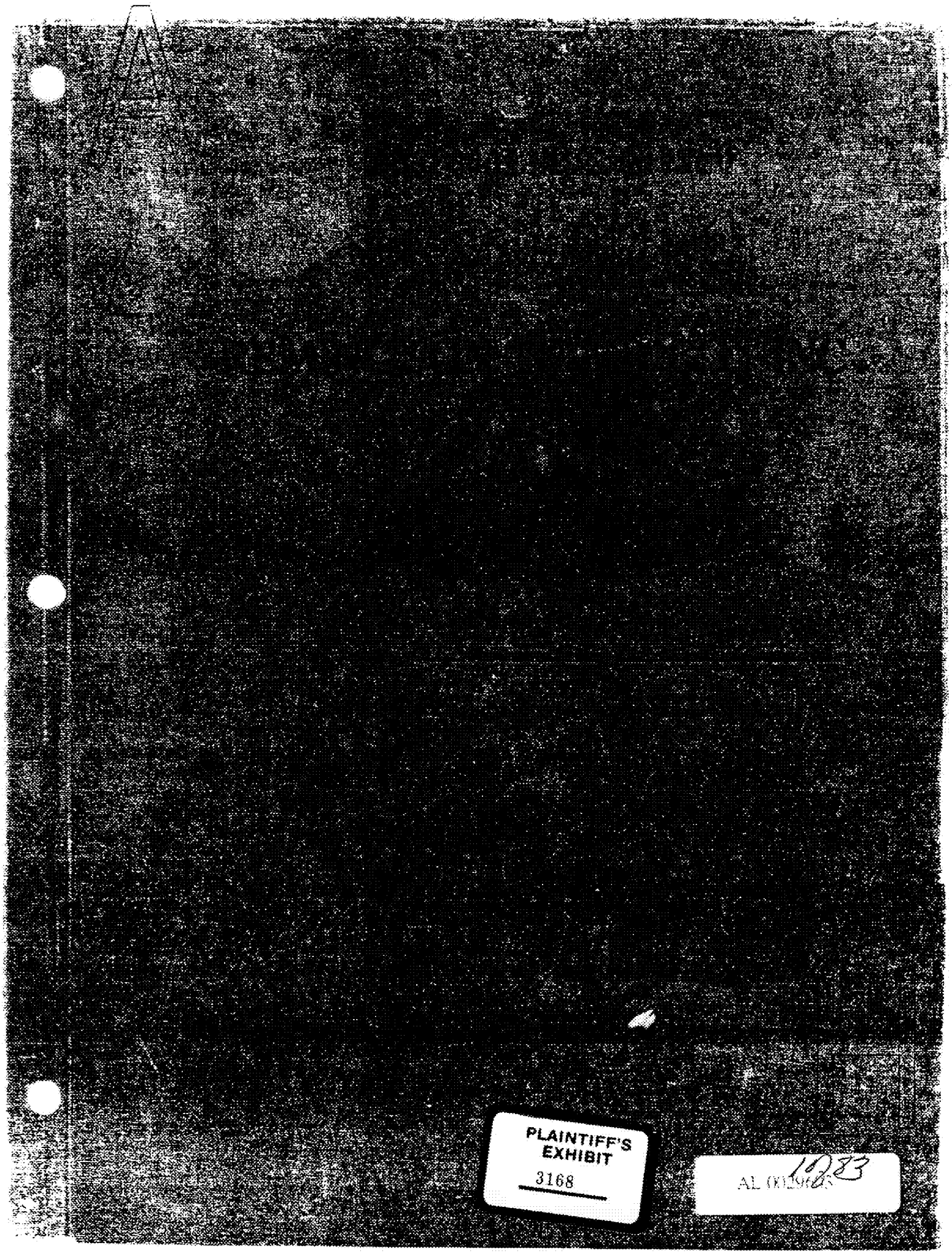

PLAINTIFF'S
EXHIBIT
3168

RELATIVE STRENGTHS OF HIGH POWER CENTER FIRE RIFLES

Model No.	Receiver Area in Tension Sq. In.	Bolt Area in Shear Sq. In.	Bolt Area in Compress. Sq. In.	Expected Deflection of Bolt & Receiver, By Young's Modulus P = 9000 E = 3x10[7] Inches	Bolt Steel AISI or NE No.	Nominal Yield Point 1000 #/Sq. In.	Load which Bolt [illegible] without Permanent Deformation Lbs.	BOLT: Mean Pressure Possible in 30-06 Case = Max. Press ÷ 1.46 #/Sq. In.	BOLT: Mean Pressure Possible in .375 H&H Case = Max. Press ÷ 1.46 #/Sq. In.	Barrel Size or Pitch Dia. of Thread at Shank Dia. in Inches	Steel AISI No. & Nominal Yield Point #/Sq. In.	BARREL: Mean Pressure Possible in 30-06 Case = Max. Press ÷ 1.45 #/Sq. In.	BARREL: Mean Pressure Possible in .375 H&H Case = Max. Press ÷ 1.45 #/Sq. In.
720	.443	.397	.109	.0015	2340	190	20,790	82,000	64,000	1.086	X-4130 120,000	58,000	54,000
721	.480	.429	.141	.0013	1335 2340	75 190	10,600 26,800	42,000 106,000	33,000 83,000	1.071	X-4130 120,000	57,000	53,000
1X-760*	.303	.206	.114	.0014	1335 2340	75 190	8,600 21,790	34,000 86,000	27,000 68,000	.897	X-4130 120,000	49,000	44,000
2X-760	.355		.071	.0150	1315 2340	75 190	5,350 13,500	21,000 53,000	17,000 42,000	.892	X-4130 120,000	48,000	43,000
M1903A3	.470	.329	.084	.0020	8620	130	10,900	43,000	34,000	1.011	1350 75,000	34,000	32,000
M-70-W	.537	.400	.086	.0020	Rock$_c$ 48	190	16,400	65,000	51,000	.959	X-4130 120,000	52,000	48,000

(*) The Barrel Extension is the Receiver in the 1X-760.

NOTE: The above Force and Pressure figures are theoretical and should be used for comparison only. According to experience actual figures would be higher.

M.H.W.
2-[illegible]-44

2883

AL 0029604

RELATIVE STRENGTHS OF HIGH POWER CENTER FIRE RIFLES

MODEL NO.	RECEIVER AREA IN TENSION SQ. IN.	BOLT AREA IN SHEAR SQ. IN	BOLT AREA IN COMPRESS. SQ. IN.	EXPECTED DEFLECTION OF BOLT & RECEIVER BY YOUNG'S MODULUS P = 9000 E = 3X10 INCHES	BOLT STEEL AISI OR N.E. Nº	NOMINAL YIELD POINT 1000 #/SQ. IN	LOAD [illegible] BOLT [illegible] (LBS.)	BOLT: MEAN PRESSURE POSSIBLE 30-06 CASE & MAX. PROOF ÷ 1.45 #/SQ. IN	BOLT: MEAN PRESSURE POSSIBLE IN .375 H&H CASE & MAX. PROOF ÷ 1.45 #/SQ. IN.	BARREL SIZE OR PITCH DIA OF THREAD AT SHANK DIA. IN INCHES	STEEL AISI Nº & NOMINAL YIELD POINT #/SQ. IN.	BARREL: MEAN PRESSURE POSSIBLE IN 30-06 CASE & MAX. PROOF ÷ 1.45 #/SQ. IN	BARREL: MEAN PRESSURE POSSIBLE IN .375 H&H CASE & MAX. PROOF ÷ 1.45 #/SQ. IN
720	.443	.397	.109	.0015	[illegible]	190	[illegible]	82,000	64,000	1.086	E-4130 120,000	58,000	54,000
721	.480	.429	.141	.0013	1335 2340	75 190	10,600 26,800	42,000 106,000	33,000 83,000	1.071	X-4130 120,000	57,000	53,000
1X-760*	.303	.206	.114	.0014	1335 2340	75 190	8,600 21,750	34,000 86,000	27,000 68,000	.897	X-4130 120,000	49,000	44,000
2X-760	.355		.071	.0150	1315 2340	75 190	5,350 13,500	21,000 53,000	17,000 42,000	.892	X-4130 120,000	48,000	43,000
M1903A3	.470	.329	.084	.0020	8620	130	10,900	43,000	34,[illegible]	1.011	135[illegible] 75,000	34,000	32,000
M-70-W	.537	.400	.086	.0020	$Rock_c$ 4[illegible]	190	16,400	65,000	51,000	.959	X-4130 120,000	52,000	48,000

(*) The Barrel Extension is the Receiver in the 1X-760

NOTE: The above Force and Pressure figures are theoretical and should be used for comparison only. According to experience actual figures would be higher.

2-25-47

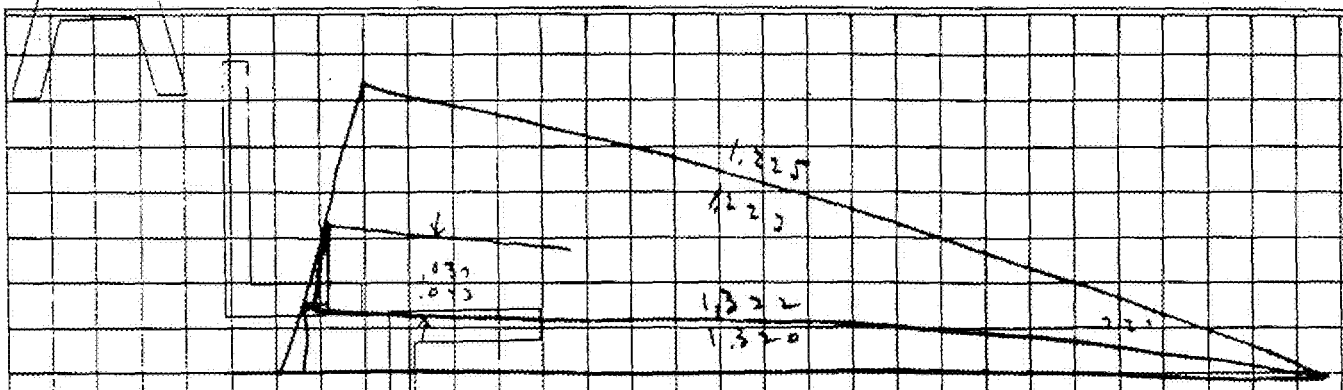
3883

ENGINEERING DEPARTMENT COMPUTATION SHEET SHEET NO.

TITLE OF PROJ. PROJ. NO.

SUBJECT Safety WORKS

COMPUTER DATE 19



Cos 22° = .037 / x = .926

x = .03999 / .0463

Cos 23° = 1.323 / x = .929

x = 1.320 / 1.322

Cos 21° = x / .0399 = .891

x = .0356 / .0413

Sin 5° = .087 = x / 1.322

x = .115 / .1148

.115 / .0413 / .1563

.1148 / .0356 / .1504

d to top = .1563 / .1504

ENGINEERING DEPARTMENT (NPW) COMPUTATION SHEET SHEET NO.

TITLE OF PROJ. PROJ. NO.

SUBJECT WORK#

COMPUTER DATE 19

.1561
.182
.3381

.1502
.178
.3282

.6504
.3645
.5149
.3341
.1768

.1563
.364
.5208
.3252
.1926

548
347
.196
.0626
.2026
.1703
.0323

540
350
.190
.0022
.1878
.1824
.0054

531
335
.196

528
338
.190

Safety light

.358
.190
.168

.335
.1969
.138

518
160
.358

522
.150
.372

518
184
370

522
134
384

444
384
060

428
384
.158

5983

AL 0029607

	1.240	±.001	.000,01
+	.062675	±.000175	.000,000,306
	1.302675	±.001175	
−	.06245	±.00005	.000,000,025
=	1.240225	±.001225	
+	.000225	±.000225	.000,001,506
=	1.240450	±.001450	
−	.972	±.001	.000,01
=	.26845	±.00245	
−	.075	±.001	.000,01
=	.19345	±.00345	

top of Trigger from fire control bushing

Diff .17835 ±.00805
= .1703 to .1864

	.650	±.001	.000,01
−	.280	±.002	.000,01
=	.370	±.003	
+	.062675	±.000175	.000,000,306
=	.432675	±.003175	
−	.06245	±.00005	.000,000,025
=	.370225	±.003225	
+	.062675	±.000175	.000,000,306
=	.432900	±.003400	
−	.124	±.001	.000,01
=	.3089	±.0044	
+	.0629	±.0002	.000,000,4
=	.3718	±.0046	
−	.1845	±.0015	.000,0225
=	.1873	±.0061	

top of selector in fire control holes

19345
1873
.00615 ±.00855
.0029 .00615
.00905 .01470
.00325 −.00240

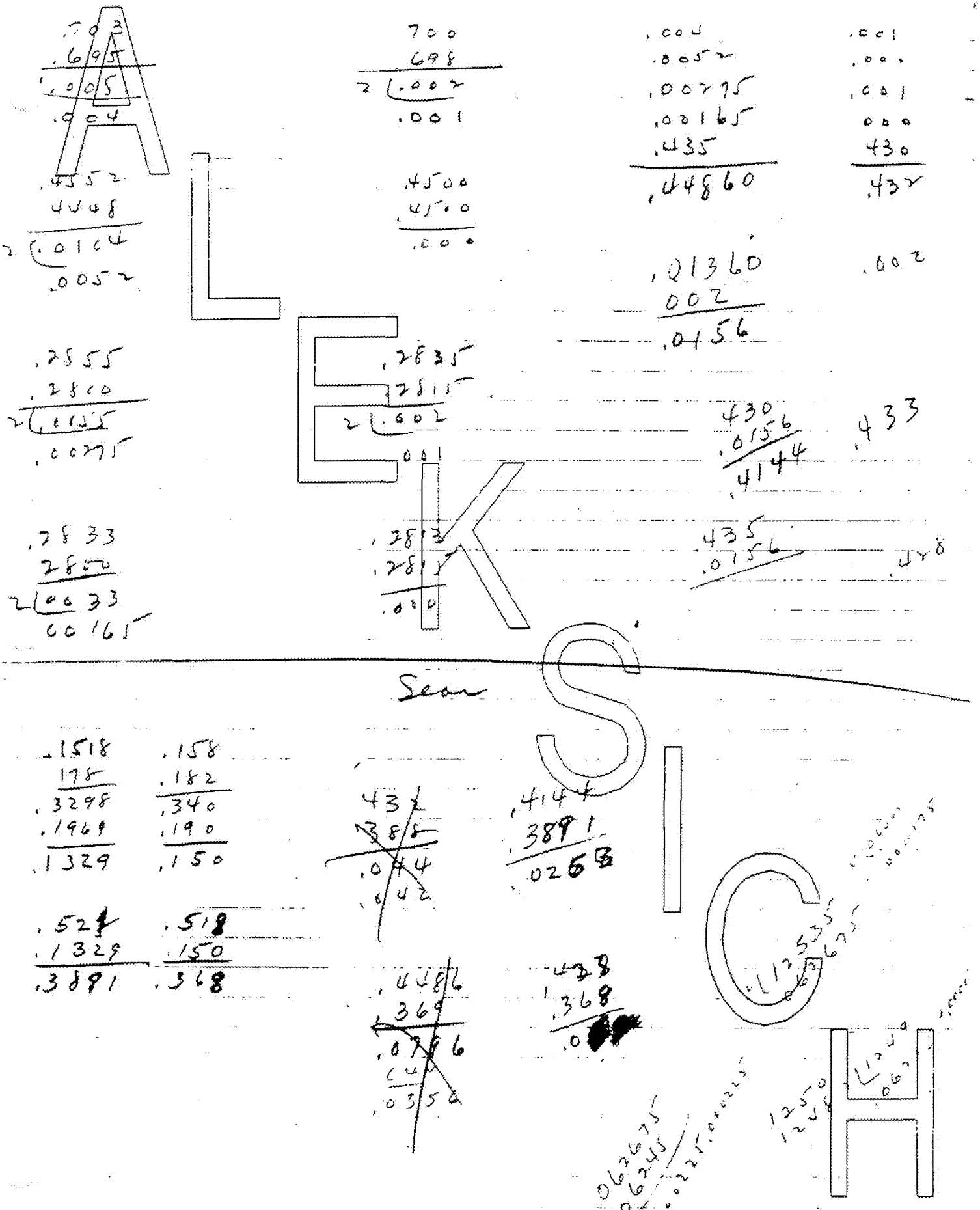
.00855
2
.01710

.0148
.0058
.0207
.01710
.0036

.0059
.0024
.0035

$.000,084,374^{-2}$ = ±.0029

6 of 83



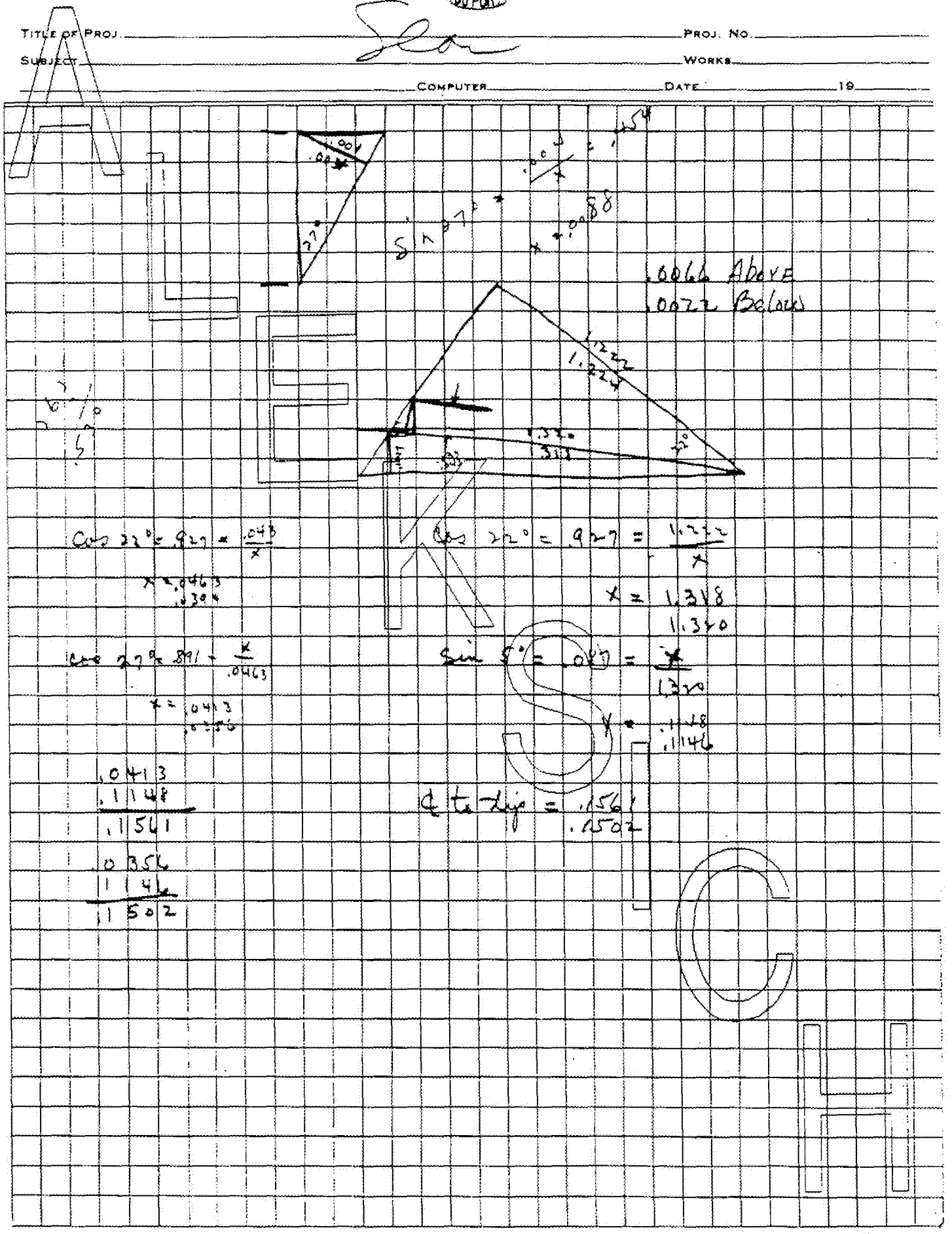
7/83

DUPLEX COMPUTATION SHEET

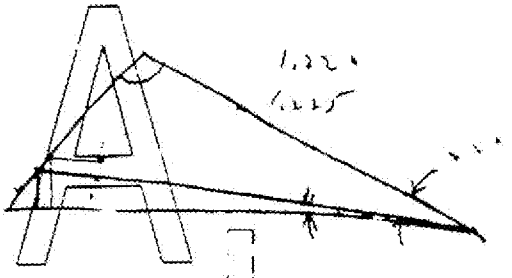
TITLE OF PROJ. _____ PROJ. NO. _____

SUBJECT _____ WORKS _____

COMPUTER _____ DATE _____ 19 _____



8283



Cos 22° = 1.220 / x = .9272

x = 1.316
1.316

Sin 5° = y / 1.316 = .0871

= .1149
.1152

Cos 5° = z / .043 = .9062

= .0474
= .0369

.1149
.1369
.1518
.1711
.3298
.19

.1152
.0474
.1550
.182
.3400

.1936
.0036
.190
.1900

9883

Book # 236

ALEKSICH

Issued to M. H. Walker

on 3/1721 (9/10/43)

To be returned on request.

