SET-UP and OPERATION
of
Brown & Sharpe
Automatic Screw Machines

No. 14

Of a Series of Booklets
for Training Operators

Attachments
and Tables

Brown & Sharpe Mfg. Co.
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NO. 14 OF A SERIES OF BOOKLETS FOR TRAINING OPERATORS

ATTACHMENTS AND TABLES

In progressing through this series of booklets, you have learned the principles of operation of a few Attachments which are representative of many others. In the following pages are briefly listed other Attachments, designed to increase production and expand the range of Brown & Sharpe Automatics. In principle of set-up and operation, they are similar to the Attachments with which you are now familiar, and with a little study, you should be able to understand them.

Useful tables are also given to assist in the general operation of the machines.

To anyone who has mastered the fundamentals in these booklets, our *"Construction and Use of Automatic Screw Machines"* offers much additional information to increase knowledge of Screw Machine work. The book also contains complete instructions and tables for designing cams. It will be sent postpaid for $1.25.

The Brown & Sharpe *"Machine Tools"* and *"Small Tools"* *Catalogs* listing Screw Machines, Tools, and the complete line of our manufacture will be gladly sent to any address on request.

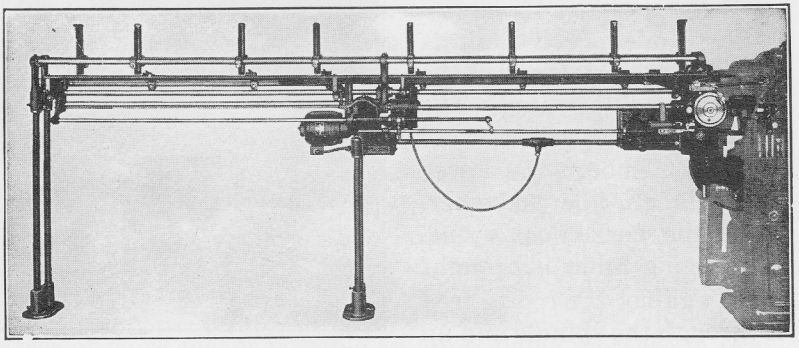
Automatic Rod Magazine — Electrically Controlled

The Automatic Rod Magazine consists essentially of two parts: (1) the magazine proper, into which stock can be loaded at any time; and (2) the feeding mechanism, which, at the proper time, takes a rod from the magazine and feeds it through the screw machine spindle, as described below. Through the use of this Attachment a substantial saving is realized, in that an appreciable reduction in idle machine time is effected. In addition, the operator is able to attend a greater number of machines and give more time to the requirements of the work.

When the rod on which the machine is working is used up, the machine (except the spindle) is automatically stopped, with the chuck open. At the same time, a switch is closed, starting the Attachment driving motor to set the Magazine feeding mechanism in motion. Drive is transmitted from the motor through a worm and wheel to a pinion, which meshes with teeth cut in the bottom of the stock pusher bar to advance the stock.

The new rod is fed through the chuck, ejecting the remaining end of the preceding rod, after which the machine automatically is started again. On completion of the feeding movement the Attachment motor reverses, returns the feeding mechanism to starting position and stops until another rod is to be fed.

The Attachment may be set to feed the rod just far enough so that the end will be squared by the cutting-off tool with the minimum waste of stock. Due to the control system used, rods for any set-up may vary up to 12 in. in length without affecting the accuracy of feed.



Automatic Rod Magazine — Electrically Controlled

If desired, the Attachment can be set to start feeding before the last piece has been cut from the preceding rod, the action being timed so that the new rod will enter the chuck immediately the preceding rod has been used up. This time-saving feature is used on set-ups where the operation is a short one and stock is consumed rapidly.

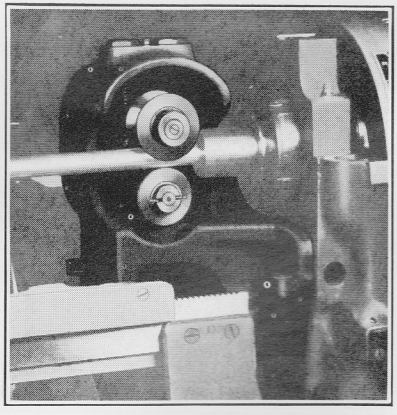
When using the Roller Feed and Timing Mechanism, the Rod Magazine is set to feed the bar only far enough to be gripped by the rollers. The magazine may be restocked at any time without interfering with the operation of either the machine or the Attachment.

Turret Swing Stock Stop is furnished with all Automatic Rod Magazines, and is used whenever the conditions are such that a turret stop must be used (in place of the machine's swing stop), unless the piece being made is of such length that the end of the rod to be ejected will clear a solid turret stop.

Roller Feed and Timing Mechanism

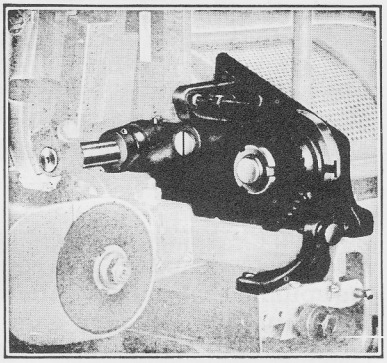
The Roller Feed and Timing Mechanism is used in conjunction with the Automatic Rod Magazine. It replaces the machine's regular feeding mechanism, and is designed primarily for use on jobs where the part is of such length as to necessitate more than one movement of the regular feeding mechanism per piece.

The Roller Feed Unit is mounted at the left end of the spindle, as illustrated. The upper of the two rollers is the driving member; the lower roller is an idler member. When the work chuck opens, the driving roller is brought down against the rod to feed it through the spindle and up to the stock stop.



Roller Feed

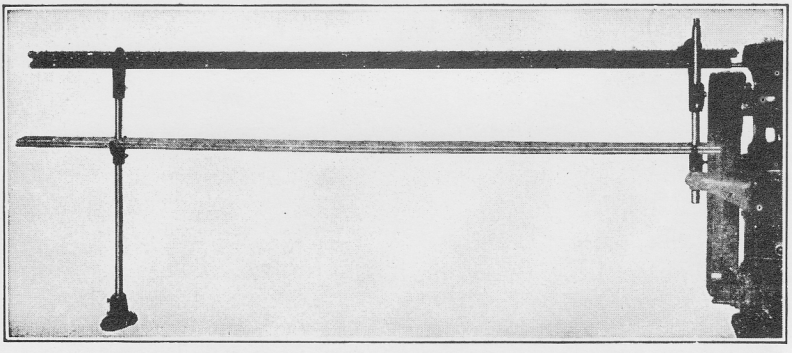
The Timing Mechanism is mounted on a bracket just above the rear cross slide, and serves to minimize waste by operating the swing stop to position each new rod for the first cut, which squares the end. On subsequent cuts the swing stop does not operate, and the rod is fed forward by roller feed to the stock stop in the turret, which is set for the required length of the piece.



Timing Mechanism

Silent Stock Support

Objectionable noise created by stock revolving in the stock tube of an Automatic Screw Machine is practically eliminated by this Silent Stock Support. The flexible metal guide, in which the stock rotates, is supported in a non-metallic casing which deadens sound and prevents transfer of noise and vibration. This is of particular advantage where hexagonal or square stock is used.



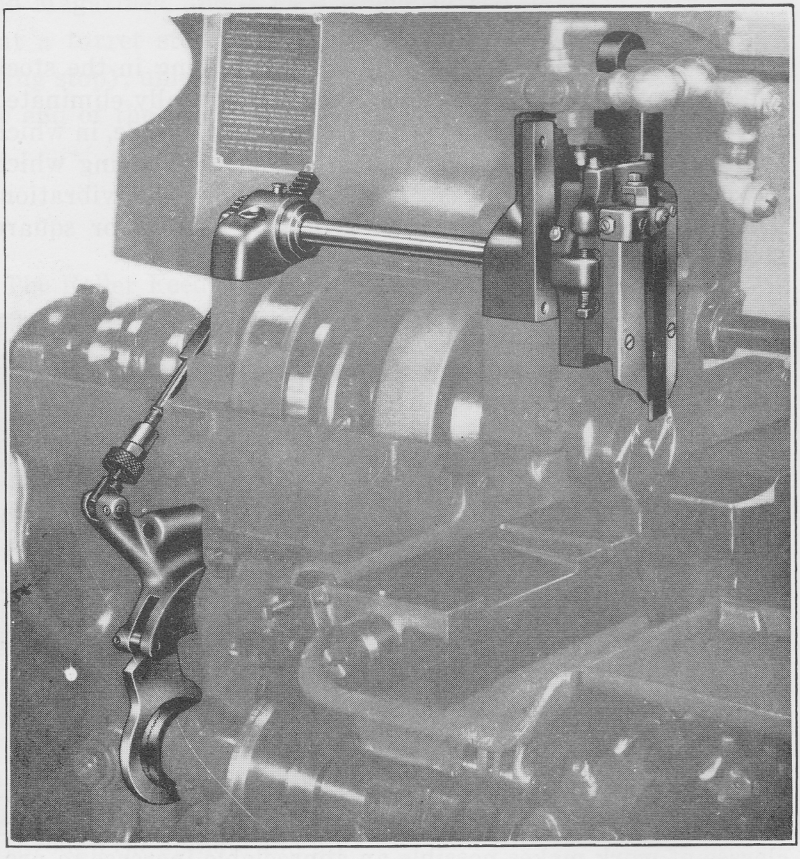
Silent Stock Support

Vertical Slide Attachment

The Vertical Slide, described in Booklet No. 11, is an Attachment which provides an additional tool slide, and on certain classes of work makes possible an appreciable increase in production. It is designed primarily for use with a cutting-off tool

to take the place of a swing tool or a cross slide tool for cutting off and forming-in shoulders where it is impossible many times to operate under ordinary conditions, leaving both cross slides free to be used for forming, thread rolling, knurling or other similar operations. A slight transverse and vertical adjustment is provided and cutting off can be accomplished with the spindle running in either direction.

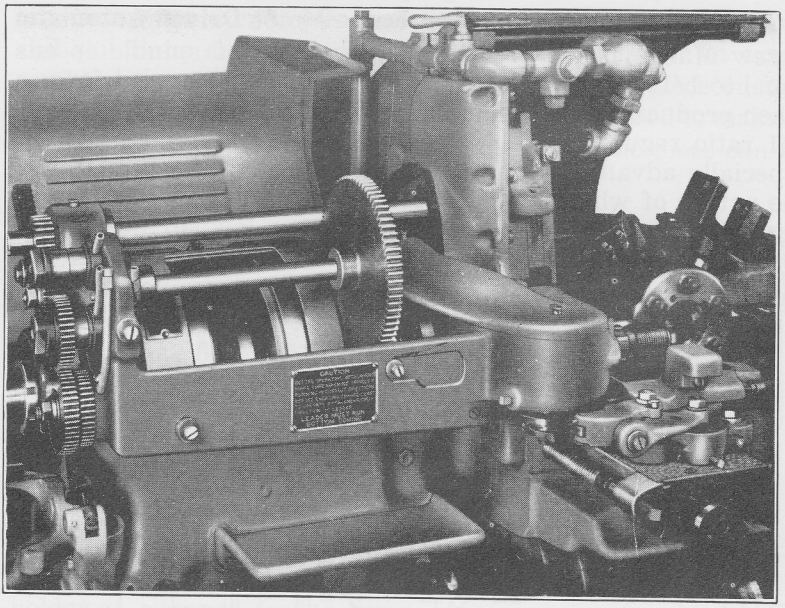
When the Vertical Slide is used in the place of a swing tool for cutting off, it materially reduces the number of revolutions of the spindle that must be allowed for tool clearance, in addition to eliminating the long cam surface required to operate the swing tool. It also permits increased cutting-off feed due to the rigid mounting of the cutting-off tool close to the spindle without interference with other tools.



Vertical Slide Attachment

Thread Chasing Attachment

Designed to meet the full requirements of a wide variety of work, the Thread Chasing Attachment permits the rapid production on Brown & Sharpe Automatics of threads of particularly accurate form, lead and pitch diameter, such as are often required on parts for timing mechanisms, electric meters and similar devices. The Attachment is also of advantage in producing threads at the back of a shoulder on parts which cannot be satisfactorily threaded by other methods.



Thread Chasing Attachment (guards removed)

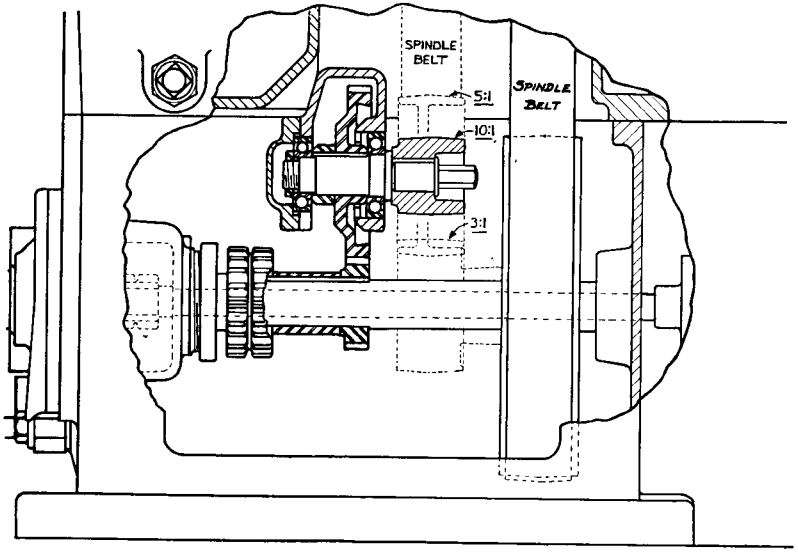
The Attachment shaft is gear-driven from the spindle of the machine, assuring perfect synchronization between spindle rotation and operation of the Attachment. The chasing tool is carried on a double slide assembly mounted on the front cross slide of the machine, and the thread is produced by several passes of the tool along the work, cutting in one direction only. The tool-carrying mechanism operates only while cutting threads.

