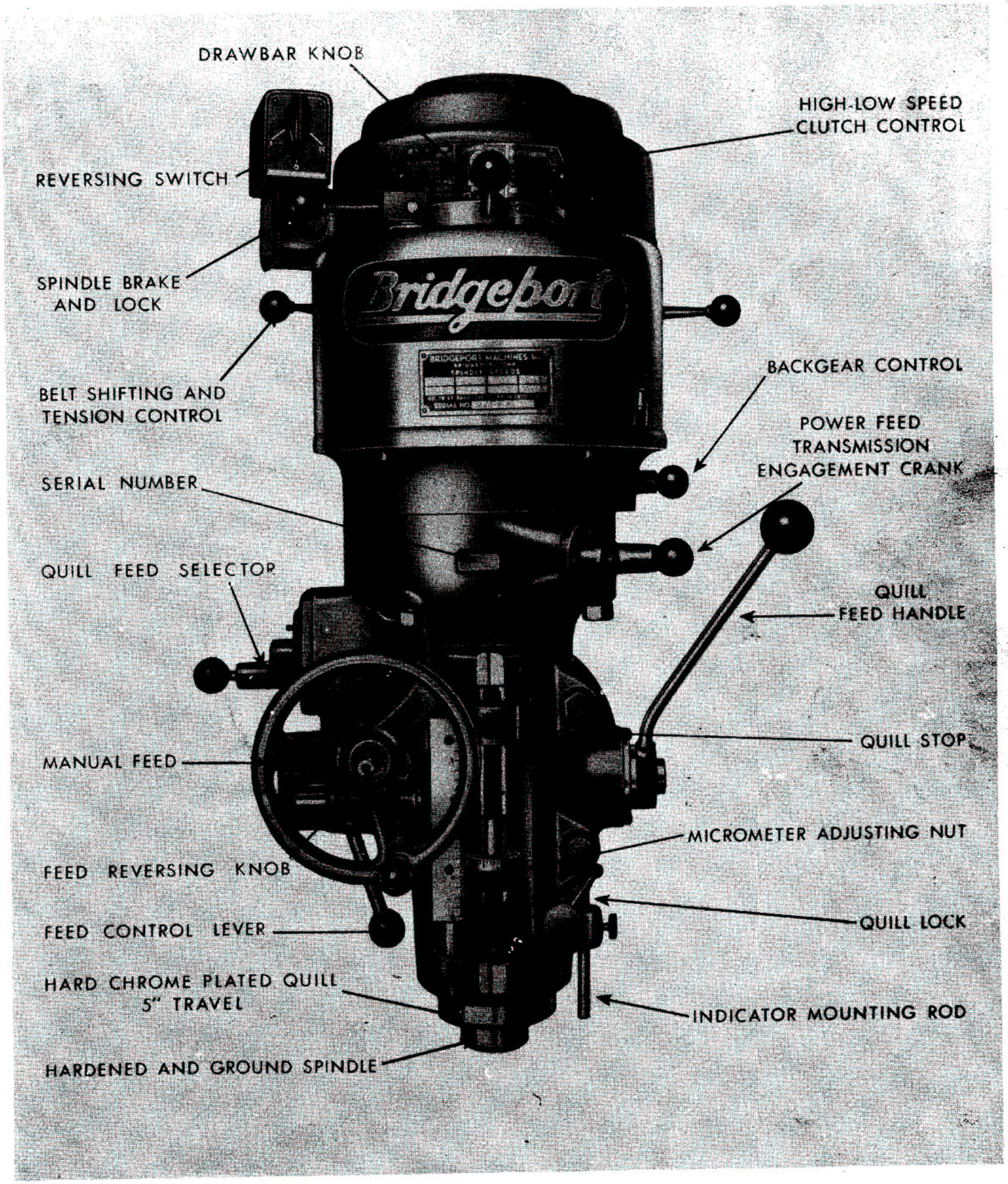

DRAWBAR KNOB
HIGH-LOW SPEED CLUTCH CONTROL
REVERSING SWITCH
SPINDLE BRAKE AND LOCK
BELT SHIFTING AND TENSION CONTROL
BACKGEAR CONTROL
SERIAL NUMBER
POWER FEED TRANSMISSION ENGAGEMENT CRANK
QUILL FEED SELECTOR
QUILL FEED HANDLE
QUILL STOP
MANUAL FEED
MICROMETER ADJUSTING NUT
FEED REVERSING KNOB
QUILL LOCK
FEED CONTROL LEVER
HARD CHROME PLATED QUILL 5" TRAVEL
INDICATOR MOUNTING ROD
HARDENED AND GROUND SPINDLE

OPERATING MANUAL

UNCRATING

Carefully remove protective crating so that the machine and parts are not marred, scratched or impaired. In the event of damage in transit, communicate at once with our representative and the transportation company making delivery.

SHORTAGES

Check shipment carefully against the itemized packing list which is included in the parts box. In case of shortages, report them immediately to the representative from whom the machine was purchased indicating parts not received which have been checked on the packing list. Shortages should be reported within ten days.

HOISTING

Do not use chain or cable! Use rope of sufficient strength around overarm. Exercise extreme care when hoisting machine, balancing on rope before raising.

MOUNTING HEAD ON OVERARM ADAPTER

Face on flange should be thoroughly cleaned, as this aligns milling head square with table working surface. Then clean mounting surface of head carefully and place against flange. When two surfaces are contacted, tighten bolts evenly using normal pressure. Care should be taken so as not to apply abnormal pressure since this will cause distortion of the quill housing.

MOUNTING MOTOR

Place belt over bottom step of spindle pulley, then place motor in housing and lower to place, switch being on left hand side.

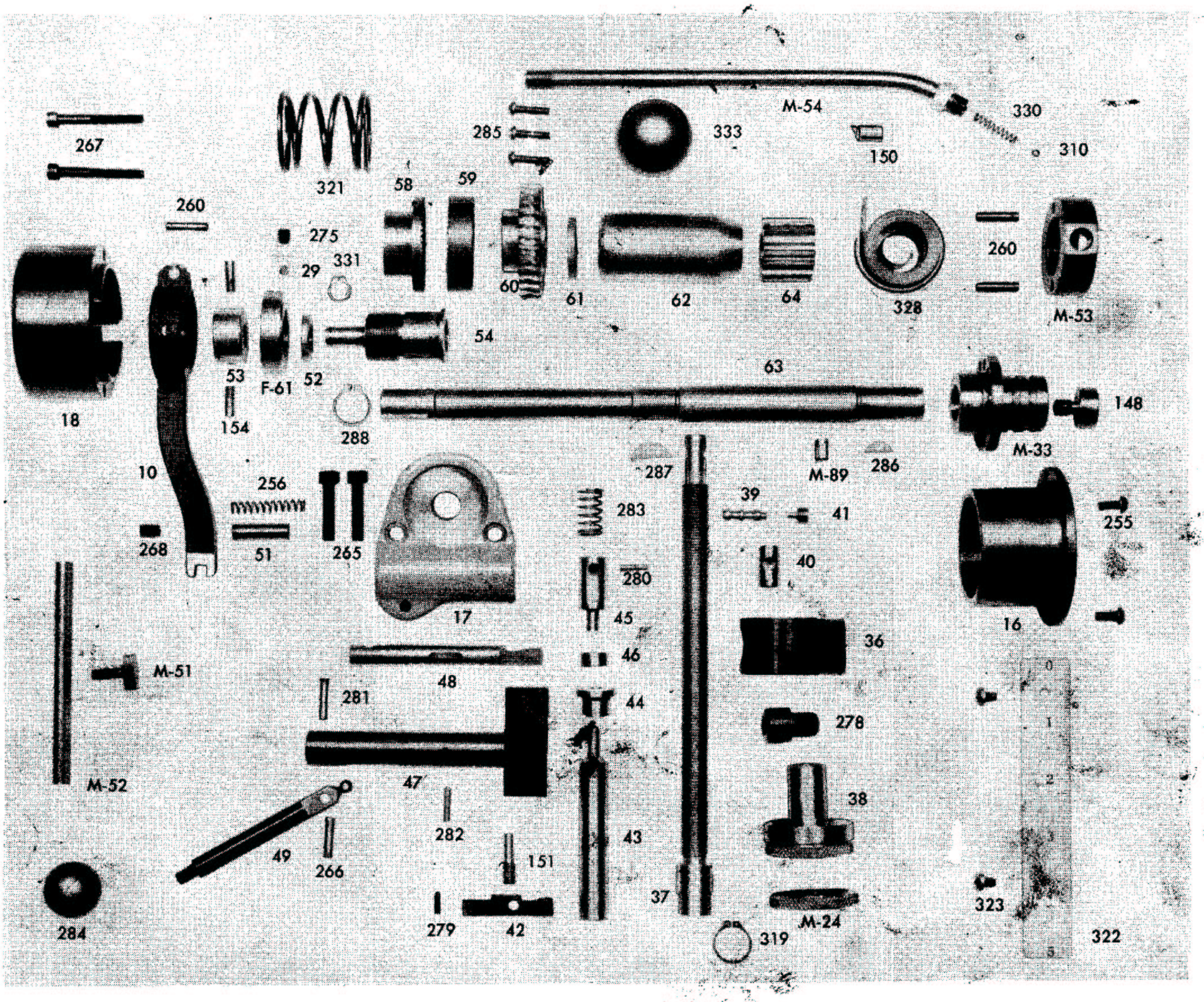
PLACING AND ADJUSTING BELTS

Release lock nut handle which is the handle on right of belt housing and also handle on left side and adjust V belts to proper driving tension, then tighten both motor clamping handles.

MACHINE IS READY TO OPERATE

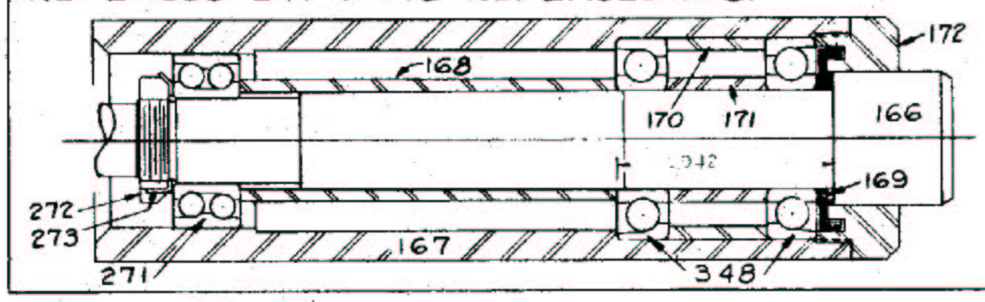
If quill and head are to be used in stationary position, quill lock should be applied. Micrometer depth stop scale is graduated in 20ths of an inch, pitch is .050 and nut is graduated in thousands. By utilizing these

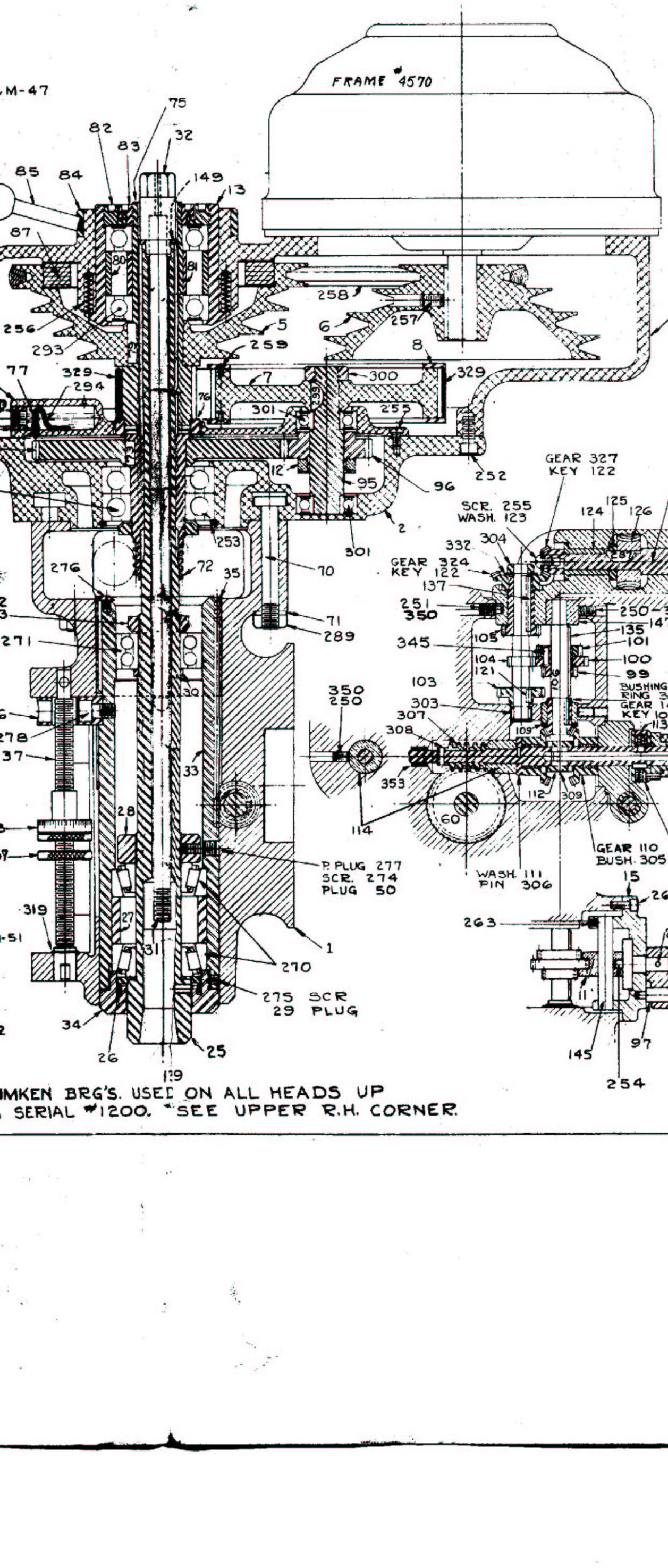
Quill Pinion and Overload Clutch Assembly - PARTS LIST

