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REPORT NO. LAMS-488 C.1

COPY NO. pt 3, C.I

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Pt. 3, c. I

PROGRESS REPORT FOR JUNE 1946

T-SITE

X-1

Written by: Gerold H. Tenney 8 July 1946

GENERAL REPORT

Most of the production work has been performed at T-Site as it has been during the past two months. The production report of the X-3 Inspection Section appears separately under the X-3 report, disregarding the fact where the work, as such, has been perfor ed. The intimate coordination between X-1 and the Inspection Section of X-3 has been of great advantage to everyone concerned, from the technical angle only. There are discrepancies in matters of personnel policy which ask for a solution in the nearest future. The most significant experimental work in X-1 has been performed on the use of Isotopes (RaLa), which is being discussed in a separate chapter.

PRODUCTION REPORT

Routine radiographic inspection work has been performed on charges coming from X-2 and Anchor. Due to delivery of the ordered stands and cassettes, it has been possible to take care of the entire tuballoy coming from Group M-1.

The following table gives a survey of the number of objects inspected at T-Site during the month of June:

OBJECTS INSPECTED IN JUNE, 1946

Group	# of Objects	# Rejected	% Rejected
X-2	314	23	7.32
X-4	44	3	6.81
M-1			
Aluminum	7	1	4.34
Tuballoy	16	0	0
Specifications Committee	19	11	57.9
Total	400	38	9.5

RESEARCH

(1) Specifications Committee

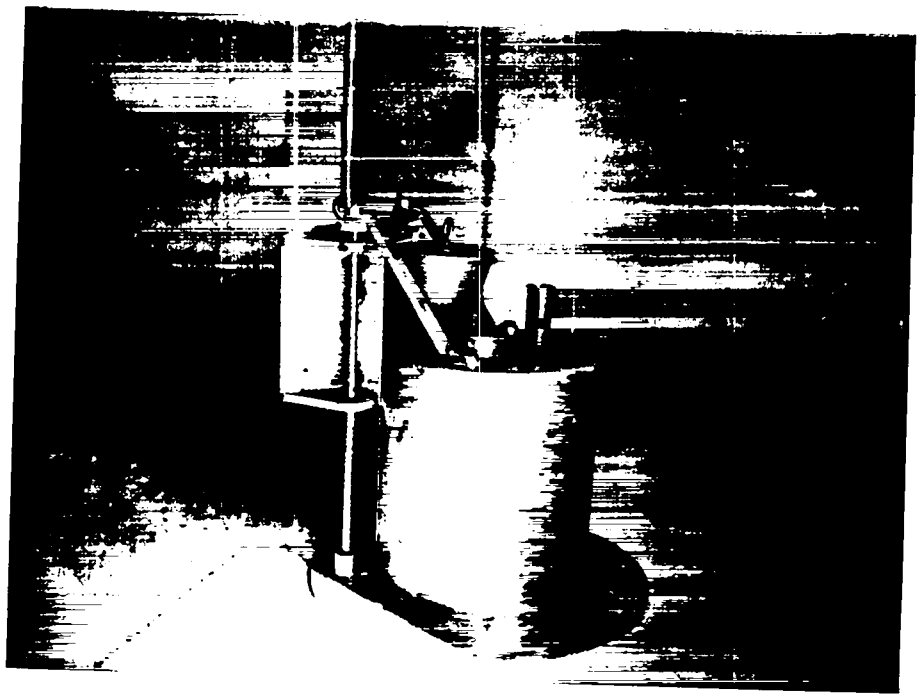
During the month of June the experimental work decided by the Specifications Committee has slowed down due to the fact that X-1 has not been able to obtain the required Baratol step wedges. As soon as these wedges are delivered from X-2, the work will be continued.