Longitudinal Turning Attachment

The Longitudinal Turning Attachment for No. 00 size Machines, fully described in Booklet No. 12, is essentially a Vertical Slide Attachment provided with longitudinal movement. In addition to performing any vertical slide operation, it also will do straight turning to 1″ in length. For turning behind a shoulder, it is particularly useful in that it eliminates the need of a swing tool. Turning is accomplished independently of other operations and with the spindle running in either direction; and, since the Attachment is rigidly mounted and of sturdy construction, comparatively rapid turning is permissible.

Low Threading Speed Attachment

This Attachment is for older design Motor Driven Automatic Screw Machines. It provides a low range of spindle speeds equal to 1/10 the high range of speeds, and is intended for use when producing work requiring a speed ratio greater than the 5:1 ratio regularly furnished. This 10:1 ratio will be found especially advantageous when producing parts from material the nature of which, though permitting high speeds for forming, turning and cutting-off, requires very low surface speeds for threading operations. This Attachment is not required for the latest Automatics, as the high ratios are available in the machine.



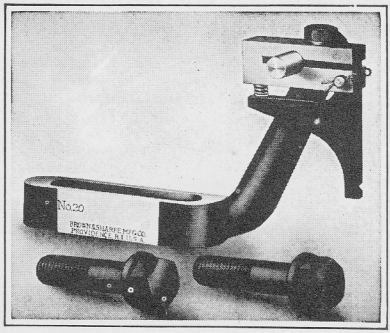
Low Threading Speed Attachment

The Attachment consists primarily of an auxiliary or intermediate shaft inside of the base at the left-hand end of the machine. This shaft is driven by spur gears from the sleeve shaft in the base of the machine. Change pulleys or sprockets used on the end of the Attachment shaft provide for ratios of 5:1 and 10:1. The 3:1 ratio is obtained as usual from the regular 3:1 ratio pulley on the sleeve shaft.

Screw Slotting Attachment

The Screw Slotting Attachment, shown in Booklet No. 6, is furnished in either belt-driven or motor-driven type. It will take screws or similar pieces as they are cut off by the machine and slot them automatically, thus doing away with an extra machine for slotting and wholly completing the piece on one machine in practically the same time that is required to make it without slotting. Light milling operations on the piece can be accomplished with this Attachment.

Slabbing Holder



Slabbing Holder

Two saws are sometimes mounted on the arbor for cutting parallel flats, in which case it is necessary to use a Slabbing Holder to prevent the work from rotating in the bushing in case one saw engages slightly ahead of the other, due to a difference in diameters of the saws. This holder is clamped to the finished surface of the saw slide, so that the finger is located between the saws and extends out ahead of them toward the work. The piece, when fed to the saws, comes first in contact with the notched edge of the finger against the pressure of a spring which is sufficiently strong to maintain the desired tension on the piece.

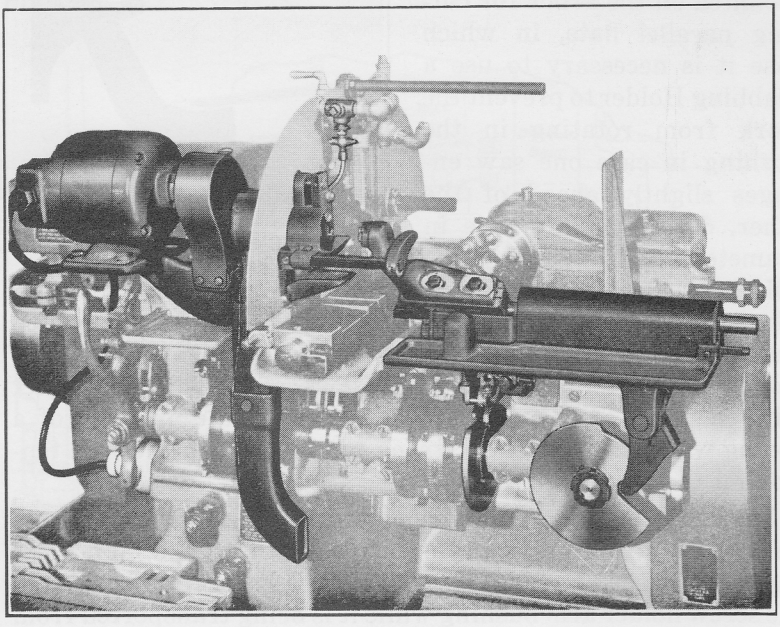
When it is required that hexagonal or other odd shaped pieces be slotted uniformly with reference to the flats, special devices can be furnished that revolve and correctly locate the piece in the screw holder arm bushing while it is being transported from the spindle to the saw.

Burring Attachment

The Burring Attachment (either Belt or Motor-Driven Type) carries a single tool for removing burrs or taking other light cuts on the cut-off ends of pieces of work before they leave the Screw Machine. The Attachment operates on one piece while the machine is making the next; consequently, in most cases, the piece is entirely completed in the same time as that required to make it without this final operation, and the necessity of an extra machine is eliminated.

The operating tool is carried by the attachment spindle, which is located as shown. A chuck, carried by the transfer arm, picks up the work piece as it is parted from the bar, and first carries it to a device that clamps it securely in the chuck, then feeds it against the tool in the spindle. The arm then moves to open the chuck and eject the finished piece. The movements of the arm are controlled by cams located on the camshaft of the machine.

The spindle is carried in a slide which is adjustable parallel to the machine spindle along a bracket fastened to the front of the machine. The depth of cut is regulated by adjusting the position of this slide.

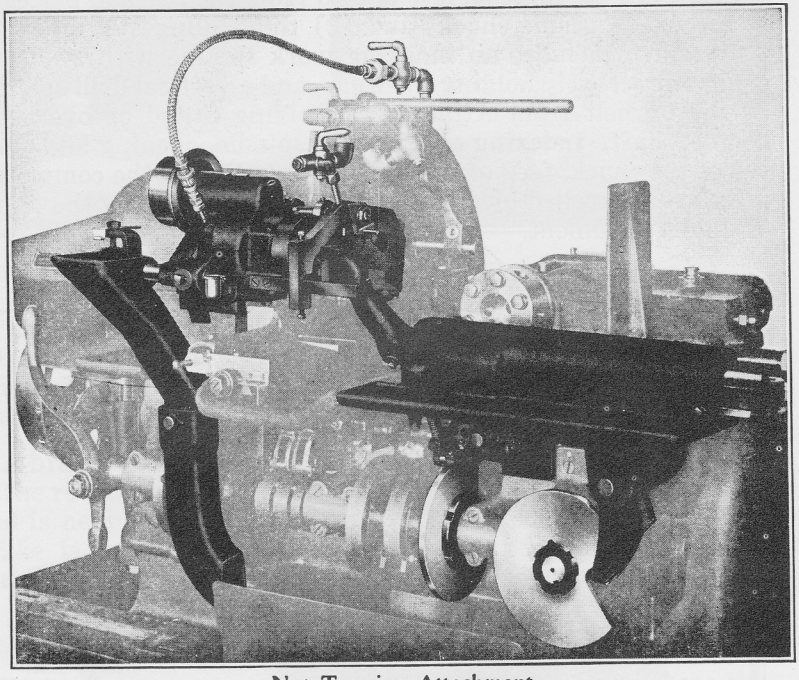


Burring Attachment (Motor-Driven Type)

Nut Tapping Attachment

The Nut Tapping Attachment is designed for the threading operation on nuts of such a shape that they can be driven by a rotating sleeve around the tap. It is of the second operation type, the tapping being done, after the piece is cut off, in a separate mechanism attached to the machine. This allows the nuts to be tapped at the same time as the blank is being made.

The Attachment is mounted above the front cross slide and consists of a transporting arm which picks up the piece as it is cut off and carries it to an intermediate spindle, where a countersinking operation is done on the back end, thence to the tapping unit proper. Here the nut is placed in a revolving



Nut Tapping Attachment

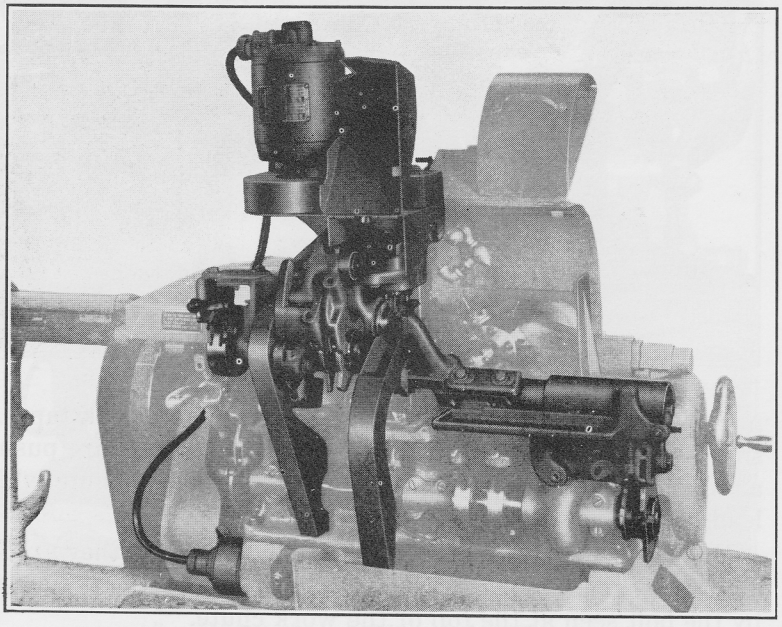
member and automatically rotated over a bent shank tap. As successive nuts are fed on, those previously tapped are pushed along the shank and dropped off the end into the chute which leads to the work pan.

The tap is held in position by the nuts, which, as they are fed along the shank, bear on two bushings. One bushing is clamped by the bolt seen at the top of the work chute.

Index Drilling Attachment

The Index Drilling Attachment is designed to drill either one or several angularly-spaced radial holes in binding posts, capstan screws, studs, bushings, and pieces of a similar character made on an Automatic Screw Machine. The Attachment is entirely automatic in its operation, and does its work while the machine is producing the next piece at the spindle; consequently, with the addition of this Attachment, the time consumed to wholly complete a piece is in most cases no more than that required to make the piece without drilling, and the necessity of an extra machine for drilling is eliminated.

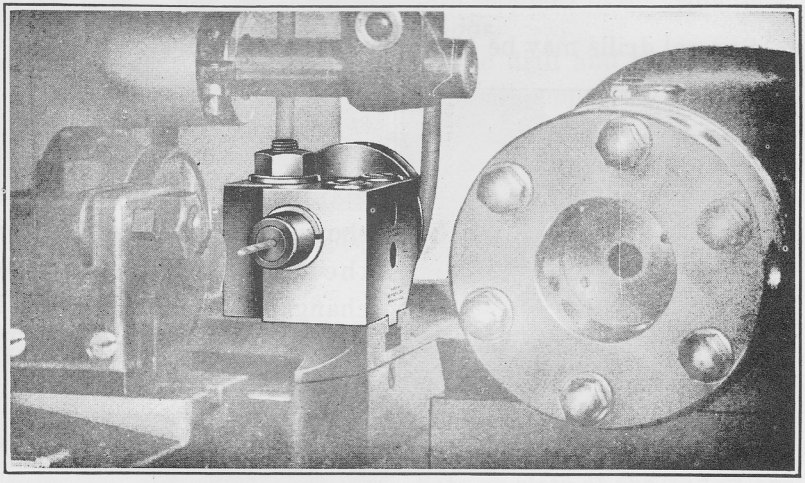
The Attachment consists of two parts: (1) the transfer arm, which takes the piece as it is parted from the bar and places it in the work spindle chuck; and (2) the drilling and indexing unit, which includes an indexing work spindle with a spring chuck for securely holding the work, and a vertical drill spindle driven by belt from Attachment Driving Stand or overhead countershaft. Indexing of the work spindle, opening and closing of the chuck, feed of the drill and ejection of the completed piece are controlled by cams carried on a camshaft at the front of the Attachment.



Index Drilling Attachment

Cross Drilling Attachment

This attachment is of advantage in making capstan screws, binding posts, pins and studs with cotter pin holes, and similar work requiring a drilled hole at right angles through the piece.



Cross Drilling Attachment

The attachment, described in Booklet No. 13, may be quickly attached to the back cross slide. It consists of a drill spindle driven from the overhead countershaft or Attachment Driving Stand, or by individual motor on the rear of the machine.

A brake is used on one of the machine spindle pulleys in place of the reverse belt, so that the spindle only runs in one direction and is held stationary when the drill is operating. A spindle brake is included with the attachment. Drills are held in changeable bushings, one blank bushing being furnished.

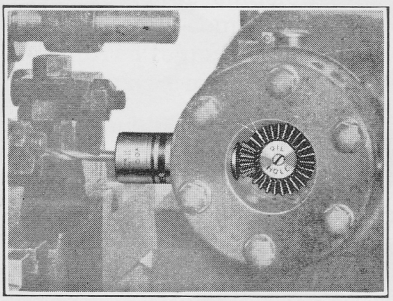
Turret Drilling Attachment

The purpose of this Drilling Attachment is to increase the speed of the drill relative to the work, without running the work spindle faster. This is accomplished by rotating the drill in the opposite direction to the bar of stock.

This attachment is found valuable in making studs and a variety of work requiring the use of one or more small drills, for on such work it is often desirable to run the drill at a much higher speed than that required for other tools, in order to obtain an economical cutting speed.

The drill spindle is driven from the overhead countershaft or Attachment Driving Stand by a round belt and bevel gears, the shank on the large bevel gear extending through the turret with a grooved pulley attached to its end. Motor drive is also available.

Several drills may be run at the same speed by meshing the bevel pinions on each drill spindle with the large bevel gear in the center, in the same manner as the single drill shown in the cut. The pulley on the counter-shaft can be changed to increase or diminish the speed of the drills as may be desired.