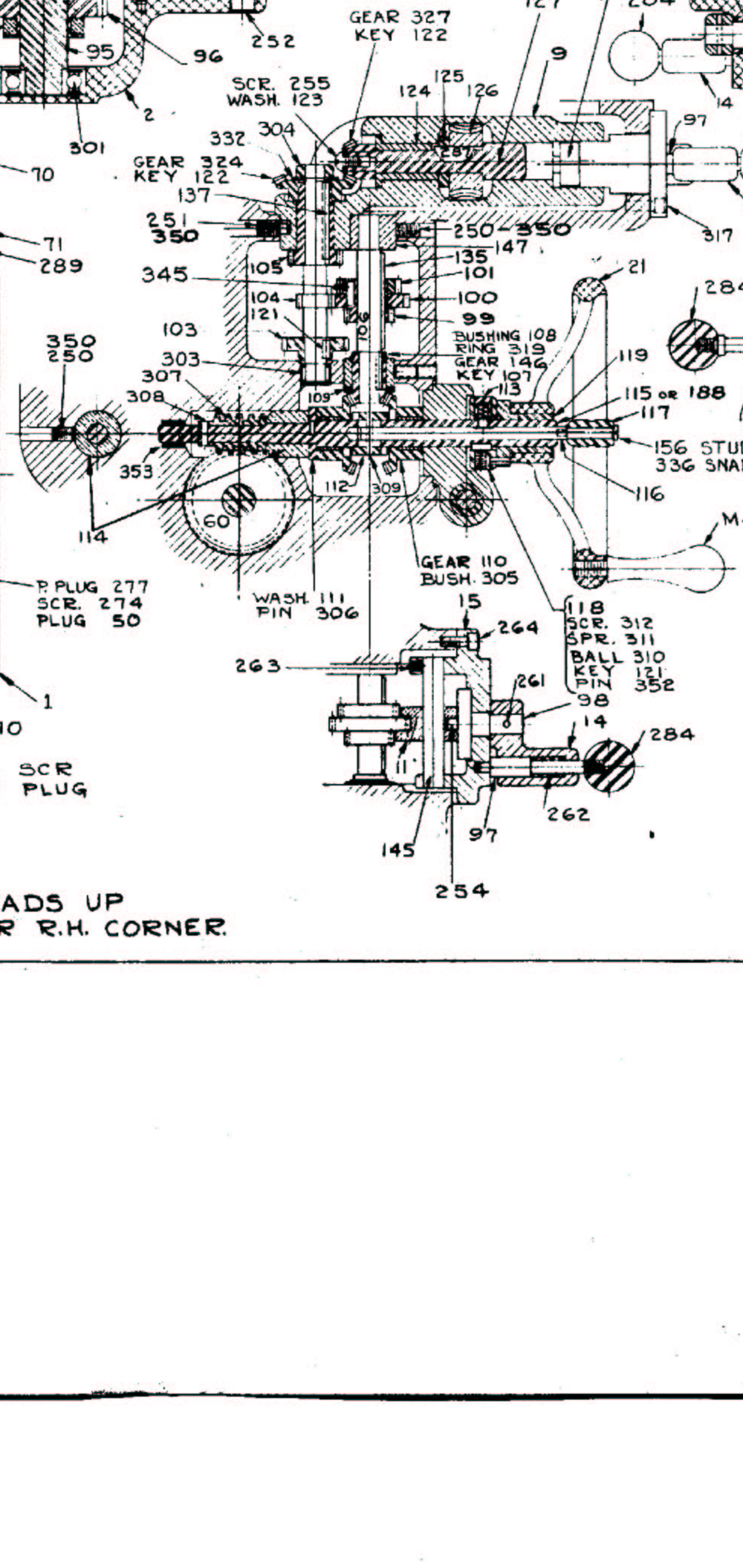


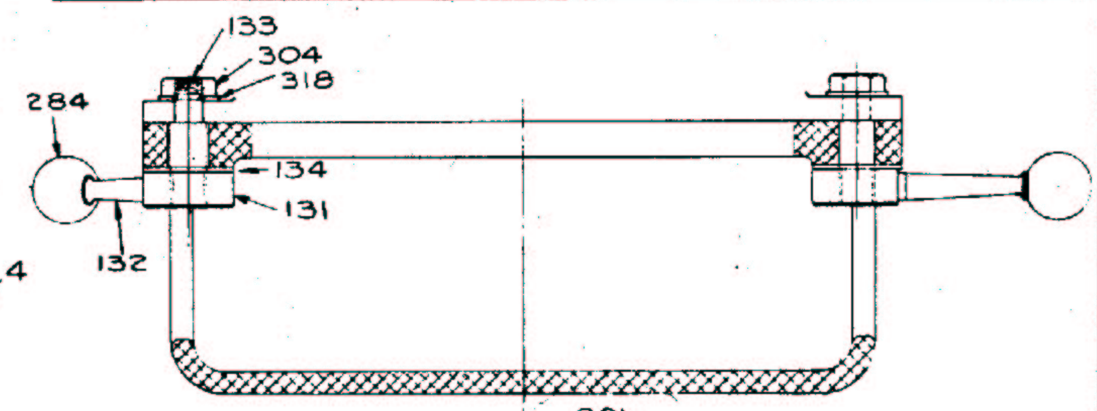
10	Overload Clutch Trip Lever	M-52	Indicator Rod	268	1/4-20 x 1/4 lg. S.L. Set Screw
16	Spring Cover	53	Clutch Ring	275	1/4-20 x 1/4 lg. Set Screw
17	Feed Trip Bracket	M-53	Pinion Shaft Hub	278	3/8-24 x 5/8 Cap Screw
18	Clutch Arm Cover	54	Overload Clutch Sleeve	279	#6-32 x 3/8 Set Screw
M-24	Micro Screw Jam Nut	M-54	Pinion Shaft Hub Handle	280	1/8 x 7/16 lg. Dowel Pin
29	Spindle Locknut Binding Plug	58	Overload Clutch	281	3/16 x 5/8 lg. Dowel Pin
M-33	Pinion Shaft Hub Sleeve	59	Overload Clutch Ring	282	1/8 x 9/16 lg. Roll Pin
36	Quill Stop Knob	60	Overload Clutch Worm Gear	283	Compression Spring
37	Quill Stop Micro. Screw	61	Pinion Shaft Worm Gear Spacer	284	1/4-20 Bakelite Ball Handle
38	Micrometer Nut	F-61	Gear Sleeve Nut	285	8-32 x 5/8 lg. Rd. Hd. Screw
39	Reverse Trip Ball Lever	62	Quill Pinion Shaft Bushing	286	#3 Woodruff Key
40	Feed Reverse Trip Plunger	63	Quill Pinion Shaft	287	#7 Woodruff Key
41	Reverse Trip Ball Lever Screw	64	Quill Pinion	288	#5108-59 Kohinoor Snap Ring
42	Feed Trip Lever	M-89	Clockspring Stud	310	3/16 Steel Ball
43	Feed Trip Plunger	148	Pinion Shaft Hub Screw	319	5108-62 Waldes Snap Ring
44	Trip Plunger Bushing	150	Outside Clockspring Pin	321	Safety Clutch Spring
45	Trip Plunger	151	Trip Lever Pin	322	Micrometer Scale
46	Feed Trip Plunger Bushing	154	Clutch Ring Pin	323	6-32 x 1/4 lg. Rd. Hd. Screw
47	Cam Rod Sleeve Assembly	255	#10-24 x 3/8 lg. Rd. Head Screws	328	5/8 x .020 x 42 lg. Clock Spring
48	Cam Rod	256	Compression Spring	330	Compression Spring
49	Trip Handle	260	3/16 x 3/4 lg. Dowel Pin	331	5108-37 Kohinoor Snap Ring
51	Overload Clutch Lever Spring Plunger	265	1/4-20 x 1 lg. Cap Screw	333	Black Ball for M-54
M-51	Indicator Rod Screw	266	3/16 x 3/4 lg. Dowel Pin		
52	Overload Clutch Washer	267	#10-24 x 1 1/2 lg. Cap Screw		

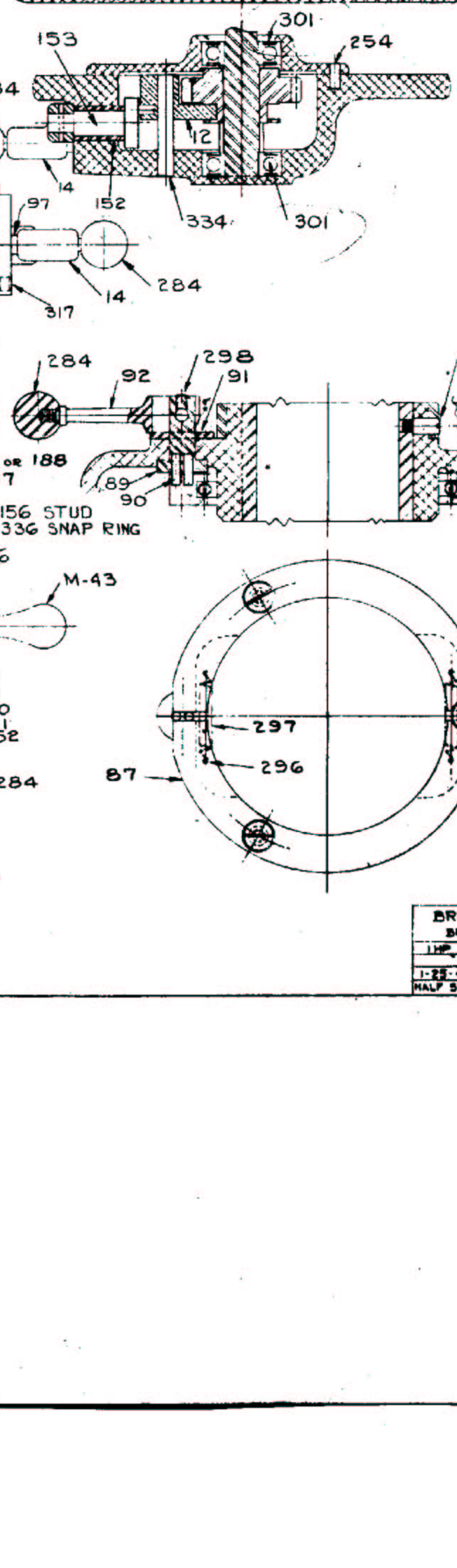
THIS DESIGN APPLIES TO ALL HEADS FROM SERIAL #1200 To 1750. FOR 1750 & UP, 349 REPLACES 271 & 176 REPLACES 168.

