} \times 23\frac{7}{16}$
RD5 -52	BLOCK	2	LINEN BAKELITE	$\frac{5}{8} \times 1 \times 1\frac{5}{8}$
RD5 -53	STOP	1	LINEN BAKELITE	$\frac{1}{16} \times \frac{3}{4} \times 23\frac{7}{16}$
RD5 -54	SPACER	4	LINEN BAKELITE	$\frac{3}{4}$ DIA. $\times \frac{5}{8}$
RD5 -55	SUPPORT	2	LINEN BAKELITE	$\frac{3}{4}$ DIA. $\times 1$
RD5 -56	PLATE	1	LINEN BAKELITE	$\frac{1}{4} \times \frac{5}{8} \times 23\frac{7}{16}$
RD5 -57	SCREW, F. HD. MACH	4	BRASS	6-32 $\times 1$
RD5 -58	SCREW, F. HD. MACH	9	BRASS	4-36 $\times \frac{1}{2}$
RD5 -59	SCREW, F. HD. MACH	6	BRASS	6-32 $\times \frac{1}{2}$





SECTION A-A



SECTION B-B

DTA 17723

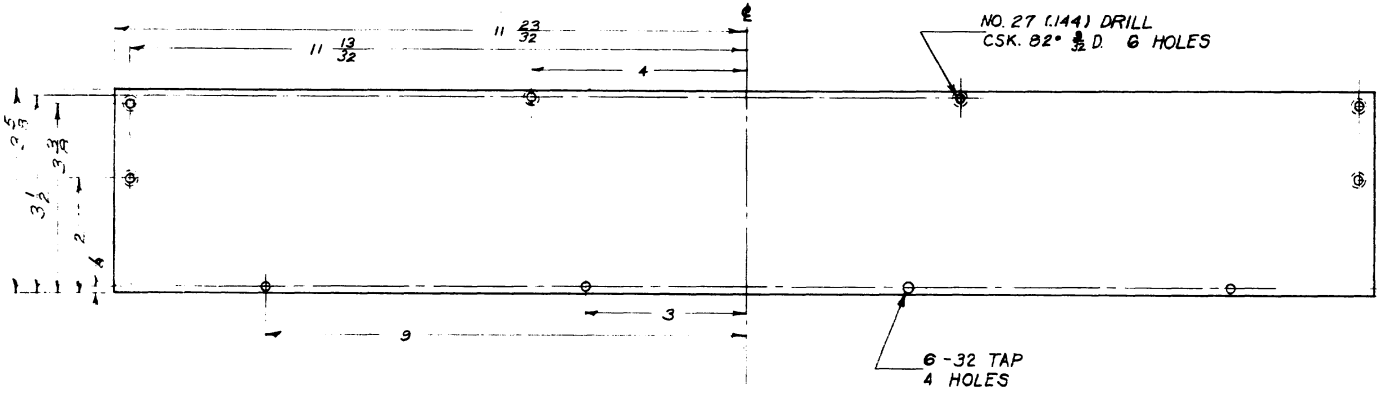
DIMENSIONAL TOLERANCE FRACTIONAL $\pm \frac{1}{64}$ DECIMAL $\pm .005$

ENGINEERING RESEARCH INSTITUTE, UNIVERSITY OF MICHIGAN, ANN ARBOR MICHIGAN	DESIGNED BY HOLBEC	APPROVED BY
	DRAWN BY	SCALE 1:2
	CHECKED BY	DATE 3-14-57
PROJECT 2145	TITLE LOADING FIXTURE, RD5-50 G-6 LAMP HOLDER	
CLASSIFICATION	DWG. NO. C- DTA 17728	
ISSUE / DATE		

DWG. NO. B

100 5-56 DETROIT BLUE PRINT & SUPPLY CO.

DTA 17729



PART NO.	NAME	REQ'D	MAT'L	SIZE
RD5-51	BASE	1	LINEN BAKELITE	1/4 × 3 5/8 × 23 7/16

DIMENSIONAL TOLERANCE ~ FRACTIONAL ± 1/64

ISSUE	DATE

ENGINEERING RESEARCH INSTITUTE
UNIVERSITY OF MICHIGAN
ANN ARBOR MICHIGAN

PROJECT 2145

CLASSIFICATION

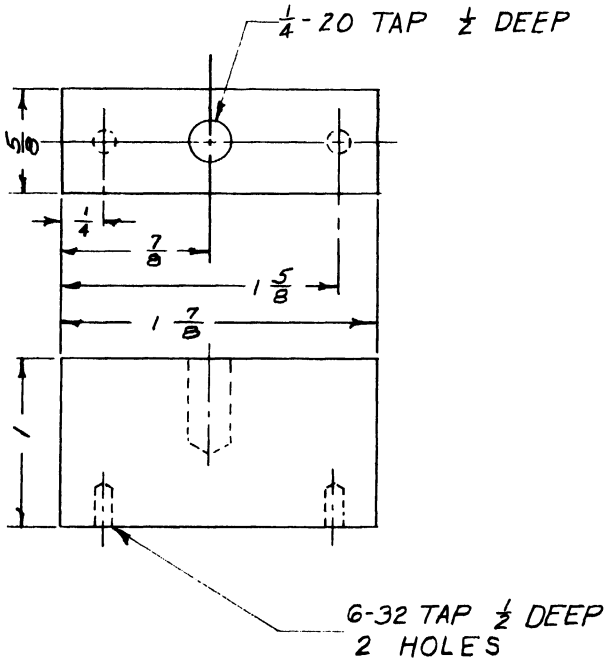
DESIGNED BY H OLMES | APPROVED BY
DRAWN BY | SCALE 1:2
CHECKED BY | DATE 3-14-57

TITLE BASE

DWG. NO. B- DTA 17729

DTA 17730

DWG. NO. A



PART NO.	NAME	REQ'D.	MAT'L.	SIZE
RD5-52	BLOCK	2	LINEN BAKELITE	5/8 × 1 × 1 7/8

ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED MUST BE HELD TO A TOLERANCE - FRACTIONAL ± 1/64," DECIMAL ± .005," ANGULAR ± 1/2°