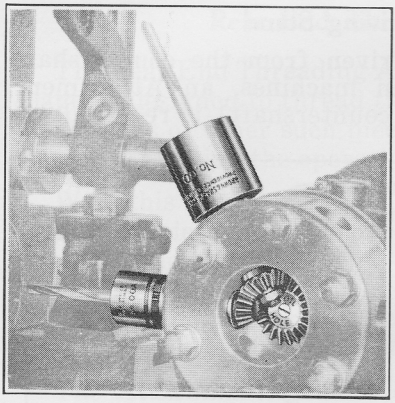
Turret Drilling Attachment

Tap or Die Revolving Attachment

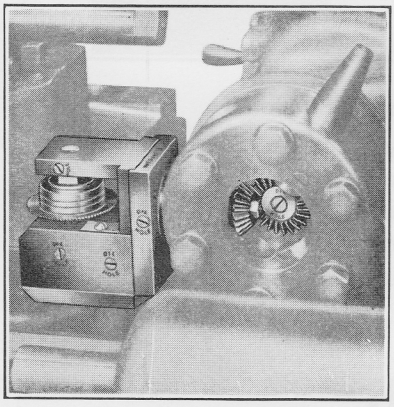
The Tap or Die Revolving Attachment, which is similar to the Turret Drilling Attachment, provides for the use of a tap or die in cases where a brake is employed on one of the spindle pulleys in conjunction with other attachments which require that the spindle be held stationary during their operation. In such cases there is consequently no means of reversing the spindle to run a stationary threading tool off the thread. The Attachment spindle is rotated continuously in the same direction as the machine spindle, but at a slower rate, the threading speed being the difference between the two spindle speeds. When the brake is applied to the machine spindle, the threading tool is quickly backed off the work at the speed of the attachment spindle.

Combination Drilling and Tapping Attachment

This Attachment is, in principle, a combination of the Turret Drilling Attachment and the Tap or Die Revolving Attachment.



Combination Drilling and Tapping Attachment



Turret Milling Attachment

It provides a suitably high speed for drilling and a low speed for tapping, while allowing the work to rotate continuously at the proper speed for best economy in the other operations.

The drill and the stock rotate in opposite directions, giving the desired high speed for drilling; while the rotation of the tap in the direction of work rotation combines with the speed of the work to give the proper speeds for thread cutting and backing out.

Turret Milling Attachment

The Turret Milling Attachment permits the milling of flats or slots at the end of the work piece while the machine spindle is held stationary by means of a brake furnished.

One or more cutters can be accommodated on the attachment spindle which runs at right angles to the machine spindle as shown in illustration.

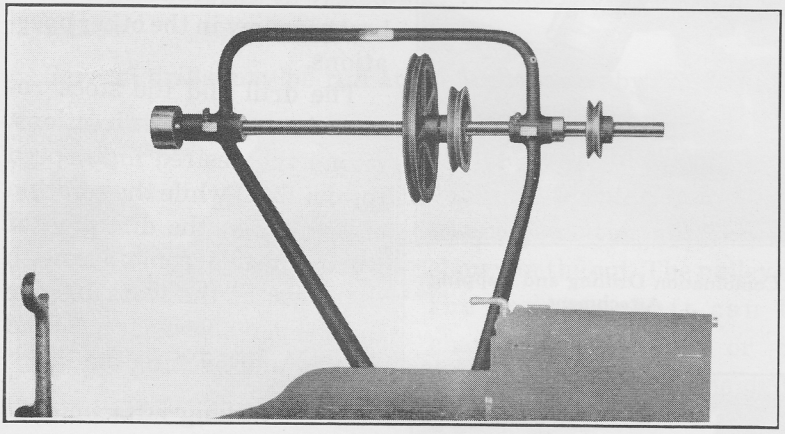
Motor Drives for Drilling and Milling Attachments

These Motor Drives (for Motor Driven Machines) are provided for either Cross Drilling, Turret Drilling, Tap or Die Revolving or Turret Milling Attachments. They are shown on Page 5 of Booklet No. 13.

The motor, attached to the rear of the machine bed by a bracket, is connected to a driving shaft through a flexible coupling. Sets of bevel gears and shafts transmit the power from the driving shaft to the respective attachment spindles. The mechanism in no way limits the turret and cross slide movements or the position of the cross drilling spindle with relation to the cross slide.

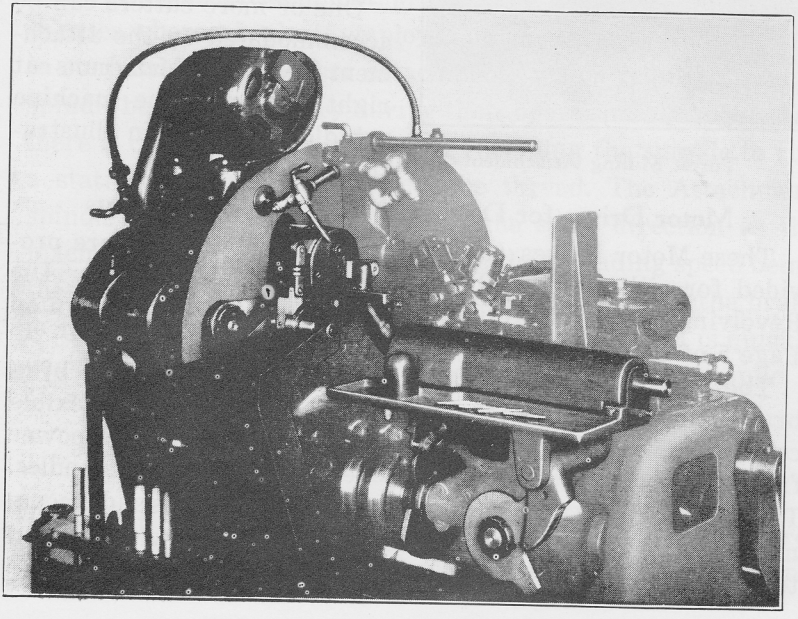
Attachment Driving Stand

When Attachments usually driven from the countershaft are to be used on motor-driven machines, an Attachment Driving Stand (small auxiliary countershaft) is required.



Attachment Driving Stand

This driving stand is driven by a belt from the pulley on the left rear of the machine. If the machine is driven from a countershaft, no driving stand is required, the pulleys for the attachments being placed on the countershaft.



Rear End Threading Attachment

Rear End Threading Attachment

The Rear End Threading Attachment, shown on the previous page, is designed to thread the rear or cut-off ends of cylinder head studs or other such pieces which cannot be satisfactorily completed during the operations at the machine spindle.

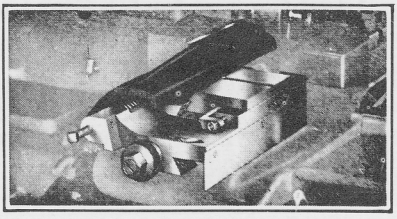
With this Attachment, the operation of threading the rear end of one piece is carried on while the succeeding piece is being made by the screw machine. Thus, in most cases, the work is wholly completed in the time required to make the piece without threading the rear end, and the need of another machine for this operation is eliminated.

The Attachment includes a transfer arm, which takes the piece as it is cut from the bar and carries it to a pair of clamp jaws. The piece, while gripped in the jaws, is threaded by means of an opening die holder in a revolving spindle. After the threading operation, the clamp jaws open and drop the completed piece into the work pan.

Double Movement Cross Slide

The Double Movement Cross Slide was designed to give a greater movement to the tool holder on the front cross slide toward and away from the spindle than could be obtained in the regular manner by the throw of the cross slide cam. This extreme movement is necessary, for example, when a magazine feeding attachment for automatically chucking small parts is employed, the principal use of the Double Movement Cross Slide being in connection with these attachments. In such cases a work carrier on this cross slide transfers each piece from the magazine to the spindle chuck.

In use, the regular cross slide is removed and the Double Movement Cross Slide put in its place. It consists of a pair of slides, one mounted on the other. The lower slide carries a pinion which meshes with a pair of parallel racks, one clamped to the machine frame, the other on the upper slide. When the lower slide is advanced in the regular way, the pinion causes the upper slide carrying the tool to advance twice the distance. An adjustable stop is provided.



Double Movement Cross Slide

Other Brown & Sharpe Screw Machines

No. 00 Automatic Screw Machine

No. 00 is a new ½" capacity machine with spindle speeds from 7200 to 34 R.P.M. The Vertical Slide is standard equipment and carbide tooling can be used when desirable. Tooling is similar to the No. 00G.

No. 0G Automatic Screw Machine — High Speed

This is a larger machine of the same general design as the No. 00G used to illustrate most jobs in these booklets.

Taking stock to ⅝" diameter, it has 196 two-speed combinations ranging from 4230 to 35 R.P.M.

No. 2G Automatic Screw Machine — High Speed

The No. 2G has choice of either 1" capacity spindle or 1½" capacity spindle for light to medium work. Speed range is 3025 (2180 on 1½" capacity machine) to 25 R.P.M.

Nos. 00G, 0G and 2G Automatic Cutting-Off Machines — High Speed

These machines are similar to the correspondingly Automatic Screw Machines except the turret is replaced by a stop holder slide, making them suitable for manufacture of parts requiring only one operating tool in addition to the cross slide tools.

No. 4 Automatic Screw Machine

For production of larger work, this machine takes stock to 1½" diameter, or where work permits, stock to 2" (with outside feed to 2⅜"). It is of massive design and has 168 two-speed combinations ranging from 1965 to 17 R.P.M.

Nos. 00, 0 and 2 Hand Screw Machines

For small-quantity runs of bar work and second operations. Use many of the same tools, collets etc. as the corresponding Automatics.

Polishing and Finishing Machine

Advantageous for burring and hand finishing of small parts.

Individual *circulars or specifications* are issued on machines and attachments. These give complete details, capacities, speeds, etc., and are available for the asking. State particular machine in which you are interested, when writing.

SURFACE SPEED OF STOCK

Revolutions per Minute

Diam. of Stock	48	57	68	80	98	116	120	140	168	180	200	225	260	280	300	342	385	445	492	540	560
1/16																					
5/64																			10	11	12
3/32																	10	11	12	13	14
7/64																10	11	13	14	15	16
1/8															10	11	13	15	16	17	18
9/64													10	10	11	13	14	16	18	20	21
5/32													11	11	12	14	16	18	20	22	23
11/64												10	12	13	14	15	17	20	22	24	25
3/16											10	11	13	14	15	17	19	22	24	26	27
13/64										10	11	12	14	15	16	18	20	24	26	29	30
7/32									10	10	11	13	15	16	17	20	22	26	28	31	32
15/64									10	11	12	14	16	17	18	21	24	27	30	33	34
1/4									11	12	13	15	17	18	20	22	25	29	32	35	37
9/32								10	12	13	15	17	19	21	22	25	28	33	36	40	41
5/16							10	11	14	15	16	18	21	23	25	28	31	36	40	44	46
11/32						10	11	13	15	16	18	20	23	25	27	31	35	40	44	48	50
3/8					10	11	12	14	16	18	20	22	26	28	30	34	38	44	48	53	55
13/32					10	12	13	15	17	19	21	24	28	30	32	36	41	48	52	57	60
7/16					11	12	13	16	19	21	23	27	30	32	34	39	44	51	56	62	64
15/32				10	12	14	15	17	20	22	25	28	32	34	37	42	47	55	60	66	69
1/2				10	13	14	16	18	22	24	26	29	34	37	39	45	50	58	64	70	73
9/16			10	12	14	17	18	21	25	27	29	33	38	41	44	50	57	66	73	80	83
5/8			11	13	16	19	20	23	28	30	33	37	43	46	49	56	63	73	81	89	92
11/16		10	12	14	18	21	22	25	30	32	36	40	47	50	54	61	69	80	89	97	101
3/4		11	13	16	19	23	24	28	33	35	39	44	51	55	59	67	76	87	97	106	110
13/16	10	12	14	17	21	25	26	30	35	38	43	48	55	60	64	73	82	95	105	115	120
7/8	11	13	16	18	23	27	28	32	38	41	46	52	60	65	69	79	89	102	113	124	129
15/16	12	14	17	20	24	28	30	33	41	44	49	55	64	69	74	84	94	109	120	132	138
1	13	15	18	21	26	29	32	36	44	47	52	58	68	73	78	89	100	116	128	141	147
1 1/8	14	17	20	23	29	34	35	41	48	53	58	65	76	82	88	100	112	130	144	159	164
1 1/4	16	19	22	26	32	38	39	46	54	59	65	74	85	92	98	112	126	146	161	177	183
1 3/8	17	21	25	29	35	42	43	50	60	65	72	81	94	101	108	123	139	160	177	194	202
1 1/2	19	22	27	32	39	46	47	55	66	71	79	89	102	110	118	135	152	174	193	212	220
1 5/8	21	25	29	35	42	50	52	60	72	78	86	97	112	121	130	148	164	189	209	229	238
1 3/4	22	26	31	37	45	53	55	64	76	82	92	103	119	128	138	157	177	204	225	247	257
1 7/8	23	28	33	39	48	57	59	68	81	88	98	110	127	137	146	168	189	218	242	265	275
2	25	30	36	42	51	61	63	73	88	94	105	118	136	148	157	179	202	233	257	283	293
2 1/8	27	32	38	45	55	65	68	79	93	101	112	127	146	156	167	190	214	247	273	300	312
2 1/4	28	34	40	47	58	69	71	83	99	106	118	133	153	165	177	202	227	262	290	318	330
2 3/8	30	35	42	50	61	72	75	87	104	112	124	140	162	174	187	213	240	277	306	336	348
2 1/2	32	37	45	52	64	76	78	92	110	118	131	147	170	184	196	224	252	291	322	354	367

