MIL-S-971A
17 JULY 1953
SUPERSEDING
MIL-S-971(SHIPS)
15 NOVEMBER 1949
NAVY 42S1i
1 SEPTEMBER 1945

MILITARY SPECIFICATION

SCREWS, WOOD

This specification has been approved by the Departments of the Army, the Navy, and the Air Force.

1. SCOPE

1.1 **Scope.**—This specification covers wood screws with flat, round, and oval heads having slotted or cross recessed type driving connections.

1.2 **Classification.**

1.2.1 *Wood screws.*—Cross recessed wood screws are for installation with the "Phillips" type screw drivers or bits. Wood screws shall be of the following types, as specified (see 6.1):

Type A—Flat-head, slotted.
Type B—Round-head, slotted.
Type C—Oval-head, slotted.
Type D—Flat-head, cross recessed.
Type E—Round-head, cross recessed.
Type F—Oval-head, cross recessed.

2. APPLICABLE SPECIFICATIONS, STANDARDS, DRAWINGS, AND PUBLICATIONS

2.1 The following specifications and standards, of the issue in effect on date of invitation for bids, form a part of this specification:

SPECIFICATIONS

FEDERAL

NN-B-591 — Boxes, W
Fiberboard (for Domestic Shipment).
NN-B-601 — Boxes, Wood-Cleated-Plywood, for Domestic Shipment.
NN-B-621 — Boxes, Wood, Nailed and Lock-Corner.
NN-K-231 —Kegs; Wood, Black.
LLL-B-631 — Boxes, Fiber, Corrugated (for Domestic Shipment).
LLL-B-636 —Boxes, Fiber, Solid (for Domestic Shipment).

MILITARY

JAN-P-100 —Packaging and Packing for Overseas Shipment: General Specification.
JAN-P-103 —Packaging and Packing for Overseas Shipment — Boxes; Wood-Cleated, Solid-Fiberboard.
JAN-P-105 —Packaging and Packing for Overseas Shipment — Boxes; Wood, Cleated Plywood.
JAN-P-106 —Packaging and Packing for Overseas Shipment — Boxes, Wood, Nailed.
JAN-P-108 —Packaging and Packing for Overseas Shipment—Boxes, Fiberboard (V-Board and W-Board), Exterior and Interior.
MIL-P-116 — Preservation, Methods of.
JAN-P-120 —Packaging and Packing — Cartons,
Folding, Paperboard.

JAN–P–133 —Packaging and Packing for Overseas Shipment—Boxes, Set-Up, Paperboard.

JAN–P–139 —Packaging and Packing for Overseas Shipment — Plywood, Container Grade.

MIL–P–3682 — Packaging of Hardware, Builders and Pole Line.

MIL–L–10547 — Liners, Case, Waterproof.

STANDARDS

MILITARY

MIL–STD–105 — Sampling Procedures and Tables for Inspection by Attributes.

MIL–STD–129—Marking of Shipments.

(Copies of specifications, standards, and drawings required by contractors in connection with specific procurement functions should be obtained from the procuring agency or as directed by the contracting officer.)

2.2 Other publications. — The following publications, of the issue in effect on date of invitation for bids, unless otherwise stated, form a part of this specification:

POST OFFICE DEPARTMENT

Postal Regulations.

(Application for copies should be addressed to the Post Office Department, Washington 25, D.C.).

CONSOLIDATED CLASSIFICATION COMMITTEE

Consolidated Freight Classification Rules.

(Application for copies should be addressed to the Consolidated Classification Committee, 202 Chicago Union Station, Chicago 6, Ill.)

AMERICAN TRUCKING ASSOCIATION

Motor Freight Classification Rules.

(Application for copies should be addressed to the American Trucking Association, 1424 — 16th Street, N.W., Washington 6, D.C.)

3. REQUIREMENTS

3.1 Material.—Screws shall be made of steel or brass as specified (see 6.1).

3.2 General.—Screws shall be furnished with gimlet points unless cone or diamond-points are specified (see 6.1).

3.3 Wood screws.

3.3.1 *Measurement of lengths.*—The length of the screw is defined as the distance from largest diameter of bearing surface of the head to the extreme end of the point measured parallel to the axis of the screw.

3.3.2 *Measurement of diameters.* — The diameter of the screw is defined as the diameter of the body of the screw directly under the head.

3.3.3 *Tolerances on diameter.*—The maximum permissible variation on diameter is plus 0.004 or minus 0.007 inch (or plus 0.1 or minus 0.2 mm.).

3.3.4 *Standard sizes.* — The numbered screw sizes, basic and limiting diameters, and threads per inch specified in table I are standard.

3.3.5 *Tolerance on number of threads per inch.*—The maximum permissible variation in the number of threads per inch is plus or minus 10 percent.

3.3.6 *Finish.*—Wood screws shall be finished plain and uncoated, unless blued, nickel-plated, or other special finish is specified (see 6.1).

3.3.7 *Head proportions and length of thread.*—The proportions of the head and length of thread shall be as shown on figures 1 and 2 and tables II, III, IV, V, VI, and VII.

3.3.8 *Included angle.*—The included angle of the head on flat- and oval-head slotted and cross recessed screws shall be 82 degrees, with a permissible variation of plus 0 degrees and minus 2 degrees.

3.3.9 *Tolerances on length.*

3.3.9.1 *Flat- and oval-head screws.*—The permissible variations in the length of flat- and oval-head slotted and cross recessed screws shall be as specified in table VIII.

3.3.9.2 *Round-head screws.*—The maximum permissible variations in the length of round head slotted and cross recessed screws shall be as specified in table IX.

3.3.10 *Standard sizes.*

3.3.10.1 *Steel screws slotted.*—The standard size of slotted steel screws shall be as specified in table X.

3.3.10.2 *Brass screws slotted.*—The standard size of slotted brass screws shall be as specified in table XI.

3.3.10.3 *Steel screws cross recessed.*—The standard size of cross recessed steel screws shall be as specified in table XII.

3.3.10.4 *Brass screws cross recessed.*—The standard size of cross recessed brass screws shall be as specified in table XIII.

3.3.10.5 The cross recesses of all cross recessed wood screws shall be concentric with the axis of the body within a tolerance of 3 percent of the maximum head diameter or 0.010 inch, whichever is greater.

3.4 **Workmanship.**—Screws shall be free from any defects which would affect serviceability.

4. SAMPLING, INSPECTION, AND TEST PROCEDURES

4.1 **Inspection lot.**—All screws of the same size and type presented at one time shall be considered a lot for purposes of acceptance inspection and tests.

4.2 **Sampling for lot acceptance.**

4.2.1 *Sampling for inspection.*

4.2.1.1 *Sampling for intermittent procurement in isolated lots.*—A random sample of screws shall be selected from each inspection lot of material offered for Government inspection of visual and dimensional characteristics with lot acceptance based on the following single sampling inspection requirements in accordance with Standard MIL–STD–105:

Sampling for visual and dimensional inspection AQL (approx.) = 4.0 percent defective.