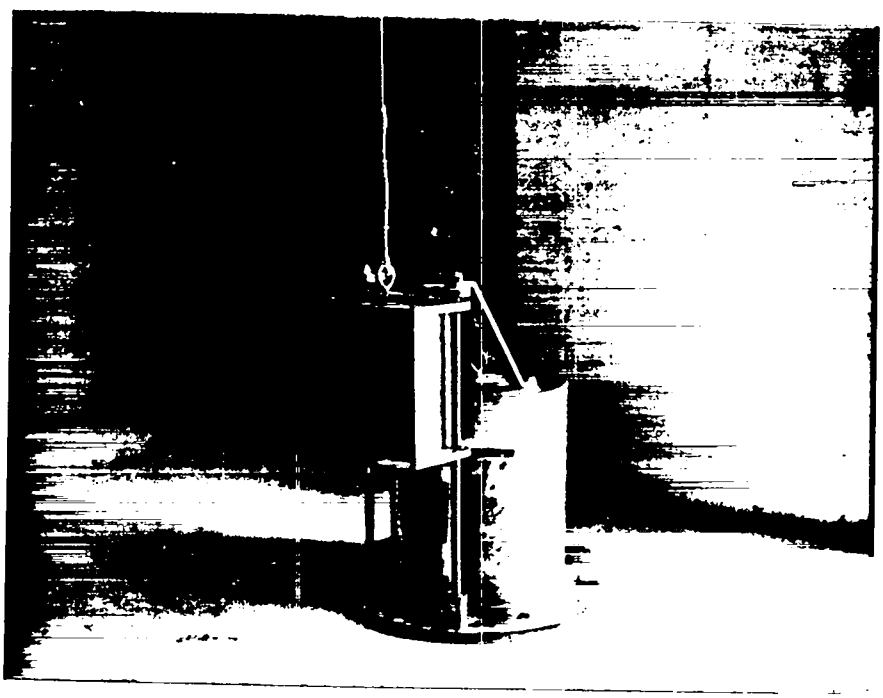
(2) ReLa

(See Pages 3 to 15)

PERSONNEL

During the month of June, Mr. John D. Fitzgibbons joined our Group. He has been an X-Ray Technician in the United States Army.





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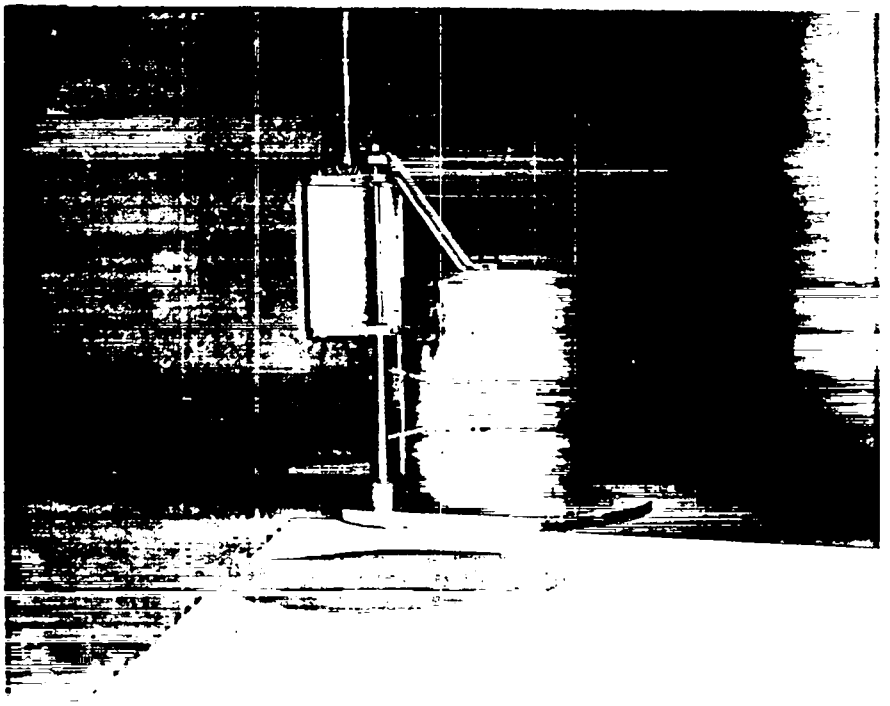