ISSUE	DATE

ENGINEERING RESEARCH INSTITUTE
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PROJECT 2145

CLASSIFICATION

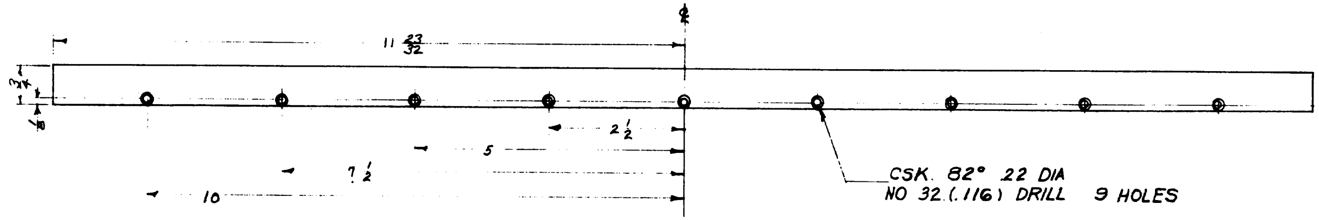
DESIGNED BY H. Olsee	APPROVED BY
DRAWN BY	SCALE 1:1
CHECKED BY	DATE 3-14-57

TITLE: BLOCK

DWG. NO. A- DTA 17730

DWG. NO. B

DTA 17731



RD5-53	STOP	1	LINEN BAKELITE	1/16 × 3/4 × 23 7/16
PART NO.	NAME	REQ'D	MAT'L	SIZE

DIMENSIONAL TOLERANCE FRACTIONAL ± 1/64 DECIMAL ±.005

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DRAWN BY	SCALE
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PROJECT 2145

TITLE STOP

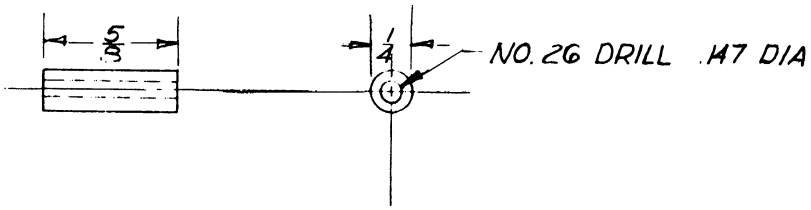
CLASSIFICATION

ISSUE | DATE

DWG. NO. B- DTA 17731

DTA 17732

DWG. NO. A



RDS -54	SPACER	4	LINEN BAKELITE	1D. x 5/8
PART NO.	NAME	REQ'D	MAT'L	SIZE

DEMENSIONAL TOLERANCE FRACTIONAL ± 1/64

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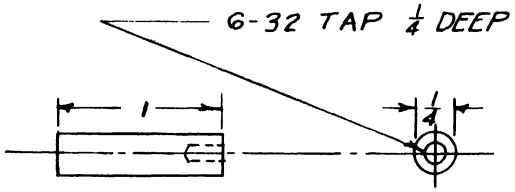
			DRAWN BY / SCALE
			CHECKED BY / DATE
		PROJECT 2145	TITLE SPACER
		CLASSIFICATION	DWG. NO. A- DTA 17732

DTA 17733

DWG. NO. A



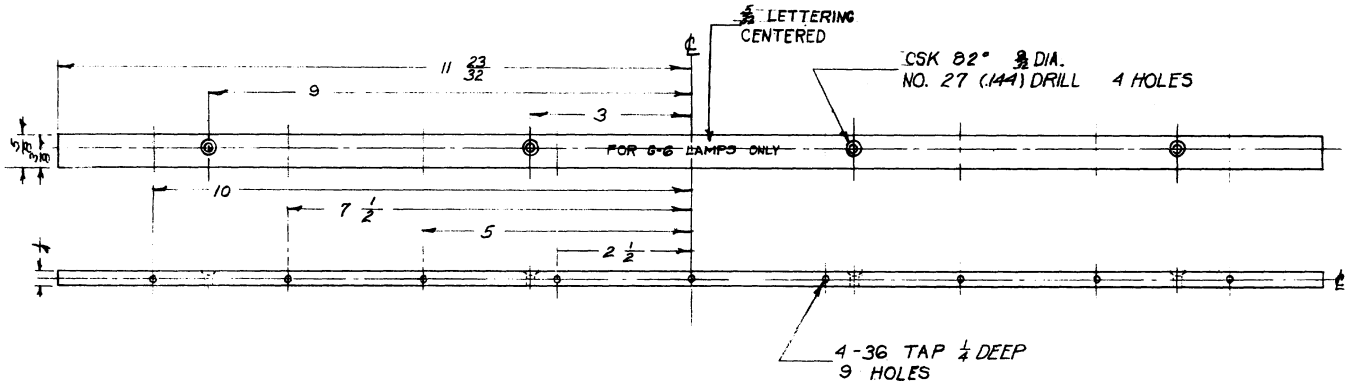
RDS-55	SUPPORT	2	LINEN BAKELITE	⅞D. x 1
PART NO.	NAME	REQ'D	MAT'L	SIZE

ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED MUST BE HELD TO A TOLERANCE - FRACTIONAL ± 1/64." DECIMAL ± .005," ANGULAR ± ½°

ISSUE	DATE			
		ENGINEERING RESEARCH INSTITUTE UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	DESIGNED BY H O Lewis	APPROVED BY
			DRAWN BY	SCALE 1:1
			CHECKED BY	DATE 3-14-57
		PROJECT 2145	TITLE SUPPORT	
		CLASSIFICATION	DWG. NO. A-DTA 17733	