Number of screws in inspection lot	Number of screws in sample	Acceptance number (defectives)	Rejection number (defectives)
110 or under	10	1	2
111 to 300	15	1	2
301 to 500	25	2	3
501 to 800	35	3	4
801 to 3,200	50	4	5
3,201 to 8,000	75	6	7
8,001 to 22,000	110	8	9
22,001 to 110,000	150	11	12
110,001 and over	300	20	21

4.2.1.2 *Sampling for continuous production.*—Where there is continuous production for the Government and inspection lots include at least 5,000 items, sampling for Government inspection shall be conducted in accordance with Standard MIL–STD–105 at inspection level I and AQL = 4.0 percent defective; the type of sampling to be determined by the Government inspector.

4.3 **Inspection.**

4.3.1 *Visual and dimensional inspection.*—Each of the sample screws selected in accordance with 4.2.1.1 shall be visually and dimensionally inspected by the Government inspector to verify compliance with this specification. Any screw in the sample containing one or more visual or dimensional defects shall be rejected, and if the number of defective screws in any sample exceeds the

acceptance number for that sample, the lot represented by the sample shall be rejected. Rejected lots may be offered again for Government inspection provided the contractor has removed all nonconforming screws. The Government inspector shall again select and examine samples from such resubmitted lots to verify compliance with this specification.

4.3.2 The cross recesses of cross recessed screws shall be inspected for penetration by the use of the gage shown on figures 3 and 4.

4.3.3 *Inspection gages.*—Unless otherwise specified in the contract or order, the manufacturer shall make available to the Government inspector the necessary gages in accordance with figures 3 and 4, the accuracy of which shall be certified in a manner satisfactory to the Government inspector. In case of controversy the certification of the National Bureau of Standards shall govern.

5. PREPARATION FOR DELIVERY

5.1 Cleaning, preservation, and packaging.

5.1.1 *For domestic shipment, immediate use.*—When specified in the contract or order, cleaning, preservation, and packaging shall be in accordance with the manufacturer's commercial practice.

5.1.2 *For domestic shipment and storage or overseas shipment.* — Unless otherwise specified in the contract or order, the screws shall be cleaned, preserved, and packaged in accordance with Specification MIL–P–3682. Unit and intermediate containers shall conform to Specification JAN–P–108, JAN–P–120, JAN–P–133, LLL–B–631, or LLL–B–636. Slack kegs shall conform to Specification NN–K–231. The gross weight of the boxes shall not exceed the weight limitations prescribed in the applicable container specification. The gross weight of slack kegs shall not exceed approximately 200 pounds. Closure and sealing of containers shall conform to the applicable container specification and appendix thereto.

5.2 Packing.

5.2.1 *For domestic shipment, immediate use.*—When specified in the contract or order, the screws, packaged as specified in 5.1.1, shall be packed in accordance with the Consolidated Freight Classification Rules, Postal Regulations, or Motor Freight Classification Rules, whichever may be applicable.

5.2.2 *For domestic shipment and storage.* —Unless otherwise specified in the contract or order, the screws, packaged as specified in 5.1.2 except those packaged in slack kegs, shall be packed in snug-fitting wood-cleated fiberboard, cleated plywood, nailed wood, corrugated, or solid fiberboard boxes conforming to Specification NN–B–591, NN–B–601, NN–B–621, LLL–B–631, or LLL–B–636, respectively. Containers shall conform to the special requirements of the applicable container specification and appendix thereto. The gross weight of wood boxes and slack kegs shall not exceed 200 pounds and that of fiberboard boxes 70 pounds. Slack kegs, where used, will require no overpacking.

5.2.3 *For overseas shipment.*—When specified in the contract or order, the screws, packaged as specified in 5.1.2 except those packaged in slack kegs, shall be packed in snug-fitting wood-cleated fiberboard, wood-cleated plywood, nailed wood, or fiberboard boxes conforming to Specification JAN–P–103, JAN–P–105, style 2 or 4 of Specification JAN–P–106, or symbol V3c or V3s of Specification JAN–P–108, respectively. Plywood shall conform to type A or B, condition I of Specification JAN–P–139. Boxes shall be lined with a waterproof case liner conforming to grade A or B of Specification MIL–L–10547, and sealed in accordance with the appendix thereto. Shipping containers shall be closed and strapped in accordance with the appendix of the applicable container specification. The gross weight of wood boxes shall not exceed 150 pounds; that of fiberboard boxes 70 pounds; and that of nailed slack kegs 200 pounds. Case liners will not

packaged

in fiberboard boxes conforming to Specification JAN–P–108 and appendix thereto. Slack kegs, where used, shall conform to Specification NN–K–231 and will require no overpacking.

5.3 For domestic shipment and storage and overseas shipment.—Where practicable, containers shall contain an identical number of items and shall be of uniform size. In addition, all containers shall be new, and shall be able to withstand storage, rehandling, and reshipment without the necessity of repacking. Cushioning methods and materials required to protect items from damage shall be in accordance with Specification JAN–P–100.

5.4 Preproduction (pilot pack sampling).—Prior to packing the item in quantity, a pilot pack shall be submitted to the Government inspector to determine conformance with the sampling, inspection, and test procedures of Specification MIL–P–116, except that the pilot pack will not be required when the prime or subcontractor has previously had such a pack tested and accepted for identical equipment on a military contract and can furnish satisfactory evidence that the equipment is being packed identically with the approved pack. Approval of the pilot pack shall not relieve the contractor of his obligation to preserve, package, and pack the equipment (and accessories where specified) in conformance with Specification MIL–P–116 and this specification.

5.5 Marking.—In addition to any special marking required by the contract or order, unit packages, intermediate, and exterior shipping containers shall be marked in accordance with Standard MIL–STD–129. The nomenclature shall be as follows: Screws, Wood.

6. NOTES

6.1 Ordering data. — Procurement documents should specify the following:

(a) Title, number, and date of this specification.

(b) Type required (see 1.2).

(c) Material required (see 3.1).

(d) If cone or diamond points are required (see 3.2).

(e) Finish required (see 3.3.6).

(f) Length and numbered size (see applicable table of dimensions).

(g) Whether to be furnished in packages or in bulk (kegs or barrels).

(h) Whether preparation for domestic or overseas shipment will be required; if domestic, the type required (see 5.1 and 5.2).

6.2 Wood screws are designated commercially by the length and the numbered size. The length is given first; for example, 1½ inch, No. 12.

6.3 Copies of U. S. Army Ordnance Engineering Standards may be obtained upon application to the Chief of Ordnance, Department of the Army, Washington 25, D. C.

Custodian:
Army—Ordinance Corps
Navy—Bureau of Ships

Other interest:
Army—ESigT
Navy—*MC*OrSY.