Diam. of Stock	614	665	735	790	850	928	973	1087	1140	1200	1285	1492	1748	1800	2062	2400	2600	2700	3100	3500	3600	3700	4300	5000	6000
1/16	10	11	12	13	14	15	15	19	19	20	21	24	28	29	34	39	42	44	51	57	59	60	70	82	98
5/64	13	14	15	16	17	19	20	22	23	25	26	30	36	37	42	49	54	56	65	73	75	77	90	104	125
3/32	15	16	18	19	21	23	24	27	28	29	32	37	43	44	51	59	64	66	76	86	88	91	106	123	148
7/64	18	19	21	23	24	26	28	31	33	34	37	43	50	52	59	69	74	77	88	99	102	105	122	142	170
1/8	20	22	24	26	28	29	32	35	37	39	42	49	57	59	68	78	85	88	102	115	118	121	141	164	197
9/64	23	24	27	29	31	34	36	40	42	44	47	55	64	66	76	88	95	99	114	128	132	135	158	183	220
5/32	25	27	30	32	35	38	40	45	47	49	53	61	72	74	85	98	106	110	127	143	147	151	176	204	245
11/64	28	30	33	35	38	42	44	49	51	54	58	67	79	81	93	108	117	121	140	157	162	166	193	225	270
3/16	30	33	36	39	42	45	48	54	56	59	63	73	86	88	102	118	127	132	152	172	177	181	211	245	294
13/64	33	35	39	42	45	49	52	58	60	64	68	79	93	96	110	128	138	144	165	186	192	197	229	267	321
7/32	35	38	42	45	49	53	56	62	65	69	74	85	100	103	119	138	149	154	178	200	207	211	246	286	343
15/64	38	41	44	48	52	57	60	66	70	73	79	91	107	110	128	147	158	164	189	213	219	225	262	304	365
1/4	40	44	47	52	56	61	64	71	75	79	84	97	114	118	136	157	170	176	203	229	237	242	281	327	393
9/32	45	49	54	58	63	69	72	80	84	88	93	110	129	133	152	177	191	199	228	258	264	272	316	368	422
5/16	50	55	60	65	70	76	79	89	93	98	106	122	143	147	169	196	213	221	254	286	294	302	351	408	490
11/32	55	60	66	71	77	83	87	98	102	108	115	134	157	162	185	216	234	243	279	315	324	333	387	450	540
3/8	60	66	72	78	84	91	96	108	112	118	127	147	171	177	202	236	255	265	304	344	354	363	422	490	588
13/32	65	71	78	84	91	99	103	116	121	128	137	158	186	191	219	255	276	287	330	372	384	393	457	532	638
7/16	70	76	84	91	98	107	111	125	131	138	148	171	200	206	236	275	298	309	355	400	414	424	493	573	688
15/32	75	82	90	97	104	114	120	134	140	147	158	183	215	221	253	295	319	332	380	430	441	455	528	614	737
1/2	80	87	96	103	111	121	127	142	149	157	168	195	229	236	270	314	340	353	406	458	471	485	563	654	
9/16	90	98	105	116	125	137	143	160	168	177	189	219	257	265	303	353	382	397	456	514	531	544	632		
5/8	101	109	120	129	139	152	159	178	186	196	210	244	286	295	337	393	425	442	507	572	588	604	702		
11/16	111	120	132	142	153	167	175	195	205	216	231	268	315	324	371	432	468	486	558	628	646	654			
3/4	120	130	144	155	167	182	191	213	224	236	252	292	342	353	404	472	510	530	608	687					
13/16	131	142	156	168	181	197	207	231	243	255	273	317	372	383	438	510	553	574	658						
7/8	141	152	168	181	195	212	223	249	261	275	294	342	400	413	472	550	595	619	710						
15/16	151	163	180	194	209	227	239	267	280	295	315	366	429	442	506	590	637	663							
1	160	174	193	206	223	242	254	284	299	314	337	390	458	471	540	628	681								
1 1/8	180	195	216	232	250	273	286	320	335	353	379	438	514	530	606	706									
1 1/4	200	218	240	259	278	303	319	355	373	393	420	488	572	588	675										
1 3/8	221	239	264	284	306	333	350	391	409	432	462	536	629												
1 1/2	241	261	289	310	334	364	382	427	448	471	505	586	688												
1 5/8	261	283	312	336	361	394	414	461	485	510	546	634													
1 3/4	281	304	336	362	389	424	446	497	522	550	588														
1 7/8	301	326	360	387	417	455	478	533	560	589															
2	321	348	384	413	445	485	509	568	596																
2 1/8	341	370	408	439	473	515	540	603																	
2 1/4	362	392	433	465	502	546	573	640																	
2 3/8	382	413	457	490	528	576	604																		
2 1/2	402	435	480	516	555	605																			

SURFACE FEET PER MINUTE

APPROXIMATE CUTTING SPEEDS AND FEEDS FOR STANDARD TOOLS

Please bear in mind these figures are only approximate, to be used as a basis from which proper figures for the job in hand may be calculated. They are averages and if the work has any features out of the ordinary take these into consideration and alter the figures accordingly.

Feed — is feed per revolution. Speed — is maximum surface speed of stock in feet per minute.

The same feed is used for both carbon and high speed steel cutting tools, the cutting speed only being different.

Tool	Cut: Width or Depth	Cut: Dia. of Hole	Brass Free Cutting: Feed	Brass Free Cutting: Speed in Surface Feet	Material: Mild or Soft Steel .10–.20% Carbon: Feed	Mild or Soft Steel: Speed in Surface Feet: Carbon Tools	Mild or Soft Steel: Speed in Surface Feet: H.S.S. Tools	Tool Steel .80–1.00% Carbon: Feed	Tool Steel: Speed in Surface Feet: Carbon Tools	Tool Steel: Speed in Surface Feet: H.S.S. Tools
Boring Tools	.005				.008	50	110	.004	30	60
Box Tools — Roller Rest	1/32		.012		.010	70	150	.005	40	75
1 Chip Finishing	1/16		.010		.008	70	150	.004	40	75
	1/8		.008		.007	70	150	.003	40	75
	3/16		.008		.006	70	150	.002	40	75
	1/4		.006		.005	70	150	.0015	40	75
Finishing	.005		.010		.010	70	150	.006	40	75
Centre Drills		under 1/8	.003		.0015	50	110	.001	30	75
		over 1/8	.006		.0035	50	110	.002	30	75
Cut-Off Tools — Angular			.0015		.0006	80	150	.0004	50	85
Cut-Off Tools — Circular	3/64–1/8		.0035		.0015	80	150	.001	50	85
Cut-Off Tools — Straight	1/16–1/8		.0035		.0015	80	150	.001	50	85
Dia. Stock under 1/8"			.002		.0008	80	150	.0005	50	85
Button Dies						30			14	
Chaser Dies						30	40		16	20
Drills		.02	.0014		.001	40	60	.0006	30	45
Twist Cut		.04	.002		.0014	40	60	.0008	30	45
		1/16	.004		.002	40	60	.0012	30	45
		3/32	.006		.0025	40	60	.0016	30	45
		1/8	.009		.0035	40	75	.002	30	60
		5/16	.012		.004	40	75	.003	30	60
		1/4	.014		.005	40	75	.003	30	60
		5/16	.016		.005	40	75	.0035	30	60
		3/8	.016		.006	40	85	.004	30	60
		1/2	.016		.006	40	85	.004	30	60
		5/8	.016		.006	40	85	.004	30	60
Form Tools — Circular	1/8–1/4		002		.0009	80	150	.0006	50	85
					.0008			.0005		
	3/8–1/2		.0015		.0007					
			.0012		.0006	80	150	.0004	50	85
	5/8–3/4		.001		.0005	80	150	.0003	50	85
	1		.001		.0004	80	150			
Hollow Mills & Balance Turning Tools — Turned diam. under 5–32"	1/32		.012		.010	70	150	.008	40	85
	1/16		.010		.009	70	150	.006	40	85
Hollow Mills & Balance Turning Tools — Turned diam. over 5–32"	1/32		.017		.014	70	150	.010	40	85
	1/16		.015		.012	70	150	.008	40	85
	1/8		.012		.010	70	150	.008	40	85
	3/16		.010		.008	70	150	.006	40	85
	1/4		.009		.007	70	150	.0045	40	85
Knee Tools	1/64–1/32				.010	70	150	.010	40	85
					.012			.008		
Knurl Tools										
Turret	on		.020		.015	150		.010	105	
	off		.040		.030	150		.025	105	
Side or Swing			.004		.002	150		.002	105	
Top			.006		.004	150		.003	105	
			.005		.003	150		.002	105	
Pointing & Facing Tools			.008		.006	150		.004	105	
			.001		.0008	70		.0005	40	80
Reamers & Bits			.0025		.002	70	150	.0008	40	80
	.003 to .004	1/8 or less	.010–.007		.008–.006	70	150	.006	40	60
	.004 to .008	1/8 or over	.010		.010	70	105	.004	40	60
								.006	40	60
								.008	40	60
Recessing Tools, End Cut			.001		.0006	70	150	.0004	40	75
			.005		.003	70	150	.002	40	75
Inside Cut	1/16–1/8		.0025		.002	70	105	.0015	40	60
			.0008		.0006	70	105	.0004	40	60
Swing Tools, Forming	1/8–1/4		.002		.0007	70	150	.0005	40	85
			.0012		.0005	70	150	.0003	40	85
	3/8–1/2		.001		.0004					
			.0008		.0003	70	150	.0002	40	85
Turning Straight	1/32		.008		.006	70	150	.0035	40	85
	1/16		.005		.004	70	150	.003	40	85
	1/8		.005		.003	70	150	.002	40	85
	3/16		.004		.0025	70	150	.0015	40	85
Taps						25	30		12	15
Swing Tools										

Use Maximum Spindle Speed Available on Machine

Taper turning same as straight turning but the feed is taken slow enough for the greatest depth of cut.

TABLE OF MACHINE CAPACITIES, SPEEDS, ETC.
Current Design Machines

Automatic Screw Machines	No. 00G (Begins Serial No. 542–00–451)	No. 0G (Begins Serial No. 542–0–321)	No. 2G (Beginning Serial No. 542–2–376) 1″ Cap. Spindle	No. 2G (Beginning Serial No. 542–2–376) 1½″ Cap. Spindle
Capacity, up to.....Round	3/8″	5/8″	1″	1½″
Hex.	9/16″	1″	7/8″	1 1/4″
Square	1/2″	7/8″	1 1/16″	1″
Capacity, where work permits, up to.....Round	7/16″	3/4″	1 1/4″	
Hex.	1/4″	5/8″	1 1/16″	
Square	5/16″	1/2″	7/8″	
Greatest length that can be turned at one movement.....	3/4″	1 1/4″	2″	
Greatest length that can be fed at one movement				
Driving shaft 240 R.P.M. (180 on No. 0G).....	1″	2″	2 1/4″	
Driving shaft 120 R.P.M.....	2″	3″	4″	
Number of combinations of high and low spindle speed....	196	196	196	170
Fastest and slowest spindle speeds, r.p.m..... Fastest	6050	4230	3025	2180
Slowest	50	35	25	25
Change gears give one revolution of cams				
Driving shaft 240 R.P.M. (180 on No. 0G) ... Fastest	3/4 sec.	1 2/3 sec.	3 sec.	
Slowest	45 1/2 sec.	176 1/2 sec.	240 sec.	
Driving shaft 120 R.P.M. ..... Fastest	1 1/2 sec.	2 1/2 sec.	6 sec.	
Slowest	91 sec.	264 3/4 sec.	480 sec.	
Time allowed to feed stock or index turret				
Driving shaft 240 R.P.M. (180 on No. 0G).....	1/4 sec.	1/3 sec.	1/2 sec.	
Driving shaft 120 R.P.M.....	1/2 sec.	1/2 sec.	1 sec.	
Time allowed to automatically reverse spindle or change speed				
Driving shaft 240 R.P.M. (180 on No. 0G).....	1/4 sec.	1/3 sec.	1/2 sec.	
Driving shaft 120 R.P.M.....	1/2 sec.	1/2 sec.	1 sec.	
Number of holes in turret.....	6	6	6	
Diameter of holes in turret.....	5/8″	3/4″	1″	
Diameter of turret.....	3 3/8″	4 1/16″	5″	
Greatest distance tools can project from turret.....	2 1/16″	3 1/16″	3 1/8″	
Greatest diameter of tool turret will swing.....	2 1/4″	3 1/8″	2 1/8″	
Greatest distance between turret and chuck.....	1 5/8″	2 5/8″	2 1/8″	
Least distance between turret and chuck.....	2 15/16″	5 1/16″	6 1/2″	
Center of holes in turret to side of turret slide.....	1 1/2″	2 1/2″	3″	
Screw adjustment of turret slide.....	1/8″	1 5/8″	1 1/2″	
Top of cross slide to center of spindle.....	3/4″	3/4″	1″	
Movement of cross slide.....	1″	1 5/16″	1 7/16″	
Distance from center of spindle to floor.....	1″	1 1/4″	1 3/4″	
H.P. required at maximum capacity.....	46″	46″	46″	
Floor space, length.....	2	3	5	7½
Floor space, width.....	68 3/4″	78 1/4″	84 1/4″	
Net weight, about, in lbs..	28 1/2″	32″	34″	
	2200	2975	3425	3525

Extra Turning Capacity (Auto. Screw Machines)	No. 00G Machine	No. 0G Machine	No. 2G Machine
	1 1/4″	2″	3″

The specifications for the following Automatic Cutting-Off Machines are the same as those listed above for the corresponding Automatic Screw Machines except for the items listed below and omitting statements pertaining to the turret.