#236

10283

AL 0029615

RULES FOR RECORDING EXPERIMENTS

1. Original records are to be in ink.

2. Each notebook page whereon there is recorded a completed experiment should be signed and dated by the experimenter in the space provided.

3. Each notebook page containing a completed experiment should be read and signed by a witness who will place his signature and the date in the space provided. The witness is to be one who understands the purpose of the experiment and the result obtained but who is not likely to be the inventor or a co-inventor. Preferably the witness signs on the same day as the experimenter and in any event as soon thereafter as possible.

4. Where entries on a single experiment do not completely fill a page, the remainder of the blank page should be ruled out. Where the record of the experiment extends over several pages which are not consecutive, proper cross-references should be inserted.

5. The bound notebook is to be preserved intact. In no case should any page or part of a page be removed.

6. No erasures are to occur in the record. Any corrections or changes should be made by cancellation, leaving the original entry legible.

7. The same rules as to signing, dating and witnessing are to be followed when the original data are recorded on loose sheets or forms other than the standard bound notebook.

11/83

SUBJECT FOR INDEXING THIS BOOK
MUST BE GIVEN BELOW

DAT
SUB

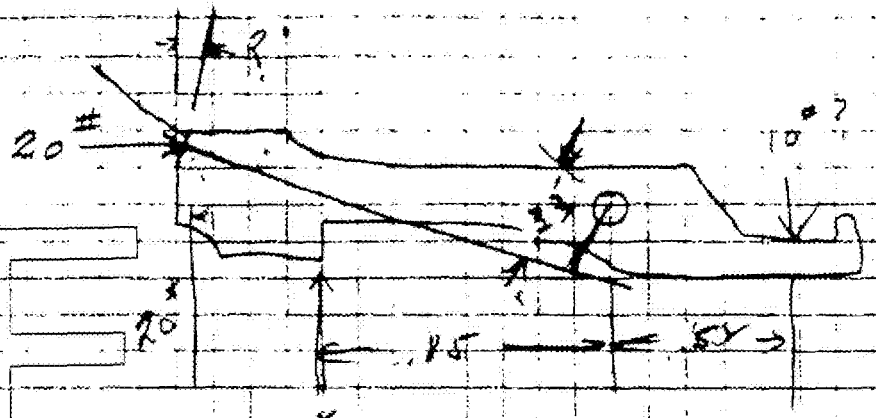
12/83

AL 0029617

EXPE
WEN

DATE 9-10-43

SUBJECT OF EXPT. Blocked semi tuyere



$(10).52 < 24(.33)$

$5.2 < 8$

$24(.33) = 10(.52) + x(.85)$

$8 = 5.2 + x(.85)$

$\frac{2.4}{.85} = x$

$x = 3.3$

EXPERIMENTER

WITNESS

DATE

DATE

AL 0029618

13983

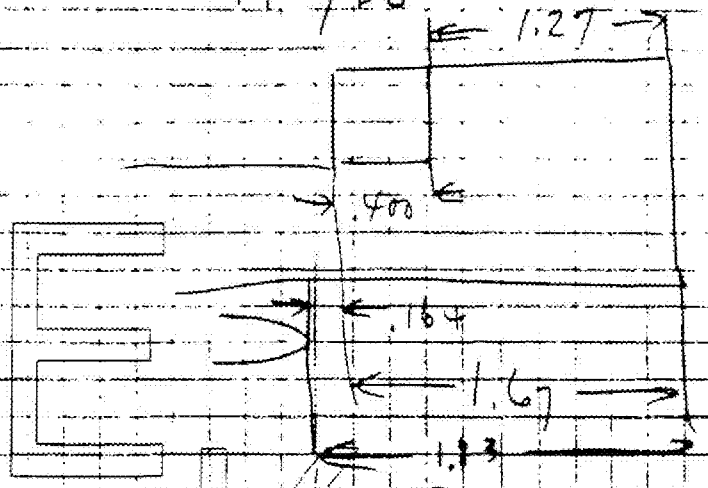
#2

DATE 9-13-43

SUBJECT OF EXPT. Dimensions - Revisions

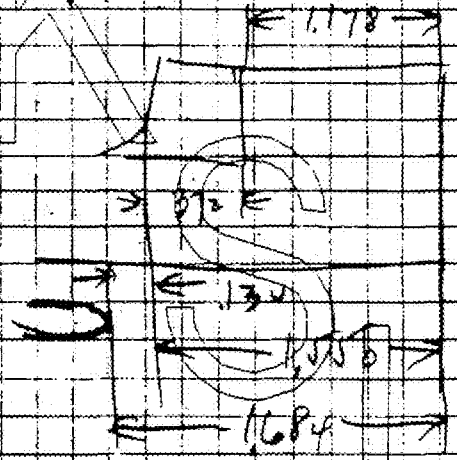
BH Thiede

M 7.0



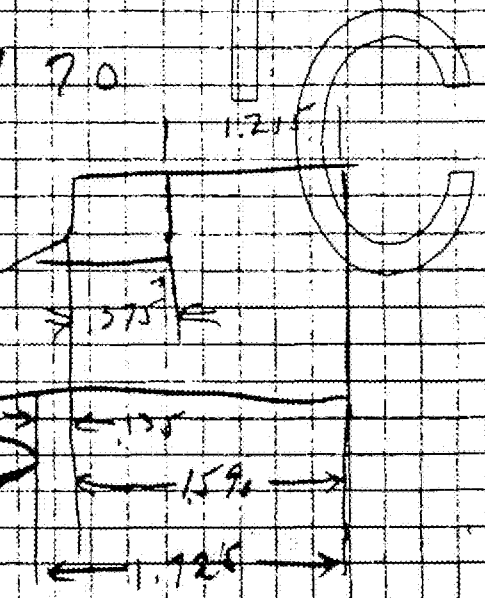
OAL - 8.85

Springfield



OAL - 8.59"

M 7.0



OAL - 8.85"

72° 4.5°

EXPERIMENTER DATE

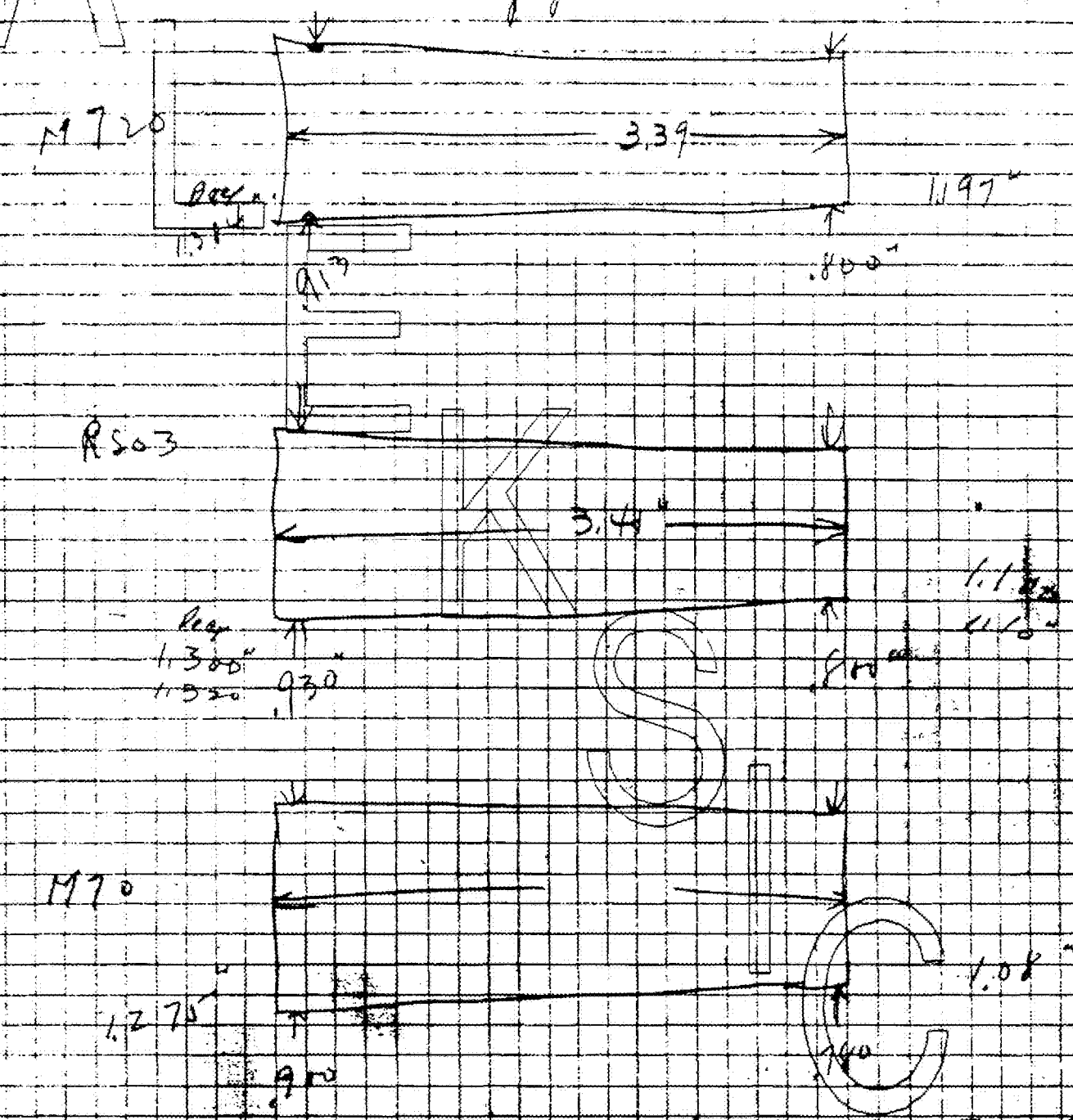
WITNESS DATE

1/4/83

AL 0029619

DATE 9-15-43

SUBJECT OF EXPT. 3 in. a.b Mortars



Width of loading port

720 = .530"

RS. = .530"

70. = .544"

15/9/43

EXPERIMENTER DATE

WITNESS DATE

AL 0029620

DATE 9-15-43

SUBJECT OF EXPT. Aluminum - Magnesium

Aluminum Rack to Bottom of Mg.

	Rear	Front
17 700	1.76	1.52
R503	1.75	1.58
M 20	1.72"	1.54"
17 760	1.60	1.48

Top width .75"

Bottom rear .95"

Bottom front .85"

EXPERIMENTER

WITNESS

DATE

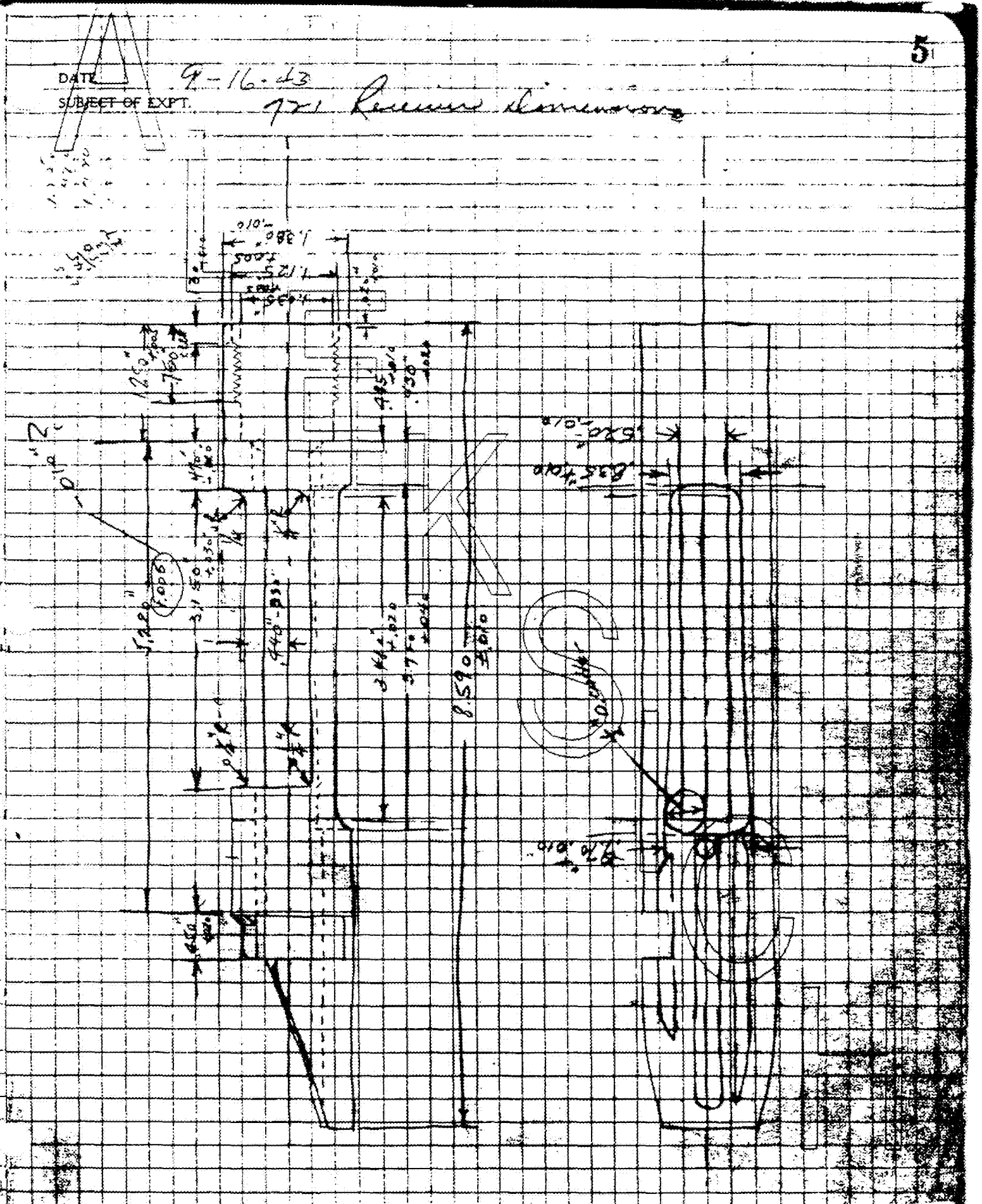
DATE

10/13/43

AL 0029621

DATE 9-16-43

SUBJECT OF EXPT. 7x1 Resume dimensions



EXPERIMENTER

WITNESS

DATE

DATE

DATE 9-17-43

SUBJECT OF EXPT. Receiver Calculations

Strength of receiver Ring

Min O.D = 1.370"

Max I.D = 1.130"

AREA O.D. = $\left(\frac{1.370}{2}\right)^2 \pi$ = 1.475 sq in.

AREA I.D = $\left(\frac{1.130}{2}\right)^2 \pi$ = 1.004 sq in

Cross Section Area .471 sq in

Yield Strength of X 1315 heat treated =

EXPERIMENTER DATE

WITNESS DATE

18883

DATE 9-26-43

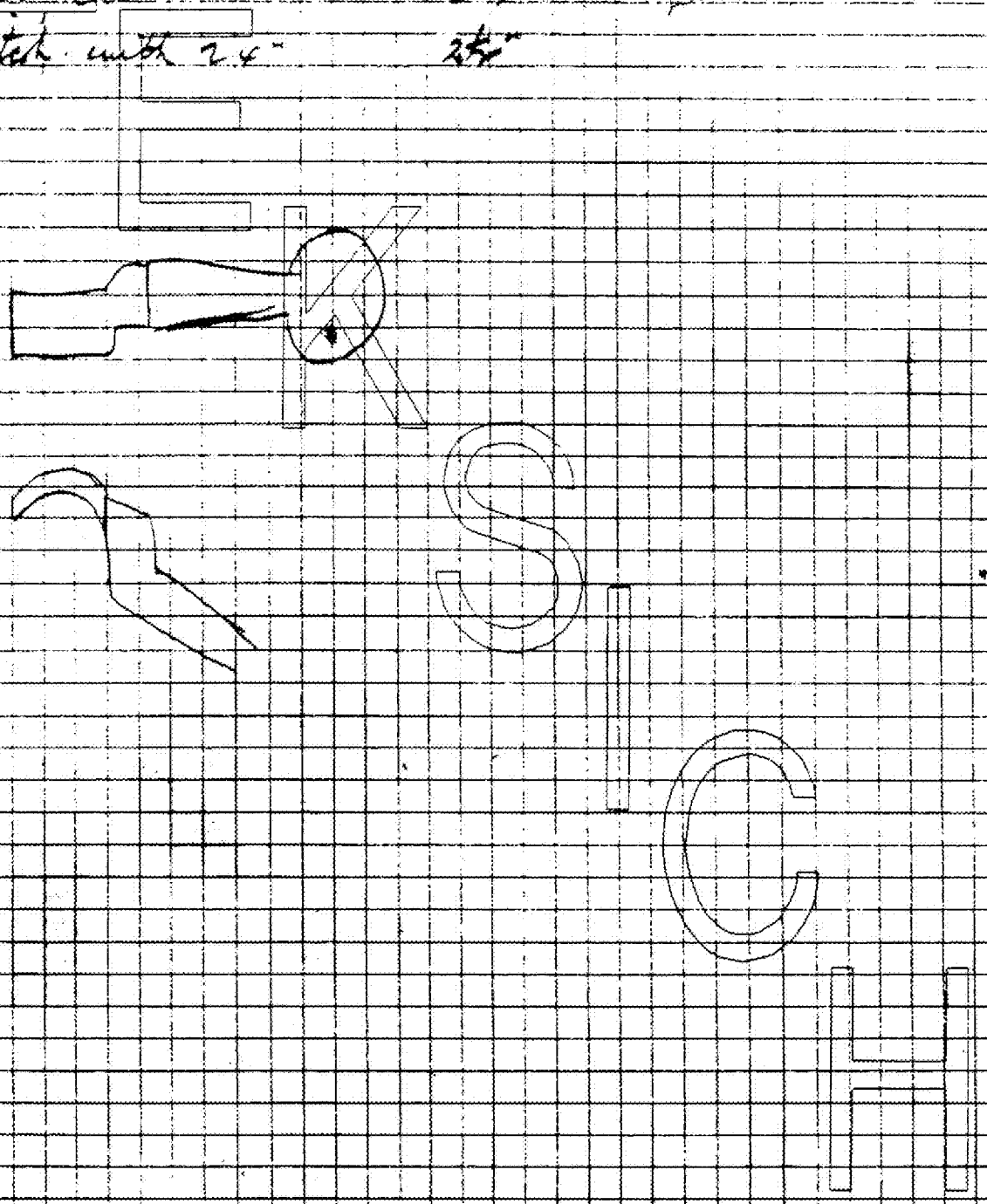
SUBJECT OF EXPT. Stock dimension 7 x 1

Rise at comb $1\frac{11}{16}$"

Rise at heel $1\frac{5}{8}$"

Length $13\frac{1}{2}$" not used

Pitch with 24" $25\frac{1}{2}$"