TABLE I.—*Standard size numbers, diameters, and pitches.*

No. of screw	Threads per inch	Diameter		
		Basic	Maximum	Minimum
		Inch	*Inch*	*Inch*
0	32	0.060	0.064	0.053
1	28	.073	.077	.066
2	26	.086	.090	.079
3	24	.099	.103	.092
4	22	.112	.116	.105
5	20	.125	.129	.118
6	18	.138	.142	.131
7	16	.151	.155	.144
8	15	.164	.168	.157
9	14	.177	.181	.170
10	13	.190	.194	.183
11	12	.203	.207	.196
12	11	.216	.220	.209
14	10	.242	.246	.235
16	9	.268	.272	.261
18	8	.294	.298	.287
20	8	.320	.324	.313
24	7	.372	.376	.365

TABLE II.—*Head proportions of type A slotted, flat-head, wood screws. (See fig. 1.)*[1]

Nominal size	D	A		H		J		T		S
	Diameter	Head diameter		Height of head		Width of slot		Depth of slot		Flat on min. screw
		Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	
	Inch	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*
0	0.060	0.119	0.105	0.035	0.026	0.023	0.016	0.015	0.010	0.002
1	.073	.146	.130	.043	.033	.026	.019	.019	.012	.003
2	.086	.172	.156	.051	.040	.031	.023	.023	.015	.003
3	.099	.199	.181	.059	.048	.035	.027	.027	.017	.004
4	.112	.225	.207	.067	.055	.039	.031	.030	.020	.004
5	.125	.252	.232	.075	.062	.043	.035	.034	.022	.005
6	.138	.279	.257	.083	.069	.048	.039	.038	.024	.005
7	.151	.305	.283	.091	.076	.048	.039	.041	.027	.005
8	.164	.332	.308	.100	.084	.054	.045	.045	.029	.006
9	.177	.358	.334	.108	.091	.054	.045	.049	.032	.006
10	.190	.385	.359	.116	.098	.060	.050	.053	.034	.007
11	.203	.411	.385	.124	.105	.057	.043	.056	.037	.007
12	.216	.438	.410	.132	.112	.067	.056	.060	.039	.008
14	.242	.491	.461	.148	.127	.075	.064	.068	.044	.009
16	.268	.544	.512	.164	.141	.075	.064	.075	.049	.010
18	.294	.597	.563	.180	.155	.084	.072	.083	.054	.011
20	.320	.650	.614	.196	.170	.084	.072	.090	.059	.012
24	.372	.756	.716	.228	.198	.094	.081	.105	.069	.013

[1] Edges of head may be rounded.

TABLE III.—*Head proportions of type B slotted, round-head, wood screws. (See fig. 1.)*[1]

Nominal size	D	A		H		J		T	
	Diameter	Head diameter		Height of head		Width of slot		Depth of slot	
		Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum
	Inch	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*
0	0.060	0.113	0.009	0.053	0.042	0.023	0.016	0.039	0.029
1	.073	.138	.122	.061	.051	.026	.019	.044	.033
2	.086	.162	.146	.070	.059	.031	.023	.048	.037
3	.099	.187	.169	.078	.067	.035	.027	.053	.040
4	.112	.211	.193	.086	.075	.039	.031	.058	.044
5	.125	.236	.217	.095	.083	.043	.036	.063	.047
6	.138	.260	.240	.103	.091	.048	.039	.068	.051
7	.151	.285	.264	.111	.099	.048	.039	.072	.055
8	.164	.309	.287	.119	.107	.054	.045	.077	.058
9	.177	.334	.311	.128	.115	.054	.045	.082	.062
10	.190	.359	.334	.136	.124	.060	.050	.087	.065
11	.203	.383	.358	.144	.132	.057	.043	.090	.067
12	.216	.408	.382	.152	.140	.067	.056	.096	.073
14	.242	.457	.429	.169	.156	.075	.064	.106	.080
16	.268	.506	.476	.185	.172	.075	.064	.115	.087
18	.294	.555	.523	.202	.188	.084	.072	.125	.094
20	.320	.604	.570	.219	.205	.084	.072	.134	.101
24	.372	.702	.664	.252	.237	.094	.081	.154	.116

[1] Edges of head may be rounded.

TABLE IV.—*Head proportions of type C slotted, oval-head, wood screws. (See fig. 1.)*[1]

Nominal size	D	A		H		J		T		F		F+H		S
	Diameter	Head diameter		Height of head		Width of slot		Depth of slot		Height of oval		Maximum	Minimum	Flat on min. screw
		Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum			
	Inch	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*
0	0.060	0.119	0.105	0.035	0.026	0.023	0.016	0.030	0.025	0.021	0.015	0.056	0.041	0.002
1	.073	.146	.130	.043	.033	.026	.019	.038	.031	0.25	.019	.068	.052	.003
2	.086	.172	.156	.051	.040	.031	.023	.045	.037	.029	.022	.080	.062	.003
3	.099	.199	.181	.059	.048	.035	.027	.052	.043	.033	.026	.092	.074	.004
4	.112	.225	.207	.067	.055	.039	.031	.059	.049	.037	.029	.104	.084	.004
5	.125	.252	.232	.075	.062	.043	.035	.067	.055	.041	.033	.116	.095	.005
6	.138	.279	.257	.083	.069	.048	.039	.074	.060	.045	.036	.128	.105	.005
7	.151	.305	.283	.091	.076	.048	.039	.081	.066	.049	.039	.140	.115	.005
8	.164	.332	.308	.100	.084	.054	.045	.088	.072	.053	.043	.153	.127	.006
9	.177	.358	.334	.108	.091	.054	.045	.095	.078	.057	.046	.165	.137	.006
10	.190	.385	.359	.116	.098	.060	.050	.103	.084	.061	.050	.177	.148	.007
11	.203	.411	.385	.124	.105	.057	.043	.110	.090	.065	.053	.189	.158	.007
12	.216	.438	.410	.132	.112	.067	.056	.117	.096	.069	.057	.201	.169	.008
14	.242	.491	.461	.148	.127	.075	.064	.132	.108	.077	.064	.225	.191	.009
16	.268	.544	.512	.164	.141	.075	.064	.146	.120	.084	.071	.248	.212	.010
18	.294	.597	.563	.180	.155	.084	.072	.160	.132	.092	.078	.272	.233	.011
20	.320	.650	.614	.196	.170	.084	.072	.175	.144	.100	.085	.196	.255	.012
24	.372	.756	.716	.228	.198	.094	.081	.204	.168	.116	.099	.344	.297	.013

[1] Edges of head may be rounded.