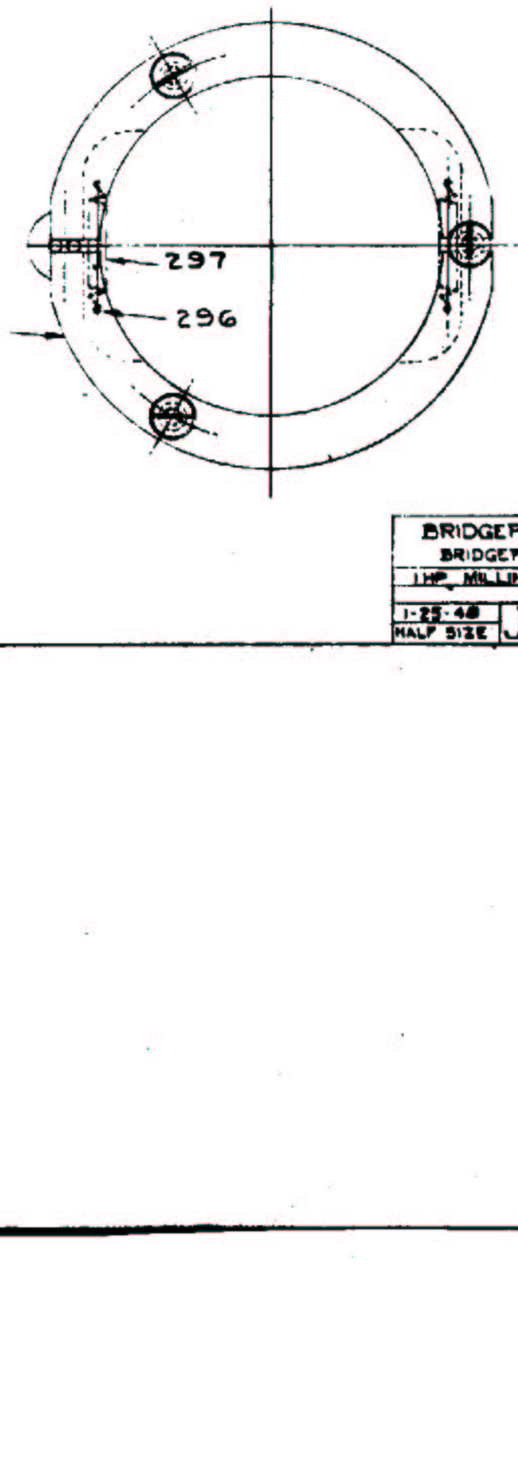






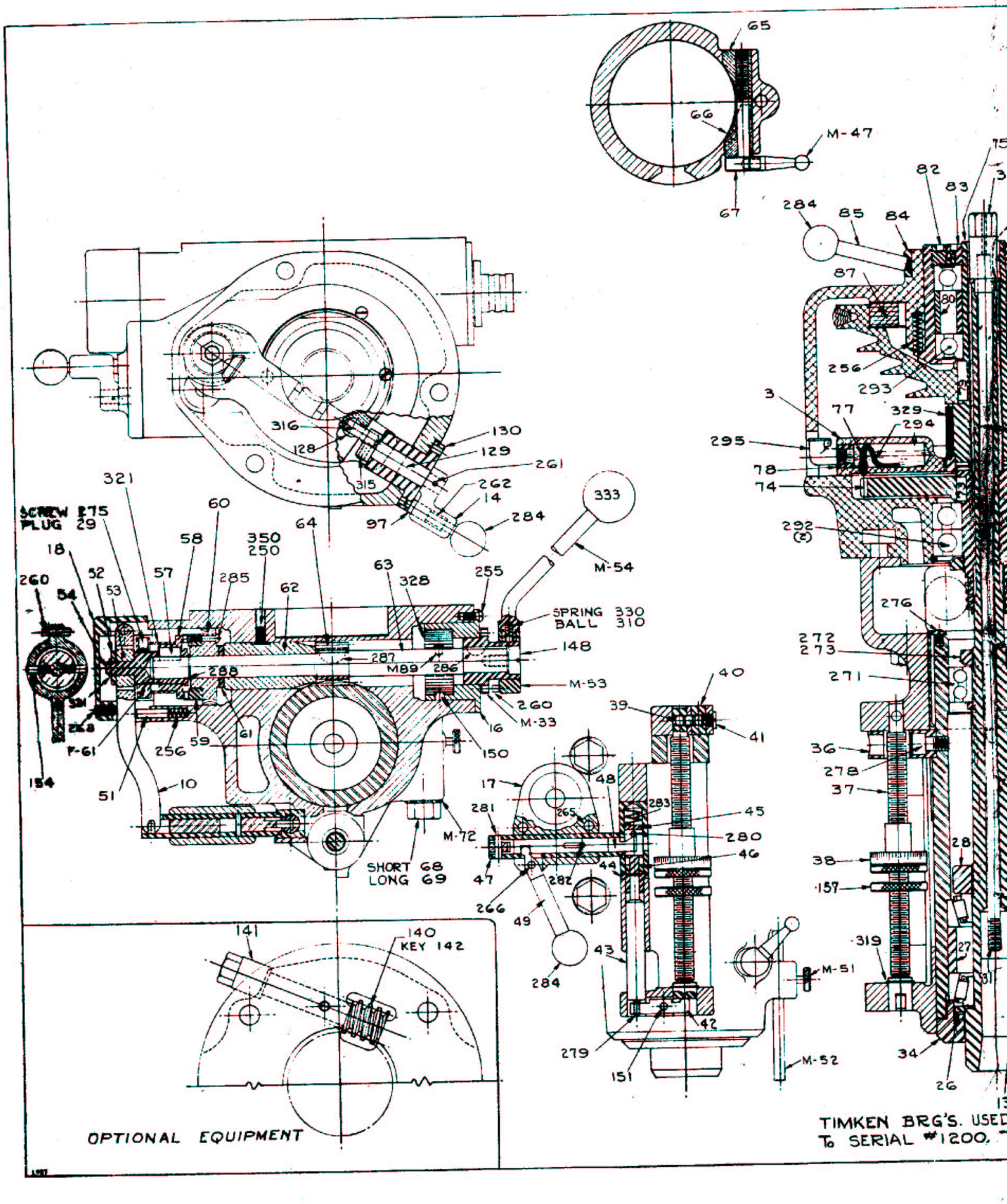






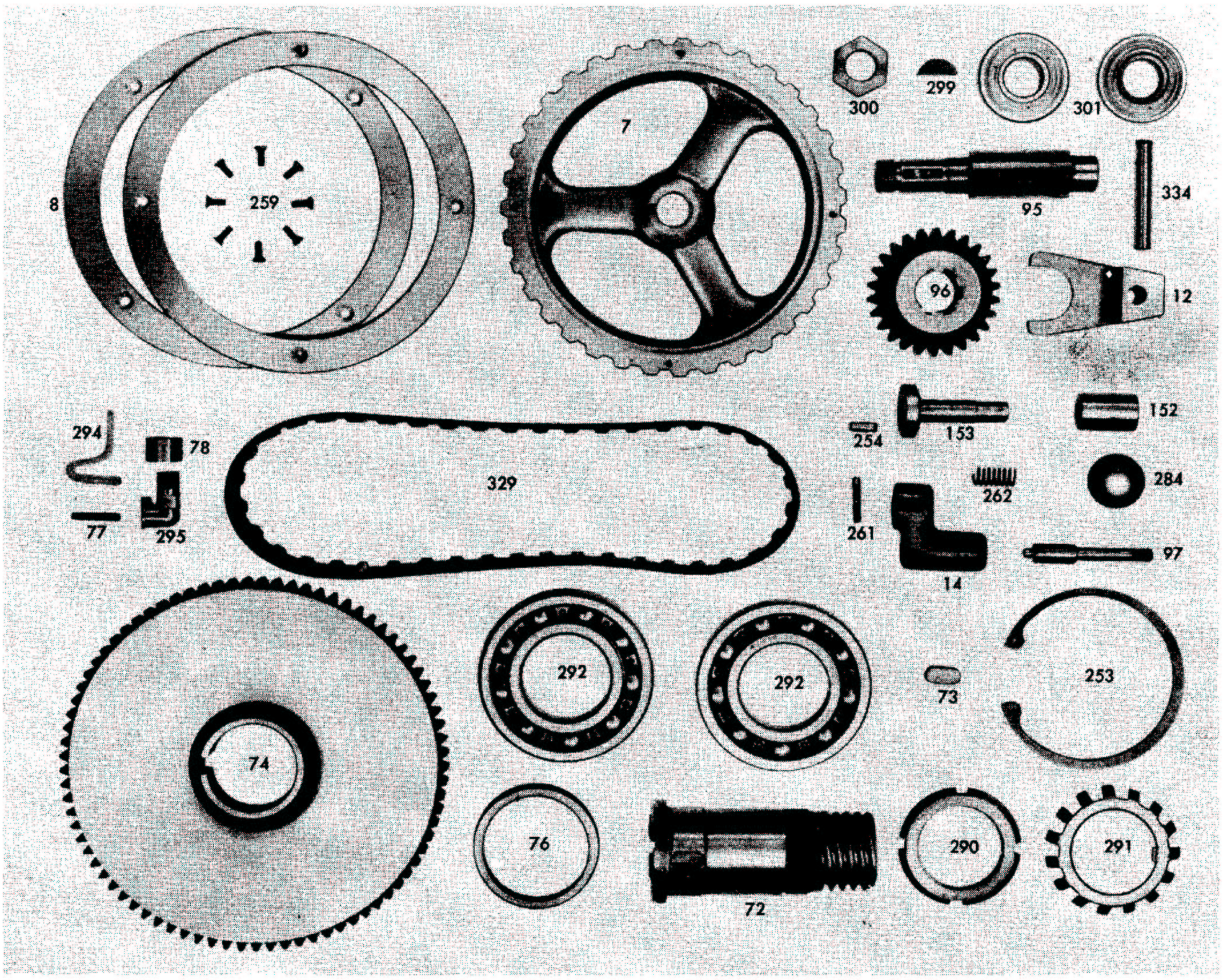
IMKEN BRG'S. USED ON ALL HEADS UP
SERIAL #1200. *SEE UPPER R.H. CORNER.

BRIDGEPORT MACHINES Inc.	
BRIDGEPORT CONN.	
1HP. MILLING ATTACHMENT	
1-25-48	J-200
HALF SIZE	


65
66
M-47
67
82
83
75
3
284
85
84
87
80
256
293
3
77
329
294
295
78
74
292
(2)
276
272
273
271
36
278
37
38
157
319
27
31
34
26
333
M-54
SPRING 330
BALL 310
148
M-53
260
M-33
16
150
40
39
41
48
17
265
283
45
281
280
46
44
282
47
266
49
284
43
M-51
42
279
151
M-52
SCREW 275
PLUG 29
18
52
53
54
260
57
58
60
285
62
350
250
64
63
328
255
287
M89
286
288
261
262
14
284
97
316
128
130
129
315
321
154
F-61
256
59
61
10
51
SHORT 68
LONG 69
M-72
141
140
KEY 142
OPTIONAL EQUIPMENT
TIMKEN BRG'S. USED
To SERIAL #1200.

Back Gear Transmission Unit

PARTS LIST



7	Timing Belt Pulley
8	Timing Belt Pulley Flange
12	Back Gear Shifter Fork
14	Shift Crank
72	Splined Gear Hub
73	Bull Gear Key
74	Spindle Bull Gear
76	Pulley Collar
77	Oiler Tube
78	Oil Plug
95	Countershaft
96	Countershaft Gear
97	Gearshift Plunger
152	Backgear Shift Bushing
153	Backgear Shift Crank
253	Kohinoor #5008-315 Snap Ring
254	3/16 x 1/2 lg. Dowel Pins
259	#6-32 x 3/8 lg. Flat Head Screws
261	1/8 x 7/8 lg. Roll Pin
262	Compression Spring
284	1/4-20 Bakelite Ball Handle
290	N-08 Special 5/16 thick Brg. Locknut
291	W-08 Lockwasher
292	ND #3208 Ball Brgs. #3 Precision
294	Wick 1/8 O.D.
295	#1249 Gits Oil Cup
299	#9 Woodruff Key
300	5/8-18 Hex Jam Nut
301	ND #99503 Double Seal Brg. #3 Precision
329	E-2 Construction Spec. TB 4B
334	5/16 x 2" lg. Dowel Pin

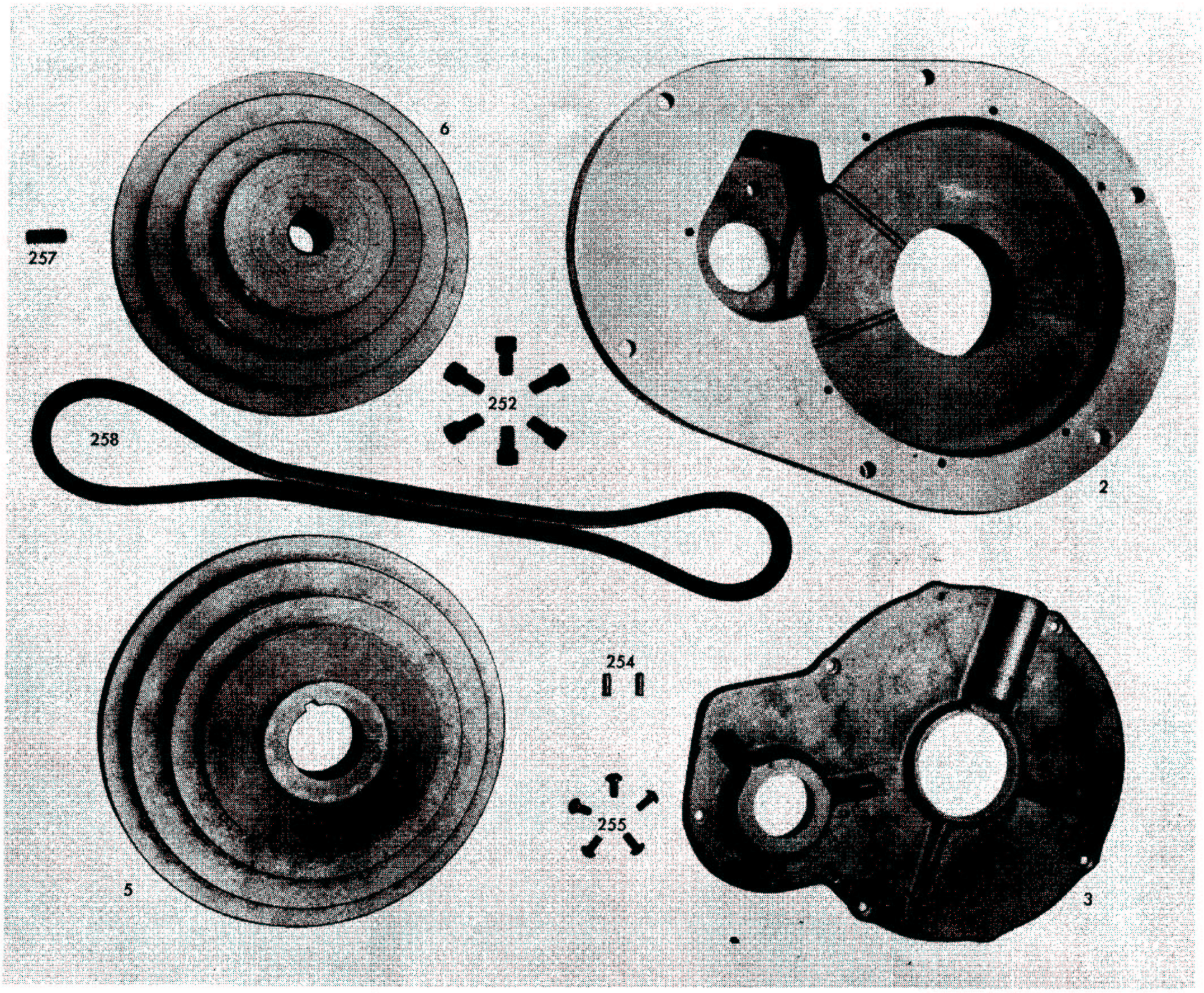
Made by

BRIDGEPORT MACHINES, INC.

500 LINDLEY STREET — BRIDGEPORT, CONN., U.S.A.

Sold By

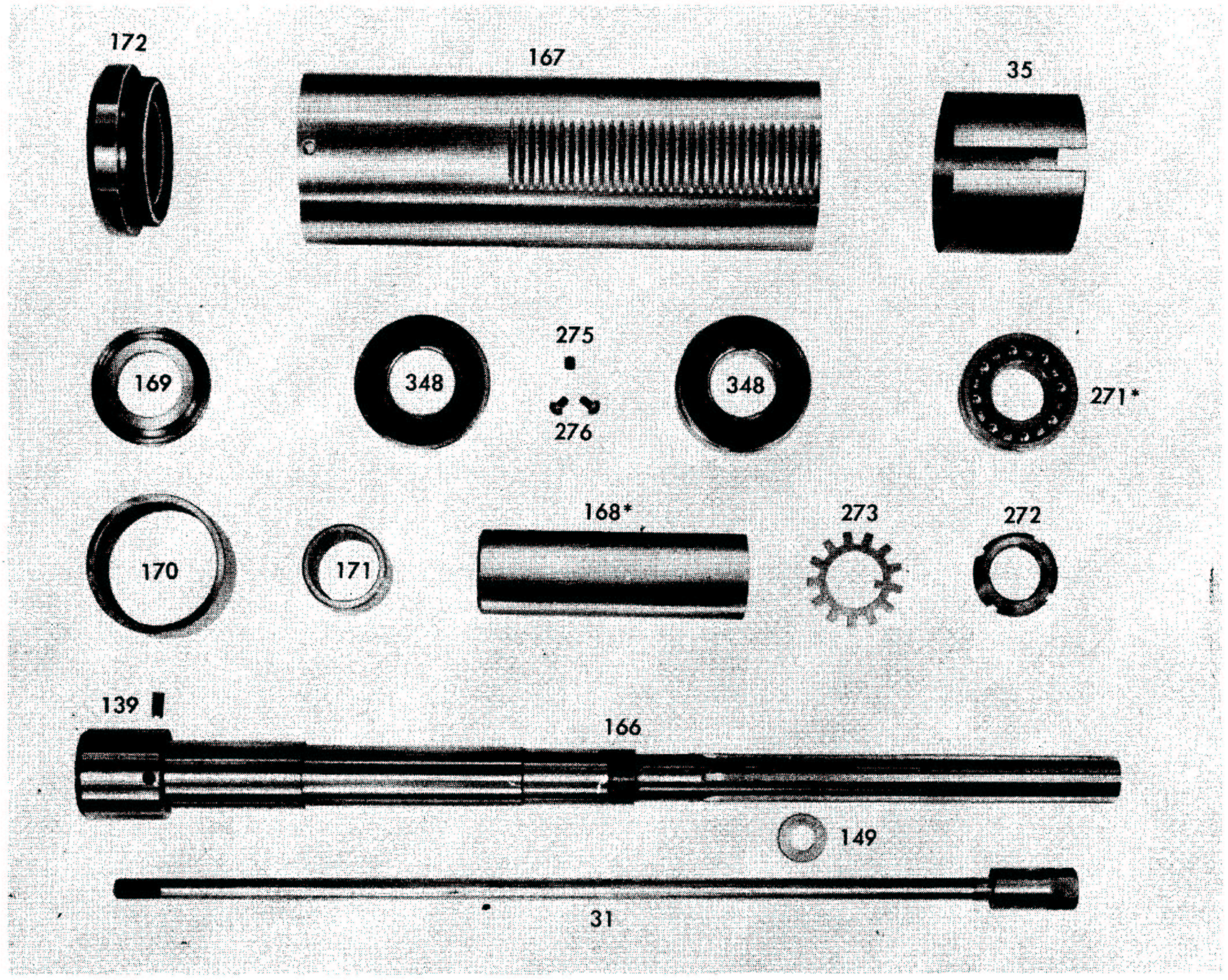
V Belt Unit - PARTS LIST



2	Gear Housing	254	3/16 x 1/2 lg. Dowel Pins
3	Gear Housing Cover	255	#10-24 x 3/8 lg. Rd. Head Screws
5	Spindle Pulley	257	5/16-18 x 1/2 lg. K.P. Set Screw
6	Motor Pulley	258	Gilmer #3345 Vee Belt
252	5/16-18 x 5/8 lg. Socket Cap Screws		