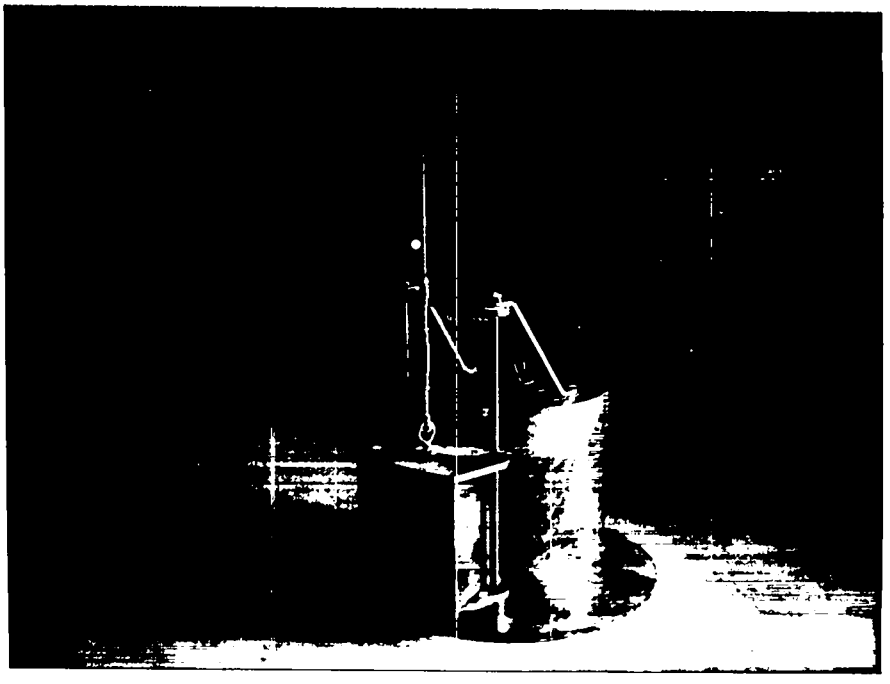

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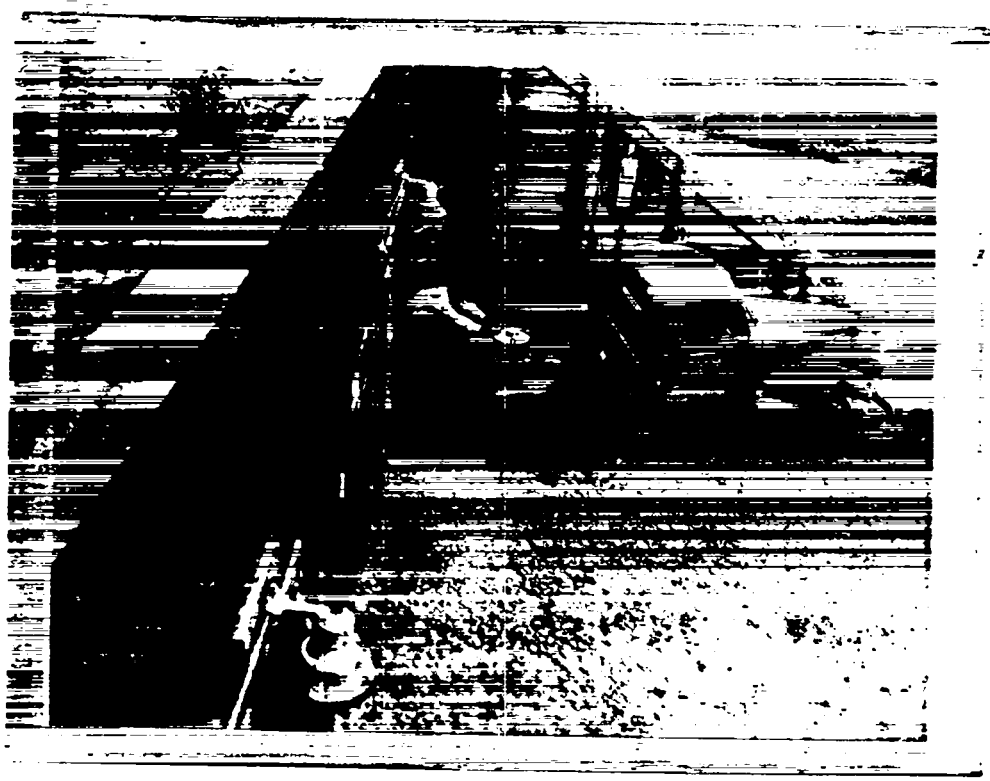