DWG. NO. B

DTA 17734



RD5-56	PLATE	1	LINEN BAKELITE	1/8 × 3/8 × 23 1/16
PART NO.	NAME	REQ'D	MAT'L	SIZE

DIMENSIONAL TOLERANCE FRACTIONAL ± 1/64 DECIMAL ±.005

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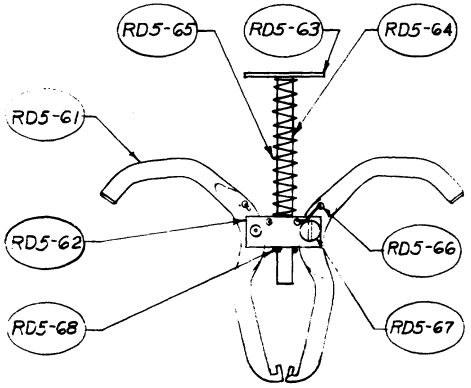
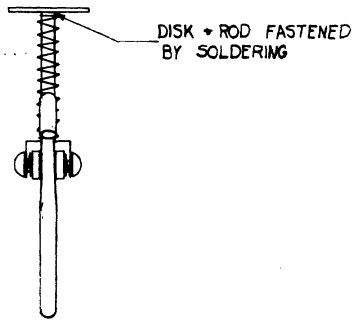
		CHECKED BY	DATE 3-15-57
PROJECT 2145		TITLE PLATE	
CLASSIFICATION		DWG. NO. B- DTA 17734	
ISSUE	DATE		

DWG. NO. B

DTA 17735

PART NO.	NAME	REQ'D.	MATERIAL	SIZE
RD5-61	ARM	2	STEEL WIRE, ANN.	#9 (.148 DIA.)
RD5-62	PIVOT BAR	1	C.R.S.	$\frac{3}{4} \times \frac{1}{2} \times \frac{11}{64}$
RD5-63	DISK	1	C.R.S.	$\frac{11}{16} \times \frac{1}{2}$ D.
RD5-64	ROD	1	STEEL WIRE, ANN.	#9 (.148 DIA.)
RD5-65	SPRING, COMPRESSION	1	MUSIC WIRE	#8 (.020 DIA.)
RD5-66	SPRING, TORSION	2	MUSIC WIRE	#11 (.026 DIA.)
RD5-67	SCREWS, RD. HD. MACH.	2	STEEL	4-36 × $\frac{1}{8}$
RD5-68	COTTER KEY	1		AS REQ'D





ENGINEERING RESEARCH INSTITUTE
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ANN ARBOR MICHIGAN

PROJECT 2145

CLASSIFICATION

ISSUE | DATE

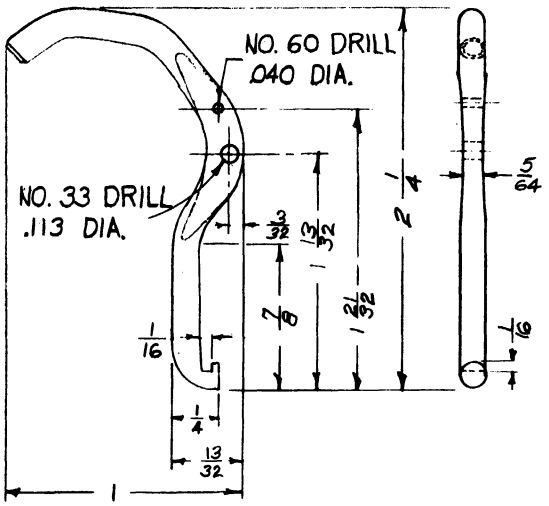
DESIGNED BY H. Olsen | APPROVED BY
DRAWN BY | SCALE 1:1
CHECKED BY | DATE 4-15-57

TITLE
LAMP INSERTION TOOL RD5-60

DWG. NO. B- DTA 17735

DTA 17736

DWG. NO. A



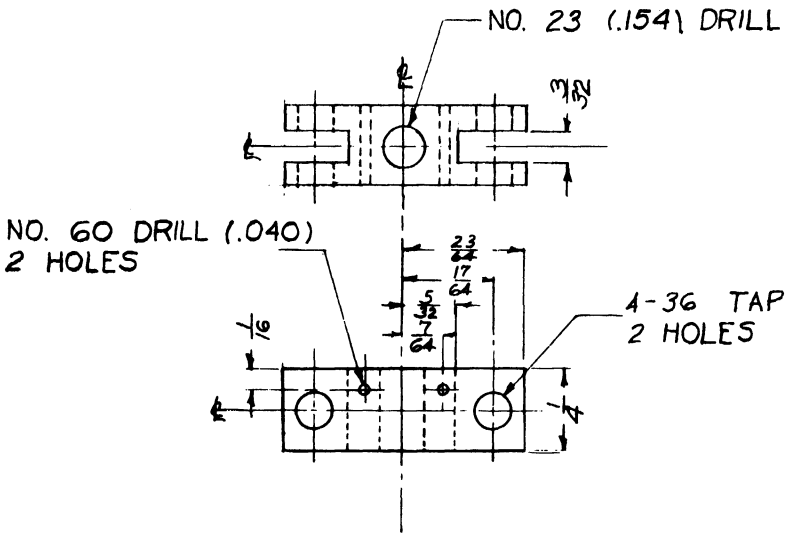
RD5-61	ARM	2	STEEL WIRE, ANN.	#9 (.148 DIA.) x 4
PART NO.	NAME	REQ'D	MAT'L	SIZE

DIMENSIONAL TOLERANCE ~ FRACTION ± 1/64

ENGINEERING RESEARCH INSTITUTE UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN		DESIGNED BY H. Olsen	APPROVED BY
		DRAWN BY	SCALE 1:1
		CHECKED BY	DATE 4-15-57
PROJECT 2145		TITLE ARM	
CLASSIFICATION		DWG. NO. A- DTA 17736	
ISSUE	DATE		

DTA 17737

DWG. NO. A



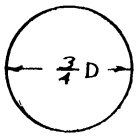
RD5-62	PIVOT BAR	1	C.R.S.	$\frac{1}{4} \times \frac{1}{4} \times \frac{23}{64}$
PART NO.	NAME	REQ'D	MAT'L.	SIZE