TABLE V.—*Head proportions of type D, flat-head cross recessed wood screws. (See fig. 2.)*

Nominal size	Dimensions of head[1]						Dimensions of recess			
	D	A		H		S[3]	Q[2]		M	Recess number
	Diameter	Head diameter		Height of head		Flat on min. screw	Penetration		Recess dia.	
		Maximum	Minimum	Maximum	Minimum		Maximum	Minimum	Maximum	
	Inch	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	
2	0.086	0.172	0.156	0.051	0.040	0.003	0.053	0.040	0.099	1
3	.099	.199	.181	.059	.048	.004	.058	.045	.104	1
4	.112	.225	.207	.067	.055	.004	.079	.066	.125	1
5	.125	.252	.232	.075	.062	.005	.072	.052	.151	2
6	.138	.279	.257	.083	.069	.005	.092	.072	.171	2
7	.151	.305	.283	.091	.076	.005	.107	.087	.186	2
8	.164	.332	.308	.100	.084	.006	.122	.102	.201	2
9	.177	.358	.334	.108	.091	.006	.132	.112	.211	2
10	.190	.385	.359	.116	.098	.007	.126	.106	.255	3
11	.203	.411	.385	.124	.105	.007	.136	.116	.265	3
12	.216	.438	.410	.132	.112	.008	.151	.131	.280	3
14	.242	.491	.461	.148	.127	.009	.171	.151	.300	3
16	.268	.544	.512	.164	.141	.010	.196	.176	.324	3
18	.294	.597	.563	.180	.155	.011	.207	.188	.375	4
20	.320	.650	.614	.196	.170	.012	.222	.203	.390	4
24	.372	.756	.716	.228	.198	.013	.253	.234	.421	4

[1] The radius of the fillet under the head shall not exceed the pitch of the thread.

[2] All recess dimensions are controlled by the penetration Q of standard gage points as specified in table XIV and figure 3.

[3] Edges of head may be rounded.

TABLE VI.—*Head proportions of type E, round-head cross recessed wood screws. (See fig. 2.)*

Nominal size	Dimensions of head[1]					Dimensions of recess			
	D	A		H		Q		M	
	Diameter	Head diameter		Height of head		Penetration[2]		Recess diameter	Recess number
		Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	
	Inch	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	
2	0.086	0.162	0.146	0.070	0.059	0.054	0.035	0.111	1
3	.099	.187	.169	.078	.067	.063	.045	.119	1
4	.112	.211	.193	.086	.075	.073	.056	.127	1
5	.125	.236	.217	.095	.083	.060	.035	.151	2
6	.138	.260	.240	.103	.091	.070	045	.159	2
7	.151	.285	.264	.111	.099	.078	.055	.167	2
8	.164	.309	.287	.119	.107	.087	.064	.175	2
9	.177	.334	.311	.128	.115	.096	.073	.183	2
10	.190	.359	.334	.136	.124	.105	.082	.192	2
12	.216	.408	.382	.152	.140	.105	.082	.246	3
14	.242	.457	.429	.169	.156	.122	.099	.262	3
16	.268	.506	.476	.185	.172	.139	.119	.278	3
18	.294	.555	.523	.202	.188	.153	.131	.336	4
20	.320	.604	.570	.219	.205	.174	.148	.353	4
24	.372	.702	.664	.252	.237	.205	.182	.384	4

[1] The radius of the fillet under the head shall not exceed one-half of the pitch of the thread.

[2] All recess dimensions are controlled by the penetration Q of standard gage points as specified in table XIV and figure 8.

TABLE VII.—*Head proportions of type F, oval-head cross recessed wood screws. (See fig. 2.)*[3]

Nominal size	Dimensions of head[1]								Dimensions of recess			
	A			H		O		S	Q[2]		M	Recess number
	Diameter of head			Height of head		Total Height of head		Flat on minimum screw	Penetration		Recess diam.	
	Maximum sharp	Minimum sharp	Minimum with maximum S	Maximum	Minimum	Maximum	Minimum		Maximum	Minimum	Maximum	
	Inch	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	
2	0.172	0.156	0.150	0.051	0.040	0.080	0.062	0.003	0.059	0.045	0.109	1
3	.199	.181	.175	.059	.048	.092	.074	.004	.071	.057	.121	1
4	.225	.207	.200	.067	.055	.104	.084	.004	.084	.070	.133	1
5	.252	.232	.225	.075	.062	.116	.095	.005	.071	.050	.155	2
6	.279	.257	.249	.083	.069	.128	.105	.005	.091	.069	.175	2
7	.305	.283	.275	.091	.076	.140	.115	.006	.101	.081	.186	2
8	.332	.308	.300	100	.084	.153	.127	.006	.117	.095	.202	2
9	.358	.334	.325	.108	.091	.165	.137	.006	.130	.108	.213	2
10	.385	.359	.348	.116	.098	.177	.148	.007	.122	.101	.258	3
12	.438	.410	.397	.132	.112	.201	.169	.008	.145	.123	.280	3
14	.491	.461	.346	.148	.127	.225	.191	.009	.168	.146	.302	3
16	.544	.512	.495	.164	.141	.248	.212	.010	.194	.172	.329	3
18	.597	.563	.544	.180	.155	.272	.233	.011	.203	.182	.378	4
20	.650	.614	.594	.196	.170	.296	.255	.012	.222	.201	.379	4
24	.756	.716	.694	.228	.198	.344	.297	.013	.259	.238	.433	4

[1] The radius of the fillet under the head shall not exceed one-half of the pitch of the thread.

[2] All recess dimensions are controlled by the penetration of Q of standard gage points as specified in table XIV and figure 3.

[3] Edges of head may be rounded.

TABLE VIII.—*Tolerances on length of type A, flat-head slotted, type C, oval-head slotted, type D flat-head cross recessed and type F, oval-head, cross recessed screws.*

Nominal length	Maximum length	Minimum length	Nominal length	Maximum length	Minimum length	Nominal length	Maximum length	Minimum length
Inch	*Inch*	*Inch*	*Inches*	*Inches*	*Inches*	*Inches*	*Inches*	*Inches*
¼	0.250	0.22	1¼	1.250	1.20	3	3.000	2.92
⅜	.375	.34	1½	1.500	1.45	3½	3.500	3.42
½	.500	.46	1¾	1.750	1.69	4	4.000	3.91
⅝	.625	.59	2	2.000	1.94	4½	4.500	4.40
¾	.750	.71	2¼	2.250	2.19	5	5.000	4.89
⅞	.875	.83	2½	2.500	2.43			
1	1.000	.96	2¾	2.750	2.68			

TABLE IX.—*Tolerances on length of type B, round-head slotted and type E, round-head cross recessed, screws.*

Screw No.	Tolerance,[1] minus	Screw No.	Tolerance,[1] minus	Screw No.	Tolerance,[1] minus
	Inch		*Inch*		*Inch*
0	0.06	6	0.10	12	0.15
1	.07	7	.11	14	.16
2	.08	8	.12	16	.18
3	.08	9	.13	18	.20
4	.09	10	.13	20	.22
5	.10	11	.14	24	.27

[1] Plus tolerance = 0.