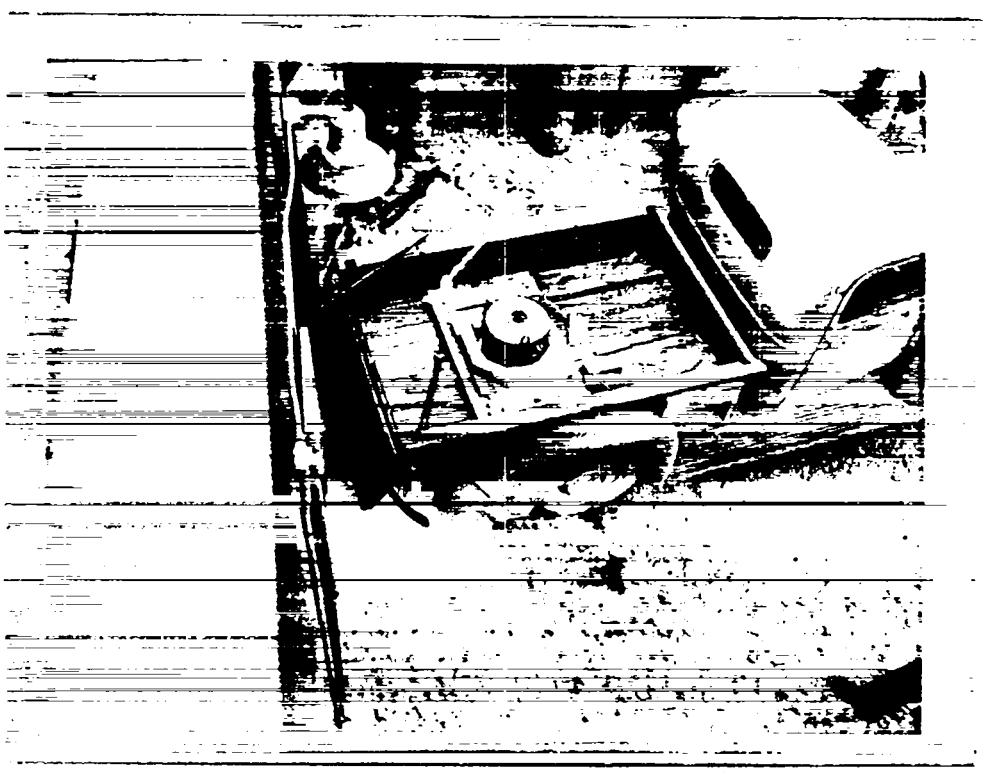

This opening can be closed with a lead plug which slides vertically on two rods and can be handled by means of a remote control. The actual source container with the source rests on an exchangeable brass cylinder imbedded in the lead cylinder. In case of contamination, the brass cylinder can be exchanged. The photos on pages II and III show the lead container and its parts in various positions. The photos on page IV show the delivery and the transfer of the source.

RADIOGRAPHIC EXPERIMENT

The first radiographic investigations were performed on steel. A step wedg with 7 steps - each step 3/4 " thick - was radiographed. The distance was 50". The curie minutes were calculated based on the decay curve of RaLa (page VII). Eastman-Kodak Industrial Type A Film between two 0.005" lead foils as intensifying screens was used. These films were developed in a commercial X-Ray developer with 2% K. I. solution for 5 minutes at 68° F.

OBTAINED DATA

The table on page VIII shows the obtained data. The curies for each exposure are tabulated from the decay curve of RaLa (page VII) based on the formula:

$$E_t = E_0 e^{-kt}$$

whereby in this case E = 13.8 curies
K = decay constant per day

The film density for each case is the average density of five readings performed with the Ansco Sweet densitometer.

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The print of the shadowgraph of film # 8 can be seen on page IX. Lead letters were placed on each step to visualize the absorption.

The graph on page X shows the characteristic curves obtained from the above-mentioned table.

The graph on page XI shows the curie minutes versus thickness of steel obtained from the graph on page X.

CONCLUSION

This preliminary experiment shows that RaLa as one of the obtainable isotopes can be used for industrial radiography. It asks for further investigation; such as, other types of obtainable films, various screen combinations, various source sizes, scattering, the resolution and other related factors. On page XII and XIII paper and film prints of the shadowgraph of an electric drill can be seen. (Exposure: 50" distance, 184 curie minutes)