Quill Unit - PARTS LIST

SERIAL No. J1200 AND UP

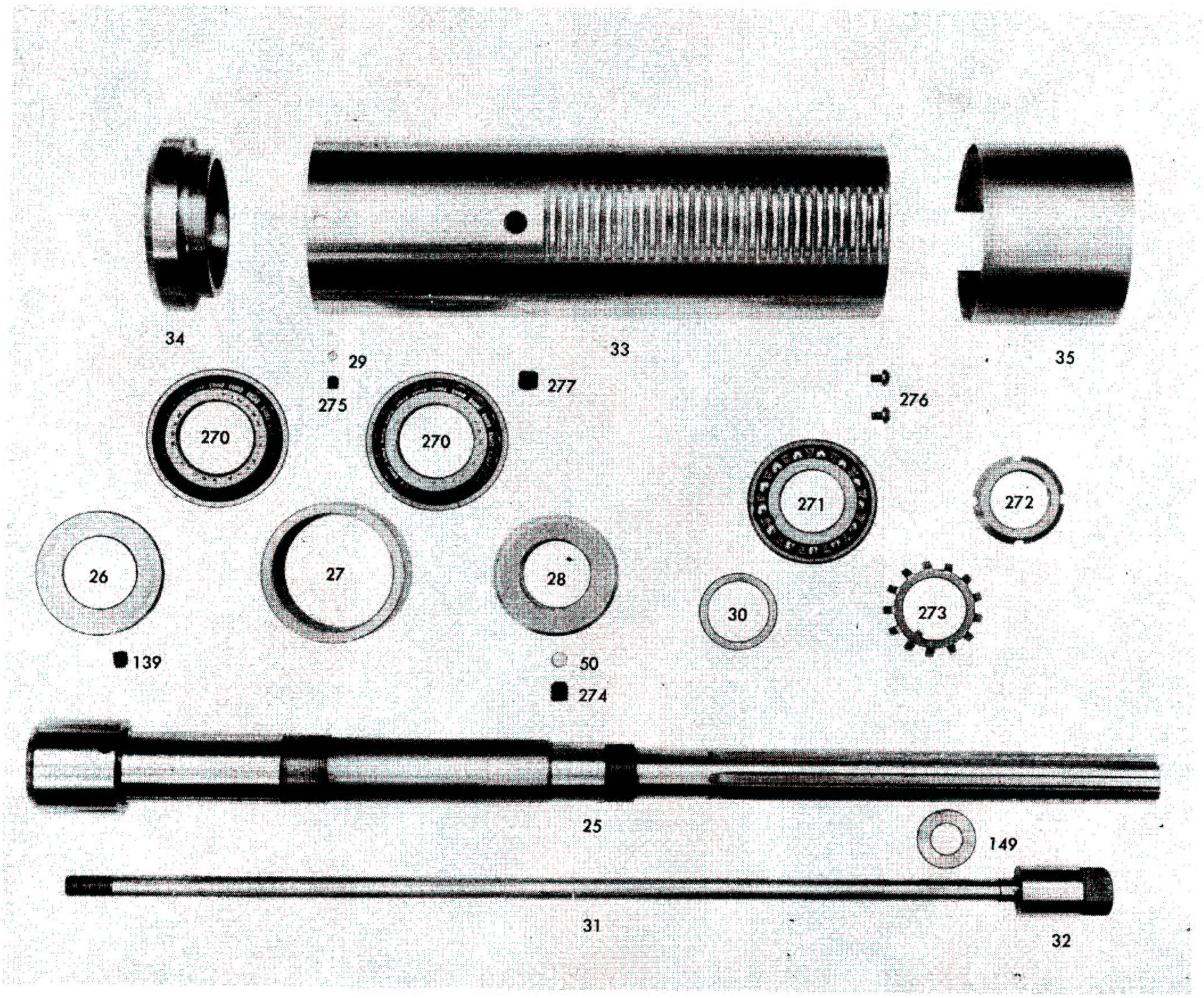


166	Spindle	139	Collet Aligning Screw
169	Spindle Dirt Shield	149	Drawbar Washer
170, 171, 168*	Brg. Spacer	348*	MM-207 WI #5 Precision
31	Drawbar for R-8 collet	271*	N.D. #5206 Ball Brg. #5 Precision
32	Drawbar Knob	272	N-06 Locknut
167	Quill	273	W-06 Lockwasher
172	Quill Nosepiece	275	1/4-20 x 1/4 lg. Set Screw
35	Quill Skirt	276	10-32 x 5/16 lg. Rd. Hd. Screw

*For Serial No. 1750 and up
#349 replaces #271 and
#176 replaces #168

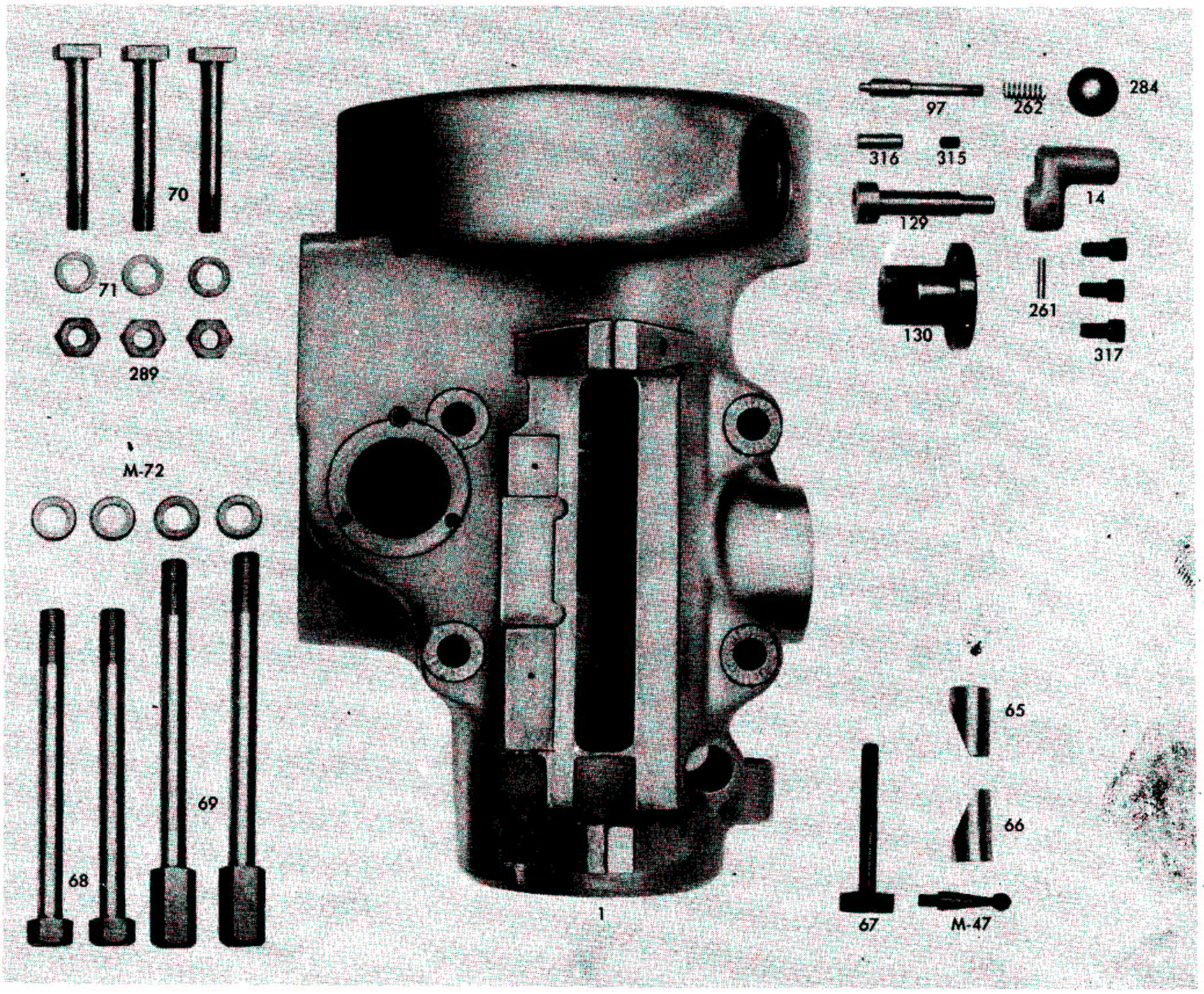
Quill Unit - PARTS LIST

UP TO SERIAL NO. J1200

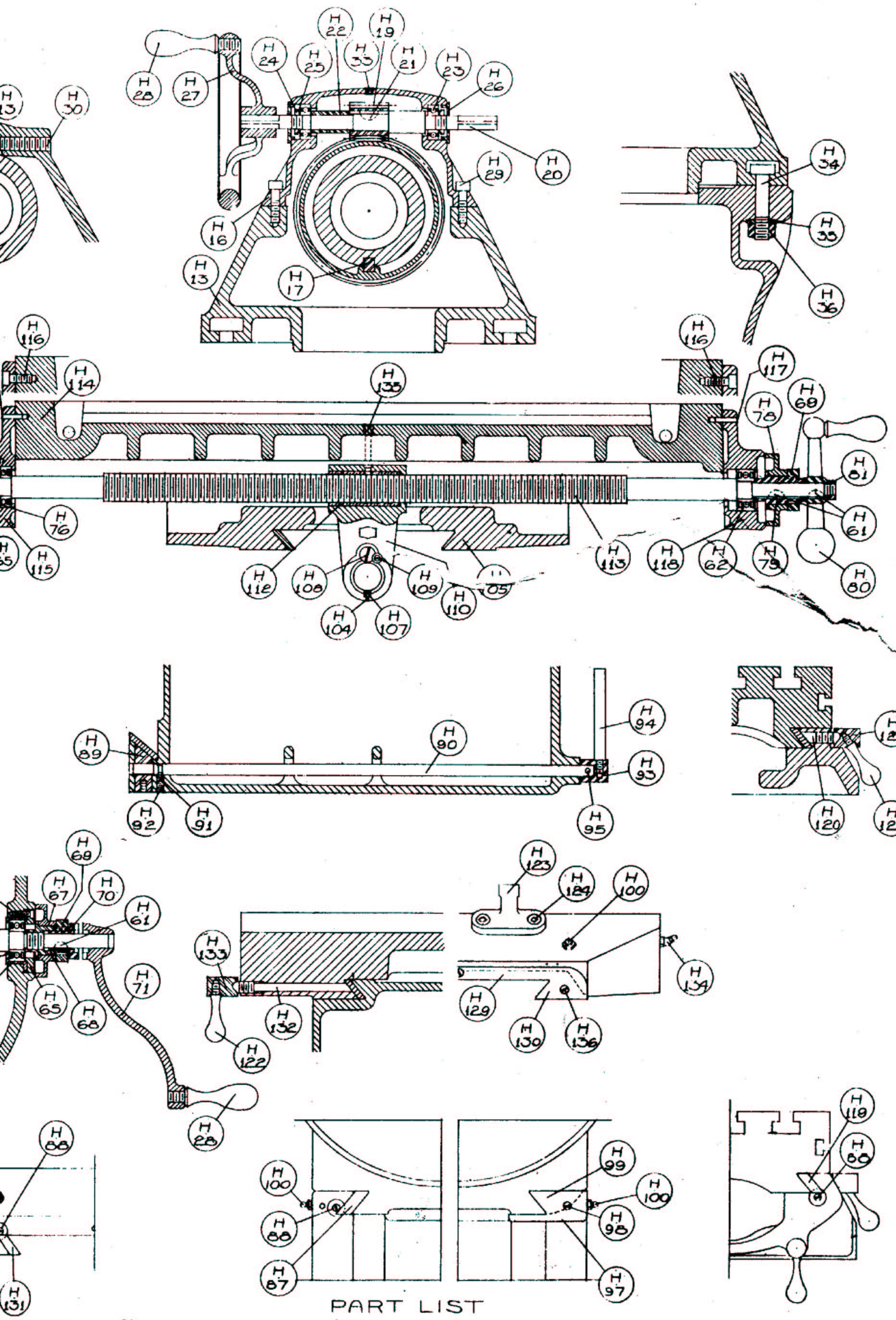


25	Spindle
26	Spindle Dirt Shield
27	Timken Brg. Spacer
28	Spindle Br. Locknut
29	Spindle Locknut Binding Plug
30	Brg. Shoulder Ring
31	Drawbar for R-8 collet
32	Drawbar Knob
33	Quill
34	Quill Nosepiece
35	Quill Skirt
50	Locknut Binding Plug
139	Collet Aligning Screw
149	Drawbar Washer
270	#0 Precision Brg.
271	N.D. #5206 Ball Brg. #5 Precision
272	N-06 Locknut
273	W-06 Lockwasher
274	3/8-16 x 3/8 K.P. Set Screw
275	1/4-20 x 1/4 lg. Set Screw
276	10-32 x 5/16 lg. Rd. Hd. Screw
277	1/8 Allen Pip Plug

Quill Housing Unit - PARTS LIST



1	Quill Housing
14	Shift Crank
M-47	Lock Handle
65	Quill Lock Sleeve (Tapped)
66	Quill Lock Sleeve
67	Quill Lock Bolt
68	Quill Housing Lockbolt
69	Quill Housing Lockbolt (Long)
70	Vertical Tee Bolt
71	Vertical Tee Bolt Washer
M-72	Quill Housing Lock Bolt Washer
97	Gearshift Plunger
129	Worm Gear Cradle Throw-out
130	Shift Sleeve
261	1/8 x 7/8 lg. Roll Pin
262	Compression Spring
284	1/4-20 Bakelite Ball Handle
289	7/16-14 Hex Nut Hardened (American Std. regular)
315	#10-24 x 3/8 lg. K. P. Set Screw
316	5/16 x 7/8 lg. Dowel Pin
317	#10-24 x 1/2 lg. Cap Screws (use 264)



PART LIST

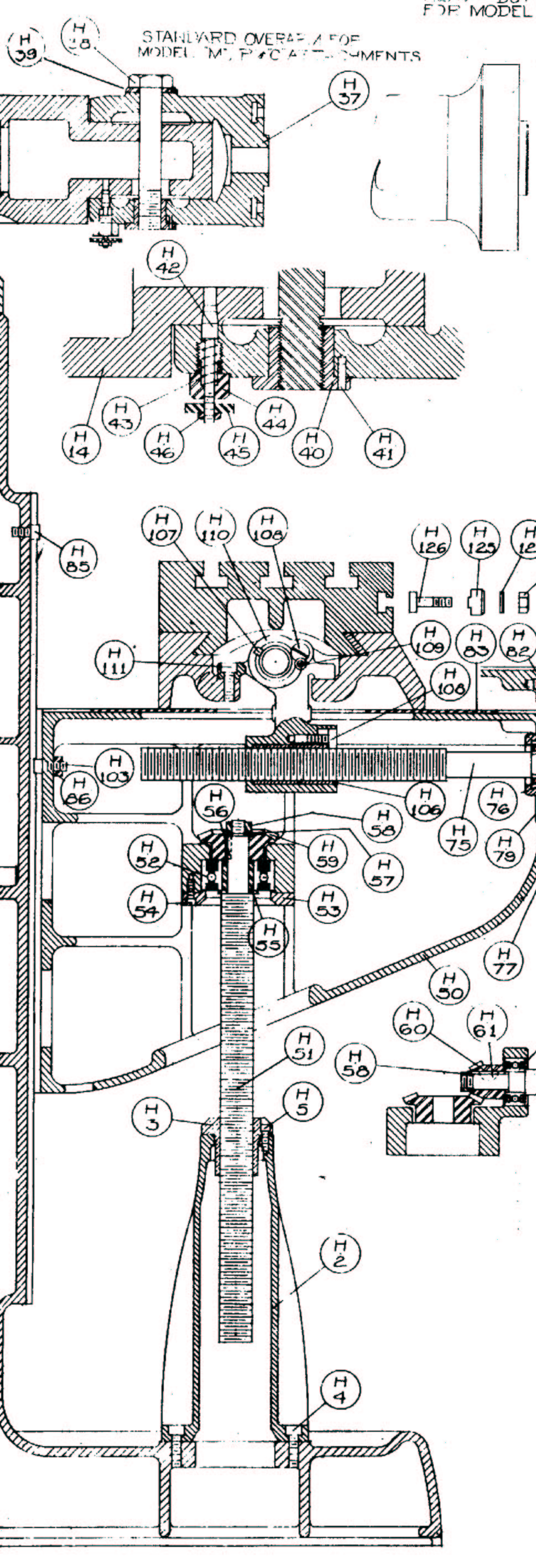
THE BRIDGEPORT TURRET MILLING MACHINE

BRIDGEPORT MACHINES, INC.