TABLE X.—*Standard sizes and lengths of slotted steel screws (F, flat-head; R, round-head; O, oval-head).*

Lengths	No. 0 diameter, 0.060 inch	No. 1 diameter, 0.073 inch	No. 2 diameter, 0.086 inch	No. 3 diameter, 0.099 inch	No. 4 diameter, 0.112 inch	No. 5 diameter, 0.125 inch	No. 6 diameter, 0.138 inch	No. 7 diameter, 0.151 inch	No. 8 diameter, 0.164 inch
Inches									
1/4	FR	FR	FR	FR	FR	----	----	----	----
3/8	FR	FR	FR	FRO	FRO	FR	FR	FR	FR
1/2	----	FR	FR	FR	FRO	FRO	FRO	FRO	FRO
5/8	----	----	FR	FR	FRO	FRO	FRO	FRO	FRO
3/4	----	----	FR	FR	FRO	FRO	FRO	FRO	FRO
7/8	----	----	----	FR	FR	FR	FRO	FRO	FRO
1	----	----	----	FR	FR	FRO	FRO	FRO	FRO
1 1/4	----	----	----	----	FR	FR	FRO	FRO	FRO
1 1/2	----	----	----	----	FR	FR	FRO	FRO	FRO
1 3/4	----	----	----	----	----	----	FRO	FRO	FRO
2	----	----	----	----	----	----	FR	FR	FR
2 1/4	----	----	----	----	----	----	FR	FR	FR
2 1/2	----	----	----	----	----	----	FR	FR	FR
2 3/4	----	----	----	----	----	----	----	----	FR

Lengths	No. 9 diameter, 0.177 inch	No. 10 diameter, 0.190 inch	No. 11 diameter, 0.203 inch	No. 12 diameter, 0.242 inch	No. 14 diameter, 0.242 inch	No. 16 diameter, 0.268 inch	No. 18 diameter, 0.294 inch	No. 20 diameter, 0.320 inch	No. 24 diameter, 0.372 inch
Inches									
1/2	FR	FR	----	----	----	----	----	----	----
5/8	FR	FR	FR	FR	----	----	----	----	----
3/4	FRO	FRO	FR	FR	----	----	----	----	----
7/8	FRO	FRO	FR	FRO	FR	----	----	----	----
1	FRO	FRO	FRO	FRO	FRO	FR	----	----	----
1 1/4	FRO	FRO	FRO	FRO	FRO	FR	FR	----	----
1 1/2	FRO	FRO	FRO	FRO	FRO	FRO	FRO	FRO	----
1 3/4	FRO	FRO	FRO	FRO	FRO	FRO	FRO	FRO	----
2	FR	FRO	FRO	FRO	FRO	FRO	FRO	FRO	----
2 1/4	FR	FR	FR	FRO	FRO	FR	F	F	----
2 1/2	FR	FR	FR	FRO	FRO	FR	FR	FR	----
2 3/4	FR	FR	F	FR	FR	F	F	F	----
3	FR	FR	F	FRO	FRO	FR	FR	F	F
3 1/2	----	FR	F	FR	FR	FR	F	F	F
4	----	----	----	FR	FR	FR	F	F	F
4 1/2	----	----	----	----	F	F	F	F	F
5	----	----	----	----	F	F	F	F	F

TABLE XI.—*Standard sizes and lengths of slotted brass screws (F, flat-head; R, round-head, O, oval-head).*

Lengths	No. 0 diameter, 0.060 inch	No. 1 diameter, 0.073 inch	No. 2 diameter, 0.086 inch	No. 3 diameter, 0.099 inch	No. 4 diameter, 0.112 inch	No. 5 diameter, 0.125 inch	No. 6 diameter, 0.138 inch	No. 7 diameter, 0.151 inch
Inches								
1/4	FRO	FRO	FRO	FRO	FRO	---	---	---
3/8	FRO	FRO	FRO	FRO	FRO	FRO	FRO	---
1/2	---	FRO	FRO	FRO	FRO	FRO	FRO	FRO
5/8	---	---	FRO	FRO	FRO	FRO	FRO	FRO
3/4	---	---	FRO	FRO	FRO	FRO	FRO	FRO
7/8	---	---	---	---	FRO	FRO	FRO	FRO
1	---	---	---	---	FRO	FRO	FRO	FRO
1 1/4	---	---	---	---	---	---	FRO	FRO
1 1/2	---	---	---	---	---	---	FRO	FRO

Lengths	No. 8 diameter, 0.164 inch	No. 9 diameter, 0.177 inch	No. 10 diameter, 0.190 inch	No. 11 diameter, 0.203 inch	No. 12 diameter, 0.216 inch	No. 14 diameter, 0.242 inch	No. 16 diameter, 0.268 inch	No. 18 diameter, 0.294 inch
Inches								
1/2	FRO	---	---	---	---	---	---	---
5/8	FRO	FRO	FRO	---	---	---	---	---
3/4	FRO	FRO	FRO	FR	FRO	---	---	---
7/8	FRO	FRO	FRO	FR	FR	---	---	---
1	FRO	FRO	FRO	FR	FRO	FRO	---	---
1 1/4	FRO	FRO	FRO	FR	FRO	FRO	---	---
1 1/2	FRO	FRO	FRO	FR	FRO	FRO	---	---
1 3/4	FRO	FRO	FRO	FR	FRO	FRO	---	---
2	FRO	FRO	FRO	FR	FRO	FRO	F	F
2 1/4	---	---	FR	FR	FR	FR	F	F
2 1/2	---	---	FR	FR	FR	FR	F	F
3	---	---	---	---	FR	FR	F	F
3 1/2	---	---	---	---	F	F	F	F