DIMENSION TOLERANCE ~ FRACTIONAL $\pm \frac{1}{64}$

ISSUE	DATE			
		ENGINEERING RESEARCH INSTITUTE UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	DESIGNED BY H. OLSEN	APPROVED BY
			DRAWN BY	SCALE 2:1
			CHECKED BY	DATE 4-16-57
		PROJECT 2145	TITLE PIVOT BAR	
		CLASSIFICATION	DWG. NO. A- DTA 17737	

DTA 17738

DWG. NO. A



PART NO.	NAME	REQ'D.	MAT'L.	SIZE
RD5 - 63	DISK	1	C.R.S.	1/32 x 3/4 D

ISSUE	DATE	CLASSIFICATION

ENGINEERING RESEARCH INSTITUTE
UNIVERSITY OF MICHIGAN
ANN ARBOR MICHIGAN

PROJECT 2145

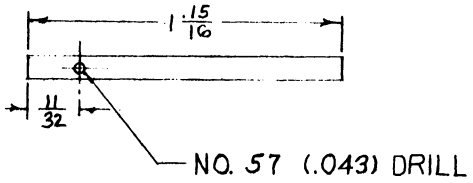
DESIGNED BY H Olsen	APPROVED BY
DRAWN BY	SCALE 1:1
CHECKED BY	DATE 4-15-57

TITLE: DISK

DWG. NO. A- DTA 17738

DTA 17739

DWG. NO. A

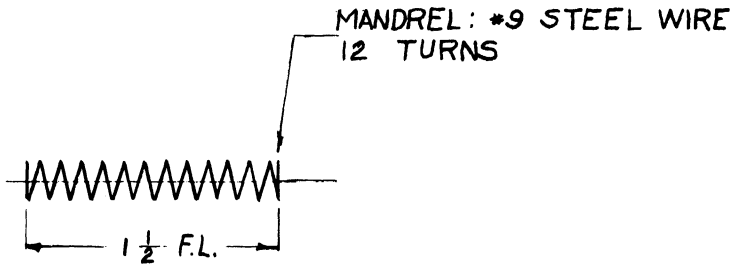


PART NO.	NAME	REQ'D	MAT'L	SIZE
RD5-64	ROD	1	STEEL WIRE, ANN.	#9 (.148 D.) x 1 15/16

ISSUE	DATE			
		ENGINEERING RESEARCH INSTITUTE UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	DESIGNED BY H. Olsen	APPROVED BY
			DRAWN BY	SCALE 1:1
			CHECKED BY	DATE 4-15-57
		PROJECT 2145	TITLE ROD	
		CLASSIFICATION	DWG. NO. A- DTA 17739	

DTA 17740

DWG. NO. A



RD5-65	SPRING, COMPRESSION	1	MUSIC WIRE	#8 (.020 DIA.)
PART NO.	NAME	REQ'D	MAT'L.	SIZE

ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED MUST BE HELD TO A TOLERANCE - FRACTIONAL ± 1/64," DECIMAL ± .005," ANGULAR ± ½°

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ANN ARBOR MICHIGAN

PROJECT 2145

CLASSIFICATION

ISSUE | DATE

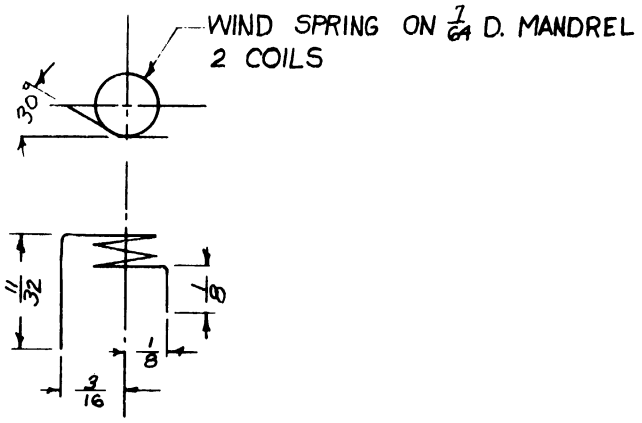
DESIGNED BY H. Olsen | APPROVED BY
DRAWN BY | SCALE 1:1
CHECKED BY | DATE 4-15-57