BRIDGEPORT, CONN. U. S. A.

HEAVY DUTY OVERARM
FOR MODEL "J" 1HP ATTACHMENT

STANDARD OVERARM FOR
MODEL "M" P.C. ATTACHMENTS



PART LIST

THE BRIDGEPORT TURRET MILLI

BRIDGEPORT MACHINES, INC.
BRIDGEPORT, CONN.

HEAVY DU
FOR MODE

STANDARD OVERARM FOR
MODEL "M" & "C" ATTACHMENTS

MADE BY
Bridgeport
MACHINES INC.
BRIDGEPORT CONN
U.S.A.
MODEL NO.
U.S.PAT.NO.2670681

NOTE: GIVE MODEL
NUMBER WHEN
ORDERING PARTS

GENERAL SPEED RECOMMENDATIONS

Material to be cut	Feet Per Minute		
	Rough Cut	Rough and Finish	Light and Finish Cut
Cast Iron-Soft-(Under 200 Brinnell)	70	80-90	120
Cast Iron-Med.-(200-300 Brinnell)	55	60-70	90
Cast Iron-Hard-(Over 200 Brinnell)	40	50-60	70
Steel (Chrome Nickel 40-45 Shore)	30	40	50
Steel (Stainless)	60	80	90
Steel (Low Carbon)	80	90	140
Steel (High Carbon)	40	50	70
Bronze (Medium)	90	120	150
Bronze (Hard)	65	90	130
Brass (Hard)	100	150	200
Copper	150	200	300
Duraluminum	400	---	600
Aluminum	600	---	1000

TABLE OF CUTTING SPEEDS AND FEEDS

Feet Per Minute	15	20	25	30	40	50	60	70	80	90	100
Diameter, Inches	Revolutions Per Minute										
1/16''	917	1222	1528	1833	2445	3056	3667	4278	4889	5500	6112
1/8''	458	611	764	917	1222	1528	1833	2139	2445	2750	3056
3/16''	306	407	509	611	815	1019	1222	1426	1630	1833	2037
1/4''	229	306	382	458	611	764	917	1070	1375	1375	1528
5/16''	183	244	306	367	489	611	733	856	978	1100	1222
3/8''	153	204	255	306	407	509	611	713	815	917	1019
7/16''	131	175	218	262	349	437	524	611	698	786	873
1/2''	115	153	191	229	306	382	458	535	611	688	764
5/8''	91	122	153	183	244	306	367	428	489	550	611
3/4''	76	102	127	153	204	255	306	357	407	458	509
7/8''	65	87	109	131	175	218	262	306	349	393	437
1 ''	57	76	95	115	153	191	229	267	306	344	382
1 1/8''	50	67	84	102	136	170	204	238	272	306	340
1 1/4''	45	61	76	91	122	153	183	214	244	275	306
1 3/8''	41	55	69	83	111	139	167	194	222	250	278
1 1/2''	38	50	63	76	102	127	153	178	204	229	255
1 5/8''	35	47	58	70	94	118	141	165	188	212	235
1 3/4''	32	43	54	65	87	109	131	153	175	196	218
1 7/8''	30	40	50	61	81	102	122	143	163	183	204
2 ''	28	38	47	57	76	95	115	134	153	172	191

OPERATION

To operate in high speed range, move high low speed clutch control handle to extreme left then put back gear control in **OUT** position.

Then, if power feed is desired, crank power feed transmission engagement to **IN** position, (refer back to explanation of controls) and feed reversing knob should be pushed in for down feed and pulled out for up feed.

The next step is to throw feed control lever to left. Power feed is now in operation in high speed range. Feeds can be selected by cranking quill feed selector to desired feeds.

BACK GEAR OR LOW SPEED RANGE

Stop spindle, then move high low speed clutch control to extreme right and also back gear control handle over to IN position.

RECOMMENDATIONS

Use 2, 3, or 4 flute end mills. 8 flute end mills are usually not as satisfactory. When using shell or face mills standard cutter practice should be observed.

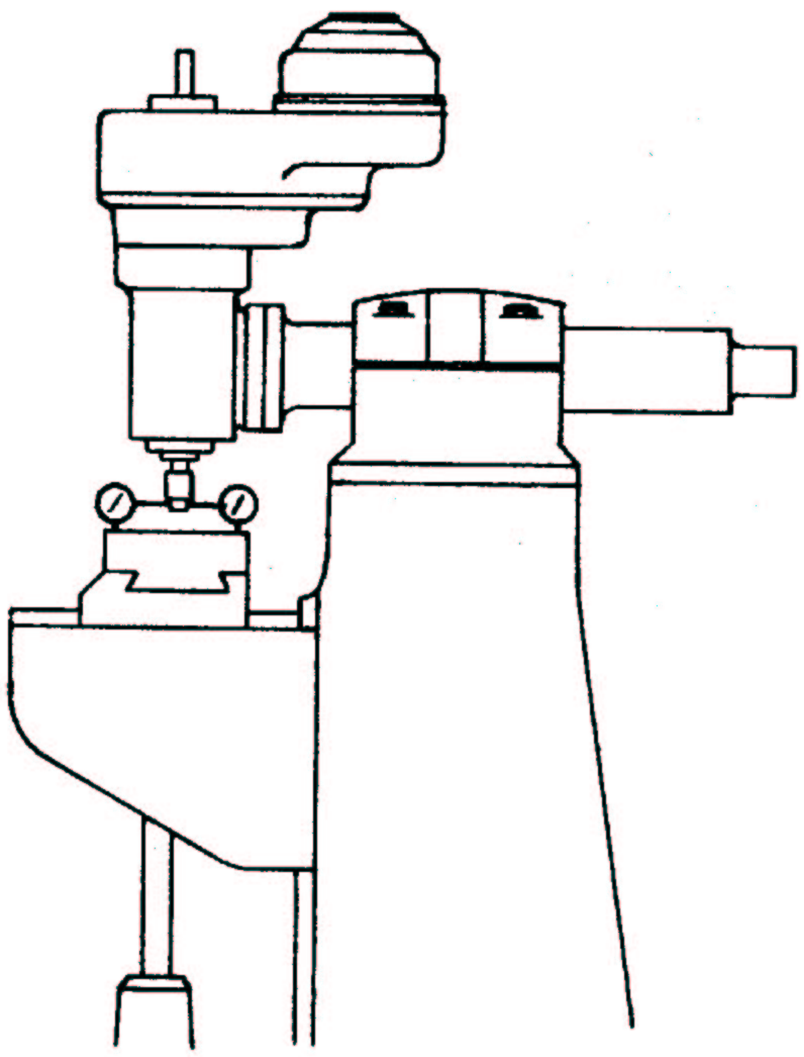
Power feed can be used for drilling up to 3/8'' diameter drills. Use manual feed for drills larger than 3/8''.

Overload clutch is set at factory to hold up to 200 lbs. **DOWN** pressure on quill, which will accommodate drills up to 3/8'' diameter in mild tool steel.

CAUTION: This clutch should not be tampered with in the field.

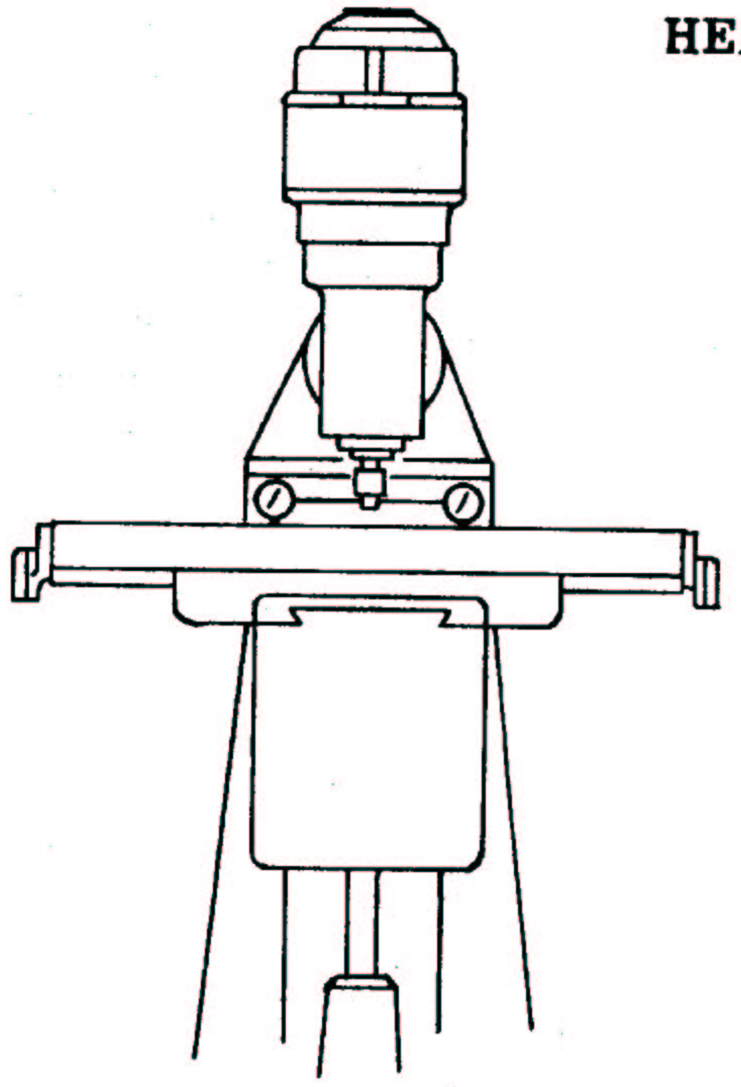
to have head perfectly square with table as described below, figure A and B.

TABLE SQUARE
WITH SPINDLE IN PLANE
THROUGH TRANSVERSE AXIS



TYPE A

TABLE SQUARE
WITH SPINDLE IN PLANE
THROUGH LONGITUDINAL AXIS
HEAD AT 0°



TYPE B

For normal milling operations, graduations on turret and overarm are sufficiently accurate.

Note: When indicating, as in figure A, it may be impossible to get a dead zero in back and front of table as machines are fitted to be slightly high in front, usually about .001''.

ANGULAR SETTINGS in one plane are achieved by turning the hand wheel which controls the keyed overarm.

POSITION OF OVERARM can be regulated by loosening two bolts on turret and pulling arm in or out to desired position.

CAUTION: Care should be taken to lock overarm securely after setting.

Note: It is recommended that on heavy milling work, head should be kept as close to face of turret as possible, as maximum rigidity is then obtained.

FEED CONTROL LEVER

Engages over-load clutch on pinion shaft when thrown to left and will stay engaged until either quill stop comes in contact with micrometer nut, forcing feed control lever to drop out automatically, or released manually by throwing lever to right.

Note: Feed Control Lever is carefully set at plant to throw out automatically when quill stop goes against micrometer nut or against safety pin in top. However, if this should go out of adjustment it may easily be brought back by regulating the screw located at bottom of tripping rod.

CAUTION: When adjusting the screw, check automatic throw off in both directions; that is with micrometer nut against the quill stop for down position and quill stop against throw out pin for up position.

QUILL FEED HANDLE

May be removed by simply pulling handle off end of shaft. It is recommended that handle be disengaged when using power feed.

QUILL STOP is used to disengage automatic feed in either direction as well as the setting point for working to given depths.

MICROMETER ADJUSTING NUT is used for setting of depths. Each graduation on nut indicates one thousand of depth, it reads directly to scale mounted along side of it. Depths may be obtained by setting micrometer nut in conjunction with quill stop.

QUILL LOCK

This is a posttive quill lock to be used when quill is in stationary position such as milling operations. It is recommended that this lock be used whenever quill movement is not desired.

INDICATOR MOUNTING ROD is used for the fastening of an indicator.

LUBRICATION

Do not operate machine until properly lubricated. Lubrication of head is obtained by use of the drip feed method through two oil cups located at right side of belt housing. Oil cup should be filled every 4 hours of running time with light machine oil such as Socony D.T.E. light or equivalent.

SQUARING ATTACHMENT

In case of precision boring or work of that nature, it is necessary

When back gear control lever is moved to IN position and HIGH LOW speed clutch control moved to extreme right then the head is ready for operation in the low speed range (80-325 RPM).

POWER FEED TRANSMISSION ENGAGEMENT CRANK engages power feed worm gear. When lever is in position as indicated in photograph, the power feed worm gear is engaged. To disengage worm gear, pull knob out and crank handle in clockwise or down direction and move to opposite position.

Note: Crank cannot be swung around in counter clockwise direction; however no damage will occur if moved in this direction. To engage the worm a counter clockwise movement is required.

CAUTION: Power feed worm gear may be engaged when spindle is rotating, however it should be engaged gently to avoid damage to worm gear. The worm gear may be disengaged at any time.

IMPORTANT: It is recommended that the Power Feed worm gear be disengaged whenever the power feed is not required. This will avoid unnecessary wear on power feed worm gear.

QUILL FEED SELECTOR

This crank is used for selecting the three feeds; 1.5, 3 and 6 thousandths per revolution. It is shifted by pulling knob out and turning from one position to the other. Feeds are stamped on cover below indentation hole. Feed is more readily engaged when spindle is running.

FEED REVERSING KNOB

Position of this handle depends upon direction of spindle rotation. If boring with right hand cutting tools, pull feed handle towards operator until clutch becomes engaged.

Neutral position is between forward and reverse position. It is recommended that the handle be left in neutral position when not in use.

MANUAL FEED

Reversing clutch knob should be in neutral position and feed control lever engaged. Clockwise rotation of handwheel moves quill down. The Manual Feed Handwheel and the quill feed handle may be disengaged by moving outward about 1/8''.

Note: Feed control lever must be engaged in order to use manual feed controls. Manual Feed Handle and Handwheel may be taken off when not in use.

graduations it is possible to work very accurately as far as different depths are concerned. Micrometer nut when in position is locked securely by tightening micrometer lock nut.

OPERATING INSTRUCTIONS

When tightening or loosening the draw bar it is necessary to lock the spindle. To accomplish this, use spindle brake and lock which is located at top of belt housing, turning it either to the right or left until it binds, then raise handle.

Drawbar has 7/16-20 right hand thread and should be tightened with normal amount of pressure using wrench furnished with machine. To loosen collet back off drawbar and if collet does not open immediately give knob on top of drawbar a slight tap. Spindle has non sticking taper and collets should release readily.

SPINDLE BRAKE

Lever can be moved in either direction to stop spindle; however, when locking spindle, lever should be moved to right or left and then raised.

CAUTION: Be certain that the spindle brake is released before starting the motor. This is important as the motor can be damaged if switch is left on with brake in locked position.

REVERSING SWITCH is used to obtain clockwise or counter clockwise rotation of spindle.