TABLE XII.—*Standard sizes and lengths of steel, cross recessed wood screws.*

Length	No. 2 dia. 0.086 inch	No. 3 dia. 0.099 inch	No. 4 dia. 0.112 inch	No. 5 dia. 0.125 inch	No. 6 dia. 0.138 inch	No. 7 dia. 0.151 inch	No. 8 dia. 0.164 inch	No. 9 dia. 0.177 inch	No. 10 dia. 0.190 inch	No. 11 dia. 0.203 inch	No. 12 dia. 0.216 inch	No. 14 dia. 0.242 inch	No. 16 dia. 0.268 inch	No. 18 dia. 0.294 inch	No. 20 dia. 0.320 inch	No. 24 dia. 0.372 inch
Inches																
1/4	FRO	------	FRO	------	------	------	------	------	------	------	------	------	------	------	------	------
5/16	FRO	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
3/8	FRO	FR	FRO	FRO	FRO	------	------	------	------	------	------	------	------	------	------	------
1/2	FRO	FR	FRO	FRO	FRO	FR	FRO	------	------	------	------	------	------	------	------	------
5/8	FRO	FR	FRO	FRO	FRO	FR	FRO	------	------	------	------	------	------	------	------	------
3/4	------	------	FRO	FRO	FRO	FRO	FRO	FR	FR	------	FR	------	------	------	------	------
7/8	------	------	FR	FR	FRO	FRO	FRO	FR	FR	------	FR	------	------	------	------	------
1	------	------	FRO	FRO	FRO	FRO	FRO	FR	FRO	------	FR	FR	F	------	------	------
1 1/4	------	------	------	------	FRO	FRO	FRO	FR	FRO	------	FRO	FR	F	------	------	------
1 1/2	------	------	------	------	FRO	FRO	FRO	FR	FRO	------	FRO	FR	F	F	------	------
1 3/4	------	------	------	------	------	------	FR	FR	FRO	------	FRO	FR	F	F	------	------
2	------	------	------	------	------	------	FR	FR	FRO	------	FRO	FR	FR	F	------	------
2 1/4	------	------	------	------	------	------	------	------	F	------	F	F	------	------	------	------
2 1/2	------	------	------	------	------	------	FR	F	FRO	------	FRO	FR	FR	F	------	------
2 3/4	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
3	------	------	------	------	------	------	------	------	FR	------	FR	FR	F	F	------	------
3 1/2	------	------	------	------	------	------	------	------	F	------	F	F	F	F	------	------
4	------	------	------	------	------	------	------	------	------	------	------	F	F	F	------	------

Note 1.—This table of screw sizes is intended as a guide to the users of these screws. Diameters, lengths and head styles not regularly stocked will be available on order of a sufficient quantity. Letters in the vertical column indicate the style of head for a particular size of screw thus: F = flat head, R = round head, O = oval head.

Note 2.—For additional sizes, lengths, and head shapes required by the Army, see U. S. Army Ordnance Engineering Standards. (See 6.3.)

TABLE XIII.—*Standard sizes and lengths of brass, cross recessed wood screws.*

Length	No. 2 dia. 0.086 inch	No. 3 dia. 0.099 inch	No. 4 dia. 0.112 inch	No. 5 dia. 0.125 inch	No. 6 dia. 0.138 inch	No. 7 dia. 0.151 inch	No. 8 dia. 0.164 inch	No. 9 dia. 0.177 inch	No. 10 dia. 0.190 inch	No. 11 dia. 0.203 inch	No. 12 dia. 0.216 inch	No. 14 dia. 0.242 inch	No. 16 dia. 0.268 inch	No. 18 dia. 0.294 inch	No. 20 dia. 0.320 inch	No. 24 dia. 0.372 inch
Inches																
1/4	FR	------	FR	------	------	------	------	------	------	------	------	------	------	------	------	------
5/16	FRO	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
3/8	FRO	F	FRO	------	R	------	------	------	------	------	------	------	------	------	------	------
1/2	FRO	F	FRO	FRO	FRO	------	FR	------	------	------	------	------	------	------	------	------
5/8	------	------	FRO	FRO	FRO	------	FRO	------	------	------	------	------	------	------	------	------
3/4	------	------	FRO	FRO	FRO	FR	FRO	FR	FR	------	------	------	------	------	------	------
7/8	------	------	------	F	FRO	FR	FRO	F	FR	------	------	------	------	------	------	------
1	------	------	FRO	FRO	FRO	FRO	FRO	FR	FRO	------	FR	------	------	------	------	------
1 1/4	------	------	------	------	FRO	FRO	FRO	FR	FRO	------	FR	F	------	------	------	------
1 1/2	------	------	------	------	FRO	FR	FRO	FR	FRO	------	FR	F	------	------	------	------
1 3/4	------	------	------	------	------	------	FR	------	FR	------	FR	F	------	------	------	------
2	------	------	------	------	------	------	FRO	------	FRO	------	FR	FR	------	------	------	------
2 1/4	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
2 1/2	------	------	------	------	------	------	------	------	FR	------	FR	FR	------	------	------	------
2 3/4	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
3	------	------	------	------	------	------	------	------	------	------	F	F	------	------	------	------
3 1/2	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
4	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------

Note 1.—This table of screw sizes is intended as a guide to the users of these screws. Diameters, lengths and head styles not regularly stocked will be available on order of a sufficient quantity. Letters in the vertical column indicate the style of head for a particular size of screw thus: F = flat head, R = round head, O = oval head.

Note 2.—For additional sizes, lengths, and head shapes required by the Army, see U. S. Army Ordnance Engineering Standards. (See 6.3.)

TABLE XIV.—*Shank dimensions of gage points for cross recess penetration gage. (See fig. 3.)*

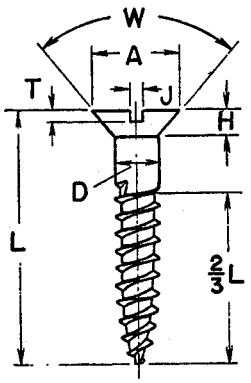
Size of recess gage	A ±.002	B ±.003	C ±.0001	D ±.0001	E ±.005	F ±.005	G ±.005
	Inch	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*
No. 1	0.012	0.020	0.0875	0.0871	5/32	11/16	13/16
No. 2	.018	.031	.1471	.1413	7/32	3/4	7/8
No. 3	.022	.037	.2097	.2093	1/4	25/32	29/32
No. 4	.031	.062	.3126	.3122	23/64	27/32	31/32

TABLE XV.—*Dimensions of cross recesses. (See fig. 4.)*

Dimensions (see fig. 4)	Recess number			
	1	2	3	4
G $^{+.002}_{-.000}$	0.050 inch	0.090 inch	0.150 inch	0.200 inch
B	$.0380^{+.000}_{-.001}$ inch	.0578 ± .001 inch	.0950 ± .001 inch	.1370 ± .001 inch
Milling angle	$7°\ ^{+15'}_{-0}$	$5°\ 45'\ ^{+15'}_{-0}$	$5°\ 45'\ ^{+15'}_{-0}$	$7°\ ^{+15'}_{-0}$
Point angle $^{+0°}_{-1°}$	28°	28°	28°	28°
Wing angle $^{+30'}_{-0}$	26° 30′	26° 30′	26° 30′	26° 30′
Base flute angle $^{+0}_{-15'}$	138°	140°	146°	153°
Side flute angle $^{+0}_{-15'}$	104°	92°	92°	92°
Width of base flute D $^{+.000}_{-.002}$	.018 inch	.033 inch	.080 inch	.096 inch
Wing thickness F	.020 inch .018 inch	.028 inch .025 inch	.030 inch .027 inch	.047 inch .044 inch

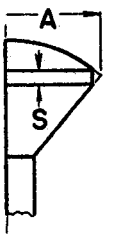
TABLE XVI.—*Dimensions of gage points.* (*See fig. 4.*)