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VII

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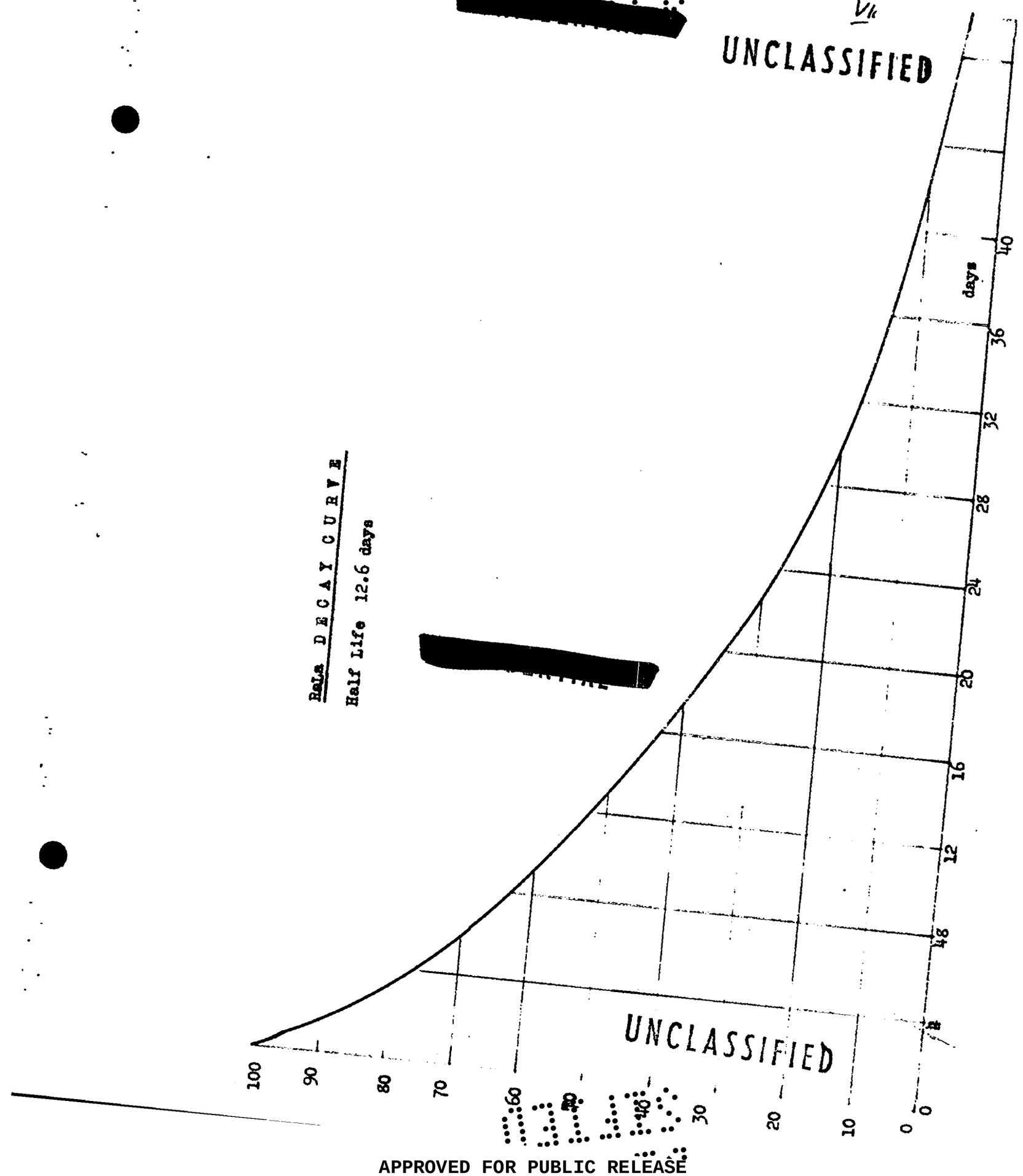

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RADIOGRAPHY OF STEEL; SOURCE: RALA FILM DISTANCE: 50 INCHES

Film #	Date	Exposure time in minutes	Average curies at that day	Curie minutes	Film density for						
					3/4"	1 1/2"	2 1/4"	3"	3 3/4"	4 1/2"	5 1/4"
8	21-6	30	12.4	372	2.15	1.46	1.01	0.71	-	-	-
9	26-6	40	9.38	375	2.23	1.51	1.06	0.80	0.65	0.53	0.42
10	26-6	50	9.38	469	2.61	1.80	1.28	0.88	0.71	0.57	0.47
11	26-6	60	9.38	563	2.80	2.00	1.44	1.05	0.83	0.68	0.56
12	26-6	80	9.38	750	3	2.48	1.84	1.31	1.03	0.83	0.69
13	26-6	100	9.38	938	3	2.87	2.27	1.63	1.30	1.01	0.85
15	27-6	150	8.97	1345	3	3	2.61	1.93	1.59	1.30	1.07
16	27-6	180	8.97	1615	3	3	2.43	1.84	1.58	1.26	1.06