Automatic Cutting-Off Machines	No. 00G (Begins Serial No. 544–00–5)	No. 0G (Begins Serial No. 544–0–1)	No. 2G (Beginning Serial No. 544–2–4)
Capacity, up to.....Round	3/8″	5/8″	1″
Hex.	5/16″	1/2″	7/8″
Square	1/4″	7/16″	11/16″
Capacity, where work permits, up to.....Round	1/4″	3/8″	1 1/4″
Hex.	7/32″	5/16″	1 1/16″
Square	5/16″	1/2″	7/8″
Number of holes in tool slide.....	1	1	1
Diameter of hole in tool slide.....	5/8″	3/4″	1″
Greatest distance between tool slide and chuck.....	10″	12″	16″
Least distance between tool slide and chuck.....	1 3/4″	2″	2 1/2″

TABLE OF MACHINE CAPACITIES, SPEEDS, ETC.
Automatic Screw and Automatic Cutting-Off Machines

Automatic Screw Machines	No. 00G (Serial No. 19799 to 22023 and No. 542–00–1 to 542–00–450)	No. 0G (Serial No. 14343 to 15417 and No. 542–0–1 to 542–0–320)	No. 2G (Serial No. 9084 to 12863) 1″ Cap. Spindle	No. 2G (Serial No. 9084 to 12863) 1½″ Cap. Spindle	No. 2G (Serial No. 12864 to 14813 and No. 542–2–1 to 542–2–375) 1″ Cap. Spindle	No. 2G (Serial No. 12864 to 14813 and No. 542–2–1 to 542–2–375) 1½″ Cap. Spindle
Capacity, up to.....Round	3/8″	5/8″	1″	1 1/2″	1″	1 1/2″
Note — For special arrangements Hex.	5/16″	1/2″	7/8″	1 1/4″	7/8″	1 1/4″
for greater capacities, see below. Square	1/2″	7/16″	11/16″	1″	11/16″	1″
Greatest length that can be turned at one movement	3/4″	1 1/4″	2″		2″	
Greatest length that can be fed at one movement						
Driving shaft 240 R.P.M. (180 on No. 0G)....	1″	2″	2 1/2″		2 1/2″	
Driving shaft 120 R.P.M.....	2″	3″	4″		4″	
Number of combinations of high and low spindle speed.....	196	196	120	100	196	170
Fastest and slowest spindle speeds, r.p.m.....	6050	4230	3000	2150	3025	2180
	50	35	67	67	25	25
Change gears give one revolution of cams						
Driving shaft 240 R.P.M. (180 on No. 0G) ..... Fastest	3/4 sec.	1 3/4 sec.	3 sec.		3 sec.	
Slowest	45 1/2 sec.	176 1/2 sec.	240 sec.		240 sec.	
Driving shaft 120 R.P.M. ..... Fastest	1 1/2 sec.	2 3/4 sec.	6 sec.		6 sec.	
Slowest	91 sec.	264 3/4 sec.	480 sec.		480 sec.	
Time allowed to feed stock or index turret						
Driving shaft 240 R.P.M. (180 on No. 0G)....	1/4 sec.	1/3 sec.	1/2 sec.		1/2 sec.	
Driving shaft 120 R.P.M.....	1/2 sec.	1/2 sec.	1 sec.		1 sec.	
Time allowed to automatically reverse spindle or change speed						
Driving shaft 240 R.P.M. (180 on No. 0G)....	1/4 sec.	1/3 sec.	1/2 sec.		1/3 sec.	
Driving shaft 120 R.P.M.....	1/2 sec.	1/2 sec.	1 sec.		1 sec.	
Number of holes in turret.....	6	6	6		6	
Diameter of holes in turret.....	5/8″	3/4″	1″		1″	
Diameter of turret.....	3 5/8″	4 7/16″	5″		5″	
Greatest distance tools can project from turret.....	2 1/4″	3 1/4″	3 1/2″		3 1/4″	
Greatest diameter of tool turret will swing.....	1 5/8″	2 5/8″	2 3/4″		2 7/8″	
Greatest distance between turret and chuck.....	2 15/16″	5 1/8″	6 3/4″		6 3/4″	
Least distance between turret and chuck.....	1 7/16″	2 1/4″	3″		3″	
Center of holes in turret to side of turret slide.....	7/8″	1 3/8″	1 1/2″		1 1/2″	
Screw adjustment of turret slide.....		1/2″	1″		1″	
Top of cross slide to center of spindle.....	1″	1 5/16″	1 7/16″		1 7/16″	
Movement of cross slide.....	1″	1 1/4″	1 3/4″		1 3/4″	
Distance from center of spindle to floor.....	46″	46″	46″		46″	
H.P. required at maximum capacity	2	3	5	7 1/2	5	7 1/2
Floor space, length.....	68 3/4″	78 1/4″	84 1/4″		84 1/4″	
Floor space, width	28 1/4″	32″	34″		34″	
Net weight, about, in lbs.	2200	2975	3375	3475	3425	3525

Largest Stock taken with Extra Size Feed Tube (for light cuts only)	Round	Hex. Flats	Square
No. 00G Machines.....	1/4″	7/16″	3/8″
No. 0G Machines.	3/8″	1/2″	1/2″
No. 2G Machines... .. .	1 1/4″	1 1/16″	7/8″

Extra Turning Capacity (Auto. Screw Machines)	No. 00G Machine	No. 0G Machine	No. 2G Machine
	1 1/4″	2″	3″

The specifications for the following Automatic Cutting-Off Machines are the same as those listed above for the corresponding Automatic Screw Machines except for the items listed below and omitting statements pertaining to the turret.

Automatic Cutting-Off Machines	No. 00G (Serial No. 19799 to 22023 and No. 544–00–1 to 544–00–4)	No. 0G (Serial No. 14343 to 15417)	No. 2G (Serial Nos. 9284 to 12863)	No. 2G (Serial No. 12864 to 14813 and No. 544–2–1 to 544–2–3)
Capacity, up to.....Round	3/8″	5/8″	1″	1″
Note — For special arrangements for Hex.	5/16″	1/2″	7/8″	7/8″
greater capacities, see above. Square	1/2″	7/16″	11/16″	11/16″
Number of holes in tool slide.....	1	1	1	1
Diameter of hole in tool slide.....	5/8″	3/4″	1″	1″
Greatest distance between tool slide and chuck..	10″	12″	16″	16″
Least distance between tool slide and chuck	1 3/4″	2″	2 1/2″	2 1/8″

For Machines of current design see Page 21

TABLE OF MACHINE CAPACITIES, SPEEDS, ETC.

	Nos. 00H.S. (3 Spds.), 00H.S. (36 Spds.), (Begin Serial No. 12852) and 00G H.S. (Serial Nos. 12852 to 19798)	Nos. 0H.S. (3 Spds.), 0H.S. (36 Spds.), (Begin Serial No. 8021) and 0G H.S. (Serial Nos. 8021 to 14342)	Nos. 2 H.S. (3 Spds.), 2 H.S. (36 Spds.), (Begin Serial No. 7353) and 2G H.S. (Serial Nos. 7352 to 9053)	Nos. 00H.S., 00G H.S. Screw Thrd. (Begin Serial No. 13432)
Diameter of hole through regular feed tube	$\frac{11}{64}$″	$\frac{11}{64}$″	$1\frac{1}{16}$″	$\frac{11}{64}$″
Largest stock taken in regular feeding fingers.....Round	$\frac{1}{4}$″	$\frac{1}{4}$″	1″	$\frac{1}{4}$″
Hex.	$\frac{9}{32}$″	$\frac{5}{16}$″	$\frac{7}{8}$″	$\frac{9}{32}$″
Square	$\frac{1}{4}$″	$\frac{7}{16}$″	$1\frac{1}{16}$″	$\frac{1}{4}$″
Note — For special arrangements for greater capacities, see below.				
Greatest length that can be turned at one movement	$\frac{3}{4}$″	$1\frac{1}{4}$″	2″	
Greatest length that can be fed at one movement	1″	2″	$2\frac{1}{2}$″	1″
Number of spindle speeds	3 36 36	3 36 36	3 36 36	10
Fastest and slowest spindle speeds r.p.m.	6000 6000 6000	4220 4220 4150	3000 3000 3000	5000
	1200 200 200	850 150 155	645 100 100	1212
Change gears give one revolution of cams.....Fastest	$\frac{1}{4}$ sec.	$1\frac{1}{2}$ sec.	3 sec.	$\frac{1}{4}$ sec.
Slowest	$45\frac{1}{2}$ sec.	$176\frac{1}{2}$ sec.	240 sec.	20 sec.
Actual time allowed to feed stock	$\frac{1}{4}$ sec.	$\frac{1}{4}$ sec.	$\frac{1}{4}$ sec.	$\frac{1}{4}$ sec.
Actual time allowed to index turret	$\frac{1}{2}$ sec.	$\frac{1}{2}$ sec.	$\frac{1}{2}$ sec.	
Number of holes in turret	6	6	6	
Diameter of holes in turret	$\frac{1}{4}$″	$\frac{1}{4}$″	1″	
Diameter of turret	$3\frac{1}{2}$″	$4\frac{1}{16}$″	5″	
Greatest distance tools can project from turret	$2\frac{1}{4}$″	$3\frac{1}{16}$″	$3\frac{1}{2}$″	
Greatest diameter of tool turret will swing	$1\frac{3}{4}$″	$2\frac{1}{8}$″	$2\frac{1}{16}$″	
Greatest distance between turret and chuck	$2\frac{11}{16}$″	$5\frac{1}{4}$″	$6\frac{3}{4}$″	3″
Least distance between turret and chuck	$1\frac{1}{2}$″	$2\frac{1}{2}$″	3″	$\frac{3}{16}$″
Center of holes in turret to side of turret slide	$\frac{7}{8}$″	$1\frac{3}{4}$″	$1\frac{1}{4}$″	
Screw adjustment of turret slide		$\frac{3}{4}$″	1″	
Rack adjustment of turret slide (one tooth)	Approx. $\frac{3}{16}$″			
Top of cross slide to center of spindle	1″	$1\frac{3}{16}$″	$1\frac{7}{16}$″	1″
Die Spindle — Number of Changes of Speeds				20
Die Spindle — Spindle Speeds, r.p.m.....Fastest				7000
Die Spindle — Slowest				1454
Threading — Number of Cutting Speeds				20
Threading — Cutting Speeds, r.p.m.....Fastest				2000
Threading — Slowest				242
Movement of cross slide	1″	$1\frac{1}{4}$″	$1\frac{3}{4}$″	1″
Distance from center of spindle to floor	46″	46″	46″	46″
H.P. required at maximum capacity	2	3	5	$2\frac{1}{2}$
Floor space, length	48″ 48″ 53″	62″ 62″ 66″	68″ 68″ 71″	48″ 60″
Floor space, width	27″ 27″ 43″	30″ 30″ 47″	34″ 34″ 48″	27″ 43″
Net weight, about, in lbs.	1400 1600 1600	1850 2075 2075	2500 2875 2975	1600 1700

Largest Stock taken with Extra Size Feed Tube (for light cuts only)	Round	Hex. Flats	Square
No. 00 Size Machines	$\frac{1}{2}$″	$\frac{7}{16}$″	$\frac{3}{8}$″
No. 0 Size Machines	$\frac{3}{4}$″	$\frac{5}{8}$″	$\frac{1}{2}$″
No. 2 Size Machines	$1\frac{1}{4}$″	$1\frac{1}{16}$″	$\frac{7}{8}$″

Extra Capacity (At 120 r.p.m. driving shaft speed)	No. 00 Size Machine	No. 0 Size Machine	No. 2 Size Machine
Turning Capacity	$1\frac{1}{4}$″	2″	3″
Feeding Length	2″	3″	4″

For Automatic Screw Machines of current design see Page 21

TABLE OF MACHINE CAPACITIES, SPEEDS, ETC.

High Speed, Nos. 4 & 6 and Screw Threading Machines

	Nos. 00H.S., 00G H.S., 00H.S. (30 Speeds) (Serial Nos. 11651 to 12851)	Nos. 0H.S., 0G H.S., 0 H.S. (30 Speeds) (Serial Nos. 7063 to 8020)	Nos. 2H.S., 2G H.S., 2H.S. (30 Speeds) (Serial Nos. 5968 to 7351)	No. 4 (Prior to Ser. 297)	No. 6	Nos. 00H.S., 00G H.S. Screw Thrd. (Ser. Nos. 11811 to 12851)
Diameter of hole through regular feed tube	$\frac{21}{64}$″	$\frac{17}{32}$″	$1\frac{1}{32}$″	$1\frac{5}{8}$″	$2\frac{1}{8}$″	$\frac{21}{64}$″
Largest stock taken in regular feeding fingers.....Round	$\frac{5}{16}$″	$\frac{1}{2}$″	1″	$1\frac{1}{4}$″	2″	$\frac{5}{16}$″
Hex.	$\frac{1}{4}$″	$\frac{7}{16}$″	$\frac{1}{8}$″	$1\frac{1}{4}$″	$1\frac{5}{8}$″	$\frac{1}{4}$″
Square	$\frac{7}{32}$″	$\frac{3}{8}$″	$1\frac{5}{16}$″	$1\frac{7}{16}$″	$1\frac{7}{16}$″	$\frac{7}{32}$″
Note — For special arrangements for greater capacities, see below.						
Greatest length that can be turned at one movement	$\frac{3}{4}$″	$1\frac{1}{2}$″	2″	4″	5″	
Greatest length that can be fed at one movement	1″	2″	$2\frac{1}{2}$″	5″	6″	1″
Number of spindle speeds	3 30 30	3 30 30	3 30 30			18 20
Fastest and slowest spindle speeds r.p.m.	5000 5000 5000 1500 243 242	3600 3600 3600 1200 177 175	2400 2400 2400 900 125 125	For Speeds see below		5000 5000 875 850
Change gears give one revolution of cams.....Fastest	$\frac{3}{4}$ sec.	$1\frac{3}{4}$ sec.	3 sec.	12 sec.	20 sec.	$\frac{3}{4}$ sec.
Slowest	$45\frac{1}{2}$ sec.	$176\frac{1}{2}$ sec.	240 sec.	800 sec.	1200 sec.	20 sec.
Actual time allowed to feed stock	$\frac{1}{4}$ sec.	$\frac{1}{3}$ sec.	$\frac{1}{2}$ sec.	2 sec.	$2\frac{2}{3}$ sec.	$\frac{1}{4}$ sec.
Actual time allowed to automatically change speed				$\frac{1}{2}$ sec.	$\frac{1}{3}$ sec.	
Actual time allowed to index turret	$\frac{1}{4}$ sec.	$\frac{1}{3}$ sec.	$\frac{1}{2}$ sec.	2 sec.	$2\frac{2}{3}$ sec.	
Number of holes in turret	6	6	6	6 Locations Flat Turret		
Diameter of holes in turret	$\frac{5}{8}$″	$\frac{3}{4}$″	1″			
Diameter of turret	$3\frac{3}{4}$″	$4\frac{1}{16}$″	5″	13″	15″	
Greatest distance tools can project from turret	$2\frac{1}{4}$″	$3\frac{1}{4}$″	$3\frac{7}{8}$″			
Greatest diameter of tool turret will swing	$1\frac{5}{8}$″	$2\frac{5}{8}$″	$2\frac{7}{8}$″			
Greatest distance between turret and chuck	$2\frac{13}{16}$″	$5\frac{1}{16}$″	$6\frac{3}{4}$″	$6\frac{7}{8}$″	$8\frac{5}{8}$″	3″
Least distance between turret and chuck	$1\frac{7}{8}$″	$2\frac{3}{8}$″	$2\frac{1}{2}$″	$2\frac{7}{8}$″	$3\frac{5}{8}$″	$\frac{3}{16}$″
Distance, face of turret to centre line of spindle				$1\frac{5}{8}$″	$1\frac{5}{8}$″	
Screw adjustment of turret slide		$\frac{3}{4}$″	1″			
Rack adjustment of turret slide (one tooth)	Approx. $\frac{3}{16}$″					
Top of cross slide to centre of spindle	1″	$1\frac{5}{16}$″	$1\frac{7}{16}$″	$2\frac{3}{16}$″	$2\frac{7}{16}$″	1″
Movement of cross slide	1″	$1\frac{1}{4}$″	$1\frac{3}{4}$″	$2\frac{1}{4}$″	$2\frac{1}{2}$″	1″
Distance from centre of spindle to floor	46″	46″	46″	46″	46″	46″
Floor space, length	40″	49″ 59″ 49″	60″ 61″ 60″	90″	97″	$40\frac{1}{2}$″ $51\frac{1}{2}$″
Floor space, width	22″	23″ 29″ 23″	26″ 31″ 26″	32″	41″	22″ 31″
Net weight, about, in lbs.	925 1600 925	1475 2075 1475	2000 2650 2000	4650	5800	1300 1700