EXPERIMENTER DATE

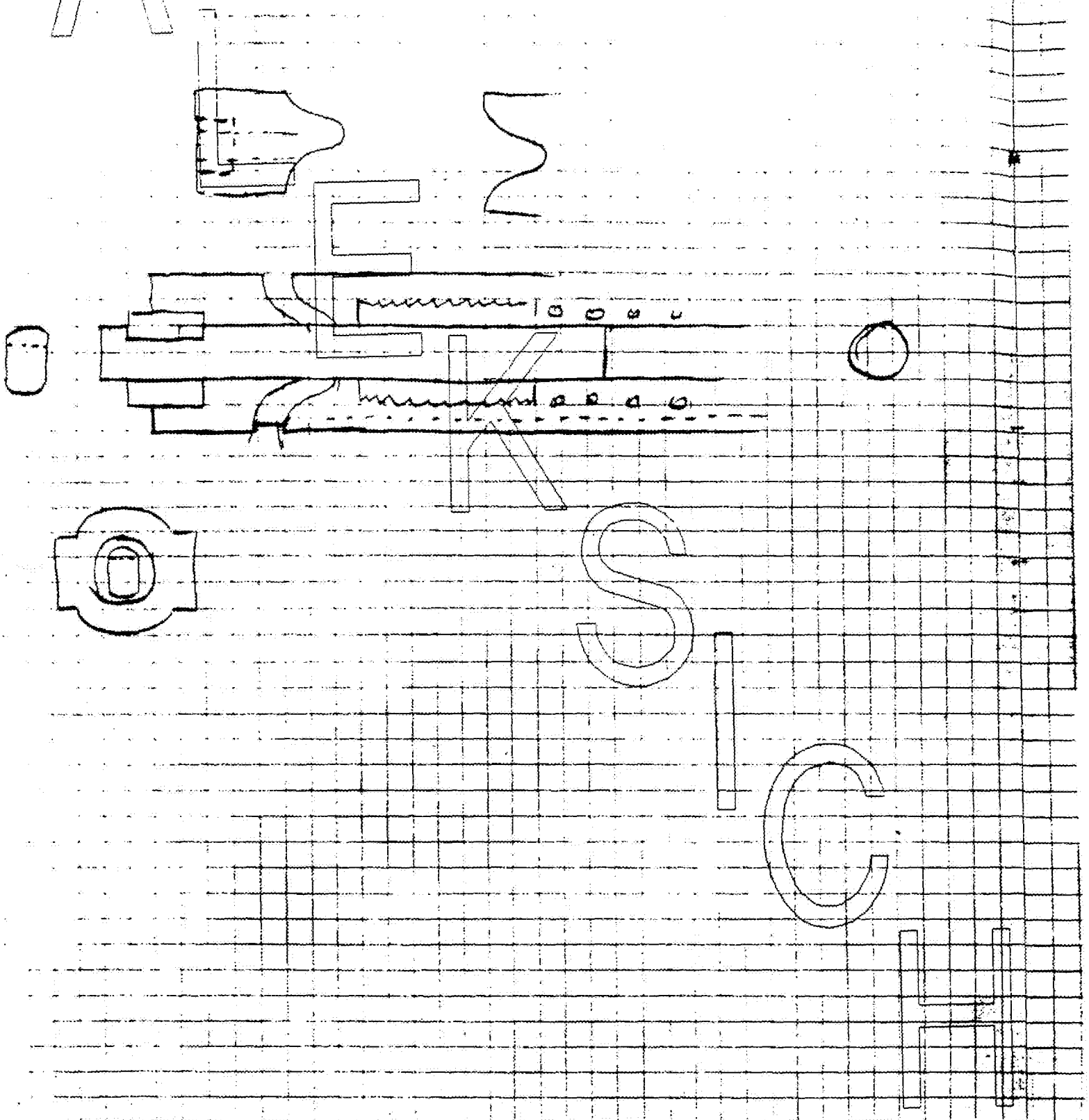
WITNESS DATE

19-983

8

DATE 9-30-43

SUBJECT OF EXPT. Bolt



EXPERIMENTER

WITNESS

DATE

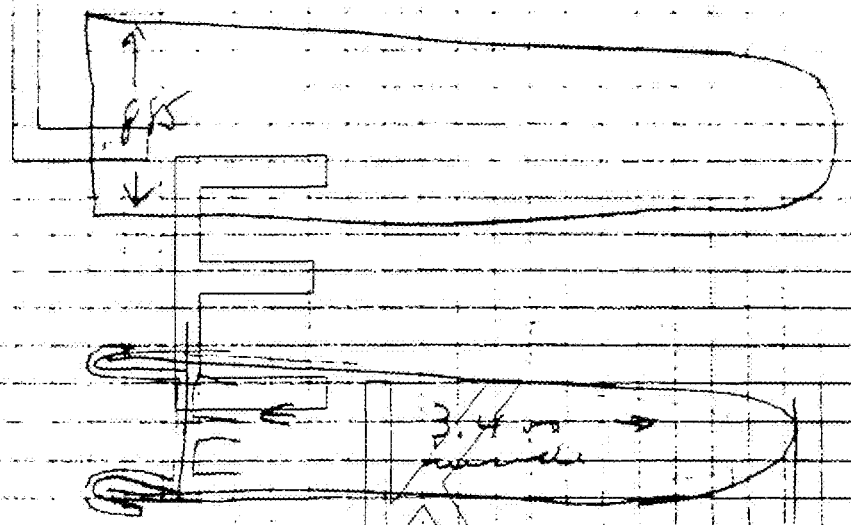
DATE

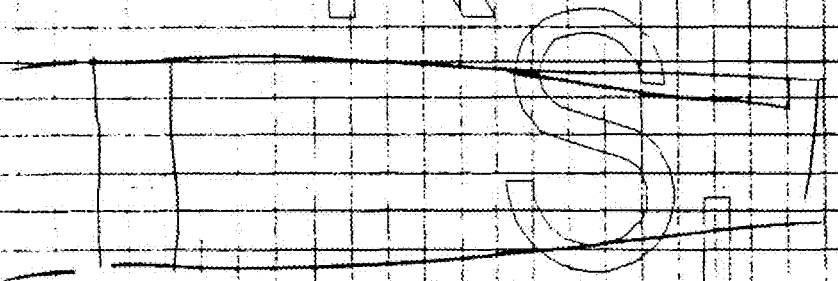
20983

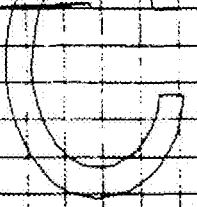
AL 0029625

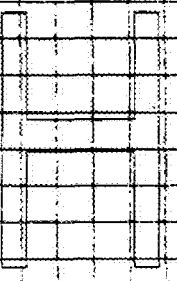
DATE 10-1-43

SUBJECT OF EXPT. Magnesium









EXPERIMENTER DATE

WITNESS DATE

10

DATE 11-16-43

SUBJECT OF EXPT. Magazine dimensions

30.00 $.75 1 man 30

30,000 $.25 1 man 50

	Win 70	Rem 720
Length Front to Rear	1.434"	1.450"
" Rear " "	1.604	1.628"
Width Rear	9/16"	9/16"
Width Front	.78"	.78"
Girth-receiver ring	7 1/16"	7 3/16"
Girth back of " "	6 7/8"	7"
Girth front of the bridge	7 1/16"	7 3/16"
Stock thickness	1.817	1.815
Grip circum.	5 5/8	4 15/16

270

EXPERIMENTER DATE

WITNESS DATE

AL 0029627

22083

DATE 7-23-64

SUBJECT OF EXPT. 7xL Main Spring

FREE LENGTH 3.325

COCKED LENGTH 3.020"

d = .055"

D = .395 - .055 = .340"

h = 38 ACTIVE

19# at 3.325" = 6" ENERGY

N.G. chart

$$P = \frac{f d^4 G}{8 n D^3} = f\left(\frac{9.15 \times 10^{-6} \quad 11.5 \times 10^6}{8 \times 38 \times .0393}\right)$$

$$= f\ 8.8$$

Set from 7# to 6#

$$8.8(L - 3.3) = 19$$

$$L = \frac{19}{8.8} + 3.3$$

$$L = 5.48 \rightarrow 5.5"$$

FREE P = 19#

COCKED P = 8.8(5.50 - 3.3) = 21.9#

STACKED P = 8.8(5.50 - 2.1) = 29.6#

$$S = \frac{8PD}{\pi d^3} = f\left(\frac{8 \times .345}{\pi (1.66) 10^{-4}}\right)$$

$$S = f(5700)$$

FREE S = 19(5700) = 98,600 PSI

COCKED S = 21.9(5700) = 113,000 PSI

STACKED S = 29.6(5700) = 153,000 PSI

EXPERIMENTER DATE

WITNESS DATE

AL 0029628

2-4-83

12

DATE I - 23 - 44

SUBJECT OF EXP'T Short M 721 Main Spring
1" Shorter

FIRED LENGTH = 2.375

COCKED LENGTH = 2.030

d = .055

D = .395 - .055 = .340

19# at 2.375 = 6"# ENERGY

STACKED L = 2.030 - .600 = 1.430" = 25 Active Coils

P = 13.4 f

13.4 (L - 2.375) = 20#

L = 3.66

FIRED P = 18#

COCKED P = (3.66 - 2.030) 13.4 = 21.8#

STACKED P = (3.66 - 1.43) 13.4 = 30.0#

S = P (5700)

FIRED S = 5700 × 16 = 93,500

COCKED S = 21.8 × 5700 = 113,000

STACKED S = 5700 × 30 = 156,000

got from ta

A L E K S I C H

EXPERIMENTER DATE

WITNESS DATE

24383

AL 0029629

DATE 3-29-44

SUBJECT OF EXPT. FIRING PIN PROTRUSION

MAX BOLT LENGTH

.451
.315
.433
.064
1.763

MIN PIN LENGTH

1.810
-.500
1.310

MIN PROTRUSION = 1.310 - 1.763 = .047

MIN BOLT LENGTH

.449
.309
.427
.066
1.745

MAX PIN LENGTH

1.813
-.491
1.315

MAX PROTRUSION = 1.315 - 1.245 = .070

EXPERIMENTER DATE

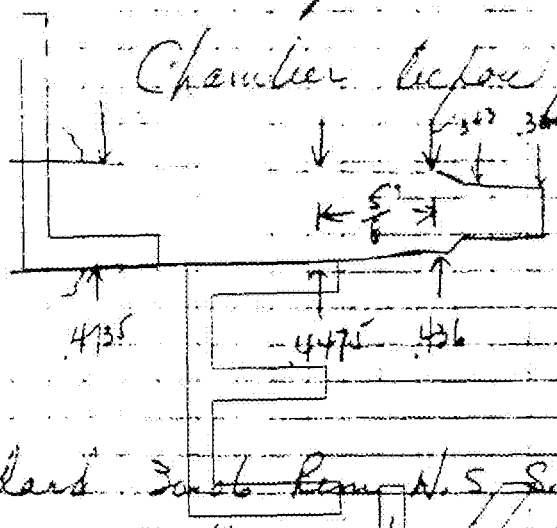
WITNESS DATE

25883

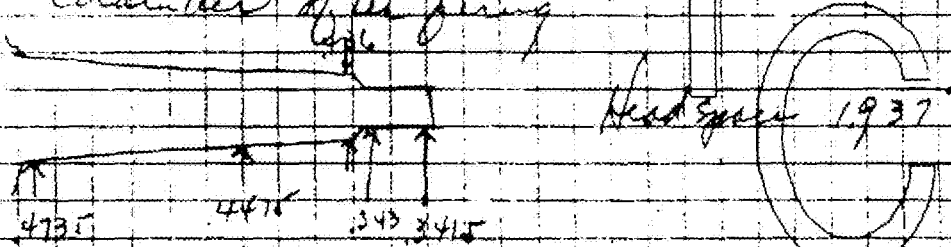
14

DATE 4-7-37

SUBJECT OF EXPT. First cartridge Fired on 3/21/37



A standard 30-06 Rem. U.S.S.P. was fired after some trouble getting the bullet up to .018. The case stretched in front of the solid head and expanded enough to let out some gas. The primer was smeared in a ring 1/4" diameter. It is from evident that the leading plug took up on the body instead of the shoulder of the chamber causing these head spaces.



No Swell is evident.

EXPERIMENTER

WITNESS

DATE

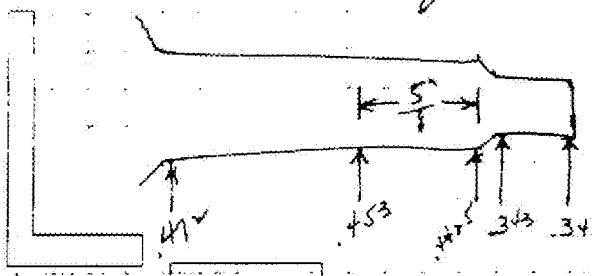
DATE

36283

AL 0029631

DATE 4-10-44

SUBJECT OF EXPT. First cartridge in 721 after reloading Before Firing



Head Space 1.957

No change in accuracy of this lot of powder

EXPERIMENTER. DATE

WITNESS DATE

27-283

AL 0029632

DATE: May 8, 19--

SUBJECT OF EXPT.: New barrel breech dimensions

$$S = \frac{P(r_2^2 + r_1^2)}{(r_2^2 - r_1^2)}$$

Press. ... 1.067   .240 Win. PRESSURE = 84000 psi

$r_1^2 = (.474 \div 2)^2 = .237^2 = .056$

$1\frac{1}{8}$ 1.067 $r_2^2 = (1.067 \div 2)^2 = .534^2 = .285$

$1\frac{1}{16}$ 1.018 $r_2^2 = (1.018 \div 2)^2 = .509^2 = .259$

$1\frac{1}{8}$ $S = \frac{84000(.341)}{.228}$ = 125,000 psi (.270 Win)

$1\frac{1}{16}$ $S = \frac{84000(.315)}{.203}$ = 130,000 psi (.270 Win)

.284 Mag. PRESSURE = 84,000 psi

$r_1^2 = (.514 \div 2)^2 = .257^2 = .066$

$1\frac{1}{8}$ 1.067 $r_2^2 = (1.067 \div 2)^2 = .534^2 = .285$

$1\frac{1}{16}$ 1.018 $r_2^2 = (1.018 \div 2)^2 = .509^2 = .259$

$1\frac{1}{8}$ $S = \frac{84000(.351)}{.219}$ = 135,000 psi (.284 Mag)

$1\frac{1}{16}$ $S = \frac{84000(.325)}{.193}$ = 141,000 psi (.284 Mag)

EXPERIMENTER: DATE

WITNESS: DATE

DATE June 5 1942

SUBJECT OR EXPT. 721 Lock Time

721 Firing Pin = 61.5 gms.

721 Spring = 12.8 gms.

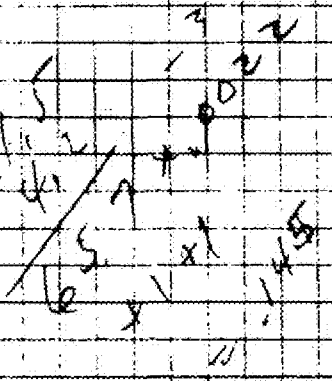
722 Firing Pin = 52.4 gms.

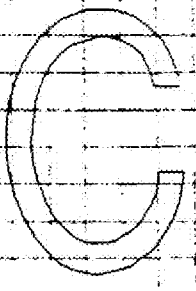
722 Spring = 9.1 gms.

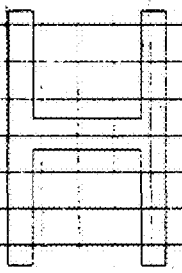
721 Lock Time = $\frac{2 \times 67.9 \times 300 \times .0022}{21 \times 32 \times 12}$ = 3.33 ms

722 Lock Time = $\frac{2 \times 56.9 \times 300 \times .0022}{21 \times 32 \times 12}$ = 3.02 ms

$= \frac{2 \pi s}{\sqrt{\quad}}$







EXPERIMENTER: DATE

WITNESS DATE

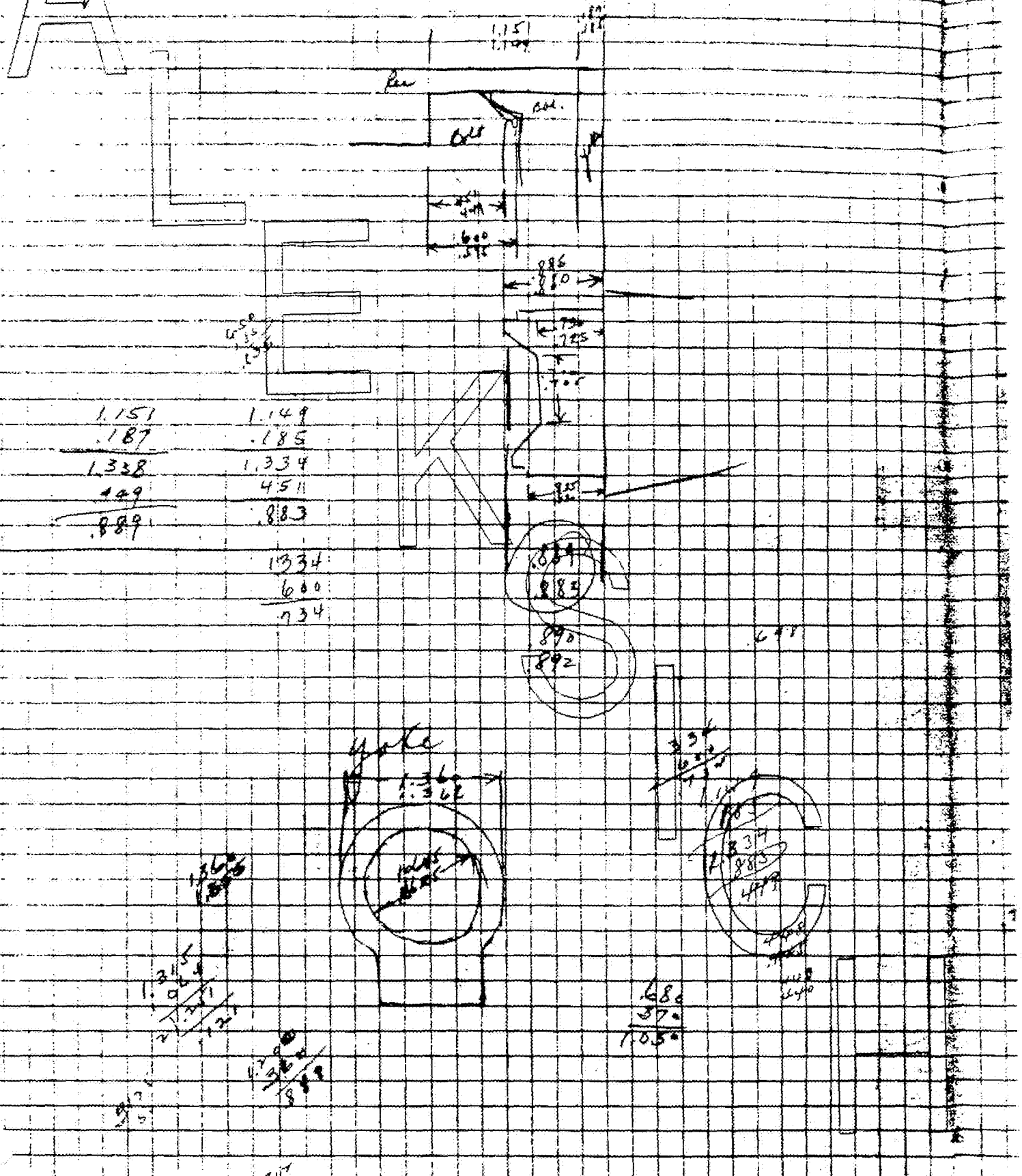
29283

AL 0029634

18

DATE June 7, 1964

SUBJECT OF EXPT. Valve, Bolt & Pressure Tolerances



EXPERIMENTER

WITNESS

DATE

DATE

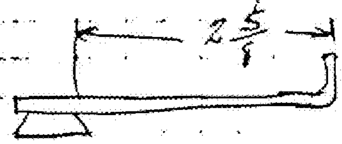
30883

AL 0029635

DATE June 1[illegible], 1944

SUBJECT OF EXPT. Rear Sight

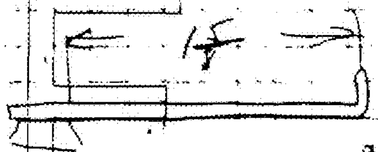
M 120

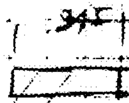


$\frac{7}{64}$ - $\frac{18}{1.4}$

Deflec = .172

M 721





Assume S of 150,000

$F = \frac{2SL^2}{3EH}$ $H = \frac{2SL^2}{3EF}$

$H = \frac{2(150,000)(1.625)^2}{3(3\times10^7)(.172)} = .044$

$P = \frac{Sbh^2}{6L} = \frac{150,000(.345)(.0019)}{6(1.625)} = 9.5$

EXPERIMENTER | DATE

WITNESS | DATE

31/83

AL 0029636

20

DATE June 13, 1946

SUBJECT OF EXPT. 721 & 722 Calibers

M 721

.284 Rem Mag.