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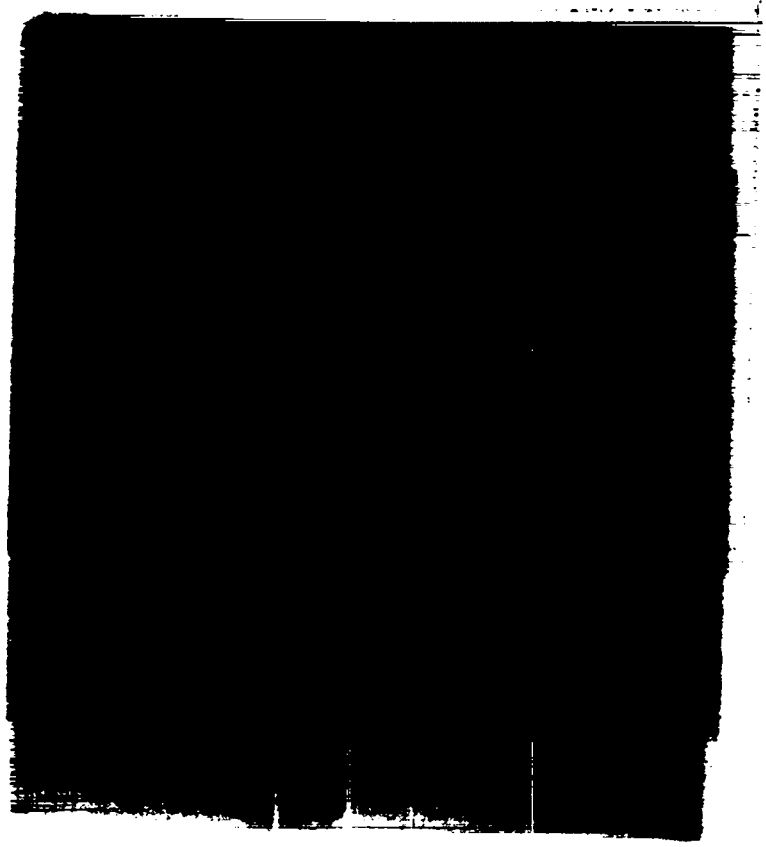

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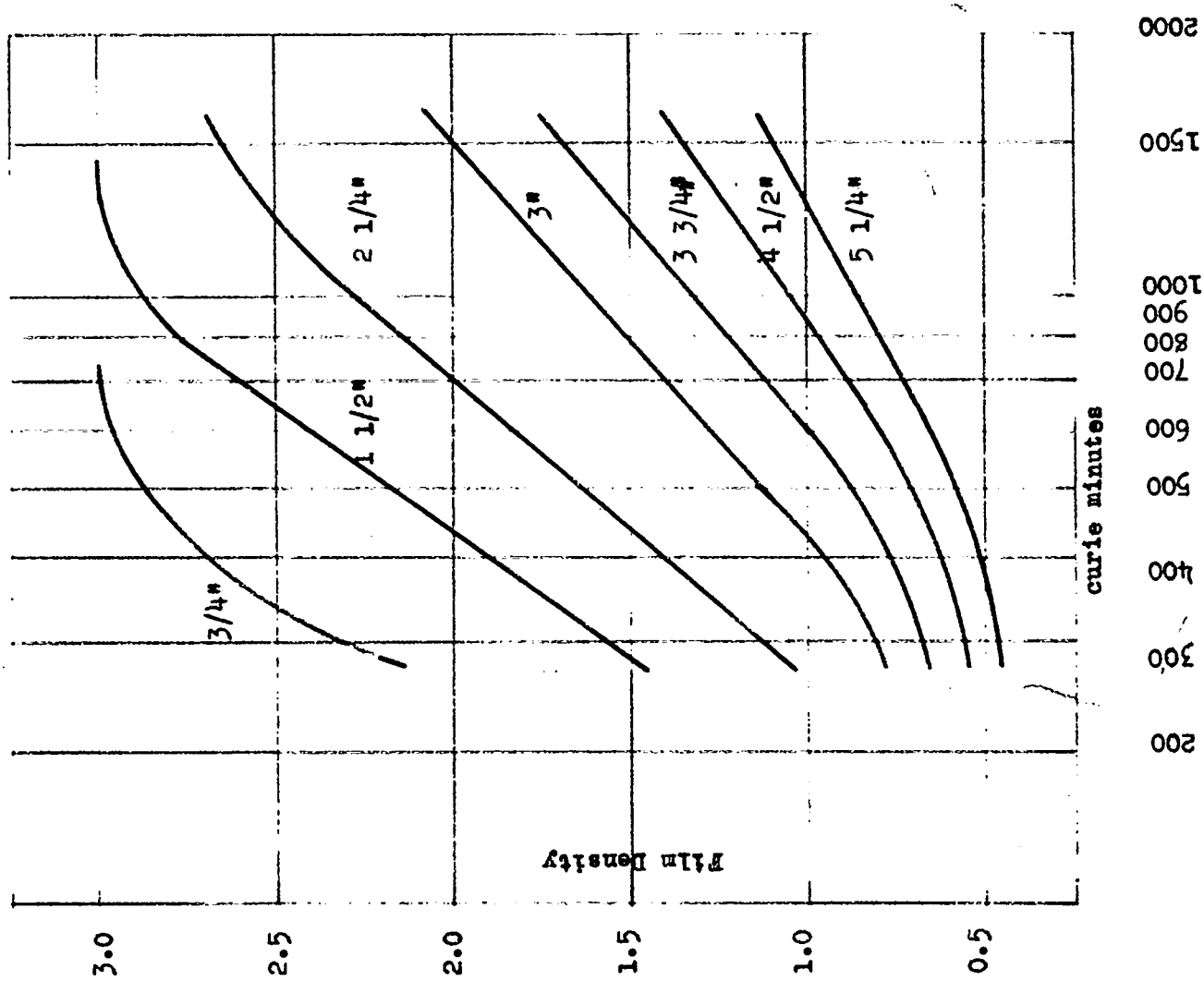
RADIOGRAPHY OF STEEL