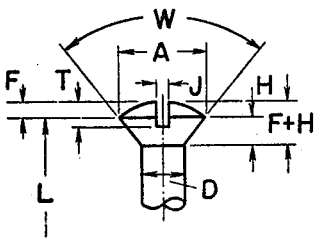
Dimensions (see fig. 4)	Recess number			
	1	2	3	4
G +.001 −.000	0.050 inch	0.090 inch	0.150 inch	0.200 inch
B +.000 −.001	.0394 inch	.0606 inch	.0983 inch	.1407 inch
Point angle +1° −0°	18°	18°	18°	18°
Milling angle +0 −15′	7°	5° 45′	5° 45′	7°
Flat on end	.015 inch .020 inch	.015 inch .020 inch	.015 inch .020 inch	.015 inch .020 inch
Wing angle +0 −15′	26° 30′	26° 30′	26° 30′	26° 30′
Angle E +15′ −0	138°	140°	146°	153°
Flute angle +15′ −0′	104°	92°	92°	92°
Wing thickness F	.018 inch .021 inch	.025 inch .028 inch	.030 inch .033 inch	.042 inch .045 inch
Width of bottom of flute +.000 −.001	.0202 inch	.0434 inch	.0826 inch	.1078 inch



FLAT HEAD

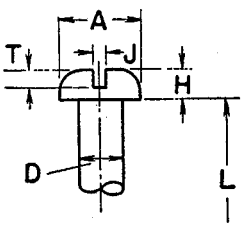
A	MAX. = 2.04 D - 0.003	
	MIN. = 1.96 D - 0.013	
H	MAX. = 0.619 D - 0.002	
	MIN. = 0.552 D - 0.007	
J	MAX. = 0.182 D + 0.020	
	MIN. = 0.164 D + 0.010	
T	MAX. = 0.288 D - 0.002	
	MIN. = 0.192 D - 0.002	
W	MAX. ANGLE, 82 DEG.	
	MIN. ANGLE, 80 DEG.	





OVAL HEAD

A	MAX. = 2.04 D - 0.003	
	MIN. = 1.96 D - 0.013	
H	MAX. = 0.619 D - 0.002	
	MIN. = 0.552 D - 0.007	
J	MAX. = 0.182 D + 0.020	
	MIN. = 0.164 D + 0.010	
T	MAX. = 0.556 D - 0.003	
	MIN. = 0.460 D - 0.003	
F	MAX. = 0.304 D + 0.003	
	MIN. = 0.268 D - 0.001	
F + H	MAX. = 0.923 D + 0.001	
	MIN. = 0.820 D - 0.006	
W	MAX. ANGLE, 82 DEG.	
	MIN. ANGLE, 80 DEG.	



ROUND HEAD

A	MAX. = 1.887 D	
	MIN. = 1.813 D - 0.010	
H	MAX. = 0.636 D + 0.015	
	MIN. = 0.624 D + 0.005	
J	MAX. = 0.182 D + 0.020	
	MIN = 0.164 D + 0.010	
T	MAX. = 0.362 D + 0.017	
	MIN. = 0.268 D + 0.013	

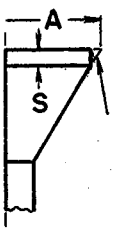
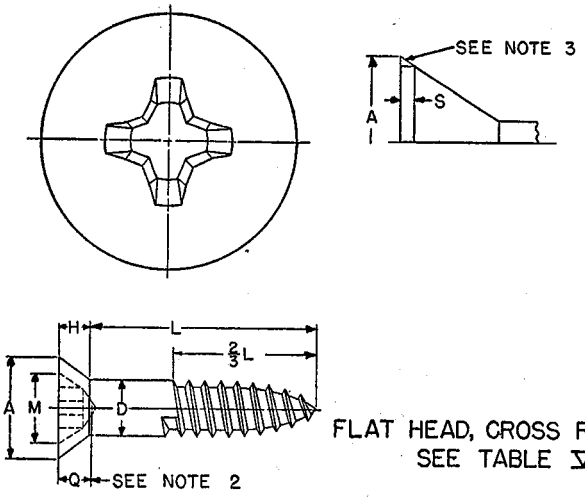
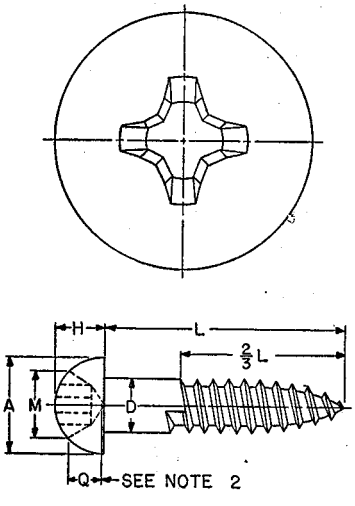


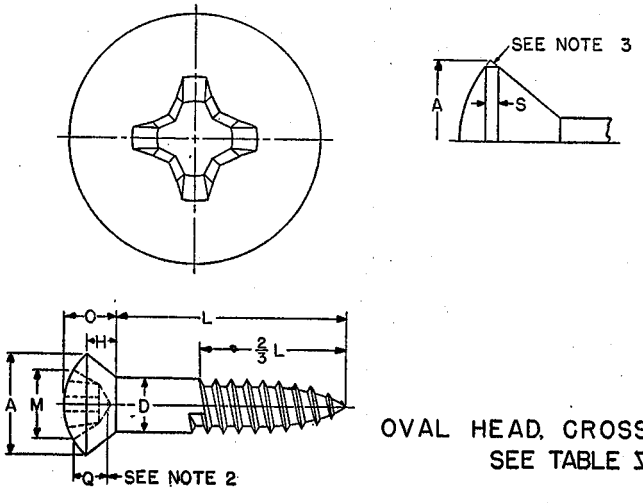
FIGURE 1.—*Head proportions and length of screws.*