.30-06

.280 Rem

M 722

.224 Rem (.250-3000)

.220 Rem (.25-20 SS)

M 710 (Single Shot)

220 Rem (.25-20 SS)

M 514 (Single Shot)

22 L.R Target Model

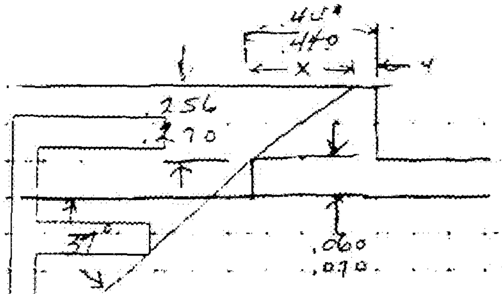
EXPERIMENTER DATE

WITNESS DATE

32983

AL 002963

DATE 6-19-44
SUBJECT OF EXPT. Cartridge Ramp



2 | .1355
.6775
.3515
.3260
.070
.2560

2 | .7030
.3515

2 | 1.360
.680
.350
330
60
.270

Tan. 37° = .7536

x = .256 / .7536 = .340

x = .270 / .7536 = .358

Max y = .440 − .340 = .100

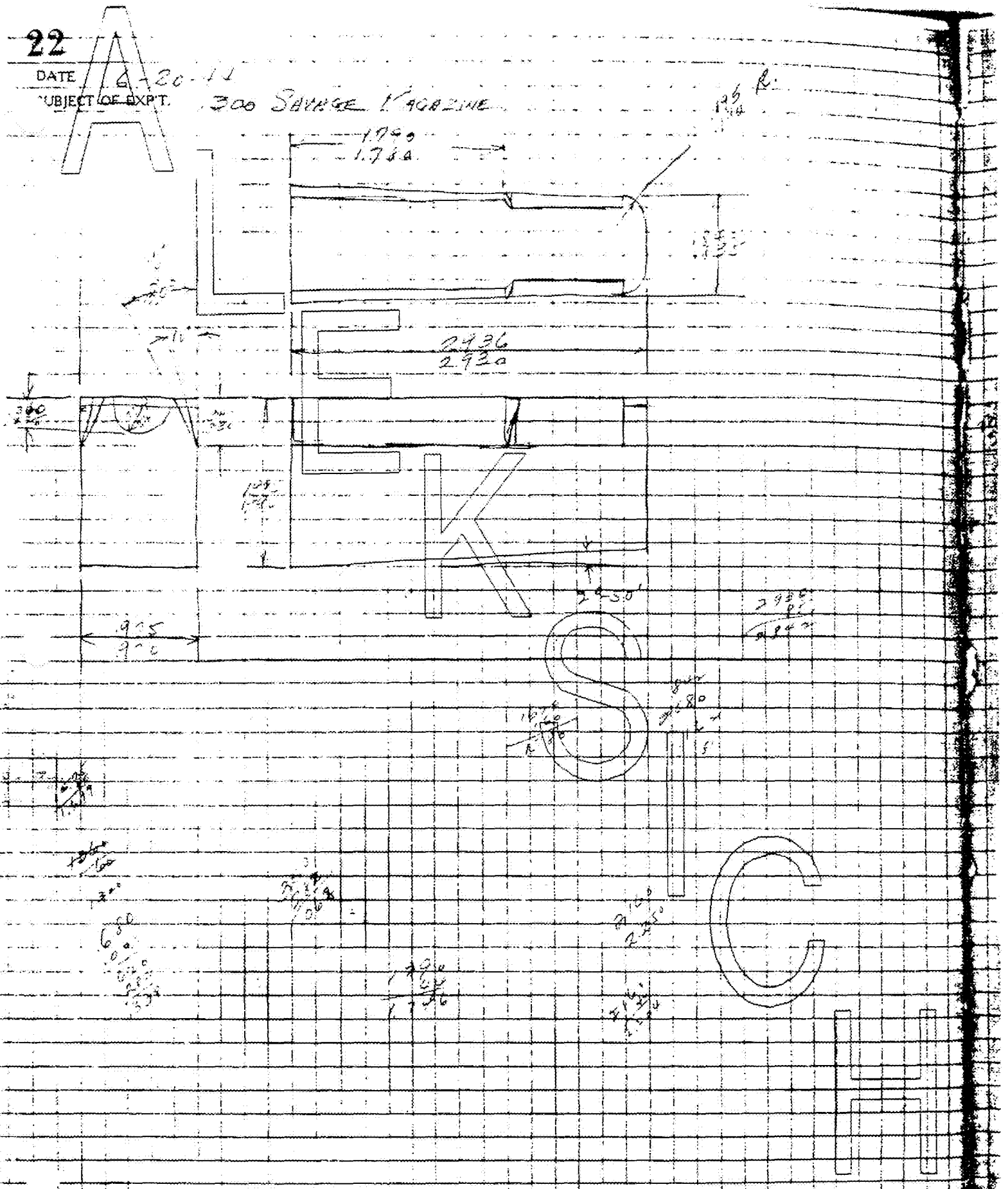
Min y = .440 − .358 = .082

EXPERIMENTER DATE
WITNESS DATE

22

DATE 6-20-11

SUBJECT OF EXPT. 300 SAVAGE RIFLE



EXPERIMENTER DATE

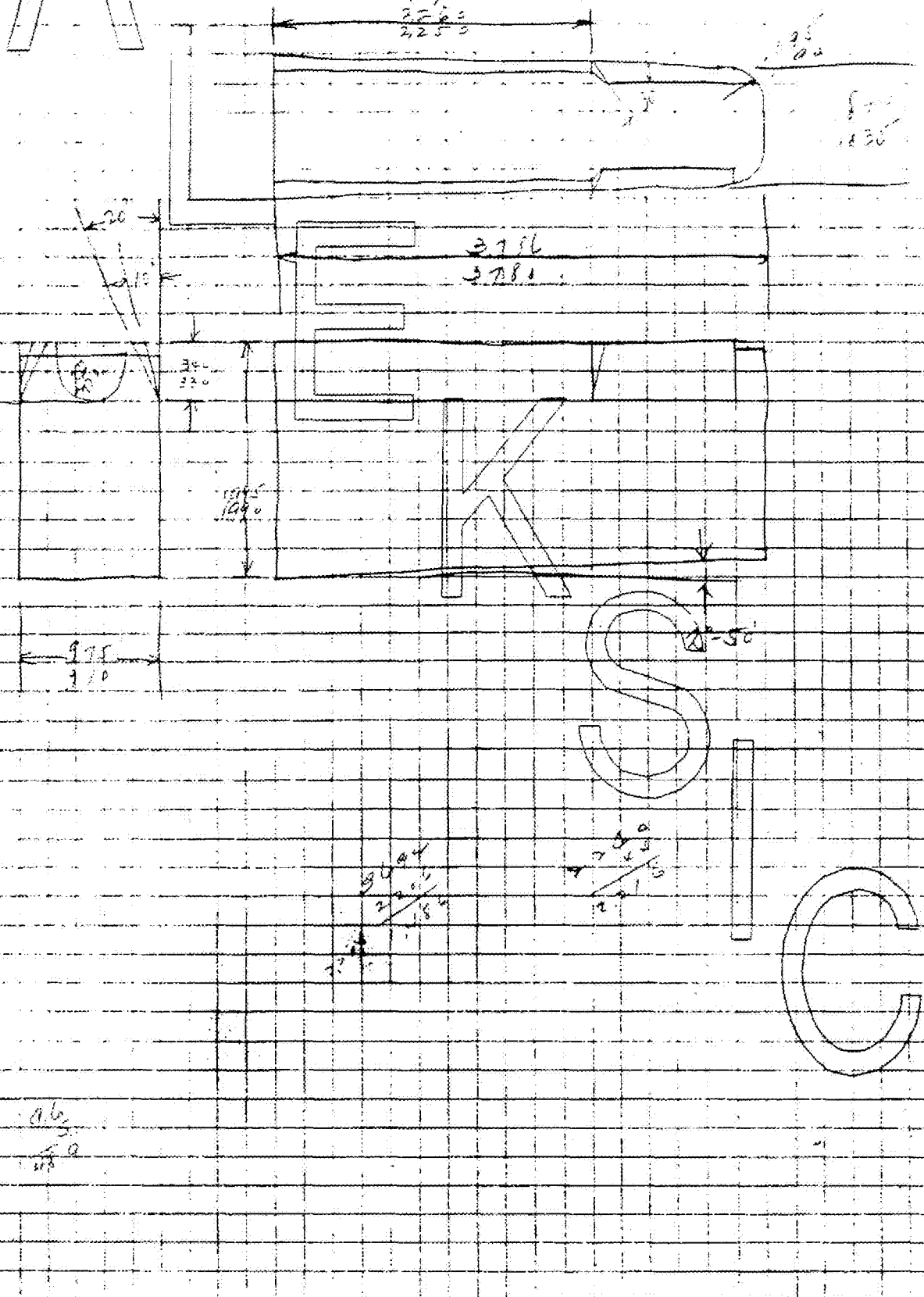
WITNESS DATE

34883

AL 0029639

DATE 6-21-62

SUBJECT OF EXPT. .300 H&H MAGNUM MAGAZINE



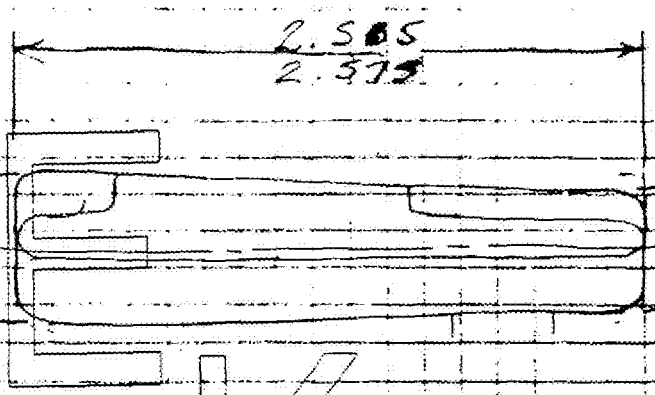
EXPERIMENTER DATE

WITNESS DATE

24

DATE 6-22-53

SUBJECT OF EXPT. 300 SAVAGE FOLLOWER



.970
.088
.882

.835
.088
.747

STOCK
.932-.936

2930
.088
2.842

.517
.072
.599

2936
.088
2.848

1.342
2.600
.242

1.590

EXPERIMENTER DATE

WITNESS DATE

36983

AL 0029641

DATE 6-27-44

SUBJECT OF EXPT. M-722 MAIN SPRING

FIRED LENGTH = 2.475
COCKED LENGTH = 2.185
d = .035
D = .395 - .407 .055 = .352 MAX.
STACKED LENGTH = 1.540
28 TOTAL COILS 26 ACTIVE
P = 11.6 #/0
4" FREE LENGTH

2.475
1.525

FIRED P = (4.00 - 2.475) 11.6 = 17.7#
COCKED P = (4.00 - 2.186) 11.6 = 21.1#

21# x .205 = 4.30

EXPERIMENTER DATE

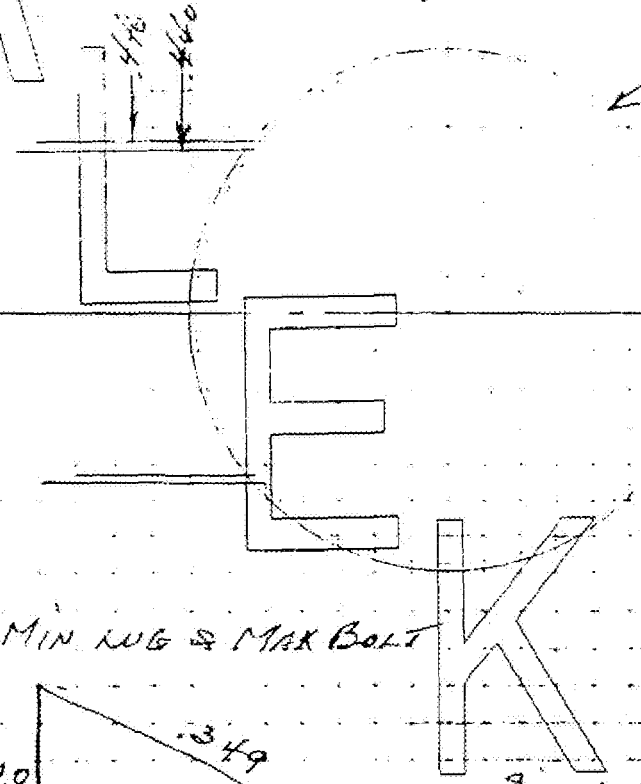
WITNESS DATE

37/83

AL 0029642

DATE 7-12-64

SUBJECT OF EXPT. Bolt Body and Lug Intersection

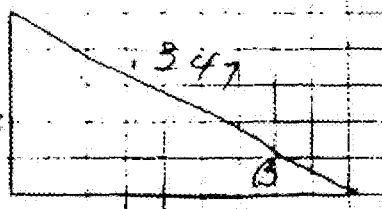


MIN LUG & MAX BOLT

$\sin\alpha = \frac{.220}{.349} = .6304$

$\alpha = 39° - 4' - 47''$

MAX LUG & MIN BOLT



$\sin\beta = \frac{.273}{.347} = .7867$

$\beta = 39° - 54' - 5''$

$\beta - \alpha = 54' - 18'' = 54.3'$

$\frac{54.3}{360 \times 60} \times .698 \times \pi =$ Linear Movement Approx

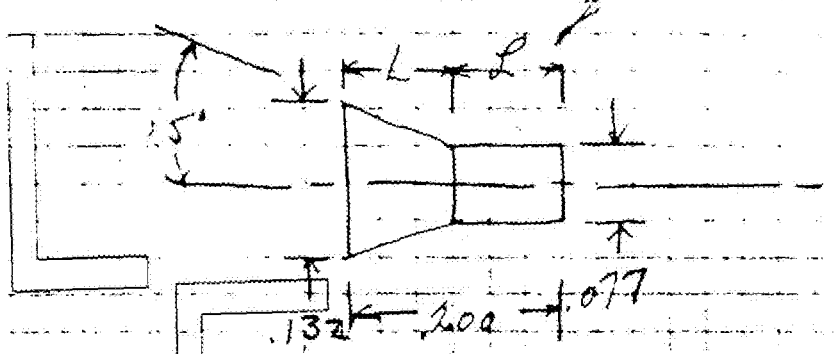
$= .00552''$

EXPERIMENTER DATE

WITNESS DATE

DATE

SUBJECT OF EXP'T. T-1444 Bolt Head - Firing Pin



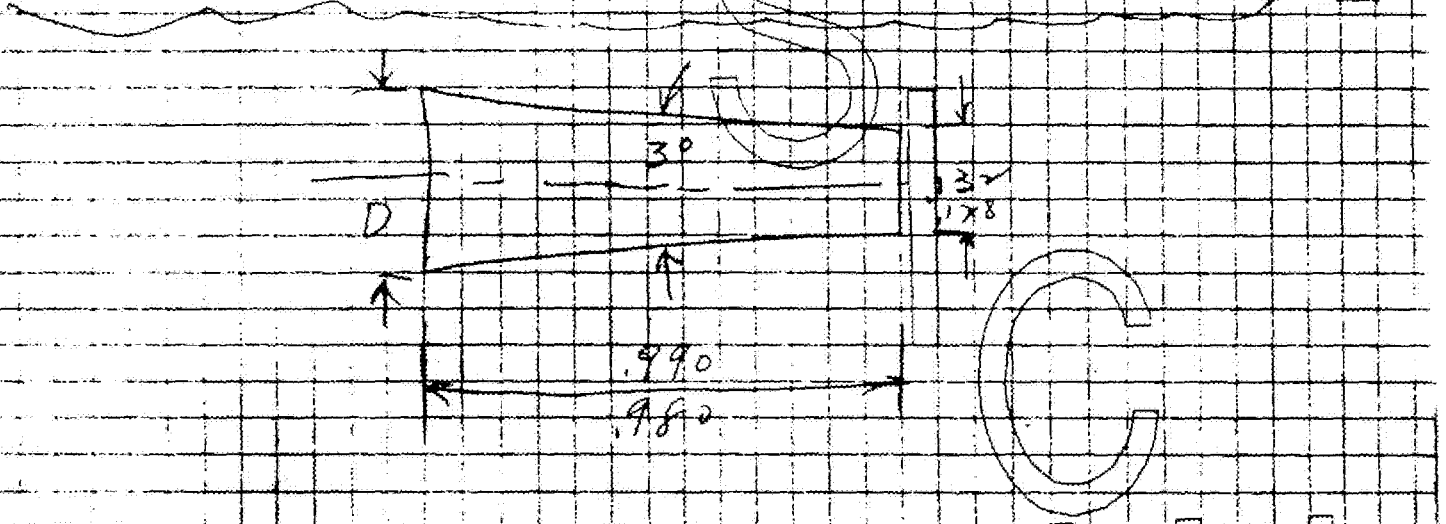
FIND Min. L $\frac{.132 - .077}{2}$ " $L = \tan 15°$

$= .2679$

$L = \frac{.0275}{.2679} = .1027$

$\frac{.137}{.035}$

Min. $L = .200 - .103 = .097$



Find Max & Min D $\frac{D_{max} - .132}{2} \div .990 = \tan 15° = .0262$

$D_{max} - .132 = .990 \times .0262 \times 2 \Rightarrow .0518$

$D_{max} = .1838$

$D_{min} - .128 = .960 \times .0262 \times 2 = .0513$

$D_{min} = .1793$

$\frac{179}{.005}$
$.1085$
$.092$
$.0165$

EXPERIMENTER DATE

WITNESS DATE

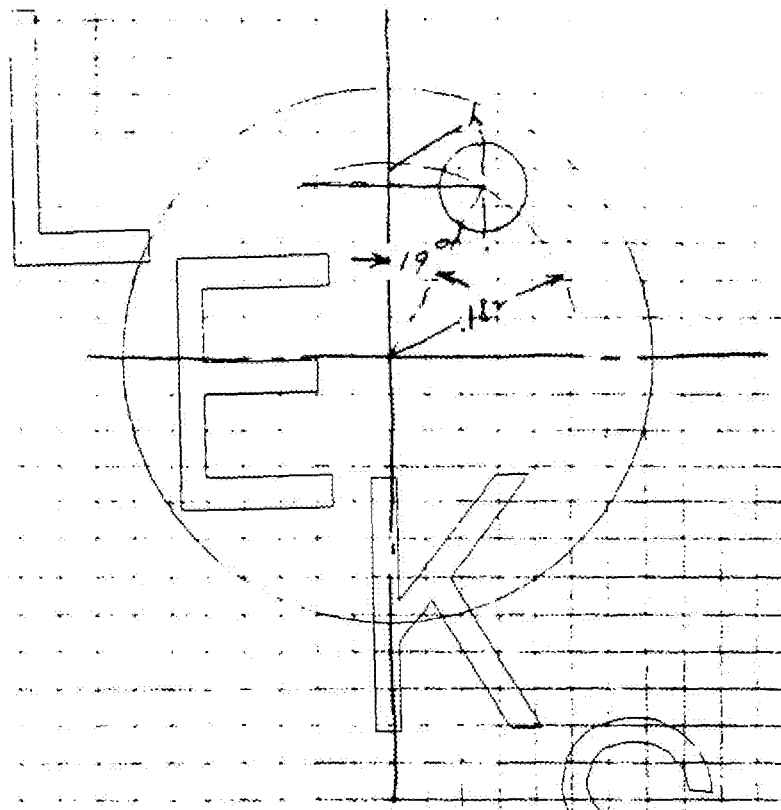
39883

AL 0029644

28

DATE 7-17-64

SUBJECT OF EXPT. Placement of ejector pin hole



$h = .18r - (.18r \cos 19°)$

$= .18r - (.18r \times .9455)$

$= .18r - .17r$

$= .019''$

EXPERIMENTER

WITNESS

DATE

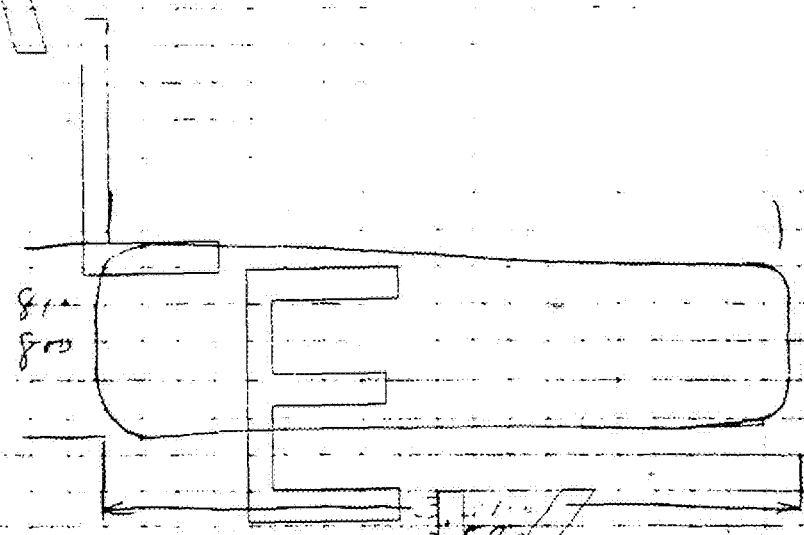
DATE

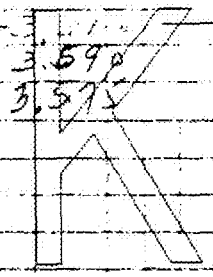
AL 0029645

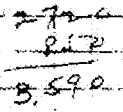
40983

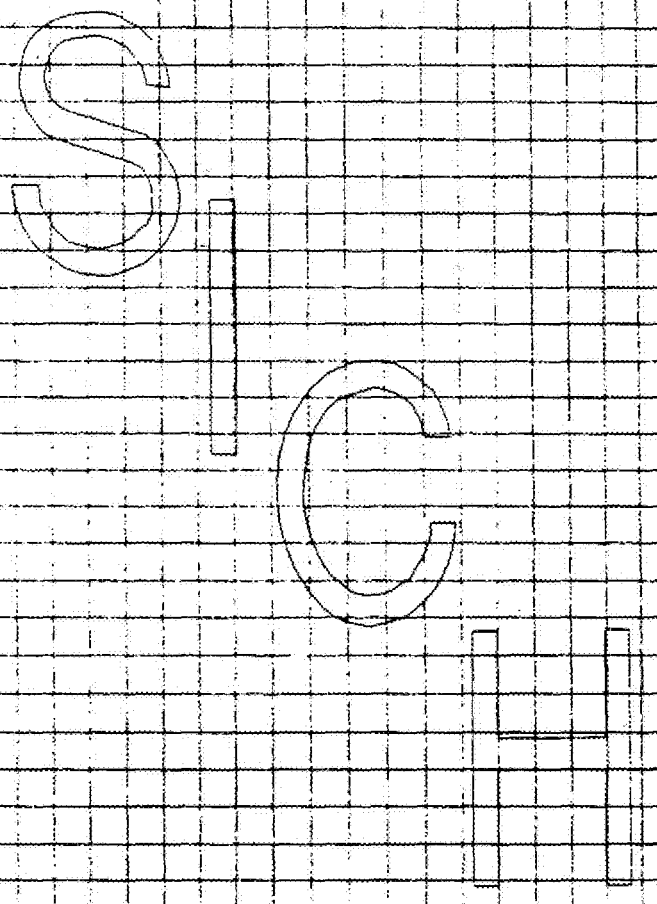
DATE: 7-18-44

SUBJECT OF EXPT. 300 HP V-8 Follower









EXPERIMENTER DATE

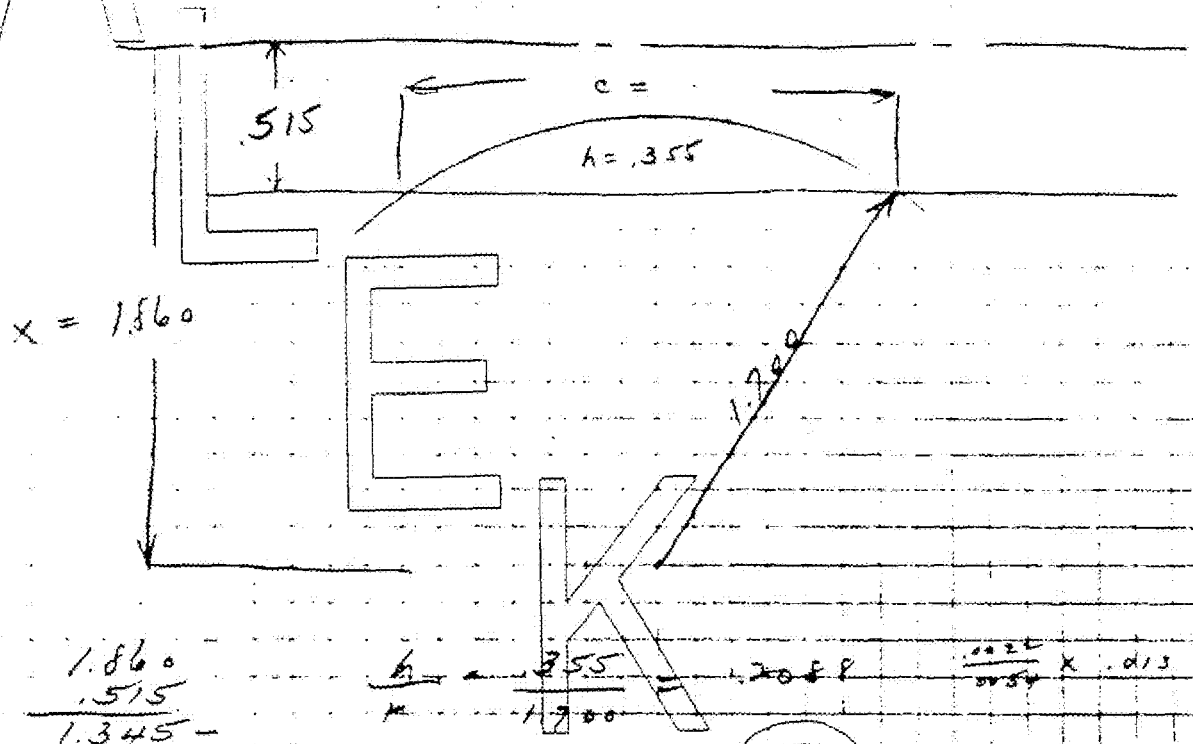
WITNESS DATE

41983

30

DATE 7-19-54

SUBJECT OF EXPT. Calculations of cutter centers for Tire control



1.860
.515
1.345 −
1.700 +
.355

$\frac{h}{r} = \frac{.355}{1.700} = .2088$ $\frac{.0026}{.0054} \times .013 = .0063$