Largest Stock taken with Outside Feeding Attachment

	Round	Hex.	Square
Nos. 0 and 0G Machines with $1\frac{3}{16}$″ hole in spindle	$\frac{2}{4}$″	$\frac{21}{32}$″	$\frac{17}{32}$″
with $\frac{1}{2}$″ hole in spindle	$\frac{13}{16}$	$\frac{11}{16}$	$\frac{9}{16}$
Nos. 2 and 2G Machines with $1\frac{5}{16}$″ hole in spindle	$1\frac{1}{4}$	$1\frac{1}{8}$	$1\frac{1}{16}$
with $1\frac{7}{16}$″ hole in spindle	$1\frac{3}{8}$	$1\frac{3}{16}$	$1\frac{1}{16}$
No. 4 Machine with 2″ hole in spindle	$1\frac{7}{8}$	$1\frac{5}{8}$	$1\frac{5}{16}$
No. 6 Machine with $2\frac{1}{2}$″ hole in spindle	$2\frac{3}{8}$	$2\frac{1}{16}$	$1\frac{11}{16}$

Largest Stock taken with Extra Size Feed Tube (for light cuts only)	Round	Hex. Flats	Square
No. 00 Size Machines	$\frac{3}{8}$″	$\frac{5}{16}$″	$\frac{1}{4}$″
No. 0 Size Machines	$\frac{5}{8}$	$\frac{1}{2}$	$\frac{7}{16}$
No. 2 Size Machines	$1\frac{1}{8}$	$\frac{15}{16}$	$\frac{7}{8}$

				No. 4	No. 6	Nos. 00H.S., 00G H.S. Screw Thrd.
Belt Drive	For Steel	Number of Spindle Speeds		17	17	
		For-ward	Fastest and Slowest Spindle Speeds r.p.m	610 70	502 48	
		Back-ward	Fastest and Slowest Spindle Speeds r.p.m.	1000 115	875 80	
	For Brass	Number of Spindle Speeds		13	13	
		For-ward	Fastest and Slowest Spindle Speeds r.p m	608 136	500 102	
		Back-ward	Fastest and Slowest Spindle Speeds r.p.m.	1000 224	870 174	
Motor Drive	Number of Spindle Speeds			17	17	
	Forward		Fastest and Slowest Spindle Speeds r.p.m.	610 70	502 48	
	Backward		Fastest and Slowest Spindle Speeds r.p.m.	1000 115	875 80	
Die Spindle	Number of Changes of Speeds					18 20
	Fastest and Slowest Spindle Speeds r.p.m.					7000 5000 1094 850
Threading	Number of Cutting Speeds					24 30
	Fastest and Slowest Cutting Speeds r.p.m.					3500 3500 219 240

For Machines of current design see Page 21

TABLE OF MACHINE CAPACITIES, SPEEDS, ETC.

Old Design Machines

	Nos. 00 & 00G	Nos. 0 & 0G	Nos. 2 & 2G
Diameter of hole through regular feed tube	$\frac{21}{64}$″	$\frac{17}{64}$″	$1\frac{1}{32}$″
Largest stock taken in regular feeding fingers..... Round	$\frac{15}{64}$″	$\frac{1}{2}$″	1″
Hex.	$\frac{1}{2}$″	$\frac{7}{16}$″	$\frac{7}{8}$″
Square	$\frac{7}{32}$″	$\frac{19}{64}$″	$\frac{31}{64}$″
Note — For special arrangements for greater capacities, see below.			
Greatest length that can be turned at one movement	$1\frac{1}{4}$″	2″	3″
Greatest length that can be fed at one movement	2″	3″	4″
Number of spindle speeds	12 15	12	12
Fastest and slowest spindle speeds r.p.m.	420 260 / 2400 2420	200 / 1800	120 119 / 1200 1216
Change gears give one revolution of cams			
Fastest	$1\frac{1}{2}$ sec.	$3\frac{1}{3}$ sec.	6 sec.
Slowest	91 sec.	353 sec.	480 sec.
Actual time allowed to feed stock	$\frac{1}{2}$ sec.	$\frac{2}{3}$ sec.	1 sec.
Actual time allowed to automatically change speed	$\frac{1}{4}$ sec.*	$\frac{1}{3}$ sec.	$\frac{1}{2}$ sec.
Actual time allowed to index turret	$\frac{1}{2}$ sec.	$\frac{2}{3}$ sec.	1 sec.
Number of holes in turret	6	6	6
Diameter of holes in turret	$\frac{3}{8}$″	$\frac{3}{4}$″	1″
Diameter of turret	$3\frac{3}{8}$″	$4\frac{1}{16}$″	5″
Greatest distance tools can project from turret	$2\frac{1}{16}$″	$2\frac{1}{16}$″	$3\frac{7}{8}$″
Greatest diameter of tool turret will swing	$1\frac{3}{8}$″	$2\frac{3}{8}$″	$2\frac{7}{8}$″
Greatest distance between turret and chuck	$2\frac{15}{16}$″	$5\frac{1}{8}$″	$6\frac{3}{4}$″
Least distance between turret and chuck	$1\frac{5}{16}$″	$2\frac{1}{8}$″	$2\frac{1}{2}$″
Screw adjustment of turret slide		$\frac{3}{4}$″	1″
Rack adjustment of turret slide (one tooth)	Approx. $\frac{3}{16}$″		
Top of cross slide to centre of spindle	1″	$1\frac{5}{16}$″	$1\frac{7}{16}$″
Movement of cross slide	1″	$1\frac{1}{4}$″	$1\frac{3}{4}$″
Distance from centre of spindle to floor	46″	46″	46″
Floor space, length	40″ 49″	51″ 62″	60″ 62″
Floor space, width	22″ 27″	23″ 28″	26″ 28″
Net weight, about, in lbs.	1100 1500	1800 2075	2600 2000

* On No. 00G Machine only.

Largest Stock taken with Outside Feeding Attachment

	Round	Hex.	Square
Nos. 0 and 0G Machines with $\frac{13}{16}$″ hole in spindle	$\frac{3}{4}$	$\frac{21}{32}$	$\frac{17}{32}$
with $\frac{7}{8}$″ hole in spindle	$\frac{13}{16}$	$\frac{3}{4}$	$\frac{9}{16}$
Nos. 2 and 2G Machines with $1\frac{5}{16}$″ hole in spindle	$1\frac{1}{8}$	$1\frac{1}{16}$	$\frac{7}{8}$
with $1\frac{7}{16}$″ hole in spindle	$1\frac{3}{8}$	$1\frac{9}{16}$	$\frac{31}{32}$

Largest Stock taken with Extra Size Feed Tube (For light cuts only)

Machine No.	Serial No.	Round	Hex. Flats	Square	
00	Prior to 3448	$\frac{3}{8}$″	$\frac{21}{64}$″	$\frac{17}{64}$″	Soldered in fingers
00G	Prior to 3098				
00	Begin 3448	$\frac{3}{8}$″	$\frac{21}{64}$″	$\frac{17}{64}$″	Threaded fingers
00G	Begin 3098				
0	Prior to 2015	$\frac{9}{16}$″	$\frac{1}{2}$″	$\frac{13}{32}$″	Soldered in fingers
0G	Prior to 2215				
0	Prior to 2015	$\frac{5}{8}$″	$\frac{17}{32}$″	$\frac{29}{64}$″	Fingers made on tube
0G	Prior to 2215				
0	Begin 2015	$\frac{5}{8}$″	$\frac{17}{32}$″	$\frac{29}{64}$″	Threaded fingers
0G	Begin 2215				
2	Prior to 2255	$1\frac{1}{16}$″	$\frac{15}{16}$″	$\frac{3}{4}$″	Soldered in fingers
2G	Prior to 2205				
2	Begin 2255	$1\frac{1}{8}$″	$\frac{31}{32}$″	$\frac{25}{32}$″	Threaded fingers
2G	Begin 2205				

For Machines of current design see Page 21

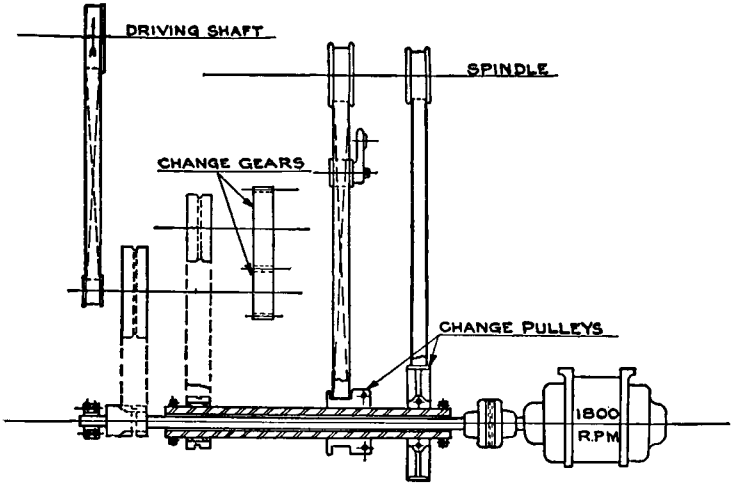
SPINDLE SPEEDS AND BELTING DIAGRAM

No. 00G Automatic Screw Machine (High Speed)

For Motor Drive Only

With 30 or 36 Spindle Speeds

(30 Speed Machine, Serial Nos. 11651 to 12851)
(36 Speed Machine, Serial Nos. 12852 to 19798)



Above diagram is for 36 Speed Machine. On 30 Speed Machine belts may be run open or crossed to suit conditions.

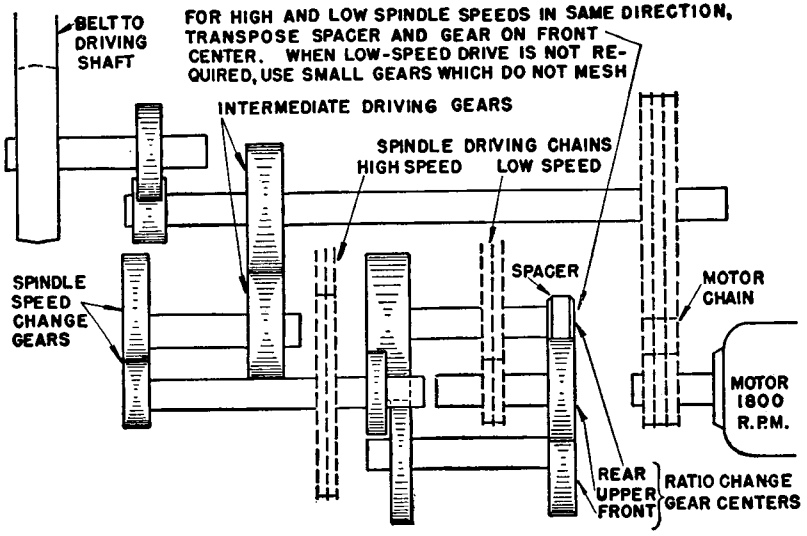
Spindle Speeds — R.P.M.				
Left-hand Pulley		Right-hand Pulley	Change Gears	
Inter. Pulley	Small Pulley	Large Pulley	Lower	Upper
*2000	*1200	*6000	71	29
1666	1000	5000	67	33
1460	876	4380	64	36
1235	742	3710	60	40
1045	626	3122	56	44
890	534	2670	52	48
760	456	2280	48	52
647	388	1940	44	56
547	328	1640	40	60
461	277	1385	36	64
404	243	1212	33	67
* 333	* 200	*1000	29	71

* 36 Speed Machine only.

SPINDLE SPEED DIAGRAM

No. 00G Automatic Screw Machine (High Speed)
(Begins with Machines Serial Nos. 19799 and 542-00-1)

No. 00G Automatic Cutting-Off Machine (High Speed)
(Begins with Machines Serial Nos. 19799 and 544-00-1)



Spindle Speeds—R.P.M.