TITLE: SPRING, COMPRESSION

DWG. NO. A - DTA 17740

DTA 17741

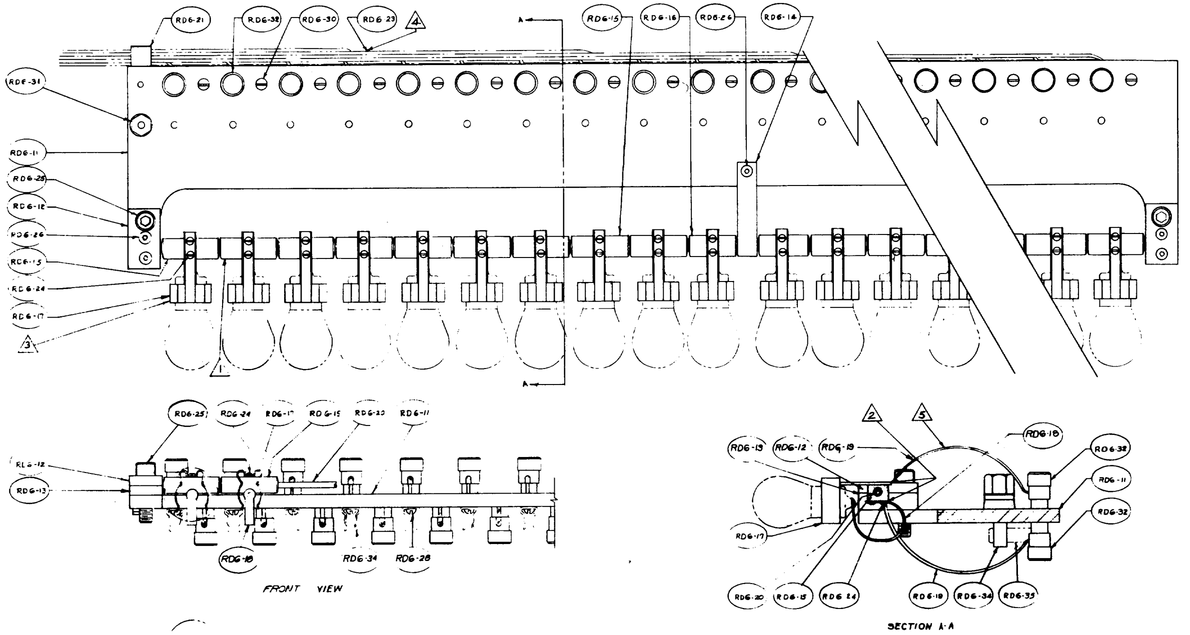
DWG. NO. A

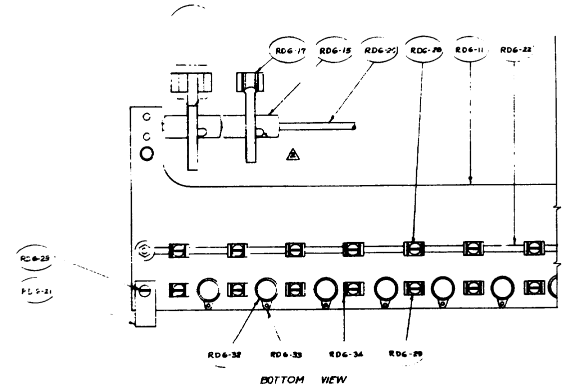


RD5-66	SPRING, TORSION	2	MUSIC WIRE	#11 (.026 DIA.)
PART NO.	NAME	REQ'D	MAT'L.	SIZE

ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED MUST BE HELD TO A TOLERANCE - FRACTIONAL ± 1/64,° DECIMAL ± .005,° ANGULAR ± ½°

ISSUE	DATE			
		ENGINEERING RESEARCH INSTITUTE UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	DESIGNED BY H. Olsen	APPROVED BY
			DRAWN BY	SCALE 2:1
			CHECKED BY	DATE 4-15-57
		PROJECT 2145	TITLE SPRING	
		CLASSIFICATION	DWG. NO. A- DTA 17741	





PART NO.	NAME	REQ'D	MATERIAL	SIZE
RD6-11	PLATE	1	USE RD5-11 DRAWING	
RD6-12	CLAMP, UPPER	2	USE RD5-12 DRAWING	
RD6-13	CLAMP, LOWER	2	LINEN BAKELITE	$\frac{5}{16} \times \frac{5}{8} \times 1\frac{1}{8}$
RD6-14	BRACKET	1	LINEN BAKELITE	$\frac{1}{2} \times \frac{3}{8} \times 1\frac{3}{4}$
RD6-15	BEARING, PIVOT	18	USE RD5-15 DRAWING	
RD6-16	BEARING, PIVOT CTR.	2	USE RD5-16 DRAWING	
△3 RD6-17	CLIP, PIVOT ARM	20	SEE PRINT	
RD6-18	SPRING CONTACT	20	SEE PRINT	
RD6-19	CABLE, CONNECTING	40	USE RD5-19 DRAWING	
RD6-20	ROD, PIVOT	1	USE RD5-20 DRAWING	
RD6-21	CABLE HOLDER	1	USE RD5-21 DRAWING	
RD6-22	GROUND STRIP or EQUIV.	1	USE RD5-22 DRAWING	
△4 RD6-23	CABLE ASSEMBLY	1	SEE NOTE	
RD6-24	SELF-TAPPING SCREW	85	PARKER-KALON TYPE F	2-56 × $\frac{1}{8}$ [illegible]
RD6-25	SCREW, HEX. SOCKET CAP	2	STEEL	$\frac{1}{4}$-20 × [illegible]
Ⓐ RD6-26	HEX. SOCKET F.Hd. MACH. SC.	5	STEEL	6-32 × $\frac{3}{4}$
RD6-27	SC., HEX. SOCKET F.Hd. MACH.	2	STEEL	6-32 × [illegible]
RD6-28	SC. RD. HD. MACH.	20	BRASS	6-32 × [illegible]
RD6-29	SC. RD. HD. MACH.	2	BRASS	6-32 × $\frac{3}{8}$
RD6-30	SCREW, F.Hd. MACH.	20	BRASS	6-32 × $\frac{3}{8}$
RD6-31	BINDING POST	1	5-WAY SUPERIOR	TYPE DF 30RC
RD6-32	BINDING POST	40		EBY NO. [illegible]M
RD6-33	LUG TERMINAL	20	WALSON #[illegible] 54 or Equiv.	#6 HOLE
RD6-34	FUSE CLIP (BUSS NO. 4540)	40	NICKEL PLATED SPRING BRONZE	(FOR 3 FUSE)
RD6-35	FUSE	20		$\frac{1}{4}$ × 2 - [illegible]A AS REQ'D

DTA 17742

△2 PART RD6-19 SHOWN ONLY IN SECTION A-A.

△4 CABLE, EITHER PART NO. RD6-23 OR AS DESIRED BY OPERATING AGENCY

△3 EITHER PART NO. RD6-17 OR RD5-17A MAY BE USED AS DESIRED.

△5 TIN END FOR SOLDERING CABLE RD6-19.

△1 TEN BEARING BLOCKS ON EACH SIDE SHOULD HAVE A TOTAL OF $\frac{1}{8}$" ± $\frac{1}{64}$" CLEARANCE. ADJUST AS NECESSARY.