$\frac{c}{r} = 1.223$

$c = 2.080''$

Ford 1.644 R. cutter

$\frac{c}{r} = \frac{2.080}{1.645} = 1.265$ $\frac{.006}{.013} \times .0055 = .0025$

$\frac{h}{r} = .254$

$h = .374$

1.645
.374
1.271
.515
1.786

$x = 1.645 - .374 + .515 = 1.786$

EXPERIMENTER DATE

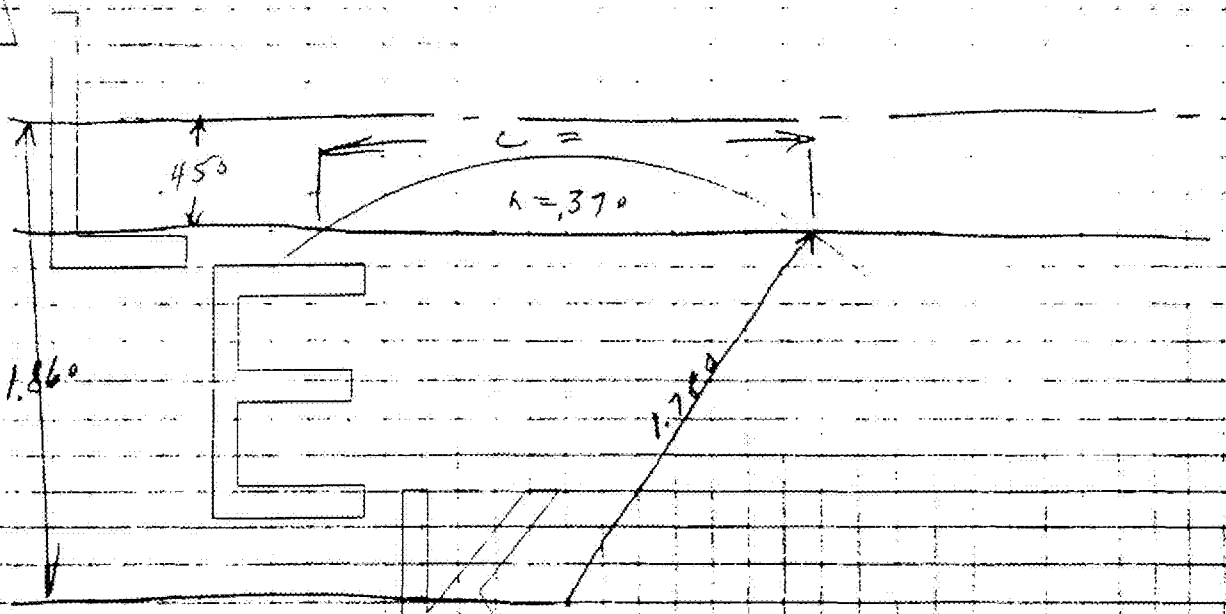
WITNESS DATE

4-28-83

AL 0029647

DATE 7-19-44

SUBJECT OF EXPT. Cutter centers



$\frac{h}{r} = \frac{.370}{1.750} = .208$

$\frac{C}{r} = 1.224$

$C = 2.173$

For 1.750 R cutter

$\frac{C}{r} = \frac{2.173}{1.750} = 1.24+$

$\frac{h}{r} = .216+$

$h = .378"$

$X = 1.750 - .378 + .450 = 1.822$

EXPERIMENTER DATE

WITNESS DATE

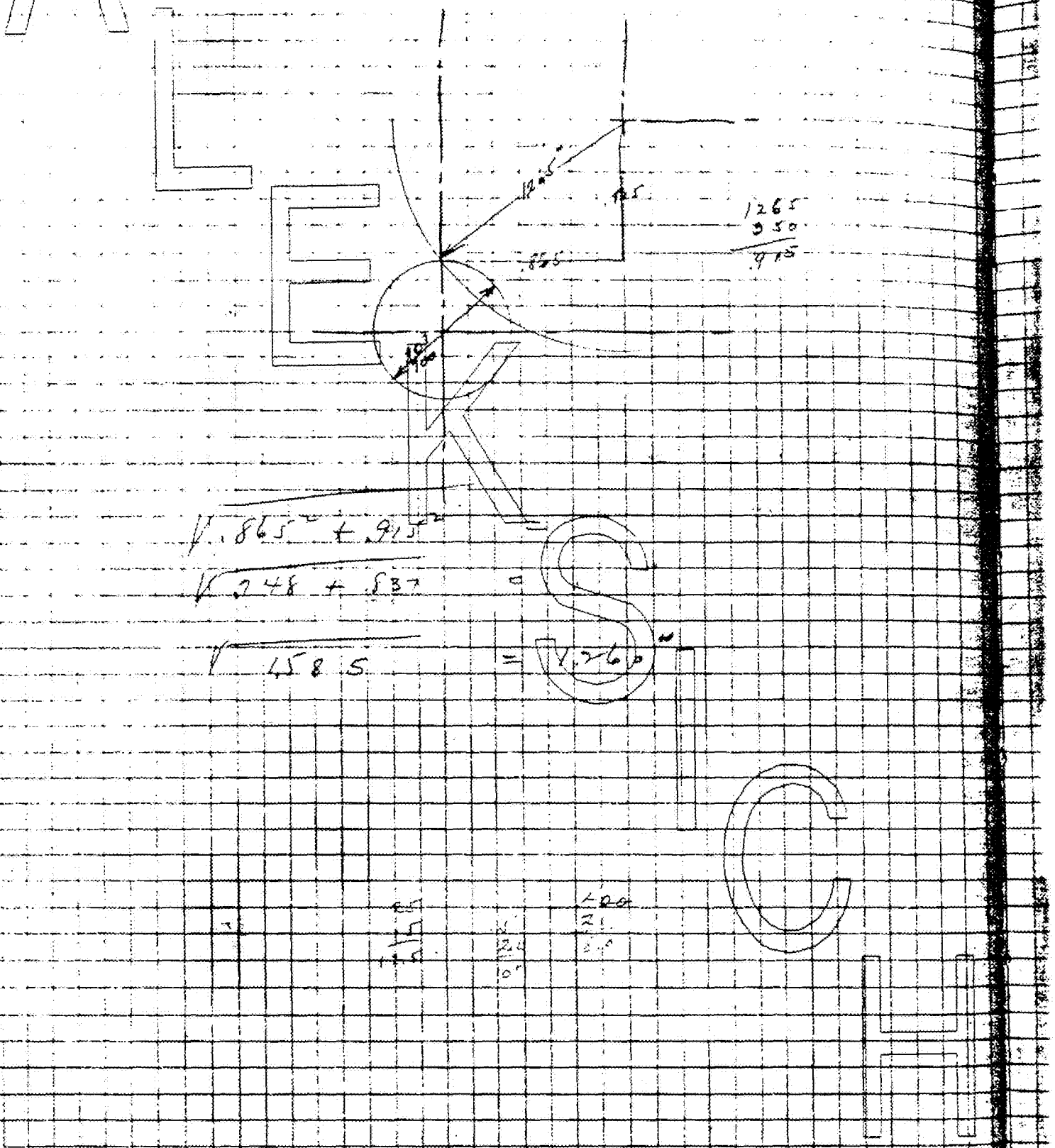
43 383

AL 0029648

32

DATE 7-20-94

SUBJECT OF EXPT. Extraction Core Cutter Center



EXPERIMENTER DATE

WITNESS DATE

44983

AL 0029649

DATE 9-5-44

SUBJECT OF EXPT. Assembly of M 721 & M 722

Two of the four models were assembled completely 9-5-44. The bolt heads were turned on and pinned to determine their actual strength requirements.

		M 721 300 H&H	M-722 300 Sav.
Headspace before		Max + .005"	Min
	After 5 proof loads	Max + .0035	10 proof loads Min

The M-721 showed very light pressure on proofing.
The M-722 showed only ordinary pressure on proofing.

The M-722 bolt head had broken loose before firing. Only the pin was holding it. However it held quite satisfactorily for proofing.

A 45° chamfer was cut in the bolt body of the 722 and the bolt head brazed on.

Considerable trouble was experienced with the safetys. Carter checked one and found it would not meet the drawing. The safety surface was .005" under min and .030" misplaced.

45/83

EXPERIMENTER DATE

WITNESS DATE

DATE 9-11-45

SUBJECT OF EXPT. M-722 bolt head & Safety

After approximately 40 regular .30s Gov. rounds the M-722 bolthead broke loose a second time. Inspection of the joint showed that the braze was not sufficient. The head was joined a third time using a ring of 1000°F silver solder in a relief spot on the head. At the same time several test specimens were made up and checked on the tensile machine using different brazing compounds. The minimum joint strength obtained with a poor brazing joint was 7000# force to separate head and body, the best joint gave 8500#. It was decided that the ring of brazing compound in a relief spot constituted the best joint.

The M-722 bolt handle bent during the proofing due to hard extraction (rough chamber). Opening the bolt by hitting with a stick of wood caused the bending. The handle was replaced and the chamber smoothed.

EXPERIMENTER DATE

WITNESS DATE

DATE. 9-13-45

SUBJECT OF EXPT. Fire control characteristics

1.046	1.241
.315	.521
1.361 min sear and trig	1.762 Max dim trig hole to Rec ℄

1.762	.430
1.361	.401
.401	.029 Min sear engagement

1.048	1.239
.335	.519
1.383	1.758 Min dim trig hole to Rec ℄

1.758	.425
1.383	.375
.375	.050 Max sear engagement

.521	.435	.385	.720	.798
.060	.050	.335	.078	.195
.581	.385	.720	.798	.603

.581 Max dim. Rec ℄ to bottom of Bolt stop pin

.603 Min dim. Rec ℄ to sear contact on bolt stop pin

Then .022 = Min clearance

.391	.586	.649
.195	.060	.646
.586	.646	.003 Min clearance between Sear & Bolt stop pin with safety on.

47883

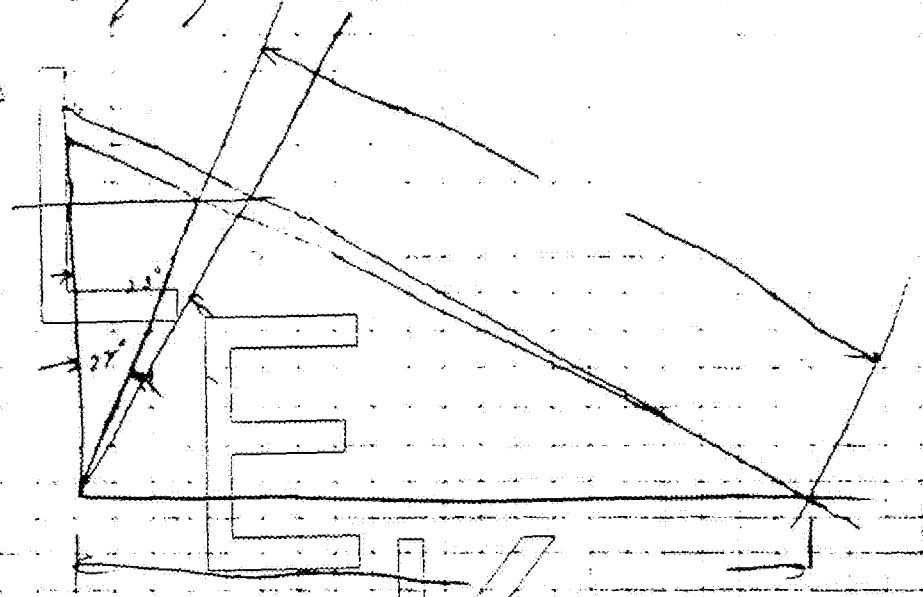
AL 0029652

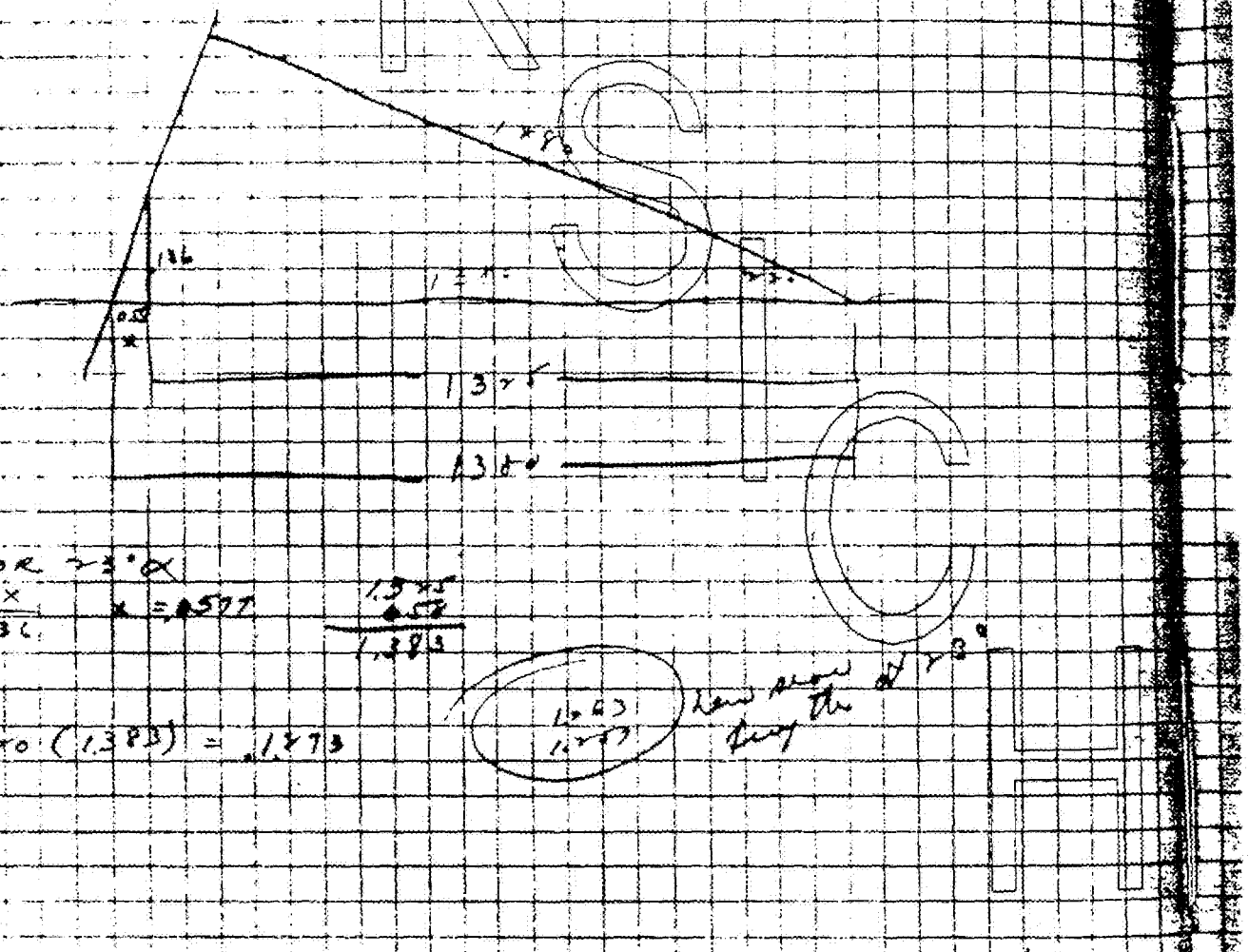
EXPERIMENTER DATE

WITNESS DATE

DATE 9-13-05

SUBJECT OF EXPT. Simple Type of Flow Control Characteristics Curve





For $\alpha = 3°$

$\frac{\text{Area}}{\text{Area}} = \frac{x}{136}$ $x = .597$

$.9 \times 0 (1.383) = .1273$

EXPERIMENTER

WITNESS

DATE

DATE

AL 0029653

DATE 9-13-44

SUBJECT OF EXPT. Safety condition

1.048	1.241	
.078	.651	
.970	.590	
	.387	
	.977	.977
		.970

Min. Safety interference = .007

1.046	1.238	
.82	.649	
.964	.589	
	.391	
	.983	
	.964	

Max Safety Int = .019

Changed slow to make Pmin .01 and Max .026

EXPERIMENTER

WITNESS

DATE 9-9-83

DATE

AL 0029654

38

DATE 9-12-62

SUBJECT OF EXPT. Flywheel Spring design

Wire .00 - .170

Wire .00 - .164

Assume mean dia .141

Length .380 Extended .090 4#

Length .370 Compressed load

$$d = \frac{2.55\,PD}{S} = \frac{2.55\,(4)\,.141}{70{,}000} = .000225$$

$d = .029$" use 028

Solid Ht. 5 x .270 = 9 coils active

$$\frac{P}{F} = 36.\text{x}$$

$$F = \frac{4}{36.\text{x}} = .11$$

.380 + .110 = .490 free length

4# load $S = \frac{2.55\,PD}{d^3} = \frac{2.55\,(4)\,.139}{.000024389} = 64{,}200$ PSI

5# load = 81,000 PSI

6# load = 97,000 PSI

EXPERIMENTER DATE

WITNESS DATE

50283

AL 0029655

DATE 9-14-62

SUBJECT OF EXPT. Seat Spring (Cont)

$$\frac{P}{F} = \frac{G d^4}{8 D^3 N}$$

$$= \frac{11{,}500{,}000 \,(.000000615)}{(.000268)} = 36.6 \text{ \#/in}$$

FREE LENGTH = .490

80% = (.468) 36.6 = 6.1# 7.6#

WT COCKED = (.490 − .380) 36.6 = 4# 4.2#

WT FIRED = (.490 − .340) 36.6 = 5.5# 6.2#

WT STACKED = (.490 − .280) 36.6 = 7.7# 9.8#

$\frac{D}{d} = 5$. WAHL K = 1.31

$$S = P \frac{255(.157)}{.000219} K = P\,16{,}200\,K$$

COCKED S = (16,200) 1.31 = 85,000 PSI

FIRED S = 5.5 = 117,000 PSI

80% S = 6.1 = 139,000 PSI

SOLID S = 7.7 = 163,000 PSI

51983

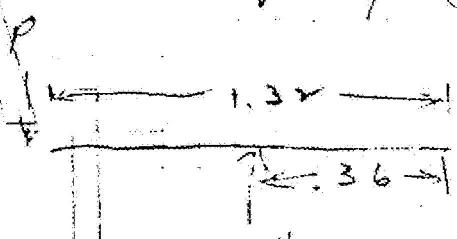
EXPERIMENTER DATE

WITNESS DATE

AL 0029656

DATE 9-4-65

SUBJECT OF EXPT. Sear Spring (second



$.36(4) = 1.32\,P$

$P = 1.1\#$

$.36(5.5) = 1.32\,P$

$P = 1.5\#$

Second Spring

O.D. = .167

WIRE = .026

MEAN D = .141

$29.5(X - .380) = 4\#$

$X = \frac{3.5}{29.5} + .380 = .500$ FREE LENGTH

.119

.499

$\frac{P}{F} = \frac{11,500,000\,(.000\,000\,457)}{64\,(.0078)} = 29.3\ \#/in$

Index = 5.4 = 1.28 WAHL K

500
234
266

COCKED $(.500 - .380)\,29.3 = 3.5\#$

FIRED $(.500 - .340)$ " $= 4.7$

STACKED $(.500 - .234)$ " $= 7.8$

60% $(.215)$ " $= 6.3$

$S = P\,\frac{2.55\,(.141)}{.00176}\,K = P\,20,400\,K$

COCKED S 3.5 (20,400) 1.28 = 92,000 PSI

FIRED 4.7 " " = 123,000

STACKED 7.8 " " = 204,000

60% 6.3 " " = 162,000

EXPERIMENTER DATE

WITNESS DATE

52/83

AL 0029657

DATE 9-18-44
SUBJECT OF EXPT. [illegible] (Fluid)

$$\frac{P}{F} = \frac{G d^4}{8 D^3 N}$$

.028 = d
.14 = D
8 = N

$$= \frac{11,500,000\ (.000000615)}{64\ (.00268)} = 41.2\ \#/in$$

$41.2\ (x - .380) = 3.5\#$

$x = \frac{3.5}{41.2} + .380 = .465$ = FREE LENGTH

WT COCKED	=	.465 - .380 (41.2)	=	3.5
" FIRED	=	" - .340 "	=	5.1
" STROKED	=	" .252 "	=	8.8
" 80%	=	.171	=	7.0

$$S = P \frac{8.55\ (.139)}{.0000219} K = P\ 16,200 K$$

$\frac{D}{d} = 5 \quad K = 1.31$

COCKED	S	=	3.5 (16,200) 1.31	=		74,000
FIRED	S	=	5.1	"	"	= 108,000
STROKED	S	=	8.8	"	"	= 187,000
80%	S	=	7.0	"	"	= 148,000

EXPERIMENTER DATE
WITNESS DATE

42

DATE 9-23-44

SUBJECT OF EXPT. DL-732 Preliminary Tests

360 specimens rounds through the DL-732 gave one passing test due to the cartridge case locking inside the bolt. The bolt on the DL-732 is noticeably loose on closing due to its operation. A few of these 360 were fired at the target with very good results.