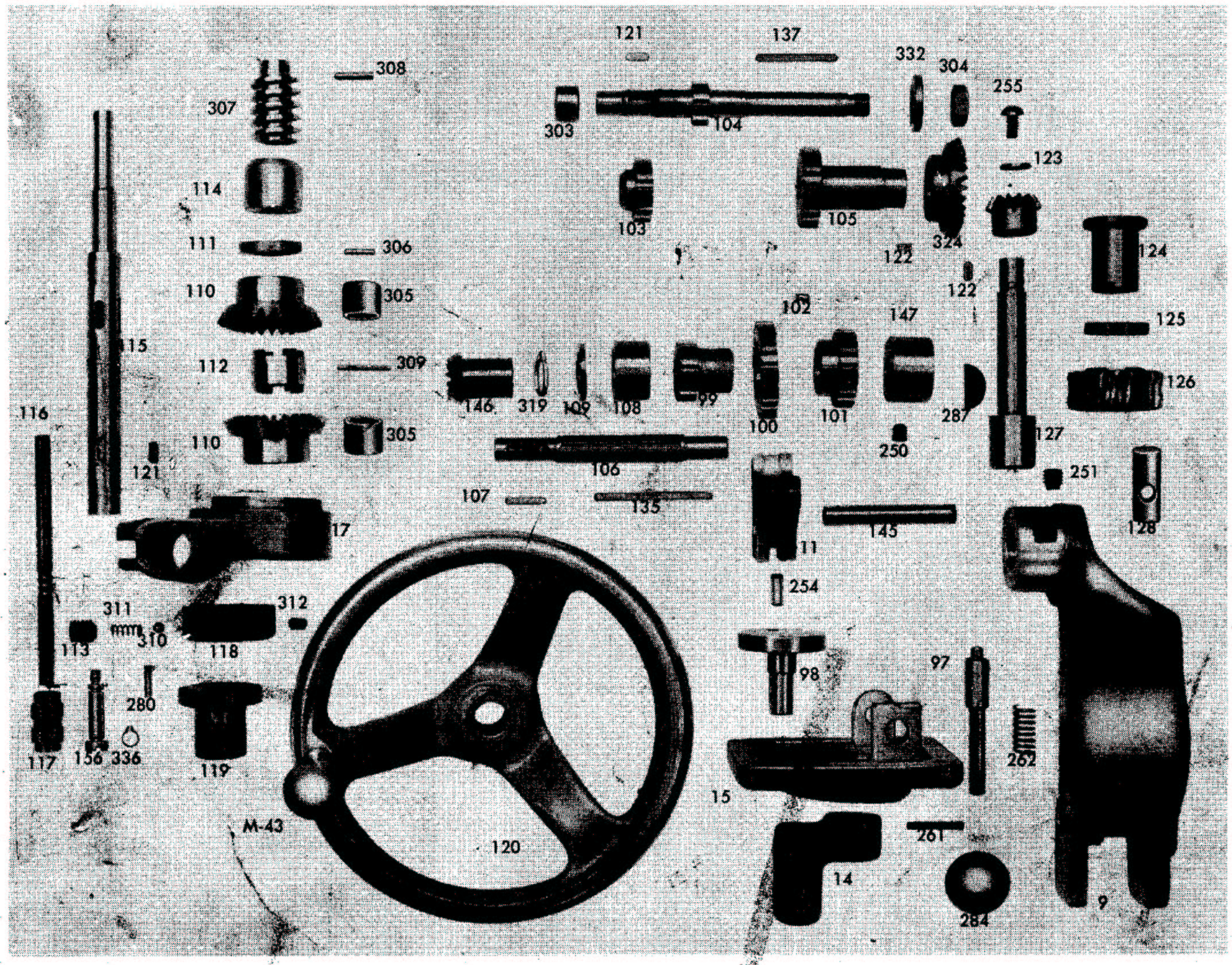
Note: Due to back gear construction, when machine is running in low speed range, spindle rotation is opposite to that of high speed range. Therefore forward on your reversing switch becomes reverse switch in low speed range.

HIGH LOW SPEED CLUTCH CONTROL is directly in front of motor. When knob is in position, as shown on picture, clutch is in high speed position. To put clutch into low speed position turn lever to the extreme right. It is necessary to rotate spindle while engaging high speed clutch. This can be accomplished by either turning spindle nose by hand or by turning drawbar knob using wrench, providing drawbar is pulled up tightly.

CAUTION: Do not shift clutch while motor is running.

Back gear control is used in conjunction with the high low speed clutch control; above back gear control handle is stamped IN and OUT. When back gear control handle is in OUT position, which is the position furthest from face of machine, then HIGH LOW speed clutch control should be located as illustrated in photograph. With these controls in position as explained, head is set for operation in high speed range (660-2720 RPM).

Feed Tran...it - PARTS LIST



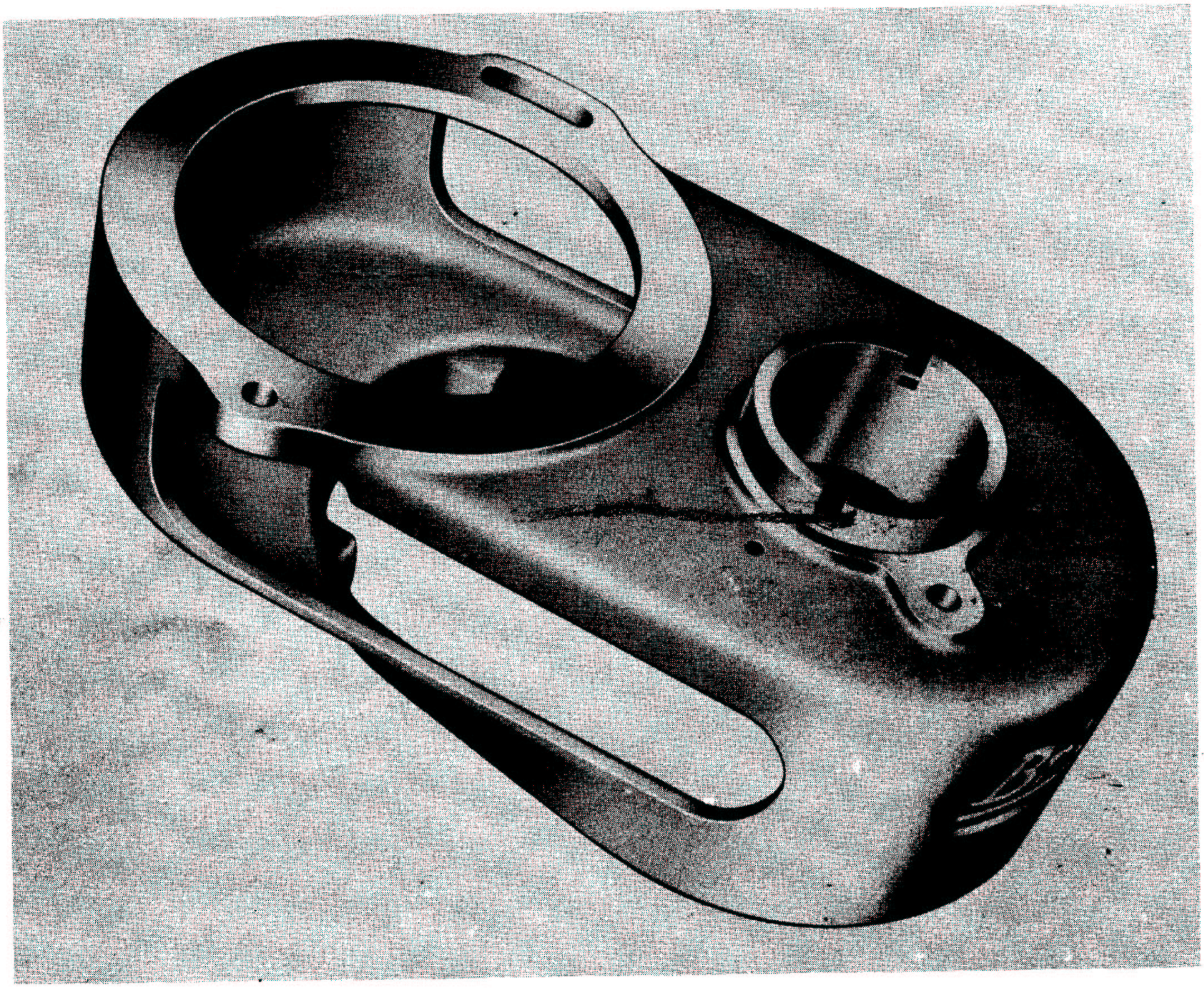
9	Worm Gear Cradle	114	Feed Worm Shaft Bushing	251	Set Screw
11	Feed Gear Shifter Fork	115	Feed Worm Shaft	254	3/16 x 1/2 lg. Dowel Pins
14	Shift Crank	116	Reverse Clutch Rod	255	#10-24 x 3/8 lg. rd. Head Screws
15	Cluster Gear Cover	117	Feed Reverse Knob	261	1/8 x 7/8 lg. Roll Pin
17	Feed Trip Bracket	118	Handwheel Clutch	262	Compression Spring
M-43	Handwheel Handle	119	Handwheel Bushing	280	1/8 x 7/16 lg. Dowel Pin
97	Gearshift Plunger	120	Handwheel (use M 42 Casting)	284	1/4-20 Bakelite Ball Handle
98	Cluster Gear Shift Crank	121	Worm Shaft Key	287	#7 Woodruff Key
99	Feed Drive Cluster Gear	122	Feed Driving Gear Key	303	B-66 Torrington Needle Brg.
100	Feed Drive Cluster Gear (Center)	123	Bevel Pinion Washer	304	3/8-24 Hex Jam Nut
101	Feed Drive Cluster Gear (Upper)	124	Feed Worm Gear Shaft Sleeve	305	A-672-4 Oilite Bearing
102	Cluster Gear Key	125	Worm Gear Spacer	306	3/32 x 5/16 lg. Pin
103	Feed Drive Gear	126	Feed Drive Worm Gear	307	Boston Worm #HLVH
104	Cluster Gear Input Shaft	127	Feed Drive Worm Gear Shaft	308	.110 Dia. x 7/16 lg. Pin
105	Feed Driving Gear	128	Feed Engage Pin	309	3/32 x 3/4 lg. Roll Pin
106	Cluster Gear Shaft	135	Cluster Gear Key	310	3/16 Steel Ball
107	Cluster Gear Key	137	Cluster Gear Key	311	Compression Spring
108	Bevel Gear Bearing	145	Feed Shift Rod	312	1/4-28 x 5/16 lg. Set Screw
109	Bevel Gear Thrust Spacer	146	Feed Reverse Bevel Pinion	319	319-5108-62 Waldes Snap Ring
110	Feed Reverse Bevel Gear (Boston L 148)	147	Cluster Gear Shaft Upper Brg.	324	Feed Reverse Bevel Gear
111	Feed Worm Shaft Thrust Washer	156	Feed Reverse Knob Stud	332	3/8 Star Washer
112	Feed Reverse Clutch	250	1/4-20 x 3/8 lg. K.P. Set Screw	336	Snap Ring 5100-25
113	Handwheel Clutch Spring Screw		5/16-18 x 5/16 lg. half dog pt.		

H-68 DIAL HOLDER
H-69 DIAL LOCK NUT (4 REQUIRED)
H-70 GEARSHAFT CLUTCH INSERT
H-71 ELEVATING CRANK
H-75 CROSS FEED SCREW
H-76 NO. XF-12 GREASE-SEALED BALL BEARINGS (2 PAIRS REQUIRED)
H-77 CROSS FEED BEARING BRACKET
H-78 DIAL WITH 200 GRADUATIONS (3 REQUIRED)
H-79 DIAL HOLDER (3 REQUIRED)
H-80 BALL CRANK HANDLE (3 REQUIRED)
H-81 1/2 - 20 JAM NUT (3 REQUIRED)
H-82 3/8 - 16 x 1 HOLLOW HEAD CAP SCREW (4 REQUIRED)
H-83 CHIP GUARD
H-84 NO. 10 - 32 x 5/8 STOP SCREW
H-85 3/8 - 16 x 3/4 MACHINE SCREW
H-86 3/8 - 16 HEXAGON NUT
H-87 KNEE COLUMN GIB
H-88 GIB SCREW (3 REQUIRED)
H-89 KNEE LOCKING PLUNGER
H-90 KNEE LOCKING CAMSHAFT
H-91 5/16 - 18 x 5/16 DOG POINT SET SCREW
H-92 5/16 - 18 x 5/16 SET SCREW
H-93 CAM SHAFT HUB
H-94 CAM SHAFT HANDLE
H-95 NO. 1 x 1" TAPER PIN
H-96 LEFT HAND KNEE-COLUMN WIPER HOLDER
H-97 RIGHT HAND KNEE-COLUMN WIPER HOLDER
H-98 1/4 - 20 x 1 HOLLOW HEAD CAP SCREW (2 REQUIRED)
H-99 FELT WIPER (2 REQUIRED)
H-100 NO. 1610 ALEMITE FITTING (4 REQUIRED)
H-103 3/8 - 16 x 1 MACHINE SCREW
H-104 3/32 x 3/8 PIN
H-105 SADDLE
H-106 CROSS FEED NUT
H-107 3/16 x 3/16 x 2 1/2 KEY (2 REQUIRED)
H-108 CROSS FEED NUT RETAINING SCREW (2 REQUIRED)
H-109 NO. 8 - 32 x 3/8 WASHER HEAD SCREW (2 REQUIRED)
H-110 FEED NUT BRACKET
H-111 3/8 - 16 x 1 HOLLOW HEAD CAP SCREW (4 REQUIRED)
H-112 LONGITUDINAL FEED NUT
H-113 LONGITUDINAL FEED SCREW
H-114 TABLE
H-115 LEFT BEARING BRACKET
H-116 3/8 - 16 x 1 HOLLOW HEAD CAP SCREW (8 REQUIRED)
H-117 3/16 x 1 DOWEL PINS (6 REQUIRED)
H-118 RIGHT BEARING BRACKET
H-119 SADDLE-TABLE GIB
H-120 TABLE LOCK PLUNGER
H-121 TABLE LOCK BOLT
H-122 TABLE LOCK BOLT HANDLE (2 REQUIRED)
H-123 TABLE STOP BRACKET
H-124 3/8 - 16 x 1/2 HOLLOW HEAD CAP SCREW (2 REQUIRED)
H-125 TABLE STOP PIECE (2 REQUIRED)
H-126 STOP PIECE T-BOLT (2 REQUIRED)
H-127 13/32 x 3/4 x 1/8 HARDENED CHAMFERED WASHER (2 REQUIRED)
H-128 3/8 - 16 HEXAGON NUT (2 REQUIRED)
H-129 SADDLE-KNEE WIPER PLATE (2 REQUIRED)
H-130 FELT WIPER (4 REQUIRED)
H-131 SADDLE-KNEE GIB
H-132 SADDLE LOCK PLUNGER
H-133 SADDLE LOCK BOLT
H-134 NO. 1611 ALEMITE FITTING (2 REQUIRED)
H-135 5/16 - 18 x 5/16 SET SCREW
H-136 NO. 10 - 32 x 1/2 OVAL HEAD SCREW (6 REQUIRED)
H-140 1 1/4 OPEN END AND 1 1/16 BOX END WRENCH
H-141 GREASE GUN