SYM	DESCRIPTION	DATE	CHK
A	PART REMOVED	3-26-57	

REVISIONS

ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED MUST BE HELD TO A TOLERANCE - FRACTIONAL ± [illegible] DECIMAL ± [illegible] ANGULAR ± [illegible]

ENGINEERING RESEARCH INSTITUTE
UNIVERSITY OF MICHIGAN
ANN ARBOR MICHIGAN

PROJECT: 2145

CLASSIFICATION

DESIGNED BY: [illegible]
DRAWN BY
CHECKED BY
APPROVED BY
SCALE: 1:1
DATE: 3/8/57

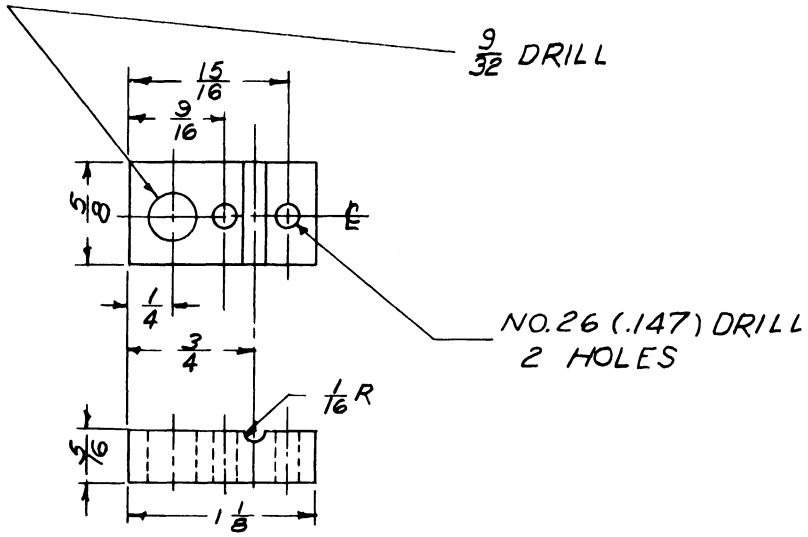
TITLE: LAMP HOLDER ASSY. 5-5 (20) RD6-10

DWG. NO. D- DTA 17742

ISSUE | DATE

DTA 17743

DWG. NO. A



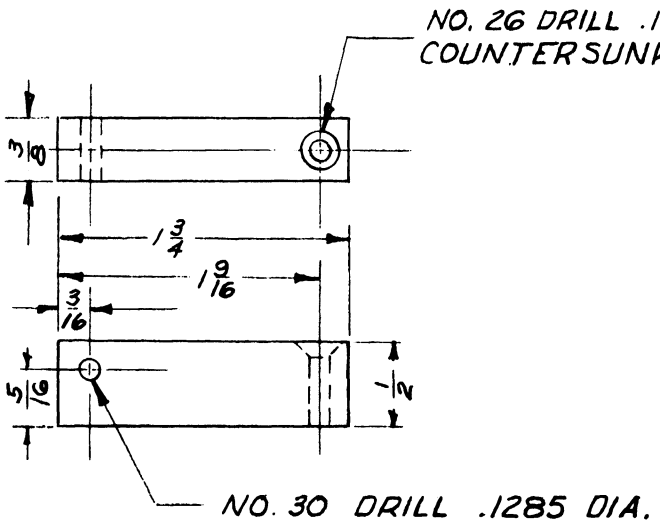
RDG - 13	CLAMP, LOWER	2	LINEN BAKELITE	5/16 × 5/8 × 1 1/8
PART NO.	NAME	REQ'D	MAT'L	SIZE

ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED MUST BE HELD TO A TOLERANCE - FRACTIONAL ± 1/64," DECIMAL ± .005," ANGULAR ± 1/2°

ISSUE	DATE			
		ENGINEERING RESEARCH INSTITUTE UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	DESIGNED BY H. Olsen	APPROVED BY
			DRAWN BY	SCALE 1:1
			CHECKED BY	DATE 3-22-57
		PROJECT 2145	TITLE CLAMP, LOWER	
		CLASSIFICATION	DWG. NO. A- DTA 17743	

DTA 17744

DWG. NO. A



RDG-14	BRACKET	1	LINEN BAKELITE	1/2 x 3/8 x 1 3/4
PART NO.	NAME	REQ'D	MAT'L	SIZE

DIMENSIONAL TOLERANCE ~ FRACTIONAL ± 1/64

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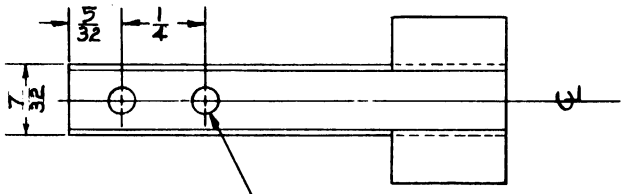
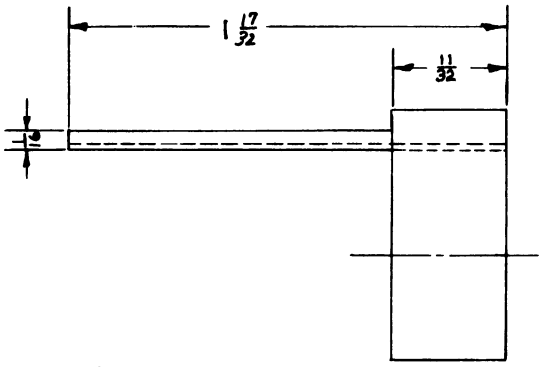
		CHECKED BY	DATE 3-22-57
PROJECT 2145		TITLE BRACKET	
CLASSIFICATION		DWG. NO. A- DTA 17744	
ISSUE	DATE		

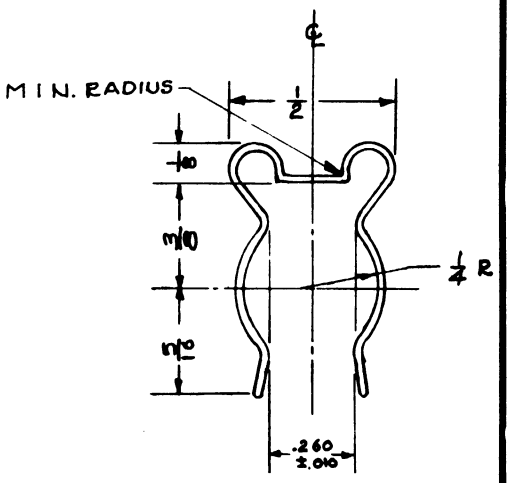
DTA 17745

DWG. NO. A



#42(.0935) DRILL 2 HOLES





SUGGESTED SOURCE:
BARNES - GIBSON - RAYMOND
PLYMOUTH, MICH.