EXPERIMENTER

WITNESS

DATE 5/1883

DATE

DATE 9-21-44

SUBJECT OF EXP'T. M-721 Preliminary tests

After [illegible] in 7x1 head .004" space head [illegible] (.227"). Poor heading on assembly and poor contact on the edge continued in this condition.

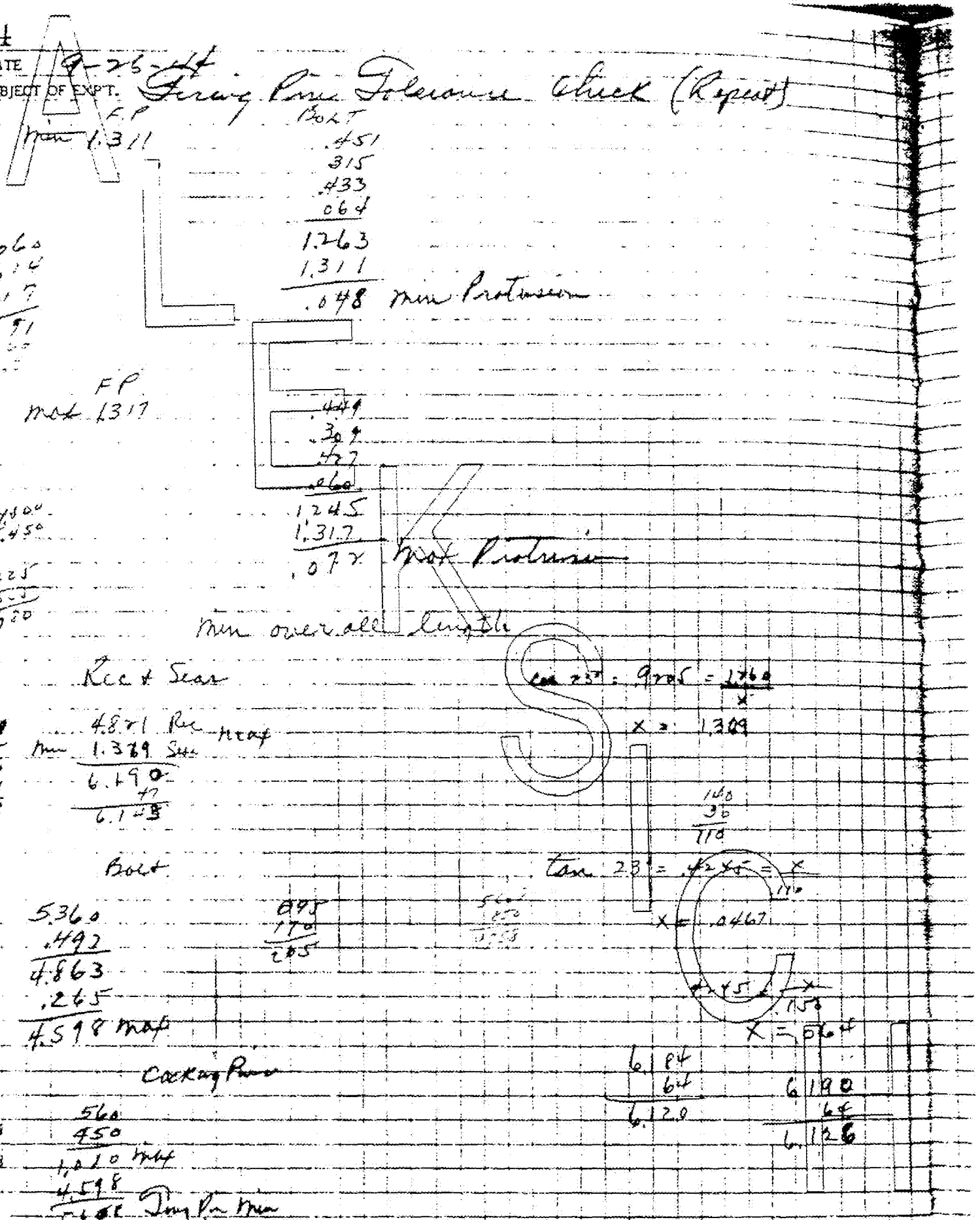
EXPERIMENTER DATE

WITNESS DATE

11

DATE 9-26-94

SUBJECT OF EXPT. Spring Pin Tolerance Stack (Repeat)



EXPERIMENTER DATE

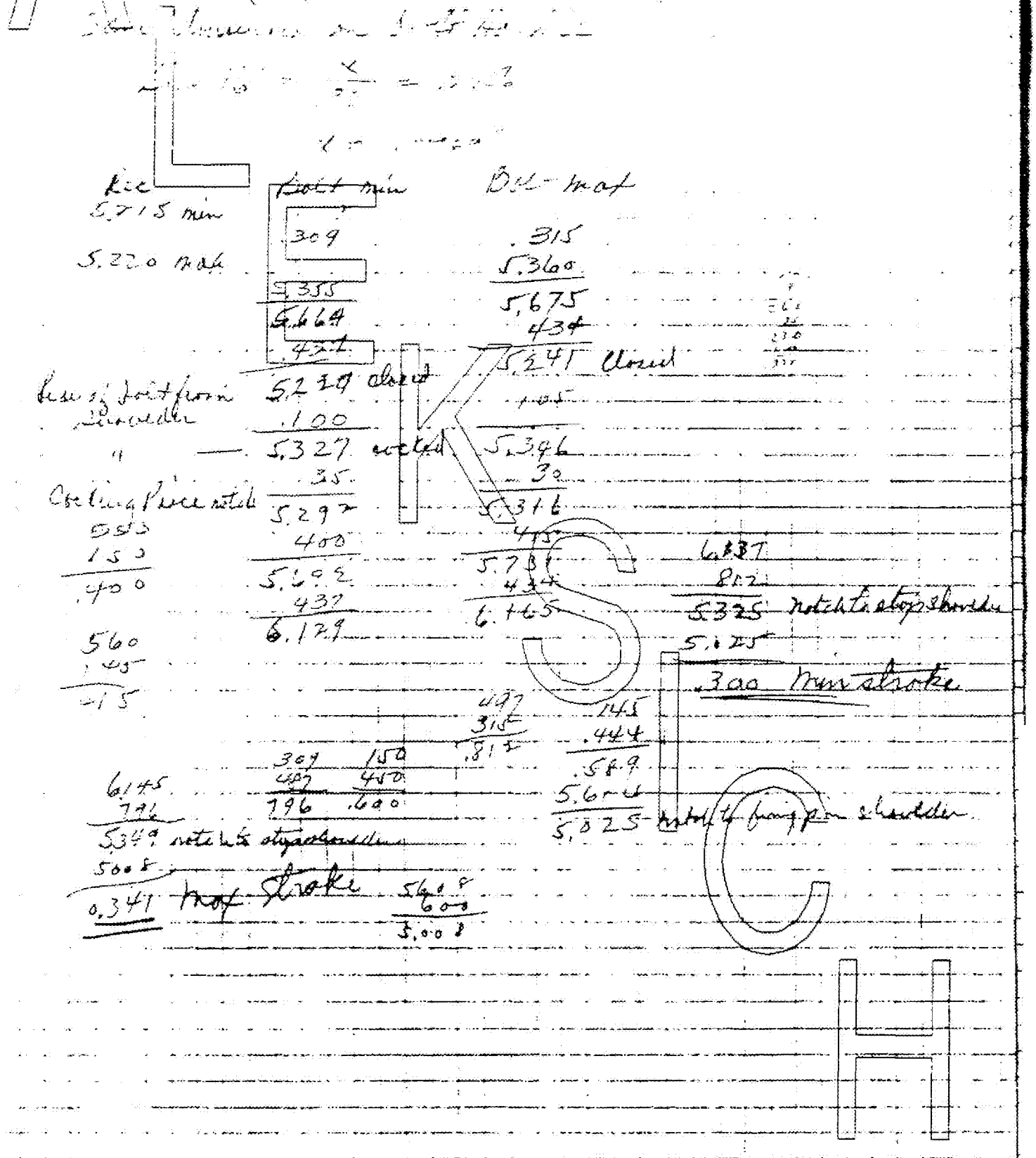
WITNESS DATE

5683

AL 0029661

DATE 9-26-44

SUBJECT OF EXPT. Cocking Tolerance check (Report)



57983

EXPERIMENTER DATE

WITNESS DATE

AL 0029662

DATE 9-27-44

SUBJECT OF EXPT. Max solid height of main spring

1.000	
.830	
1.830	Bolt plug
1.010	
2.840	

.450	
.560	
1.010	cocking piece

5.500	
[illegible]	
5.363	
2.840	
2.513	Max solid height 721

722

4.758	
.255	
4.503	
2.840	
1.663	Max Solid height 722

EXPERIMENTER DATE

WITNESS DATE

DATE 9-27-44

SUBJECT OF EXP'T. Main Springs M-72
Dwg # A-7537

Load 24.4 - 26.8 at 2.00 .283 deflec.

Length fired .985
365
.620
.330
.950
.742
1,692

430
62
.492
.250
.742

Stress .313
Prot .054

3.665
.850
2.815

5357
1.692
3.665 Length fired 19 #
.317
3.348 Length cocked 21 #

.297
.338
.635
.3175

3.348
.850
2.498

400
15

5300
3.665
2.135 = 18.5 #
21.1 #
21.396
19.8 # X .297 = 5.9" # Main Energy Stocked

5700
3.348
2.452 = 21.1 #

24.3
26.5
51.2
25.6
6.63
32.23

2.97
2.20
.77

$S = \frac{8 P D}{\pi d^3} = \frac{8 (32.2) .345}{3.1416 (.0166)} = 184,000$

Max Working Stress = 121,000

M-72

69,883

3.348
3.628
290
145
1493
1.49

EXPERIMENTER DATE
WITNESS DATE

AL 0029664

DATE 9-3-[illegible]

SUBJECT OF EXPT. [illegible] Spring [illegible]

[illegible] Hole

[illegible] on .753" [illegible] Pin

[illegible] 1.600" Free Length

.055 Wire — 29 total coils

.400 outside — 27 active

Spring Rate $\frac{F}{f} = \frac{Gd^4}{8D^3N} = \frac{11{,}500{,}000\,(.00000915)}{8\,(27)\,(.0412)} = 11.8$

Cocked Length 2.498 — 21#

Fired Length 2.815 — 17# — Stroke .313 — Pilot .054

2) 5.313 — 2.656 — 1.490 — 4.246

S (stressed) $= \frac{8PD}{\pi d^3} = \frac{8(21.9)\,.345\,(1.03)}{3.14\,(.000166)} =$

Wt cocked = 4.2 − 2.498 (11.8) = 20.1#

Wt Fired = 4.2 − 2.815 (11.8) = 16.5#

2) 36.6 — 18.3

18.3 × .297 = 5.42 "/# Energy

Max Working Stress = 117,000#

3.40 / 1.86 / 2.06 / 1.54 / .52

23.6 / 26 / 2) 49.6 / 24.8

24.8 / 6.6 / 31.4

4.00 / 1.92 / 2.08

2) 1.0 / .56

2.12 / 1.60 / .52

25.6 / 28.2 / 53.8 / 26.9 / 32 / 3.1

6.13

EXPERIMENTER — DATE

WITNESS — DATE

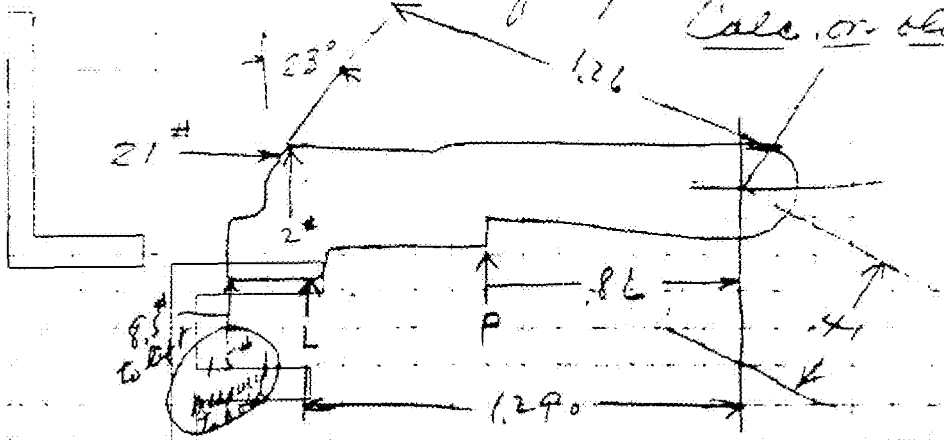
60083

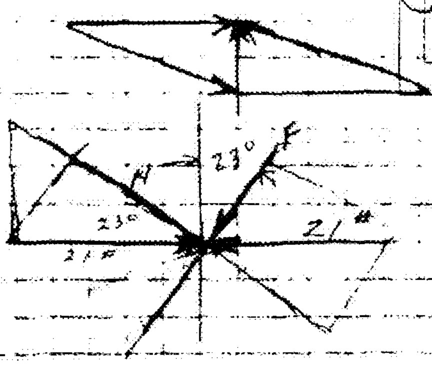
AL 0029665

DATE 12-20-44

SUBJECT OF EXPT. New Sear + Safety

Calc. on old Sear





f = .39 in dust chamber
f = .29 oiled

NORMAL FORCE = $N = 21(\cos 23°) = 21(.92)$
$N = 19.3$

MOMENTS ABOUT O Neglecting f

$2(1.29) + P(.86) = 22.8(.41)$

$P(.86) = 9.35 - 2.58$

$P = \frac{6.77}{.86} = 7.87^{\#}$

$L = \frac{6.77}{1.29} = 5.25^{\#}$

$\cos 23° = .920 = \frac{21}{N}$

$N = 22.8$

$F = Nf$
$= 19.3(\ \ )$
$=$

USING MEASURED FORCES

$1.5(1.5) = P(.86)$

$P = 2.6$

$L = 1.75$

MOMENTS TO FIND F

$1.5(1.5) + 2(1.29) + F(1.26) = 22.8(.41)$

$F(1.26) = 9.35 - 2.25 - 2.58$

$F = \frac{4.52}{1.26} = 3.62^{\#}$

$\frac{F}{N} = f = \frac{3.62}{19.3} = .19$

EXPERIMENTER DATE

WITNESS DATE

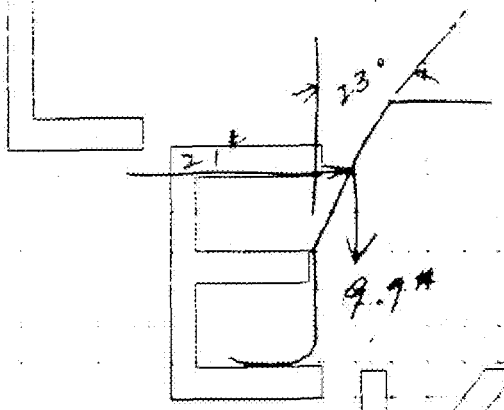
50

DATE 12-20-4[illegible]

SUBJECT OF EXPT. New Scar + Safety

(Cont) - calc on old scar + Safety

Actual $L = \frac{8.5(1.5)}{1.29} = 9.9^{\#}$



4.3/1 = ADVANTAGE

$3.6(1.24) + 22.8(.41) - 2(1.29) = 1.29\ L$

$4.52 + 9.35 - 2.58 = 1.29\ L$

Then $L = \frac{11.29}{1.29} = 8.8^{\#}$

Actual Load to put safety on = 6# off = 4#

Theoretical on = 11.3# neglecting safety factor

Calculate the detent

Detent = 3½#

$\frac{N}{8.8} = \cos 35 = .707$

$N = 6.2^{\#}$

$\frac{x}{390} = \cos 45 = .707$

$x = .276$

$F_{safety} = \frac{.276 \times 6.2^{\#}}{.97} = 1.8^{\#}$

By calc $\frac{9.9}{4.3} = 2.3^{\#}$ to put safe on

Actual = $6^{\#} - 3\frac{1}{2}^{\#} = 2.5^{\#}$

62983

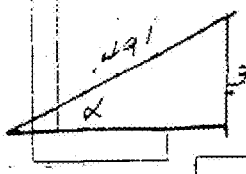
EXPERIMENTER DATE

WITNESS DATE

AL 0029667

DATE 1-3-46

SUBJECT OF EXPT. New location of Safety Slotted Hole in Housing



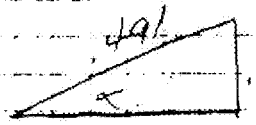
$\sin \alpha = \frac{.301}{.491} = .613 \quad \alpha = 37°-42'$

Adding 5° to α

$\alpha' = 42°-42'$

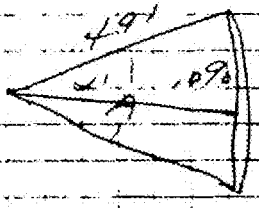
$\sin \alpha' = .6794 = \frac{x}{.491}$

$x = .334$ Not Satisfactory



$\sin \alpha = \frac{.161}{.491} = .3277$

$\alpha = 19°-8'$



$\sin \alpha' = \frac{.098}{.491} = .1996$

$\alpha' = 11°-33'$

$A = 21°-6''$

10 45'
21 36
10 1
32 22

$\alpha + A = 40° - 14'$

$37° + 41'$

Use 40° 46'

$\sin 40°-48' = .6534 = \frac{x}{.491} \quad x =$

63 f 83

EXPERIMENTER DATE

WITNESS DATE

52

DATE 10-18-45

SUBJECT OF EXPT. COCKING LOL. CHECK.

Sear-pin hole from Lug = 3.971 MAX
" " " to sear Point = 1.3036 MAX
LUG SEAT TO POINT OF SEAR 5.2746 MAX

MAX LUG TO BOLT HANDLE = 4.380.

MIN LUG TO COCKING Point

.309 Bolt Head
4.505 Bolt Body
4.814
−.035 Cam Seat
4.779
.550 Cam Point to shoulder
5.329
−.145 Shoulder to Notch
5.184
− 4.380
.804 MIN BOLT HANDLE TO COCKING PT.
4.380 MAX LUG TO BOLT HAND SEAT
+ COMPRESSION EXT.
5.269 MIN LUG TO NOTCH BOLT OPEN
+.030 for camming into notch in bolt
giving .025 MIN OVER TRAVEL
IF PRIMARY EXTRACTION CAM IS O.K.