Source: RaLa

Film: Eastman Kodak
Industrial Type A
0.005 inches Lead Foils

Distance 50 inches



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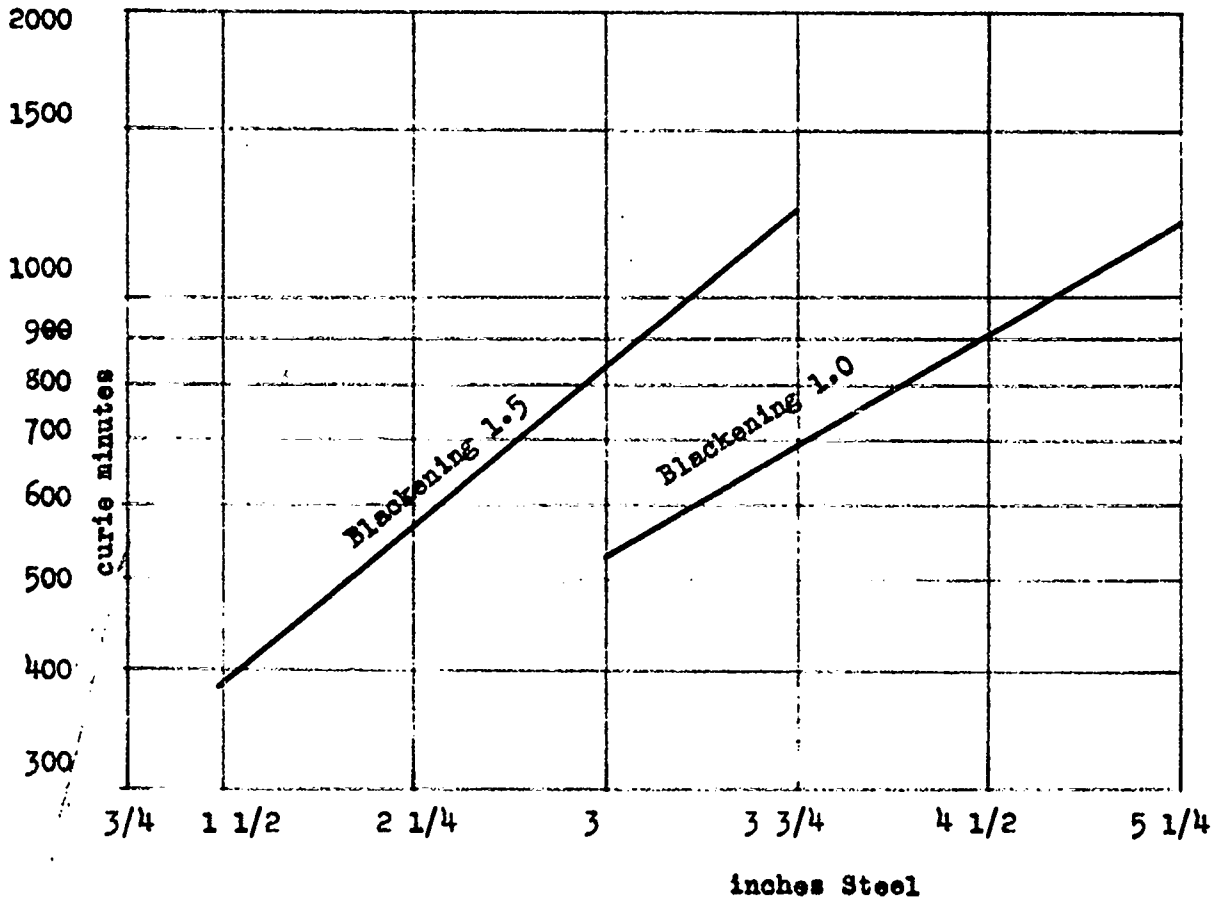
RADIOGRAPHY OF STEEL