RD6-17	CLIP	20	SAE 1074 ANN.	1 5/32 x 2 1/2 x .020
			ROCKWELL C-43-46	
PART NO.	NAME	REQ'D	MATERIAL	SIZE

ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED MUST BE HELD TO A TOLERANCE - FRACTIONAL ± 1/64," DECIMAL ± .005," ANGULAR ± 1/2°

ISSUE	DATE

ENGINEERING RESEARCH INSTITUTE
UNIVERSITY OF MICHIGAN
ANN ARBOR MICHIGAN

PROJECT 2145

CLASSIFICATION

DESIGNED BY H. OLSEN	APPROVED BY
DRAWN BY PJM	SCALE 2:1
CHECKED BY	DATE 2-8-57

TITLE: CLIP

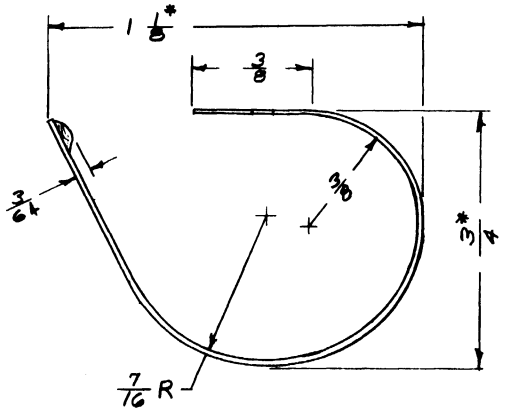
DWG. NO. A- DTA 17745

DTA 17746

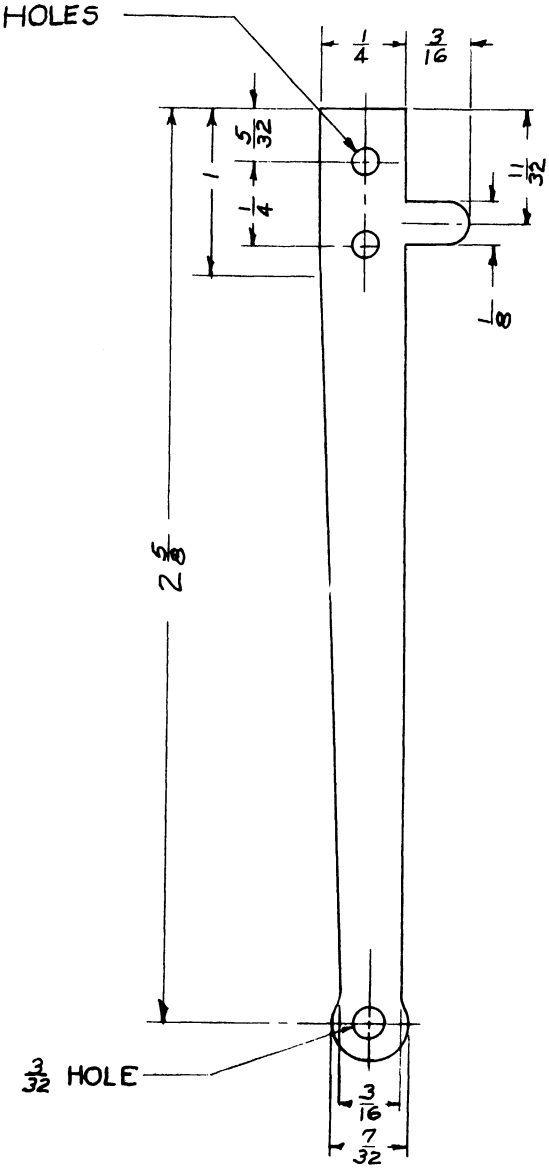
DWG. NO. A

#42 (.0935) DRILL 2 HOLES

SUGGESTED SOURCE:
BARNES - GIBSON - RAYMOND
PLYMOUTH, MICH.



*APPROXIMATE



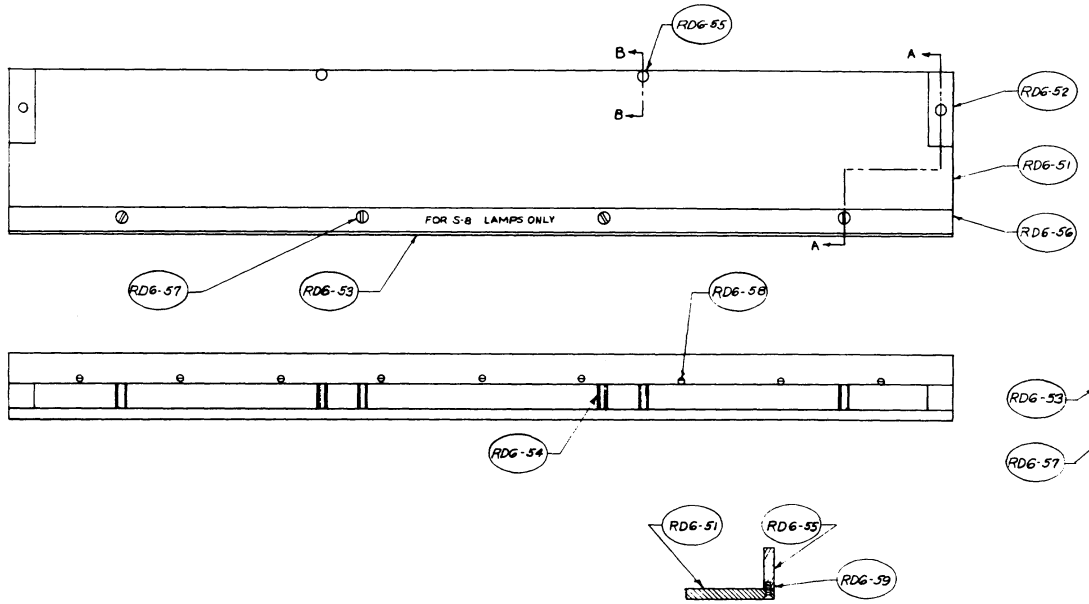
RD6-18	SPRING CONTACT	20	BERYLLIUM COPPER	1/4 x 2 3/4 x .010
			SPRING TEMP	
PART NO.	NAME	REQ'D	MATERIAL	SIZE