Spindle Change Gears — Ratio Change Gears: Upper / Lower — Low Speeds — Opposite Direction: Front — Same Direction: Rear

L.H. Centers Low. | Up.	High Speed	28/67	31/64	35/60	39/56	42/53	46/49	49/46	53/42	56/39	60/35	64/31	67/28	70/25	73/22
		†	†	†	†	†	†	†	†						
73–22	6050	3780	3255	2700	2265	1990	1680	1480	1240	1100	920	765	660	565	
		†	†	†											
70–25	5110	3180	2745	2280	2015	1680	1420	1250	1055	930	775	645	555		400
67–28	4365		2345	1950	1630	1435	1210	1065	900	790	665	550		440	345
64–31	3770	2345		1680	1410	1225	1045	920	780	685	575		410	350	295
60–35	3130	1950	1680		1170	1030	870	765	645	565		395	340	290	245
56–39	2620	1630	1410	1170		860	725	640	540		400	330	285	245	205
53–42	2305	1435	1240	1030	860		640	565		420	350	290	250	215	180
49–46	1945	1210	1045	865	725	640			400	350	295	245	210	190	155
46–49	1715	1065	920	765	640	560			355	310	260	220	185	160	135
42–53	1450	900	780	645	540		400	355		260	220	185	160	135	115
39–56	1270	790	680	565		415	350	310	260		195	160	125	120	100
35–60	1065	660	570		395	350	295	260	220	195		135	115	100	85
31–64	885	550		395	330	290	245	215	185	160	135		100	85	70
28–67	765		410	340	285	250	210	185	155	140	115	95		70	60
25–70	650	405	350	290	245	215	180	160	135	120	100	80	70		50
22–73	550	345	295	245	205	180	155	135	115	100	85	70	60	50	
Ratio of High to Low Speed		1.6	1.8	2.2	2.6	3	3.6	4.1	5	5.5	6.5	7.9	9.1	11	13

Spindle Running Fast Backward — Cross Driving Shaft Belt.
Spindle Running Fast Forward — Open Driving Shaft Belt.

† These combinations not to be used in opposite directions.

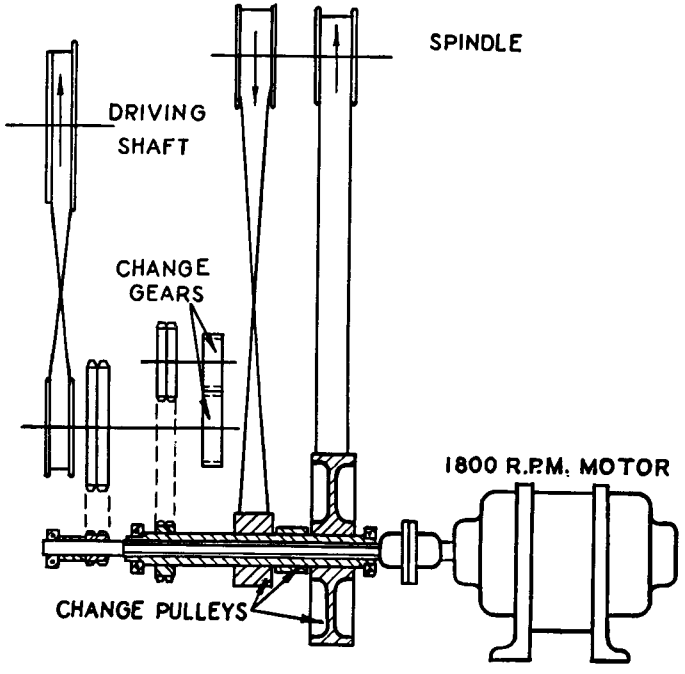
SPINDLE SPEEDS AND BELTING DIAGRAM

No. 0G Automatic Screw Machine (High Speed)

For Motor Drive Only

With 36 Spindle Speeds

(Machine Serial Nos. 8021 to 14342)

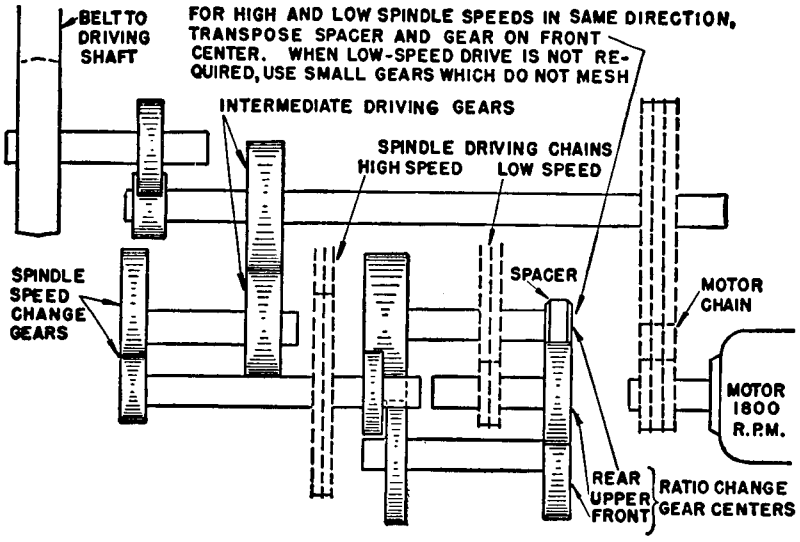


Spindle Speeds — R.P.M.				
Left-hand Pulley		Right-hand Pulley	Change Gears	
Inter. Pulley	Small Pulley	Large Pulley	Lower	Upper
1390	840	4150	35	15
1230	745	3660	33	16
1060	640	3160	32	18
890	540	2660	30	20
755	460	2260	28	22
645	390	1920	26	24
550	335	1640	24	26
465	285	1400	22	28
395	240	1180	20	30
335	205	1000	18	32
290	175	860	16	33
255	155	760	15	35

SPINDLE SPEED DIAGRAM

No. 0G Automatic Screw Machine (High Speed)
(Begins with Machines Serial Nos. 14343 and 542-0-1)

No. 0G Automatic Cutting-Off Machine (High Speed)
(Begins with Machines Serial Nos. 14343 and 544-0-1)



Spindle Speeds—R.P.M.

Spindle Change Gears — Ratio Change Gears: Upper / Lower — Opposite Direction (Front) / Same Direction (Rear) — Low Speeds

L.H. Centers Low. | Up.	High Speed	28/67	31/64	35/60	39/56	42/53	46/49	49/46	53/42	56/39	60/35	64/31	67/28	70/25	73/22
73–22	4230	† 2590	† 2230	1855	1550	1365	1150	1015	855	750	630	525	450	385	
70–25	3570	† 2185	† 1885	1565	1310	1150	970	855	725	635	530	440	380		275
67–28	3050		1610	1340	1120	985	830	730	620	545	455	380		280	235
64–31	2630	1610		1155	965	850	715	630	535	470	390		280	240	205
60–35	2185	1335	1155		805	705	595	525	445	390		270	235	200	170
56–39	1830	1120	970	805		590	500	440	370		275	225	195	165	140
53–42	1610	985	850	705	590		440	385		285	240	200	170	145	125
49–46	1360	830	715	595	500	440			275	240	200	170	145	125	105
46–49	1200	730	630	525	440	385			240	215	180	150	130	110	90
42–53	1010	620	535	445	370		275	240		180	150	125	110	90	80
39–56	890	545	470	390		285	240	215	180		130	110	95	80	70
35–60	745	455	390		270	240	200	180	150	130		90	80	65	55
31–64	620	380		272	230	200	170	150	125	110	90		65	55	50
28–67	535		280	235	195	170	145	125	110	95	80	65		50	40
25–70	455	280	240	200	170	145	125	110	90	80	70	55	50		35
22–73	385	235	200	170	140	125	105	90	80	70	55	50	40	35	
Ratio of High to Low Speed		1.6	1.8	2.2	2.6	3	3.6	4.1	5	5.5	6.5	7.9	9.1	11	13

Spindle Running Fast Backward — Cross Driving Shaft Belt.
Spindle Running Fast Forward — Open Driving Shaft Belt.

† These combinations not to be used in opposite directions.

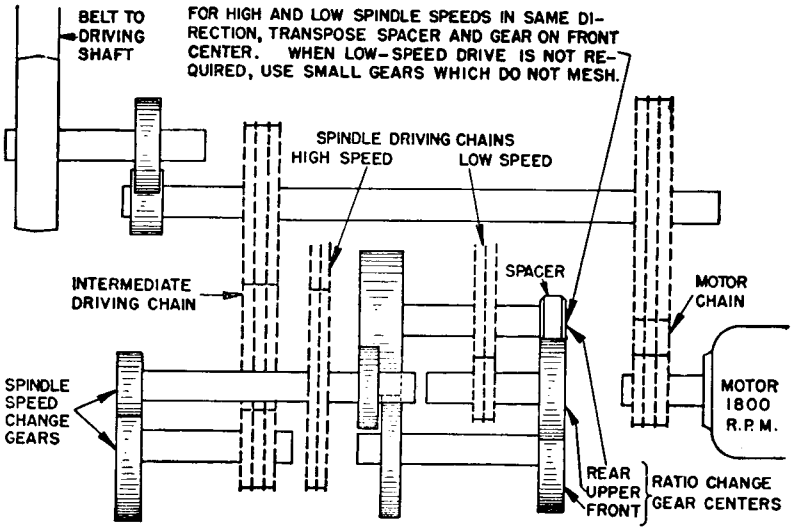
SPINDLE SPEED DIAGRAM

No. 2G Automatic Screw Machine (High Speed)

(For Machines Serial Nos. 9084 to 12863)

No. 2G Automatic Cutting-Off Machine (High Speed)

(For Machines Serial Nos. 9284 to 12863)



Spindle Speeds—R.P.M.

Spindle Change Gears — Ratio Change Gears: Upper / Lower — Opposite Direction (Front) — Same Direction (Rear) — Low Speeds

L.H.Centers Lower Upper	High Speed	28/67	31/64	35/60	39/56	42/53	46/49	49/46	53/42	56/39	60/35	64/31	67/28
*67-28	3000		† 1630	† 1355	† 1135	† 1000	† 840	† 740	625	550	460	385	
*64-31	2600	† 1630		† 1170	980	860	725	640	540	475	395		285
60-35	2150	1355	1170		810	715	600	530	450	395		275	235
56-39	1800	1135	980	815		600	505	445	375		275	230	200
53-42	1580	1000	860	715	600		445	390		290	245	200	175
49-46	1340	840	725	600	505	445			280	245	205	170	147
46-49	1180	740	640	530	445	390			245	215	180	150	130
42-53	1000	625	540	450	375		280	245		180	155	130	110
39-56	875	550	475	395		290	245	215	180		135	110	96
35-60	735	460	400		275	245	205	180	155	135		93	80
31-64	610	385		275	230	200	170	150	127	110	93		67
28-67	525		285	235	200	175	145	130	110	96	80	67	
Ratio of High to Low Speed		1.6	1.8	2.2	2.6	3	3.6	4.1	5	5.5	6.5	7.9	9.1

Spindle Running Fast Backward — Open Driving Shaft Belt.
Spindle Running Fast Forward — Cross Driving Shaft Belt.

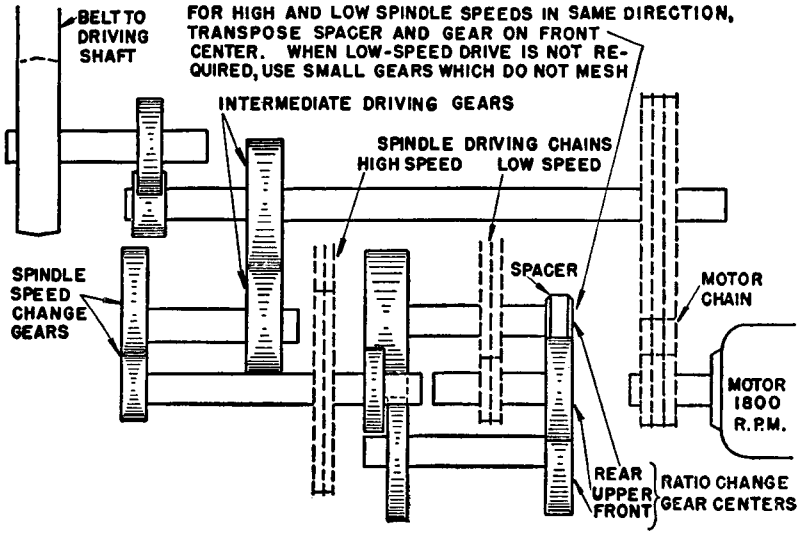
† These combinations not to be used in opposite directions.

* These Speed Groups not to be used on machines equipped with 1½" capacity spindle.

SPINDLE SPEED DIAGRAM

No. 2G Automatic Screw Machine (High Speed)
(Begins with Machines Serial Nos. 12864 and 542-2-1)

No. 2G Automatic Cutting-Off Machine (High Speed)
(Begins with Machines Serial Nos. 12864 and 544-2-1)



Spindle Speeds—R.P.M.