Max. Dist sear pin to Point of sear = Z

Tan 27° = .509 = x/.140

X^{max} = .0714
X^{min} = .0765

Cos 27° = .891 = 1.375/Y

Y^{max} = 1.375
Y^{min} = 1.369

1.375 − .0714 = Z^{max}
.0714
1.3036

1.369 − .0765 = Z^{min}
.0765
1.2925
1.3036
2.5961
.298

.021

Tan 27° = .01/x

.509

.25"

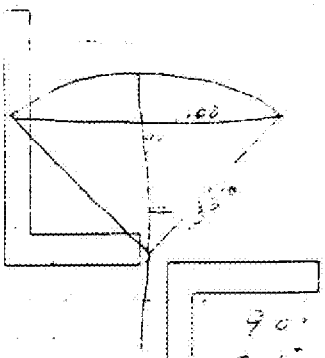
64983

EXPERIMENTER DATE
WITNESS DATE

AL 0029669

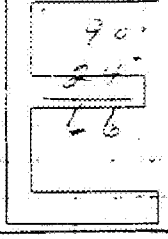
DATE 10-18-95

SUBJECT OF EXPT. PRIMER EXTRACTION CHECK



$\sin x = \frac{.15}{.35} = .2855$

$x = 16°35'$



$3\alpha = 5/40$ TYP.

Sear Pin hole from Rec Lug	=	3.270 ± 1	1
Sear Pin hole to sear Notch	=	1.398 ± 5.6	5.6
		4.668 ± 6.6	
Bolt Head	=	.312 ± 3	3
Bolt Body	=	4.5675 ± 2.5	2.5
		4.8195 ± 5.5	
Cam Seat	=	.0825 ± 2.5	2.5
		4.7820 ± 8.0	
Cam point to shoulder	=	.555 ± 5.0	5.0
		5.3420 ± 13.0	
shoulder to Notch	=	.1425 ± 2.5	2.5
		5.1995 ± 15.5	
Lug to Bolt Handle	=	4.3775 ± 2.5	2.5
Rec shoulder to Extractor Cam	=	4.3675 ± 2.5	2.5
	=	.1025 ± 2.5	2.5
		4.4700 ± 5	

$\sqrt{\Sigma t^2} = \pm 10.2$

5.268 ± 6.6	.822 ± 1.8	5.1995	± 15.5	
4.470 ± 5.0	.298 ± 1.1.6	4.3705	± 7.5	
.798 ± 11.6	.024 ± 39.6	.8290	± 46.	65983

EXPERIMENTER DATE

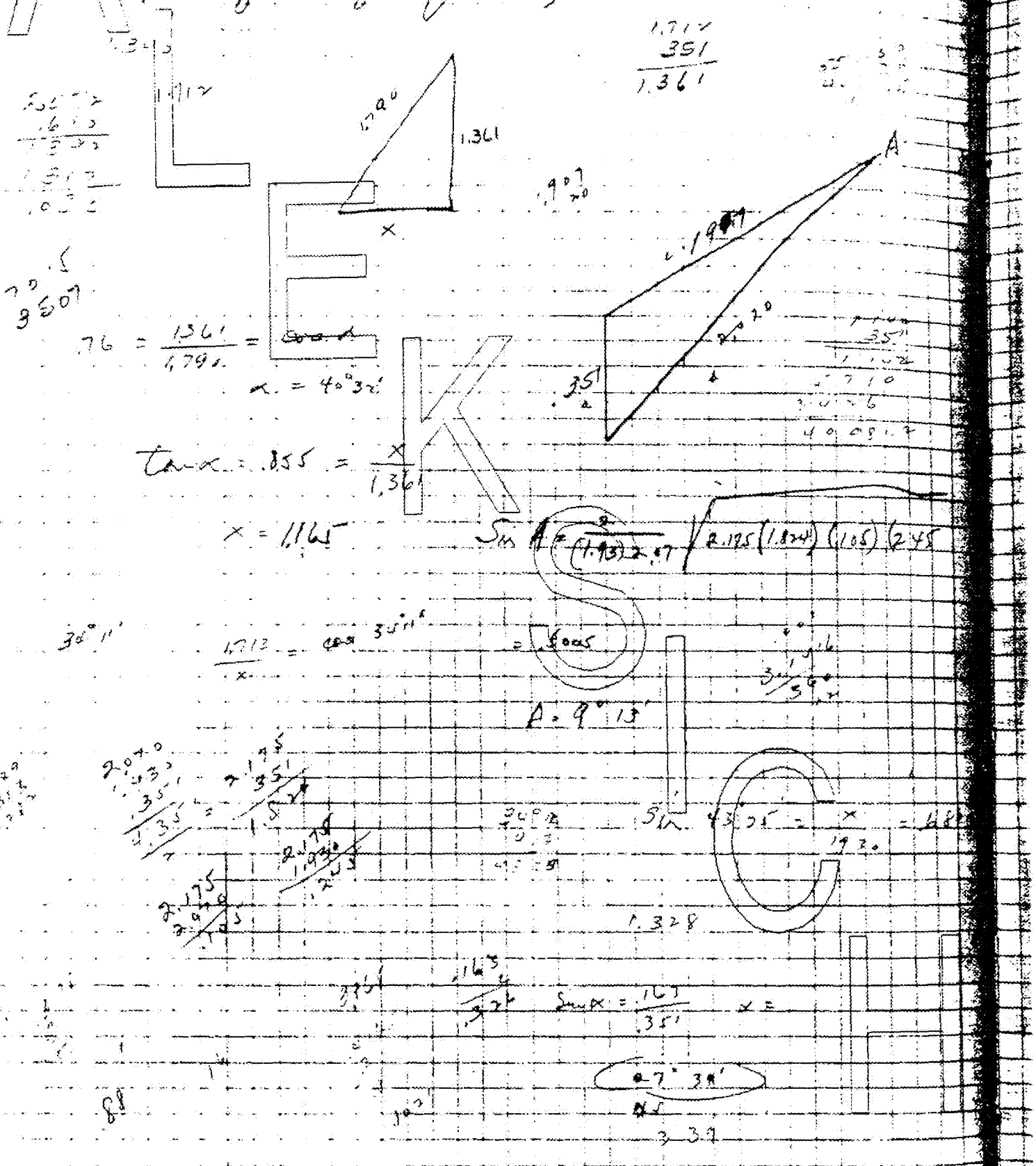
WITNESS DATE

AL 0029670

54

DATE 10-22-45

SUBJECT OF EXPT. New specification point of retraction cam cutter rotation as per request of engineering.



EXPERIMENTER

WITNESS

DATE 6/20/83

DATE

AL 0029671

DATE
SUBJECT OF EXP'T.

$h = .351(1 - .8858)$
$= .351(.1142)$
$= .0401$

Angle of chord on ext cam on Rec = 13° 47' with h

N.G

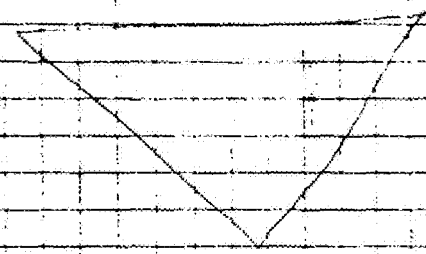
.117
.112

1.93
1.79
.14

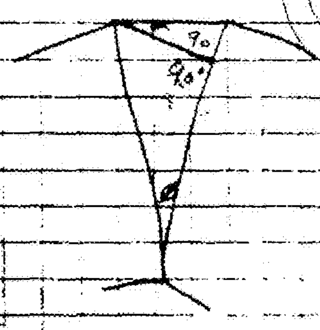
$\tan x = \frac{.1145}{.14} =$

N.G.

$\alpha = 39° 16'$



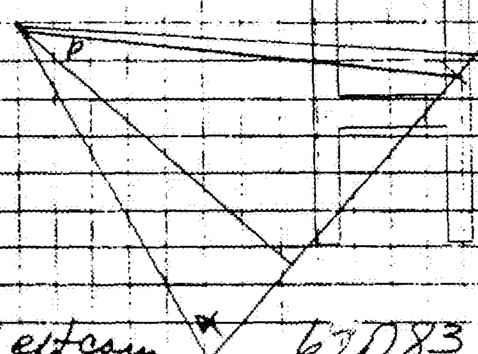
$.9355 = \frac{x}{.351}$



2.1256
.351
21256
106280
63768
.7460856
.1494

1.71
.370
1.39

$\sin x° = .4067 = \frac{x}{.351}$



$\sin 43°13' = \frac{1.308}{x}$

1.165
.143
1.308
1.392

.6849

x = 1.910 outer R ext cam.

67/83

EXPERIMENTER DATE
WITNESS DATE

DATE

SUBJECT OF EXP'T.

$$\sin A = \frac{2}{bc}\sqrt{s(s-a)(s-b)(s-c)}$$

2.2345 (1.7355) (.1645) (.3345)

a = .499
b = 2.070
c = 1.900
4.469
2.2345
.499
1.7355

2.2345
2.070
.1645

2.2345
1.9
.3345

= .508

Sin A = .2348

A = 13° - 35'
34° - 12'
47° - 47'

Sin 47° 47' = x / 1.900 = .7406

x = 1.407

Cos α = .143 / .146

.26791
351
26791
133955
80373
.07297641
2
.14594

α = 11° - 45' eft cam chord angle with Hoking.

1.910
1.79
.120

.1145 / .120

A = 43° 39' eft cam angle with Ree.

EXPERIMENTER DATE

WITNESS DATE

AL 0029673

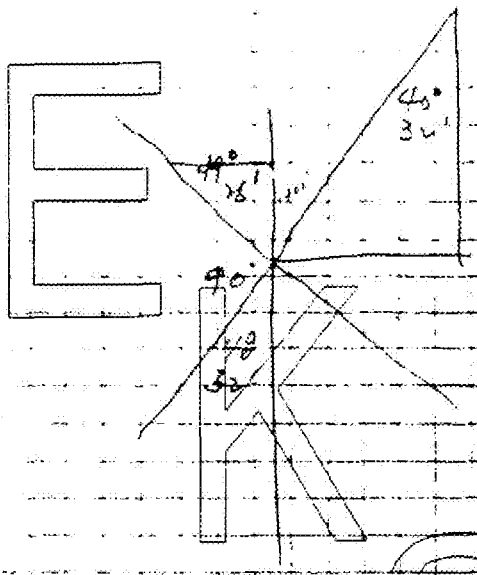
DATE

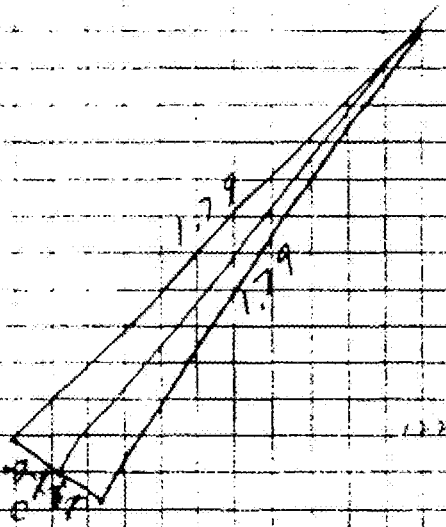
SUBJECT OF EXP'T.

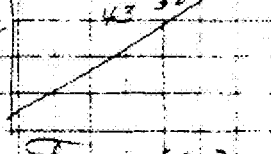
$\frac{1.165}{1.361} = \tan \alpha$

$\alpha =$

$\frac{1.712}{1.361}$







$\frac{1.79}{130\ 32'}$

$49\ 28'$

$\cos 49°28' = \frac{.1405}{x}$

$= .6499$

$x = .2161$

$\sec 49°28' = 1.5382$

$= 1.5387\ (.1405)$

$= .2161$

$\tan 43.3 a = \frac{.9496}{x}$

$x = .129$

69.983

EXPERIMENTER

WITNESS

DATE

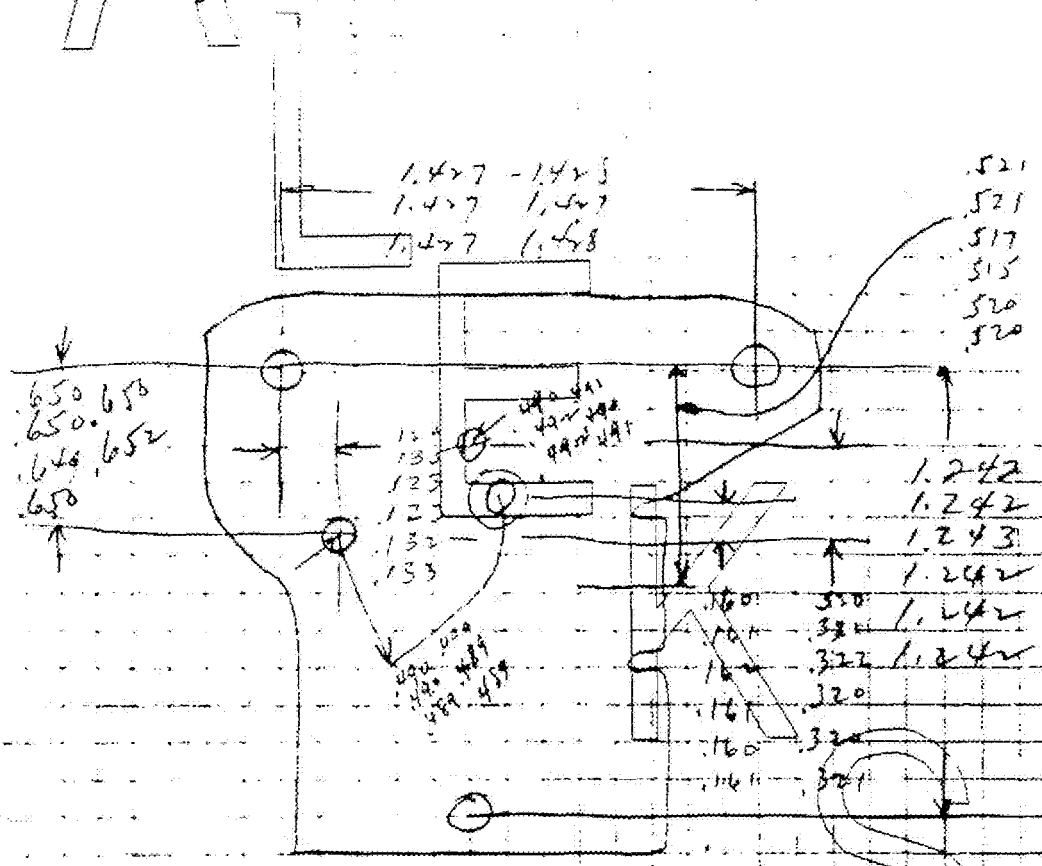
DATE

AL 0029674

58

DATE 11-6-45

SUBJECT OF EXPT. Clutch Housings



EXPERIMENTER

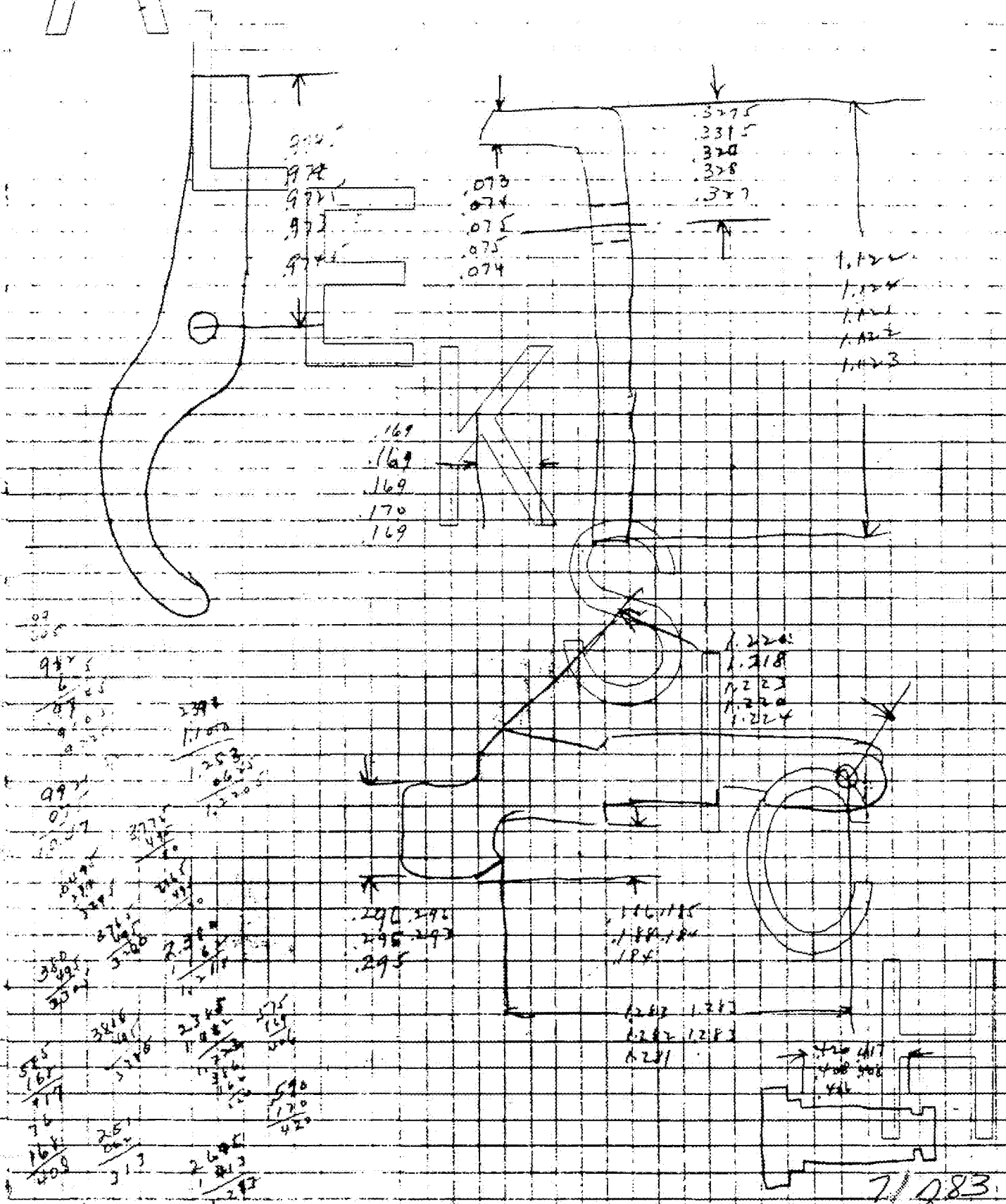
DATE

WITNESS

DATE

DATE 11-12-45

SUBJECT OR EXPT. Check on TRIGGERS ETC.