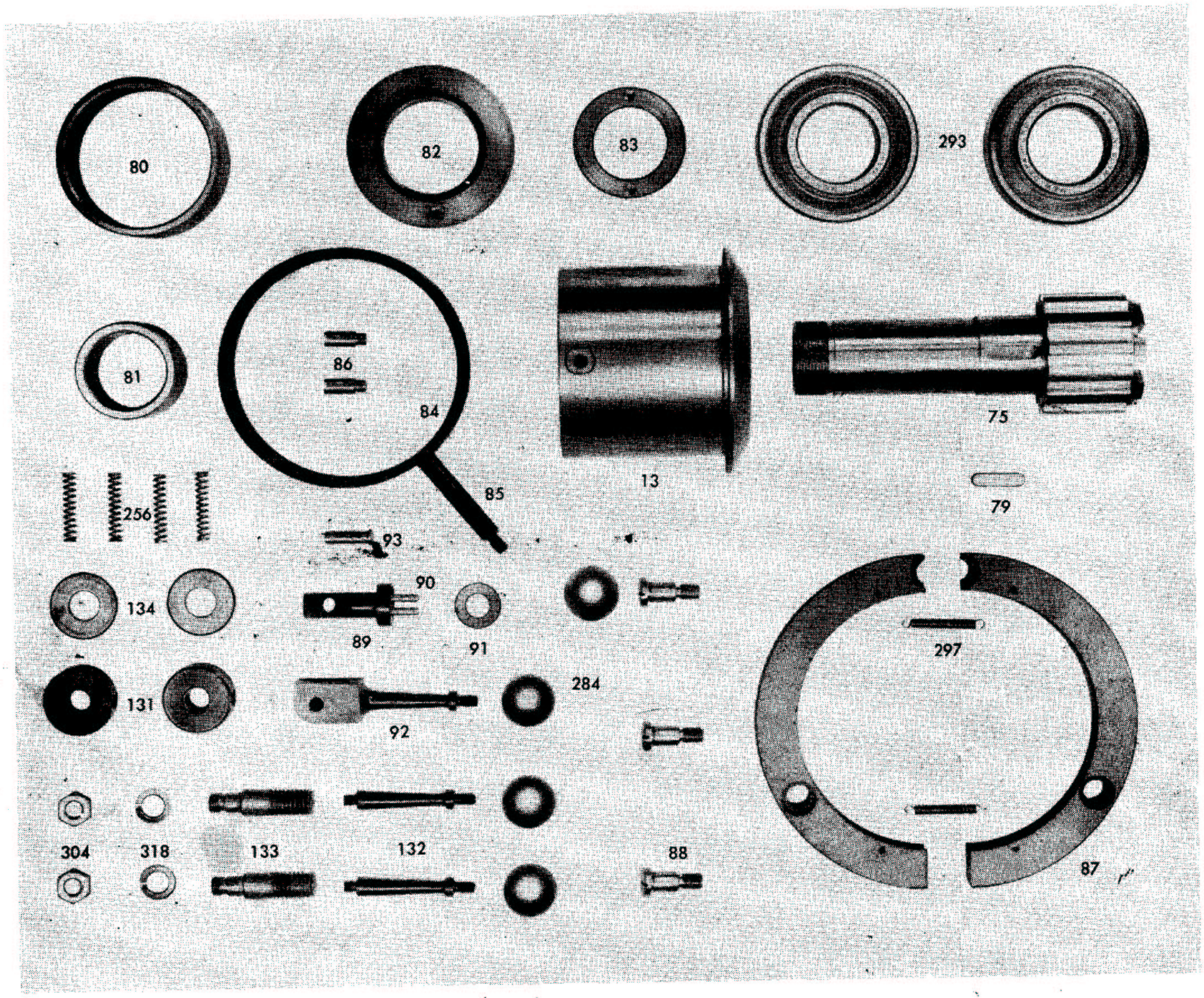
PART LIST--THE BRIDGEPORT TURRET MILLING MACHINE

1 COLUMN AND BASE
2 ELEVATING SCREW HOUSING
3 ELEVATING SCREW NUT
4 3/8 - 16 x 1 HOLLOW HEAD CAP SCREW (2 REQUIRED)
5 1/4 - 20 x 3/4 HOLLOW HEAD CAP SCREW (3 REQUIRED)
6 DOOR
7 DOORKNOB
8 DOOR LOCKING CAM
9 1/4 - 20 x 1/4 SET SCREW
10 17/32 x 1 SPACER
11 3/16 x 1 1/2 HINGE PIN (2 REQUIRED)
12 WOODEN SHELF (2 HALVES)
13 TURRET
14 OVERARM
15 WORM GEAR
16 WORM GEAR HOUSING
17 5/8 x 5/8 x 4 KEY
18 3/16 x 1 PIN
19 WORM
20 WORM SHAFT
21 NO. 9 WOODRUFF KEY
22 SPACER
23 NO. 203 PP BALL BEARINGS (2 REQUIRED)
24 NO. N-03 BEARING LOCKNUT (2 REQUIRED)
25 NO. W-03 BEARING LOCK WASHER (2 REQUIRED)
26 BEARING COVER (2 REQUIRED)
27 HAND WHEEL
28 HANDLE (2 REQUIRED)
29 3/8 x 16 x 1 1/2 HOLLOW HEAD CAP SCREW (2 REQUIRED)
30 OVERARM LOCKING BOLT (2 REQUIRED)
31 21/32 x 1 3/16 x 3/16 WASHER
32 OVERARM LOCKING BOLT HANDLE (2 REQUIRED)
33 BALL VALVE OILER
34 TURRET T-BOLT (4 REQUIRED)
35 21/32 x 1 3/16 x 3/16 HARDENED, CHAMFERED WASHER (4 REQUIRED)
36 5/8 - 11 HARDENED HEXAGON NUT (4 REQUIRED)
37 OVERARM ADAPTER
38 ADAPTER LOCKING BOLT
39 29/32 x 2 x 1/4 WASHER
40 ADAPTER LOCK NUT
41 3/16 x 1/2 PIN
42 ADAPTER INDEXING PLUNGER
43 5/16 x 1 1/4 COIL SPRING
44 ADAPTER INDEXING PLUNGER SPRING NUT
45 KNURLED PLUNGER NUT
46 #10 - 32 JAM NUT
50 KNEE
51 ELEVATING SCREW
52 NO. 3606-J GREASE-SEALED BALL BEARING
53 BEARING RETAINER RING
54 1/4 x 20 x 1/2 HOLLOW HEAD CAP SCREW (3 REQUIRED)
55 BEARING BUSHING
56 3/16 x 3/16 x 7/8 KEY
57 33/64 x 1 x 0.100 WASHER
58 1/2 - 20 JAM NUT (2 REQUIRED)
59 BEVEL GEAR
60 BEVEL PINION
61 NO. 7 WOODRUFF KEY
62 NO. 77020 GREASE-SEALED BALL BEARINGS (3 REQUIRED)
63 GEAR SHAFT
64 BEARING CUP
65 BEARING RETAINER RING (3 REQUIRED)
66 1/4 - 20 x 1/2 HOLLOW HEAD CAP SCREW (9 REQUIRED)
67 DIAL WITH 100 GRADUATIONS

No. _ _ _ _Using



Brake & [illegible] - PARTS LIST



13	Spindle Pulley Brg. Sleeve
75	Spindle Pulley Hub
79	Spindle Pulley Key
80	Upper Brg. Spacer (Large)
81	Upper Brg. Spacer (Small)
82	Brg. Sleeve Locknut
83	Upper Brg. Locknut
84	Cam Ring
85	Spindle Clutch Lever
86	Spindle Clutch Cam Ring Pin
87	Brake Block
88	Brake Ring Screw
89	Brake Lock Stud
90	Brake Pins
91	Brake Lock Washer
92	Brake Lock & Handle
93	Brake Lock Pin
131	Motor Locknut
132	Motor Locknut Handle
133	Motor Mounting Studs
134	Motor Mounting Stud Washers
256	Compression Spring
284	1/4-20 Bakelite Ball Handle
293	ND #9507 Single Plate Ball Brg.
297	W.B. Jones #167-A Ext. Spring (Lindquist)
304	3/8-24 Hex Jam Nut
318	3/8 Lockwasher

HEAVY DU
FOR MODE

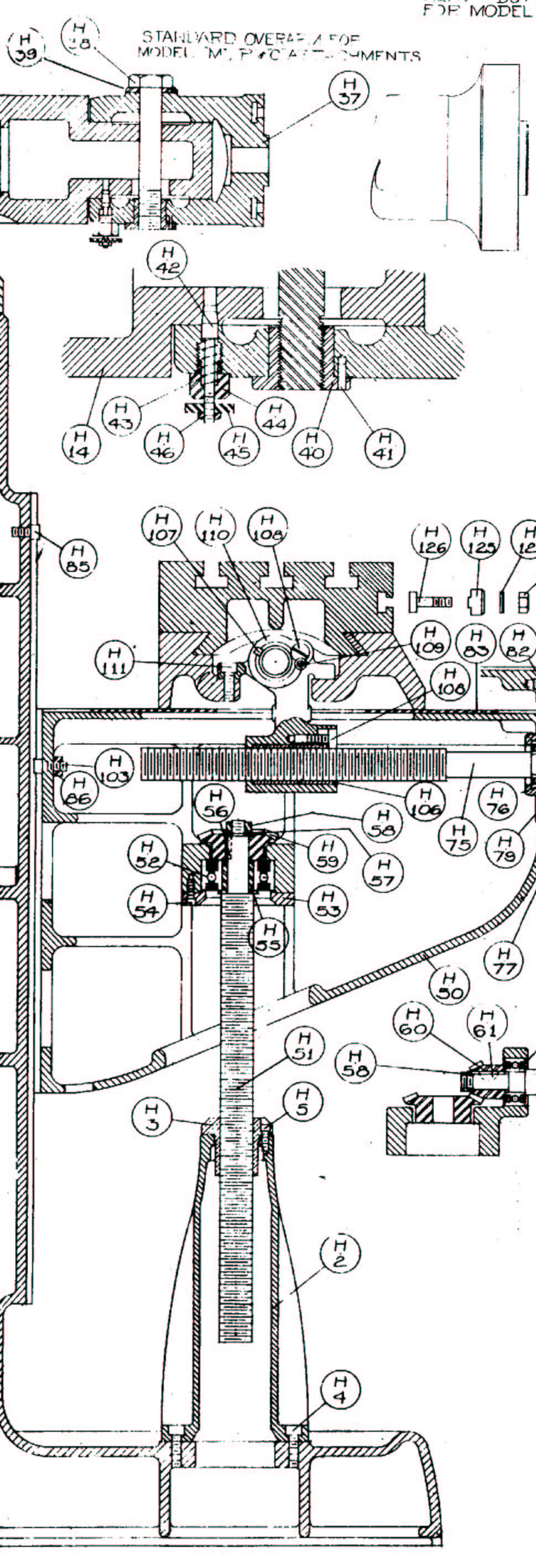
STANDARD OVERARM FOR
MODEL "M" & "C" ATTACHMENTS

MADE BY
Bridgeport
MACHINES INC.
BRIDGEPORT CONN
U.S.A.
MODEL NO.
U.S.PAT.NO.2670681

NOTE: GIVE MODEL
NUMBER WHEN
ORDERING PARTS

HEAVY DUTY OVERARM
FOR MODEL "J" 1HP ATTACHMENT

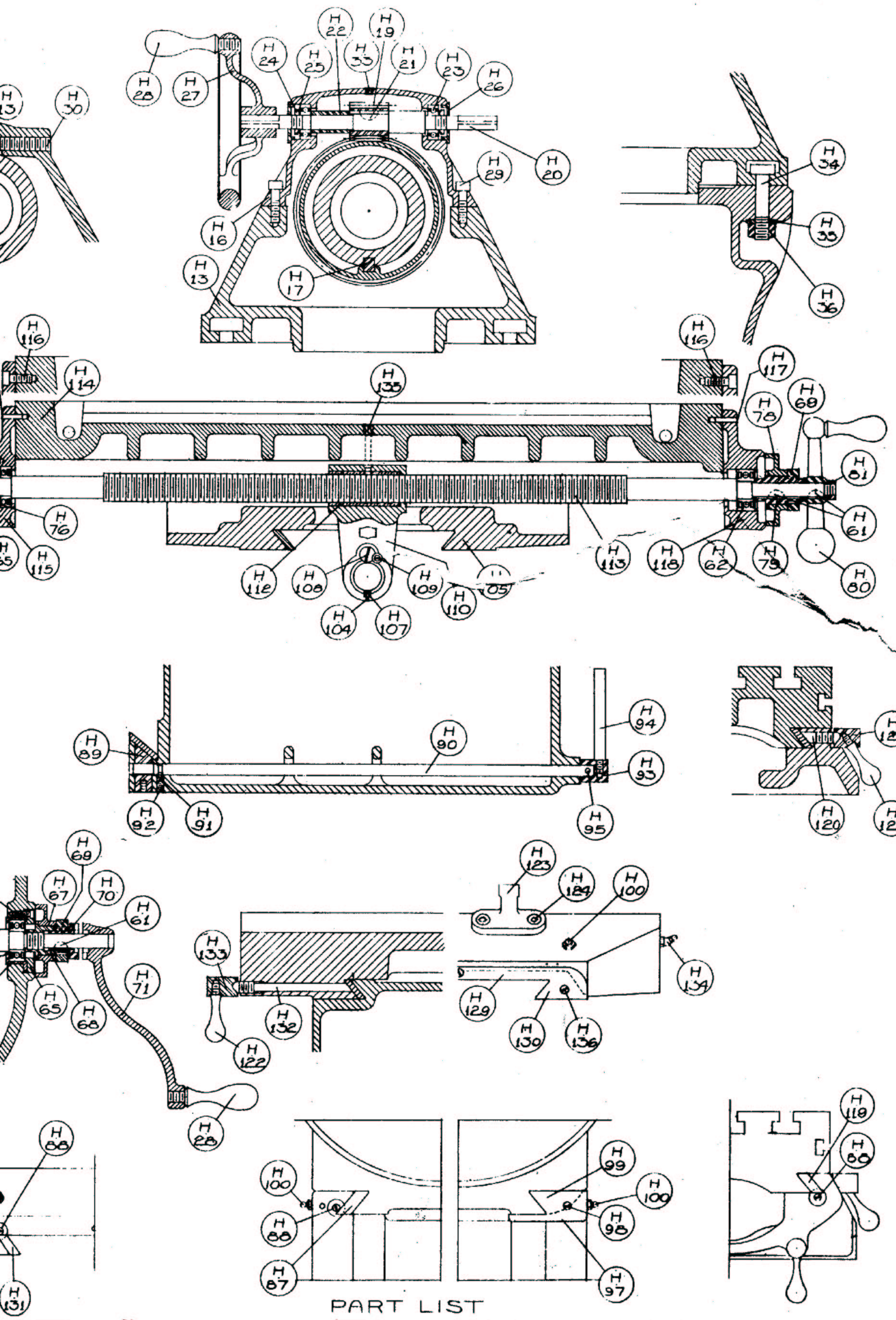
STANDARD OVERARM FOR
MODEL "M" P.C. ATTACHMENTS



PART LIST

THE BRIDGEPORT TURRET MILLI

BRIDGEPORT MACHINES, INC.
BRIDGEPORT, CONN.



PART LIST

THE BRIDGEPORT TURRET MILLING MACHINE

BRIDGEPORT MACHINES, INC.

BRIDGEPORT, CONN. U. S. A.

OPERATING MANUAL

UNCRATING

Carefully remove protective crating so that the machine and parts are not marred, scratched or impaired. In the event of damage in transit, communicate at once with our representative and the transportation company making delivery.

SHORTAGES

Check shipment carefully against the itemized packing list which is included in the parts box. In case of shortages, report them immediately to the representative from whom the machine was purchased indicating parts not received which have been checked on the packing list. Shortages should be reported within ten days.

HOISTING

Do not use chain or cable! Use rope of sufficient strength around overarm. Exercise extreme care when hoisting machine, balancing on rope before raising.

MOUNTING HEAD ON OVERARM ADAPTER

Face on flange should be thoroughly cleaned, as this aligns milling head square with table working surface. Then clean mounting surface of head carefully and place against flange. When two surfaces are contacted, tighten bolts evenly using normal pressure. Care should be taken so as not to apply abnormal pressure since this will cause distortion of the quill housing.