Spindle Change Gears / L.H. Centers Low. | Up.	High Speed	Ratio Change Gears Upper / Lower: 28/67	31/64	35/60	39/56	42/53	46/49	49/46	53/42	56/39	60/35	64/31	67/28	70/25	73/22
						Low Speeds				Opposite Direction Front			Same Direction Rear		
*73–22	3025	† 1890	† 1635	† 1355	† 1135	† 1000	† 840	† 740	625	550	460	385	330	285	
*70–25	2550	1595	† 1380	† 1145	960	840	710	625	530	465	390	325	280		200
67–28	2180		1175	980	820	720	610	535	450	395	335	275		205	170
64–31	1880	1175		845	705	620	525	460	390	345	285		205	175	150
60–35	1560	980	845		585	515	435	385	325	285		200	170	145	125
56–39	1310	820	705	585		430	365	320	270		200	165	145	120	105
53–42	1150	720	620	515	430		320	280		210	175	145	125	105	90
49–46	970	610	525	435	365	320			200	175	150	125	105	90	75
46–49	855	535	460	385	320	280			175	155	130	110	95	80	65
42–53	720	450	390	325	270		200	175		130	110	90	80	65	55
39–56	635	395	345	285		210	175	155	130		95	80	70	60	50
35–60	530	335	285		200	175	150	130	110	95		65	60	50	40
31–64	440	275		200	165	145	125	110	90	80	65		50	40	35
28–67	380		205	170	145	125	105	95	80	70	60	50		35	30
25–70	325	205	175	145	120	105	90	80	65	60	50	40	35		25
22–73	275	170	150	125	105	90	75	65	55	50	40	35	30	25	
Ratio of High to Low Speed		1.6	1.8	2.2	2.6	3	3.6	4.1	5	5.5	6.5	7.9	9.1	11	13

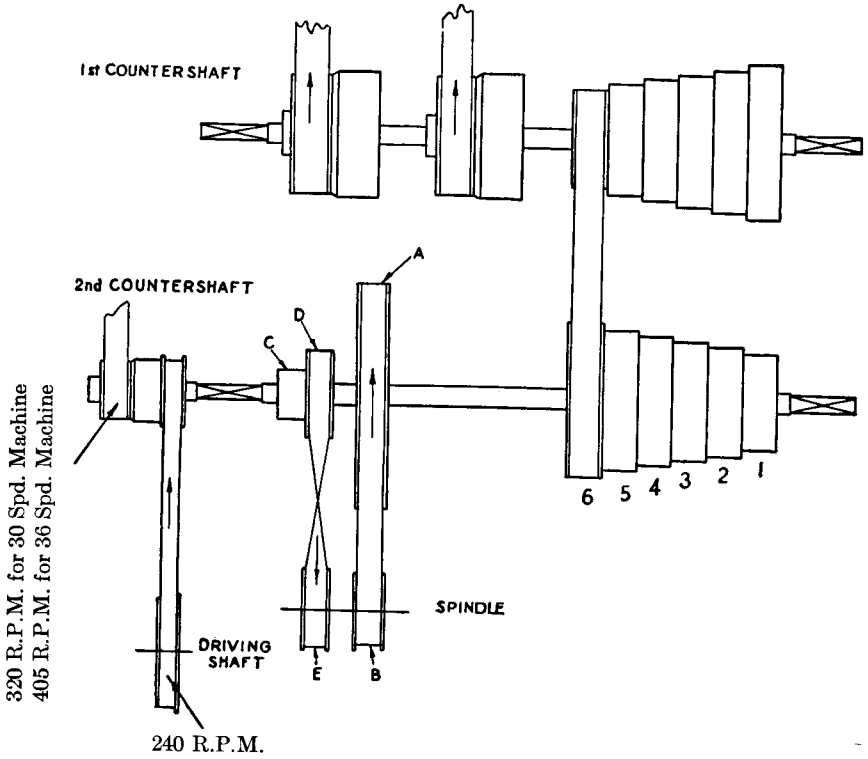
Spindle Running Fast Backward — Cross Driving Shaft Belt.
Spindle Running Fast Forward — Open Driving Shaft Belt.

† These combinations not to be used in opposite directions.

* These Speed Groups not to be used on machines equipped with 1½" capacity spindle.

SPINDLE SPEEDS AND BELTING DIAGRAM
No. 00 Automatic Screw Machine (High Speed) With 30 or 36 Spindle Speeds

(30 Speed Machine, Prior to Serial No. 12852)
(36 Speed Machine Begins with Serial No. 12852)

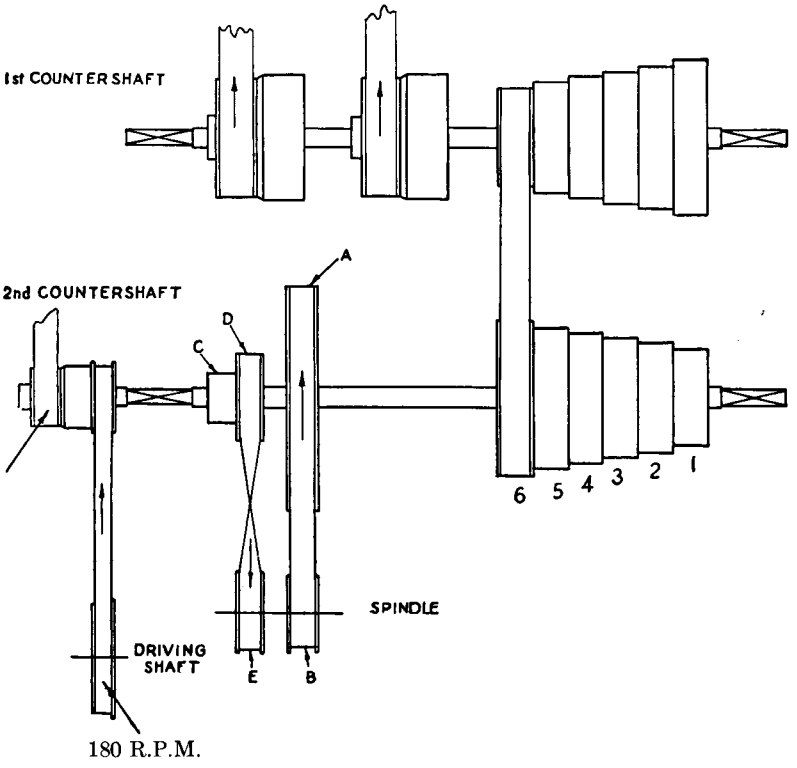


Belt on Spindle Driving Pulleys	R.P.M. Backward		Belt on Spindle Driving Pulleys	R.P.M. Forward		Belt on Spindle Driving Pulleys	R.P.M. Forward		Belt on C'Shaft Cone Step	1st C'Shaft R.P.M.	
	30 Spd.	36 Spd.		30 Spd.	36 Spd.		30 Spd.	36 Spd.		30 Spd.	36 Spd
	5000	6000		1666	2000		1000	1200	1		
	4264	5100		1420	1700		852	1025	2		
	3641	4360		1212	1450		727	875	3		
	3118	3720		1035	1240		622	745	4	575	688
	2660	3190		885	1060		531	640	5		
A–B		2720	*D–E*		905	*C–E*		545	6		
	2280	2210		760	735		456	440	1		
	1940	1880		641	625		388	375	2		
	1659	1610		551	535		331	320	3		
	1419	1370		472	455		283	275	4	260	253
	1213	1170		404	390		242	235	5		
		1000			333			200	6		

SPINDLE SPEEDS AND BELTING DIAGRAM

No. 0 Automatic Screw Machine (High Speed)
With 30 or 36 Spindle Speeds

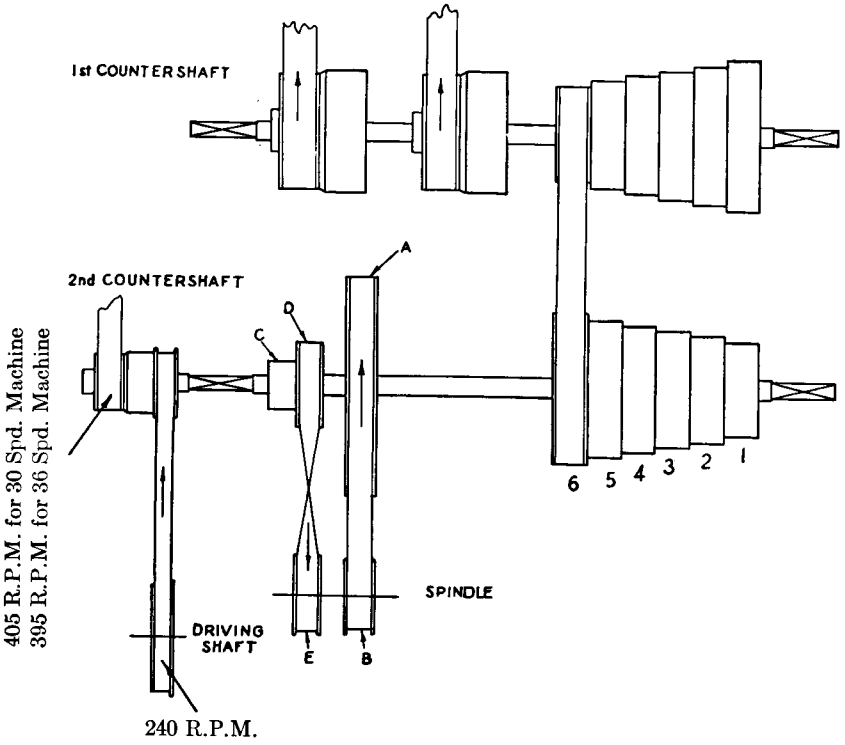
(30 Speed Machine, Prior to Serial No. 8021)
(36 Speed Machine Begins with Serial No. 8021)



Belt on Spindle Driving Pulleys	R.P.M. Backward		Belt on Spindle Driving Pulleys	R.P.M. Forward		Belt on Spindle Driving Pulleys	R.P.M. Forward		Belt on C'Shaft Cone Step	1st C'Shaft R.P.M.	
	30 Spd.	36 Spd.		30 Spd.	36 Spd.		30 Spd.	36 Spd.		30 Spd.	36 Spd.
	3600	4220		1205	1410		730	850	1		
	3080	3600		1025	1200		620	725	2		
	2630	3080		875	1030		530	620	3	540	630
	2250	2620		750	875		455	530	4		
	1920	2240		640	745		385	450	5		
A–B		1910	*D–E*		640	*C–E*		385	6		
	1640	1640		545	545		330	330	1		
	1400	1400		465	465		280	280	2		
	1190	1200		400	400		240	240	3	245	245
	1020	1020		340	340		205	205	4		
	870	870		290	290		175	175	5		
		745			250			150	6		

SPINDLE SPEEDS AND BELTING DIAGRAM
No. 2 Automatic Screw Machine (High Speed) With 30 or 36 Spindle Speeds

(30 Speed Machine, Prior to Serial No. 7352)
(36 Speed Machine Begins with Serial No. 7352)



Belt on Spindle Driving Pulleys	R.P.M. Backward		Belt on Spindle Driving Pulleys	R.P.M. Forward		Belt on Spindle Driving Pulleys	R.P.M. Forward		Belt on C'Shaft Cone Step	1st C'Shaft R.P.M.	
	30 Spd.	36 Spd.		30 Spd.	36 Spd.		30 Spd.	36 Spd.		30 Spd.	36 Spd.
	2400	3000		890	1070		510	645	1		
	2100	2460		780	880		450	525	2		
	1775	2110		655	750		380	450	3	540	590
	1510	1790		560	640		320	385	4		
	1280	1530		475	545		275	330	5		
A–B		1250	*D–E*		445	*C–E*		270	6		
	1090	1090		405	390		235	235	1		
	930	895		345	320		200	190	2		
	790	765		290	275		170	165	3	240	215
	665	650		245	230		140	140	4		
	585	560		215	200		125	120	5		
		455			160			100	6		

WEIGHTS OF STEEL AND BRASS BARS

STEEL.—Weights cover hot worked steel about .50% carbon. One cubic inch weighs .2833 lbs. High speed steel 10% heavier.

BRASS.—One cubic inch weighs .3074 lbs.

Actual weight of stock may be expected to vary somewhat from these figures because of variations in manufacturing processes.

WEIGHT OF BAR ONE FOOT LONG

	Steel			Brass		
SIZE	○	□	⬡	○	□	⬡
Inches	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
1/16	.0104	.013	.0115	.0113	.0144	.0125
1/8	.042	.05	.046	.045	.058	.050
3/16	.09	.12	.10	.102	.130	.112
1/4	.17	.21	.19	.18	.23	.20
5/16	.26	.33	.29	.28	.36	.31
3/8	.38	.48	.42	.41	.52	.45
7/16	.51	.65	.56	.55	.71	.61
1/2	.67	.85	.74	.72	.92	.80
9/16	.85	1.08	.94	.92	1.17	1.01
5/8	1.04	1.33	1.15	1.13	1.44	1.25
11/16	1.27	1.61	1.40	1.37	1.74	1.51
3/4	1.50	1.92	1.66	1.63	2.07	1.80
13/16	1.76	2.24	1.94	1.91	2.43	2.11
7/8	2.04	2.60	2.25	2.22	2.82	2.45
15/16	2.35	2.99	2.59	2.55	3.24	2.81
1	2.67	3.40	2.94	2.90	3.69	3.19
1 1/16	3.01	3.84	3.32	3.27	4.16	3.61
1 1/8	3.38	4.30	3.73	3.67	4.67	4.04
1 3/16	3.77	4.80	4.16	4.08	5.20	4.51
1 1/4	4.17	5.31	4.60	4.53	5.76	4.99
1 5/16	4.60	5.86	5.07	4.99	6.35	5.50
1 3/8	5.04	6.43	5.56	5.48	6.97	6.04
1 7/16	5.52	7.03	6.08	5.99	7.62	6.60
1 1/2	6.01	7.65	6.63	6.52	8.30	7.19
1 9/16	6.52	8.30	7.19	7.07	9.01	7.80
1 5/8	7.05	8.98	7.77	7.65	9.74	8.44
1 11/16	7.60	9.68	8.38	8.25	10.51	9.10
1 3/4	8.18	10.41	9.02	8.87	11.30	9.78
1 13/16	8.77	11.17	9.67	9.52	12.12	10.49
1 7/8	9.39	11.95	10.35	10.19	12.97	11.24
1 15/16	10.02	12.76	11.05	10.88	13.85	12.00
2	10.68	13.60	11.78	11.59	14.76	12.78
2 1/16	11.36	14.46	12.53	12.33	15.69	13.60
2 1/8	12.06	15.35	13.30	13.08	16.66	14.42
2 3/16	12.78	16.27	14.09	13.87	17.65	15.29
2 1/4	13.52	17.22	14.91	14.67	18.68	16.17
2 5/16	14.28	18.19	15.75	15.50	19.73	17.09
2 3/8	15.06	19.18	16.62	16.34	20.81	18.02