EXPERIMENTER

WITNESS

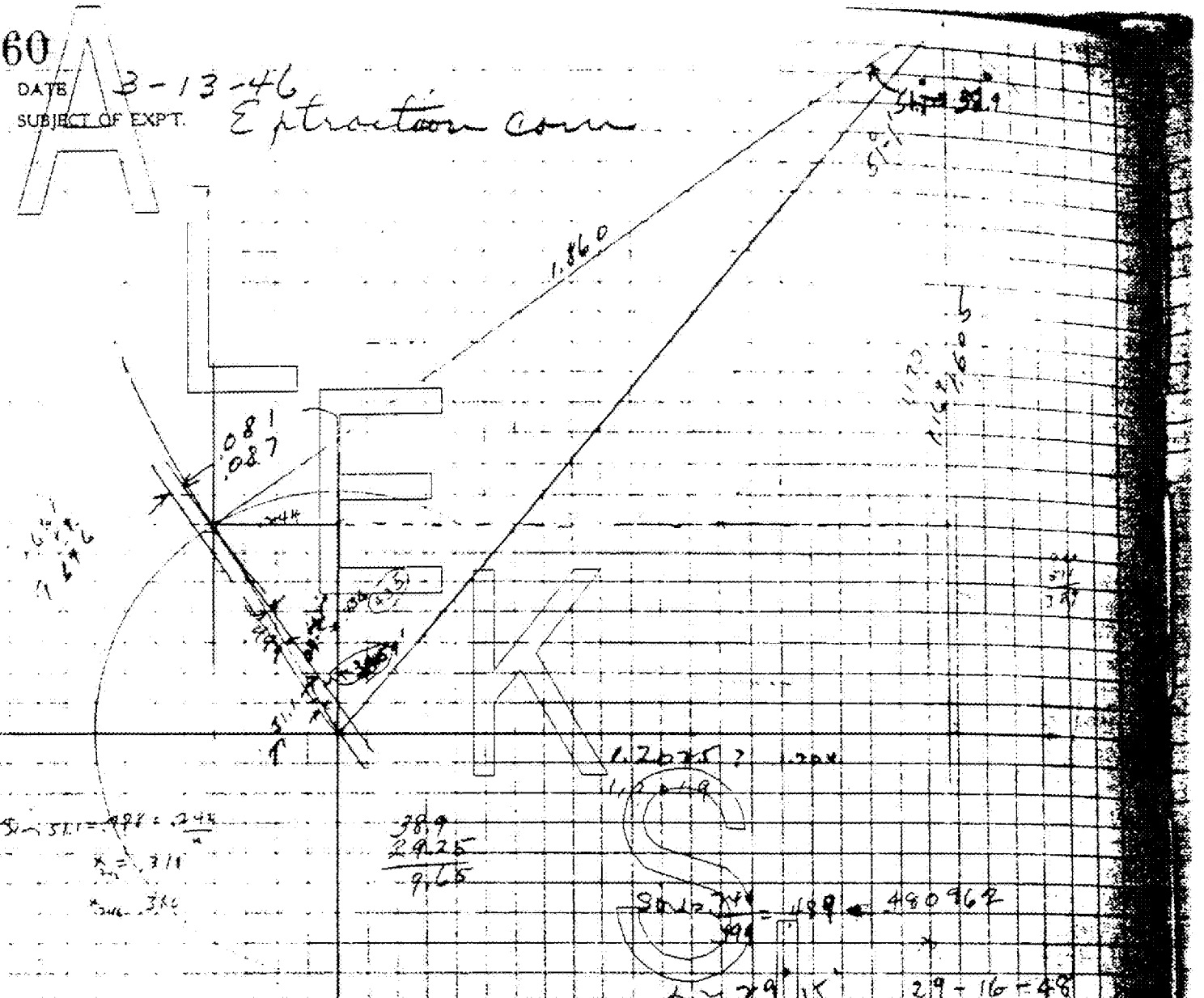
DATE

DATE

60

DATE 2-13-46

SUBJECT OF EXPT. Extraction cam



EXPERIMENTER

WITNESS

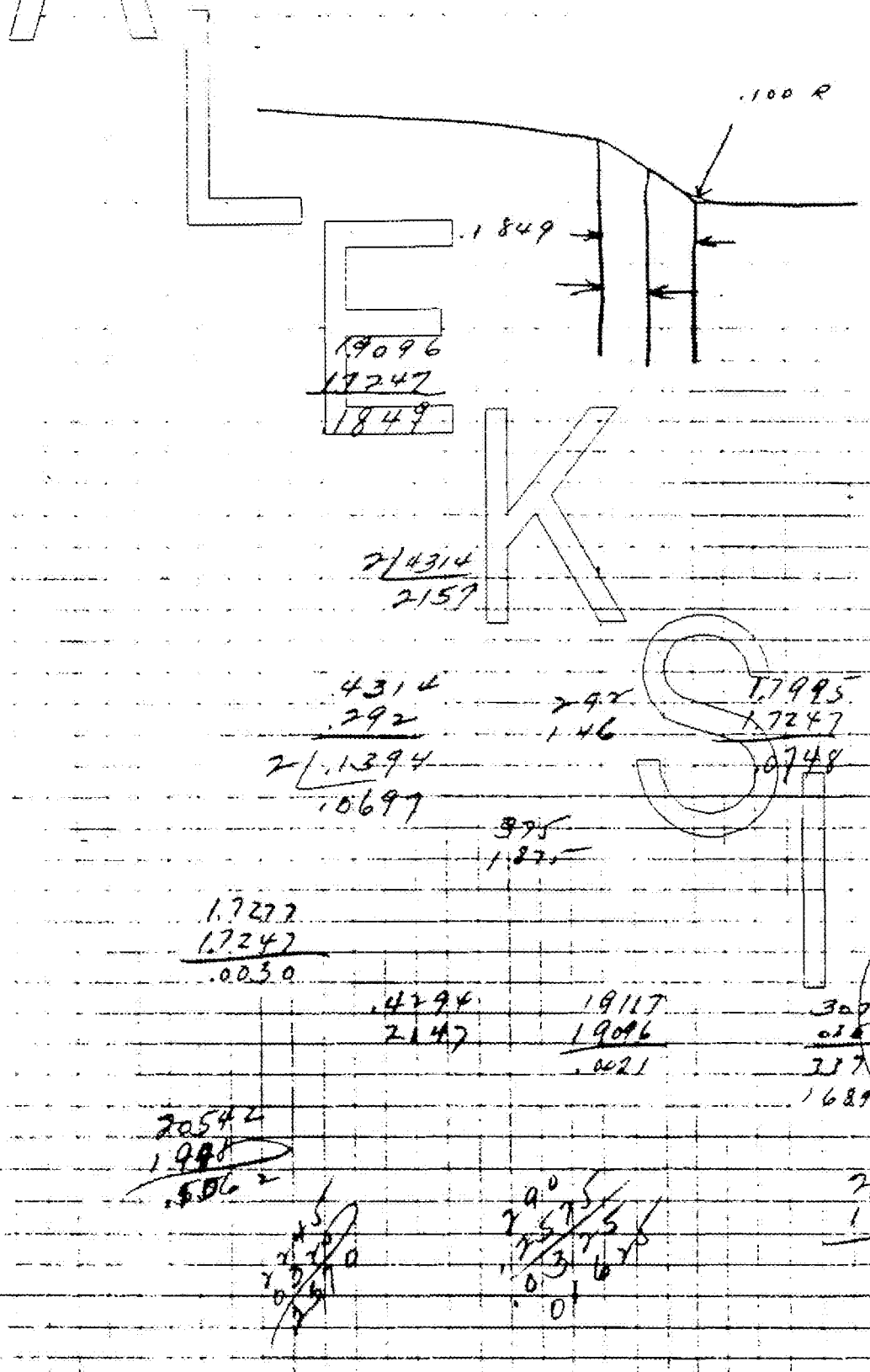
DATE

DATE

AL 0029677

DATE 4-8-46

SUBJECT OF EXPT. .274 Rem.



13883

AL 0029678

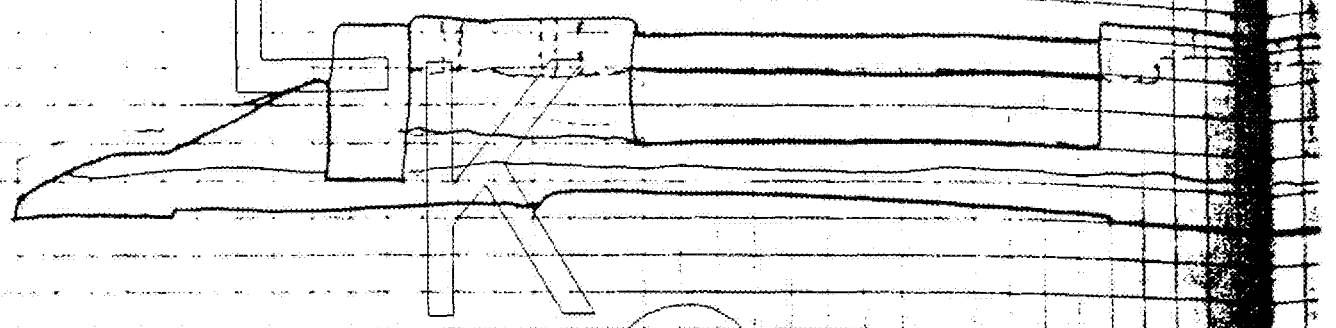
EXPERIMENTER DATE

WITNESS DATE

62

DATE 5-21-46

SUBJECT OR EXPT. Sketch for Signs



ALEXSIC

EXPERIMENTER

WITNESS

DATE

DATE

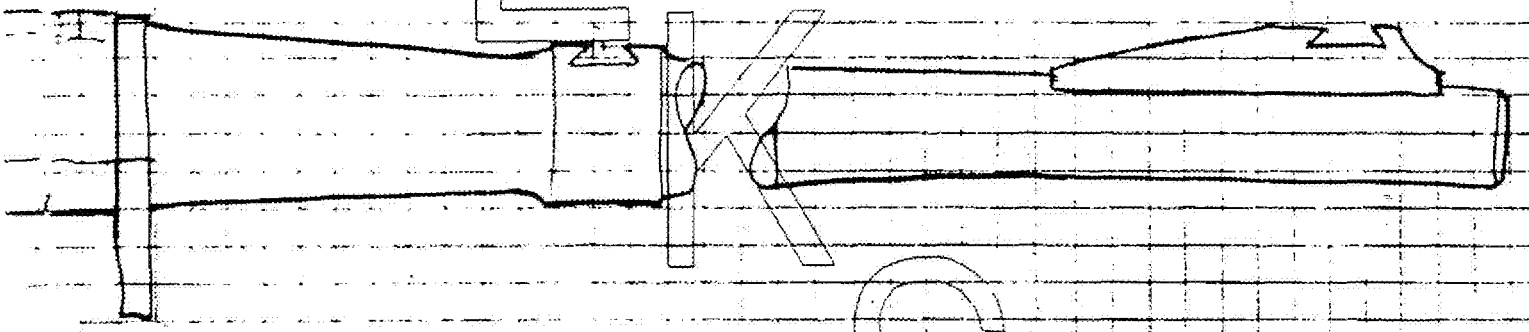
7/1983

AL 0029679

DATE

SUBJECT OF EXPT.

ALEXSIC



75283

EXPERIMENTER

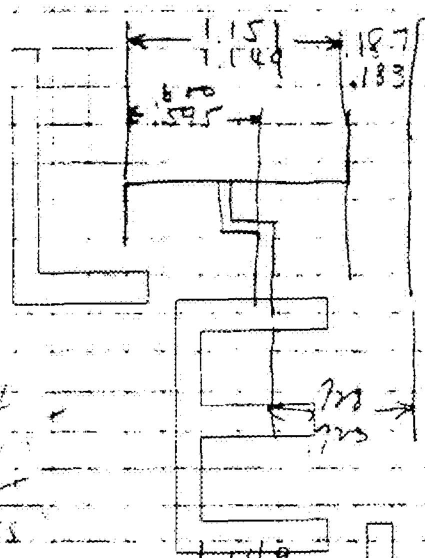
WITNESS

DATE

DATE

DATE 8-25-47

SUBJECT OF EXPT. Bbl + Bolt Clear.



93
2
95

1.151
.187
1.338
.723
.615
.595
.020 Max

1.149
.183
1.332
.728
.604
.600
.004 Clear min

.4485

1.151
.187
1.338
.4485
.8895

1.149
.183
1.332
.4515
.8805

EXPERIMENTER DATE

WITNESS DATE

DATE 10-1-48

SUBJECT OF EXPT. New Calculations for Report in "Product Engineering Article"

BARREL STRENGTH

FORMULAE Lame's

$$S = \frac{P(r_2^2 + r_1^2)}{r_2^2 - r_1^2}$$

S = stress tang.
P = Int press.
r_1 = inside r
r_2 = outside r
t = thickness

$r_1 = .250'' = .0625'$

$r_2 = .575'' = .331'$

$P = 84000$ psi

$$S = \frac{84000(.343)}{.269}$$

$$= 123,000 \text{ psi}$$

$$S' = \frac{\frac{1}{2} r P}{t}$$

$$= \frac{\frac{1}{2}(.250)\,84{,}000}{.575}$$

$S' = 18,250$ tangit

$\frac{123{,}000}{18{,}250} = 6.75$

ORDNANCE

$$\Theta = \frac{P}{\frac{3}{2}\left(\frac{r_2^2 - r_1^2}{r_2^2 + 2r_1^2}\right)}$$

Θ = Elastic Limit of material used

$$= \frac{84000}{\frac{3}{2}\left(\frac{.264}{.724}\right)}$$

$$= \frac{84{,}000}{.551}$$

$$= 152{,}000$$

77983

EXPERIMENTER DATE

WITNESS DATE

AL 0029682

DATE 10-5-45

SUBJECT OF EXPT. A

Cox's

$$Y = \frac{2}{3} \frac{P}{W^2 - 1} \left(2W^2 + 1 \right)$$

W = outside dia / inside dia

P = Pressure unit

Y = Stress

$= \frac{1.15}{.5} = 2.3$ $W^2 = 5.19$

$Y = \frac{2}{3} \frac{8400}{4.19}$ 11.38

$= 15,000$

K

Average S using LAMES $P_o = 0$

$$S = \frac{P \left(r_1^2 + \frac{r_1^2 r_2^2}{r^2} \right)}{r_2^2 - r_1^2}$$

Substituting

$r = .250$	S_1	$= 123,000$	
$r = .331$	S_2	$= 80,600$	$203,600$
$r = .412$	S_3	$= 57,200$	$132,800$
$r = .494$	S_4	$= 43,600$	$100,400$
$r = .575$	S_5	$= 38,800$	$82,400$

C

78,983

EXPERIMENTER DATE

WITNESS DATE

AL 0129683

DATE 10-4-48

SUBJECT OF EXPT. CON'T.

ALEK

AREA = $\frac{123,000 + 80,600}{2}(.081) = 8230$

$\frac{80,600 + 57,200}{2}(.081) = 5580$

$\frac{57,200 + 45,600}{2}(.082) = 4160$

$\frac{45,600 + 38,800}{2}(.081) = 3420$

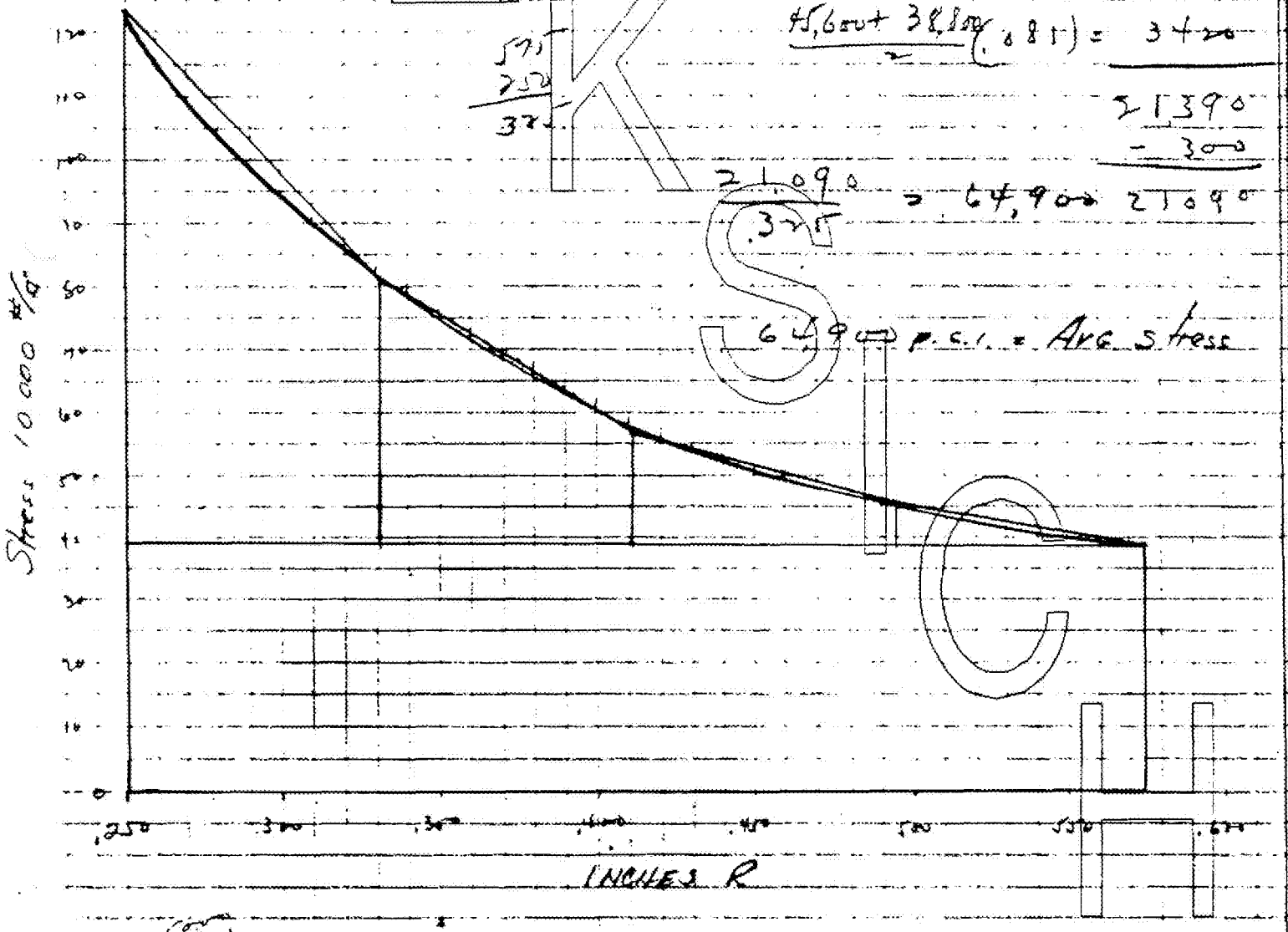
21390

− 300

21090

$\frac{21090}{325} = 64,900$

64,900 P.S.I. = Avg. stress



77983

EXPERIMENTER DATE

WITNESS DATE

AL 0029684

DATE 10-11-82

SUBJECT OF EXPT. Cont. LOCK TIME

A

$E = \frac{1}{2} M V^2$

$E = PS.$

$V = \frac{2S}{T}$

$V = \sqrt{\frac{2E}{M}}$

$T = \frac{2S}{\sqrt{\frac{2PS}{M}}}$

$= K$

$V = \frac{V_1 - V_2}{2}$

$V_1 = 0$

$V = \frac{V_2}{2}$

$\frac{2\left(\frac{.300}{12}\right)}{\frac{2(21)\frac{.500}{12}}{67.9 \times .022}} = \frac{2(.025)}{\frac{1.0}{.00447}}$

$= \frac{.050}{\sqrt{2246}} = \frac{.050}{149} = .00334$

$2l\left(\frac{.300}{12}\right) = \frac{1}{2} \frac{67.9(.022)}{32} V^2$

$T^2 = \frac{4S^2}{\frac{2PS}{M}}$

$T^2 = \frac{2SM}{P}$

80983

EXPERIMENTER DATE

WITNESS DATE

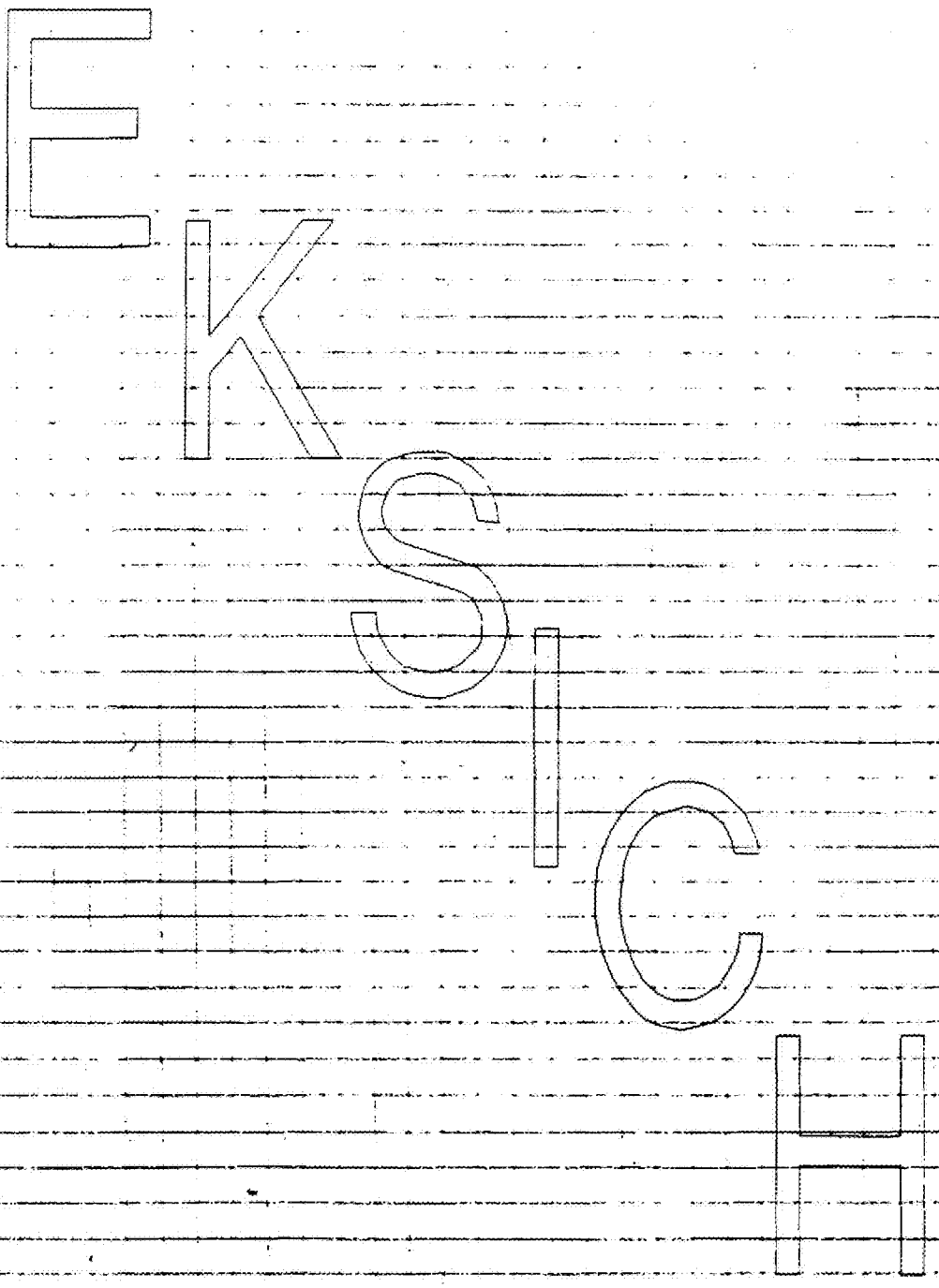
AL 0029685

DATE

SUBJECT OR EXPT.

$T = \sqrt{\frac{2MS}{P}}$

$E = \frac{1}{2} m v^2 \quad E = PS$



8/8/53

EXPERIMENTER DATE

WITNESS DATE

10

DATE

SUBJECT OF EXPT.

EXPERIMENTER DATE

WITNESS DATE

DATE

SUBJECT OF EXPTL

THIS BOOK MICROFILMED
AS COMPLETE
MAKE NO ADDITIONAL ENTRIES

EXPERIMENTER

WITNESS:

DATE

DATE