MOUNTING MOTOR

Place belt over bottom step of spindle pulley, then place motor in housing and lower to place, switch being on left hand side.

PLACING AND ADJUSTING BELTS

Release lock nut handle which is the handle on right of belt housing and also handle on left side and adjust V belts to proper driving tension, then tighten both motor clamping handles.

MACHINE IS READY TO OPERATE

If quill and head are to be used in stationary position, quill lock should be applied. Micrometer depth stop scale is graduated in 20ths of an inch, pitch is .050 and nut is graduated in thousands. By utilizing these

graduations it is possible to work very accurately as far as different depths are concerned. Micrometer nut when in position is locked securely by tightening micrometer lock nut.

OPERATING INSTRUCTIONS

When tightening or loosening the draw bar it is necessary to lock the spindle. To accomplish this, use spindle brake and lock which is located at top of belt housing, turning it either to the right or left until it binds, then raise handle.

Drawbar has 7/16-20 right hand thread and should be tightened with normal amount of pressure using wrench furnished with machine. To loosen collet back off drawbar and if collet does not open immediately give knob on top of drawbar a slight tap. Spindle has non sticking taper and collets should release readily.

SPINDLE BRAKE

Lever can be moved in either direction to stop spindle; however, when locking spindle, lever should be moved to right or left and then raised.

CAUTION: Be certain that the spindle brake is released before starting the motor. This is important as the motor can be damaged if switch is left on with brake in locked position.

REVERSING SWITCH is used to obtain clockwise or counter clockwise rotation of spindle.

Note: Due to back gear construction, when machine is running in low speed range, spindle rotation is opposite to that of high speed range. Therefore forward on your reversing switch becomes reverse switch in low speed range.

HIGH LOW SPEED CLUTCH CONTROL is directly in front of motor. When knob is in position, as shown on picture, clutch is in high speed position. To put clutch into low speed position turn lever to the extreme right. It is necessary to rotate spindle while engaging high speed clutch. This can be accomplished by either turning spindle nose by hand or by turning drawbar knob using wrench, providing drawbar is pulled up tightly.

CAUTION: Do not shift clutch while motor is running.

Back gear control is used in conjunction with the high low speed clutch control; above back gear control handle is stamped IN and OUT. When back gear control handle is in OUT position, which is the position furthest from face of machine, then HIGH LOW speed clutch control should be located as illustrated in photograph. With these controls in position as explained, head is set for operation in high speed range (660-2720 RPM).

When back gear control lever is moved to IN position and HIGH LOW speed clutch control moved to extreme right then the head is ready for operation in the low speed range (80-325 RPM).

POWER FEED TRANSMISSION ENGAGEMENT CRANK engages power feed worm gear. When lever is in position as indicated in photograph, the power feed worm gear is engaged. To disengage worm gear, pull knob out and crank handle in clockwise or down direction and move to opposite position.

Note: Crank cannot be swung around in counter clockwise direction; however no damage will occur if moved in this direction. To engage the worm a counter clockwise movement is required.

CAUTION: Power feed worm gear may be engaged when spindle is rotating, however it should be engaged gently to avoid damage to worm gear. The worm gear may be disengaged at any time.

IMPORTANT: It is recommended that the Power Feed worm gear be disengaged whenever the power feed is not required. This will avoid unnecessary wear on power feed worm gear.

QUILL FEED SELECTOR

This crank is used for selecting the three feeds; 1.5, 3 and 6 thousandths per revolution. It is shifted by pulling knob out and turning from one position to the other. Feeds are stamped on cover below indentation hole. Feed is more readily engaged when spindle is running.

FEED REVERSING KNOB

Position of this handle depends upon direction of spindle rotation. If boring with right hand cutting tools, pull feed handle towards operator until clutch becomes engaged.

Neutral position is between forward and reverse position. It is recommended that the handle be left in neutral position when not in use.

MANUAL FEED

Reversing clutch knob should be in neutral position and feed control lever engaged. Clockwise rotation of handwheel moves quill down. The Manual Feed Handwheel and the quill feed handle may be disengaged by moving outward about 1/8''.

Note: Feed control lever must be engaged in order to use manual feed controls. Manual Feed Handle and Handwheel may be taken off when not in use.

FEED CONTROL LEVER

Engages over-load clutch on pinion shaft when thrown to left and will stay engaged until either quill stop comes in contact with micrometer nut, forcing feed control lever to drop out automatically, or released manually by throwing lever to right.

Note: Feed Control Lever is carefully set at plant to throw out automatically when quill stop goes against micrometer nut or against safety pin in top. However, if this should go out of adjustment it may easily be brought back by regulating the screw located at bottom of tripping rod.

CAUTION: When adjusting the screw, check automatic throw off in both directions; that is with micrometer nut against the quill stop for down position and quill stop against throw out pin for up position.

QUILL FEED HANDLE

May be removed by simply pulling handle off end of shaft. It is recommended that handle be disengaged when using power feed.

QUILL STOP is used to disengage automatic feed in either direction as well as the setting point for working to given depths.

MICROMETER ADJUSTING NUT is used for setting of depths. Each graduation on nut indicates one thousand of depth, it reads directly to scale mounted along side of it. Depths may be obtained by setting micrometer nut in conjunction with quill stop.

QUILL LOCK

This is a posttive quill lock to be used when quill is in stationary position such as milling operations. It is recommended that this lock be used whenever quill movement is not desired.

INDICATOR MOUNTING ROD is used for the fastening of an indicator.

LUBRICATION

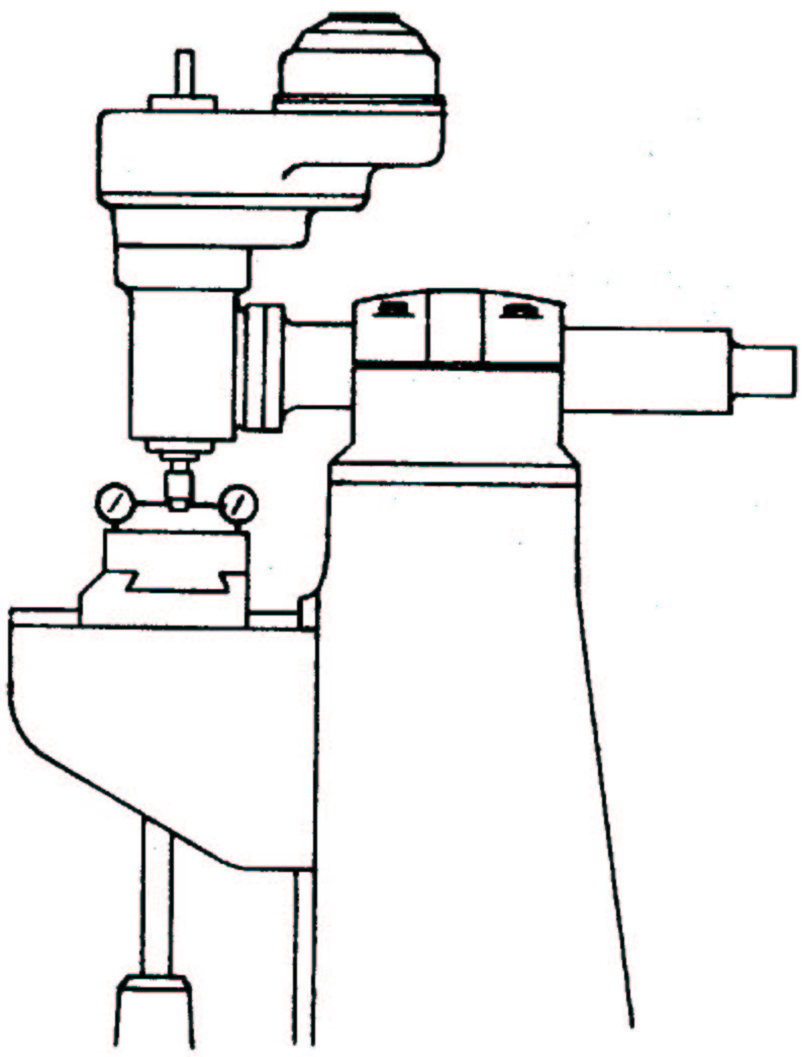
Do not operate machine until properly lubricated. Lubrication of head is obtained by use of the drip feed method through two oil cups located at right side of belt housing. Oil cup should be filled every 4 hours of running time with light machine oil such as Socony D.T.E. light or equivalent.

SQUARING ATTACHMENT

In case of precision boring or work of that nature, it is necessary

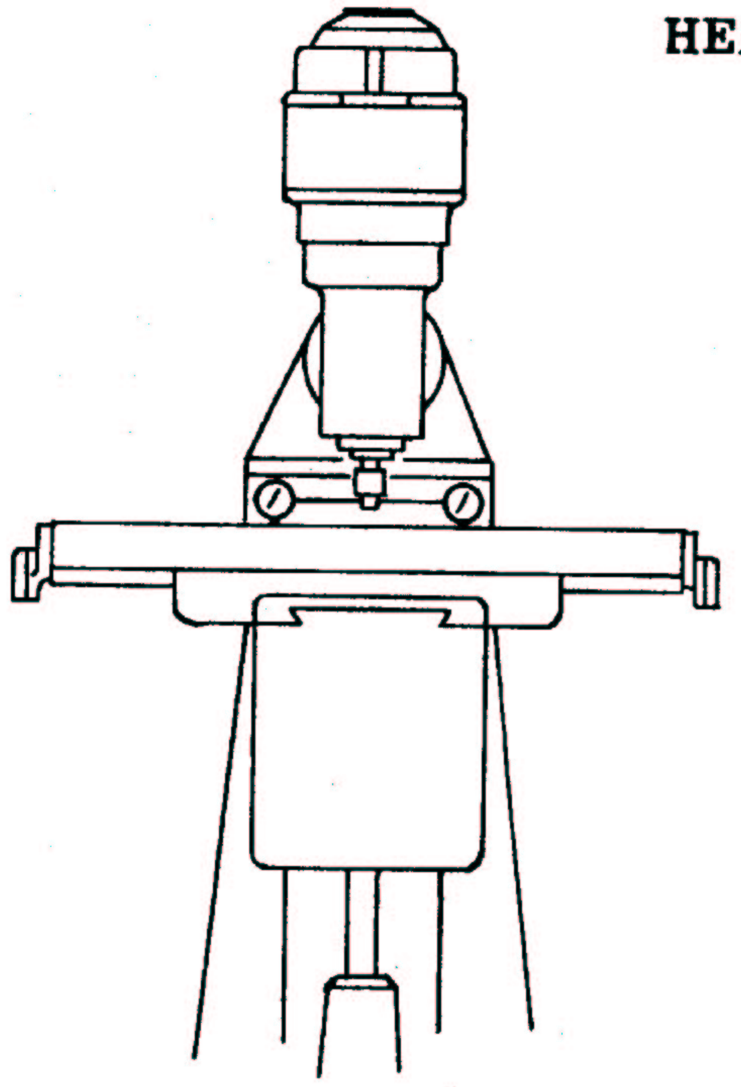
to have head perfectly square with table as described below, figure A and B.

TABLE SQUARE
WITH SPINDLE IN PLANE
THROUGH TRANSVERSE AXIS



TYPE A

TABLE SQUARE
WITH SPINDLE IN PLANE
THROUGH LONGITUDINAL AXIS
HEAD AT 0°



TYPE B

For normal milling operations, graduations on turret and overarm are sufficiently accurate.

Note: When indicating, as in figure A, it may be impossible to get a dead zero in back and front of table as machines are fitted to be slightly high in front, usually about .001''.

ANGULAR SETTINGS in one plane are achieved by turning the hand wheel which controls the keyed overarm.

POSITION OF OVERARM can be regulated by loosening two bolts on turret and pulling arm in or out to desired position.

CAUTION: Care should be taken to lock overarm securely after setting.

Note: It is recommended that on heavy milling work, head should be kept as close to face of turret as possible, as maximum rigidity is then obtained.

OPERATION

To operate in high speed range, move high low speed clutch control handle to extreme left then put back gear control in **OUT** position.

Then, if power feed is desired, crank power feed transmission engagement to **IN** position, (refer back to explanation of controls) and feed reversing knob should be pushed in for down feed and pulled out for up feed.

The next step is to throw feed control lever to left. Power feed is now in operation in high speed range. Feeds can be selected by cranking quill feed selector to desired feeds.

BACK GEAR OR LOW SPEED RANGE

Stop spindle, then move high low speed clutch control to extreme right and also back gear control handle over to IN position.

RECOMMENDATIONS

Use 2, 3, or 4 flute end mills. 8 flute end mills are usually not as satisfactory. When using shell or face mills standard cutter practice should be observed.

Power feed can be used for drilling up to 3/8'' diameter drills. Use manual feed for drills larger than 3/8''.

Overload clutch is set at factory to hold up to 200 lbs. **DOWN** pressure on quill, which will accommodate drills up to 3/8'' diameter in mild tool steel.

CAUTION: This clutch should not be tampered with in the field.

GENERAL SPEED RECOMMENDATIONS

Material to be cut	Feet Per Minute		
	Rough Cut	Rough and Finish	Light and Finish Cut
Cast Iron-Soft-(Under 200 Brinnell)	70	80-90	120
Cast Iron-Med.-(200-300 Brinnell)	55	60-70	90
Cast Iron-Hard-(Over 200 Brinnell)	40	50-60	70
Steel (Chrome Nickel 40-45 Shore)	30	40	50
Steel (Stainless)	60	80	90
Steel (Low Carbon)	80	90	140
Steel (High Carbon)	40	50	70
Bronze (Medium)	90	120	150
Bronze (Hard)	65	90	130
Brass (Hard)	100	150	200
Copper	150	200	300
Duraluminum	400	---	600
Aluminum	600	---	1000

TABLE OF CUTTING SPEEDS AND FEEDS

Feet Per Minute	15	20	25	30	40	50	60	70	80	90	100
Diameter, Inches	Revolutions Per Minute										
1/16''	917	1222	1528	1833	2445	3056	3667	4278	4889	5500	6112
1/8''	458	611	764	917	1222	1528	1833	2139	2445	2750	3056
3/16''	306	407	509	611	815	1019	1222	1426	1630	1833	2037
1/4''	229	306	382	458	611	764	917	1070	1375	1375	1528
5/16''	183	244	306	367	489	611	733	856	978	1100	1222
3/8''	153	204	255	306	407	509	611	713	815	917	1019
7/16''	131	175	218	262	349	437	524	611	698	786	873
1/2''	115	153	191	229	306	382	458	535	611	688	764
5/8''	91	122	153	183	244	306	367	428	489	550	611
3/4''	76	102	127	153	204	255	306	357	407	458	509
7/8''	65	87	109	131	175	218	262	306	349	393	437
1 ''	57	76	95	115	153	191	229	267	306	344	382
1 1/8''	50	67	84	102	136	170	204	238	272	306	340
1 1/4''	45	61	76	91	122	153	183	214	244	275	306
1 3/8''	41	55	69	83	111	139	167	194	222	250	278
1 1/2''	38	50	63	76	102	127	153	178	204	229	255
1 5/8''	35	47	58	70	94	118	141	165	188	212	235
1 3/4''	32	43	54	65	87	109	131	153	175	196	218
1 7/8''	30	40	50	61	81	102	122	143	163	183	204
2 ''	28	38	47	57	76	95	115	134	153	172	191