Source: RaLa

Film: Eastman Kodak Industrial Type A
0.005 inches Lead foils

Distance: 50 inches



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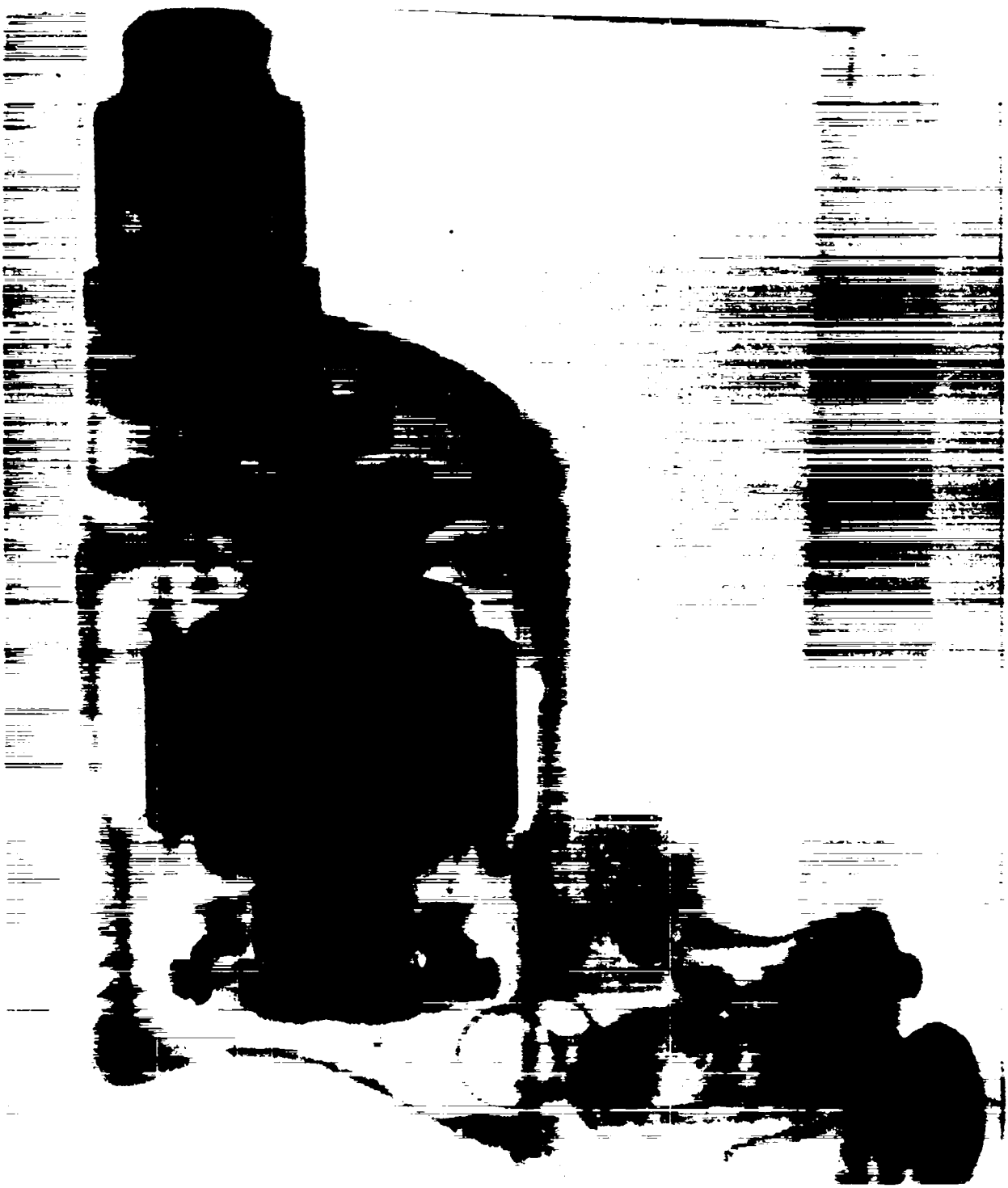

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