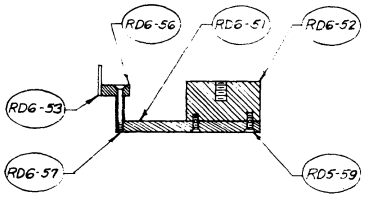
ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED MUST BE HELD TO A TOLERANCE - FRACTIONAL ± 1/64," DECIMAL ± .005," ANGULAR ± 1/2°

		ENGINEERING RESEARCH INSTITUTE UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	DESIGNED BY H. Olsen	APPROVED BY
			DRAWN BY PJM	SCALE
			CHECKED BY	DATE 3-25-51
		PROJECT 2145	TITLE SPRING CONTACT	
ISSUE	DATE	CLASSIFICATION	DWG. NO. A- DTA 17746	

DWG. NO. C

PART NO.	NAME	REQ'D	MATERIAL	SIZE
1 RDG-51	BASE	1	LINEN BAKELITE	$\frac{1}{16} \times 3\frac{1}{8} \times 23\frac{7}{16}$
RDG-52	BLOCK	2	LINEN BAKELITE	$\frac{3}{8} \times 1 \times 1\frac{1}{8}$
RDG-53	STOP	1	LINEN BAKELITE	$\frac{1}{16} \times \frac{3}{4} \times 23\frac{7}{16}$
RDG-54	SPACER	4	LINEN BAKELITE	$\frac{1}{2}$ D. $\times \frac{5}{8}$
RDG-55	SUPPORT	1	LINEN BAKELITE	$\frac{1}{2}$ D. $\times 1$
RDG-56	PLATE	1	LINEN BAKELITE	$\frac{1}{16} \times \frac{3}{4} \times 23\frac{7}{16}$
RDG-57	SCREW F. HD. MACH.	4	BRASS	6-32 × 1
RDG-58	SCREW F. HD. MACH.	9	BRASS	4-36 × $\frac{3}{8}$
RDG-59	SCREW F. HD. MACH.	6	BRASS	6-32 × $\frac{1}{4}$





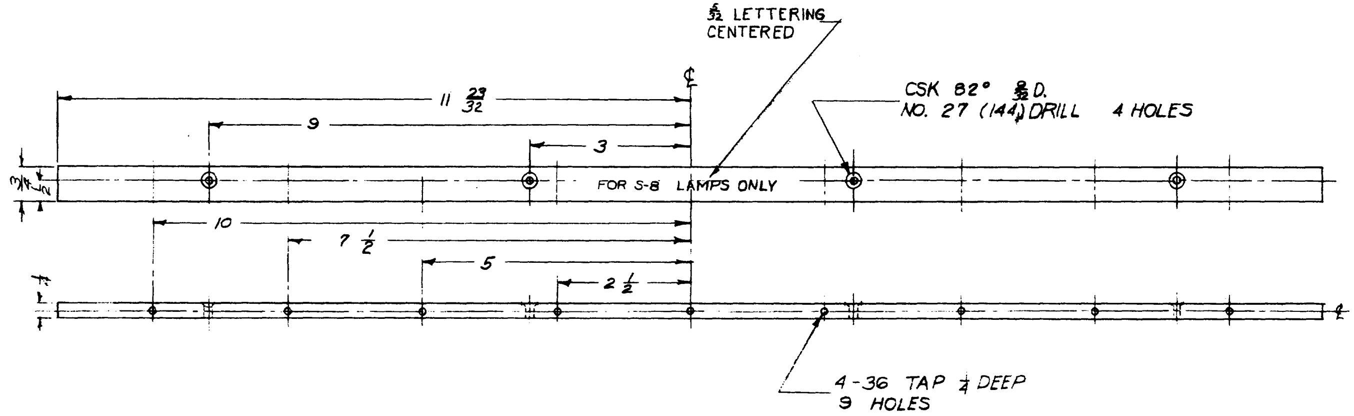
DTA 17747

1 USE EQUIV. RDS-PRINT FOR RDG-51, -52, -53, -54, AND -55.

DIMENSIONAL TOLERANCE ~ FRACTIONAL ± 1/64 DECIMAL ± .005

ENGINEERING RESEARCH INSTITUTE, UNIVERSITY OF MICHIGAN, ANN ARBOR MICHIGAN	DESIGNED BY H. Olsen	APPROVED BY
	DRAWN BY	SCALE 1:2
	CHECKED BY	DATE 3-29-57
PROJECT 2145	TITLE: LOADING FIXTURE (RDG-501) S-8 LAMP HOLDER	
CLASSIFICATION	DWG. NO. C- DTA 17747	
ISSUE / DATE		

DTA 17748



RD6-56	PLATE	1	LINEN BAKELITE	1/4 × 3/4 × 23 7/16
PART NO	NAME	REQ'D.	MAT'L	SIZE

DIMENSIONAL TOLERANCE FRACTIONAL ± 1/64

Engineering Research Institute
University of Michigan
ANN ARBOR MICHIGAN

PROJECT 2145

CLASSIFICATION

DESIGNED BY H OLson	APPROVED BY
DRAWN BY	SCALE 1:2
CHECKED BY	DATE 3-27-57

TITLE PLATE

DWG. NO. B- DTA 17748

ISSUE | DATE