FLAT HEAD, CROSS RECESSED
SEE TABLE V



ROUND HEAD, CROSS RECESSED
SEE TABLE VI



OVAL HEAD, CROSS RECESSED
SEE TABLE VII

FIGURE 2.—*Head proportions and length of screws.*

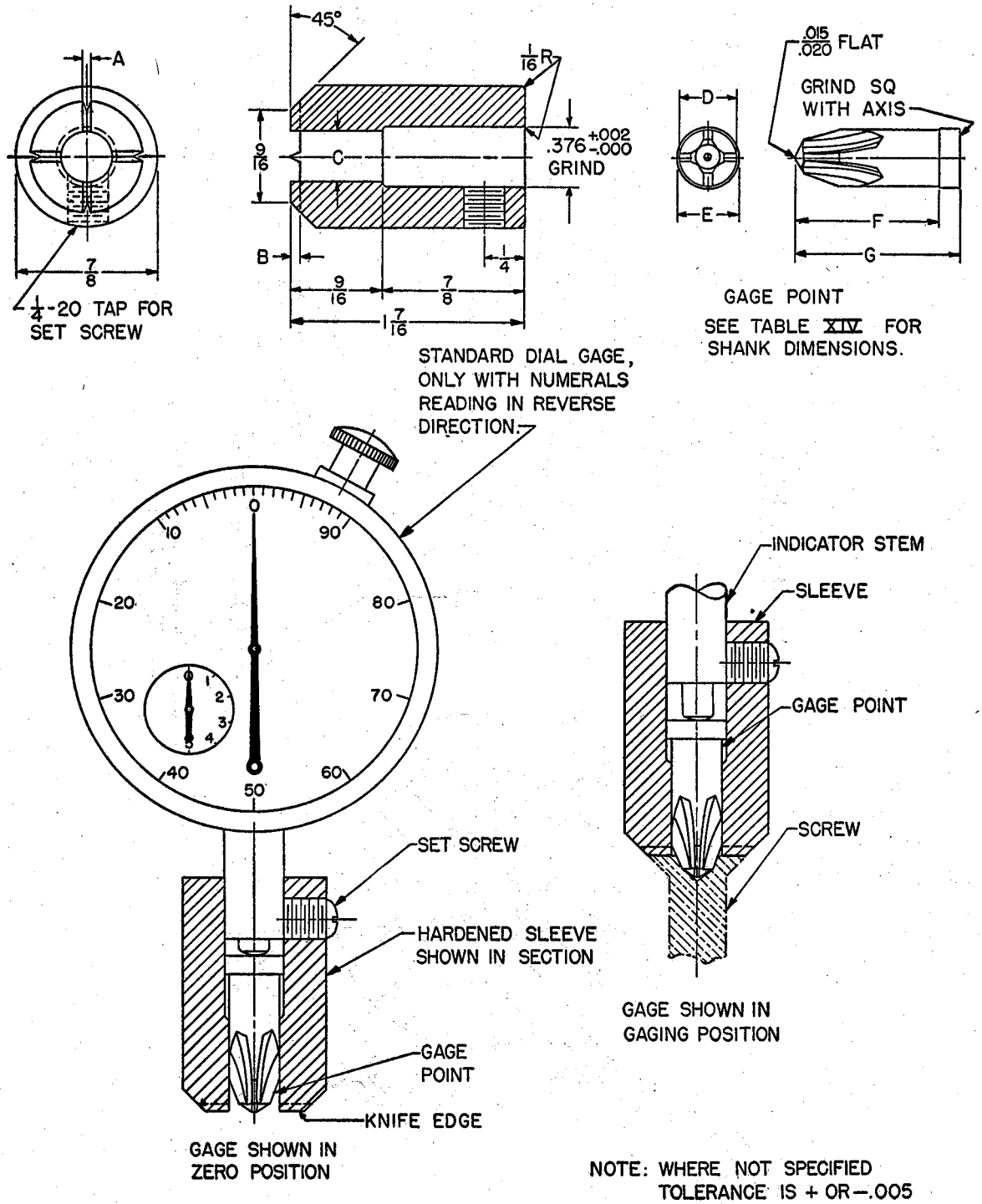


FIGURE 3.—*Penetration gage for cross recesses.*

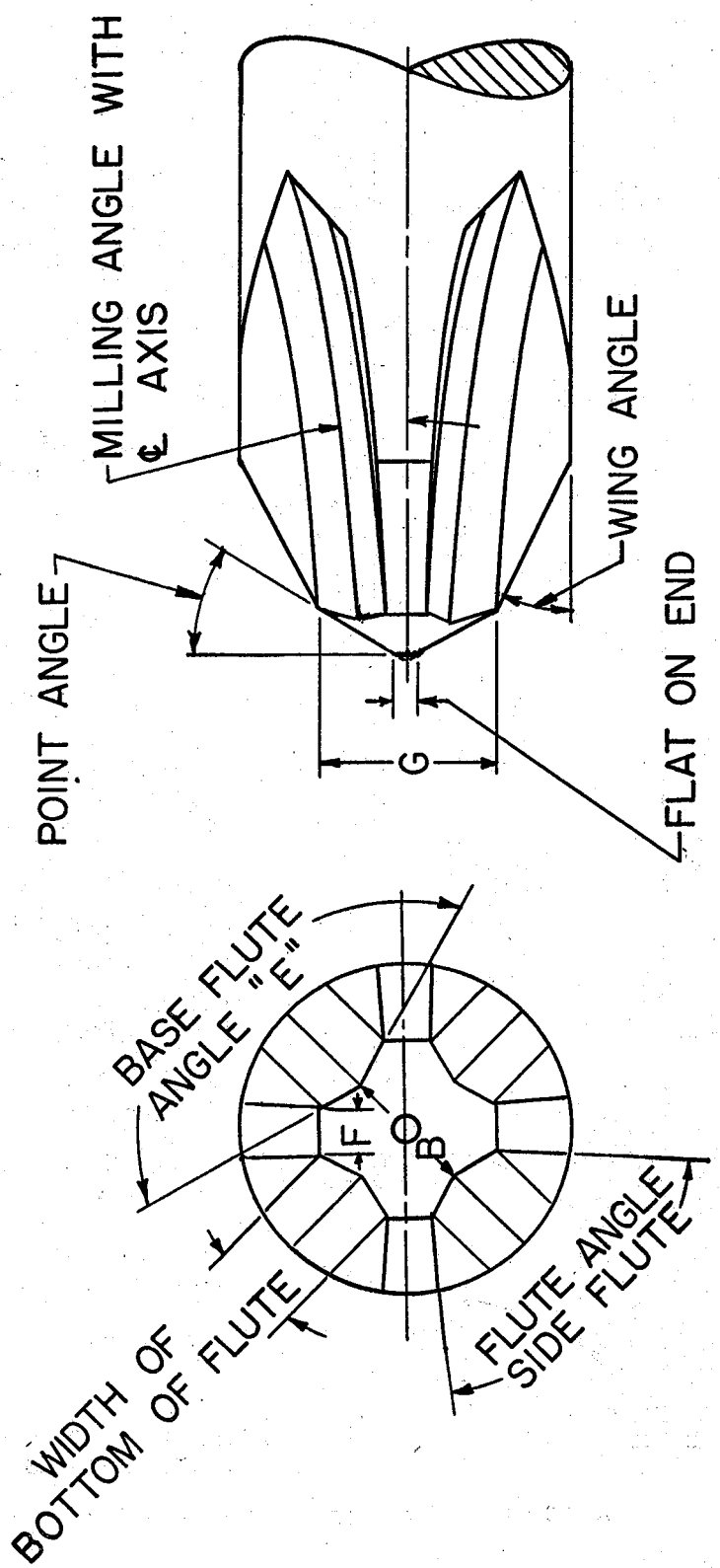


FIGURE 4.—*Gage point and recess dimensions (see tables XV and XVI).*