Each Union Special machine is identified by a Style number which is stamped into the name plate on the machine. Style numbers are classified as Standard and Special. Standard Style numbers have one or more letters suffixed, but never contain the letter "Z". Example: "Style 39600 A". Special Style numbers contain the letter "Z". When only minor changes are made in a standard machine, a "Z" is suffixed to the Standard Style number. Example: "Style 39600 AZ".

Styles of machines similar in construction are grouped under a class number which differs from the style number in that it contains no letters. Example: "39600".

The distance between the rows of stitches or between the needles is represented by a gauge number measured in 1/64ths of an inch, going from left to right. The width of overedge is represented by a fraction. Collectively, the gauge number and the width of overedge represent the machine gauge. Example: "5-1/8". Thus, 5-1/8 gauge represents a distance of 5/64 inch between the left needle (401 stitch) and the right needle (503 stitch) and the 1/8 represents the width of overedge to the right of the right hand needle.

APPLICATION OF CATALOG

This catalog applies specifically to the Standard Styles of machines as listed herein. It can also be applied with discretion to some Special Styles of machines in this class. Reference to direction, such as right, left, front, back, etc., are given from the operator's position while seated at the machine. Operating direction of handwheel is away from operator.

STYLES OF MACHINES

Two Curved Needles, Left Needle in Front, Two Loopers, One Spreader, Four Thread, Dual Stitch, 401 Double Locked Stitch on Left Needle, 503 Two Thread Overedge Stitch on Right Rear Needle, Differential Feed, Low and High Throw, Trimming Mechanism with Spring Pressed Lower Knife, Automatic Lubricating System.

39600 A Light to medium duty machine for simultaneously seaming and overedging on sport shirts, ladies' blouses, street and house dresses, coat linings, pillow cases and similar operations on light to medium weight materials. Seam specification, 401-503-SSa-2; standard gauge and seam widths are 5-1/8 and 12-3/16; stitch range, 8 to 16 per inch; cam adjusted main and differential feeds.

39600 P Same as Style 39600 A except medium to heavy duty, for operations on slacks, jackets, sport shirts, street and house dresses, coat linings, shoulder pads and similar garments.

OILING

CAUTION! Oil was drained from machine when shipped, so reservoir must be filled before beginning to operate. Oil capacity of Class 39600 is six ounces. A straight mineral oil of a Saybolt viscosity of 90 to 125 seconds at 100° Fahrenheit should be used. This is equivalent to Union Special Specification No. 174.

Machine is filled with oil at spring cap in top cover. Oil level is checked at the sight gauge on front of the machine. Red tip of oil indicator should show between gauge lines when machine is stationary.

Machine is automatically lubricated. No oiling is necessary, other than keeping main reservoir filled. Check oil daily before the morning start; add oil as required.

The drain plug screw is located at the back of machine near bottom edge of base. It is a magnetic screw designed to accumulate possible foreign materials which may have entered the crank case. It should be removed and cleaned periodically.

503 STITCH NEEDLE THREAD CONTROL

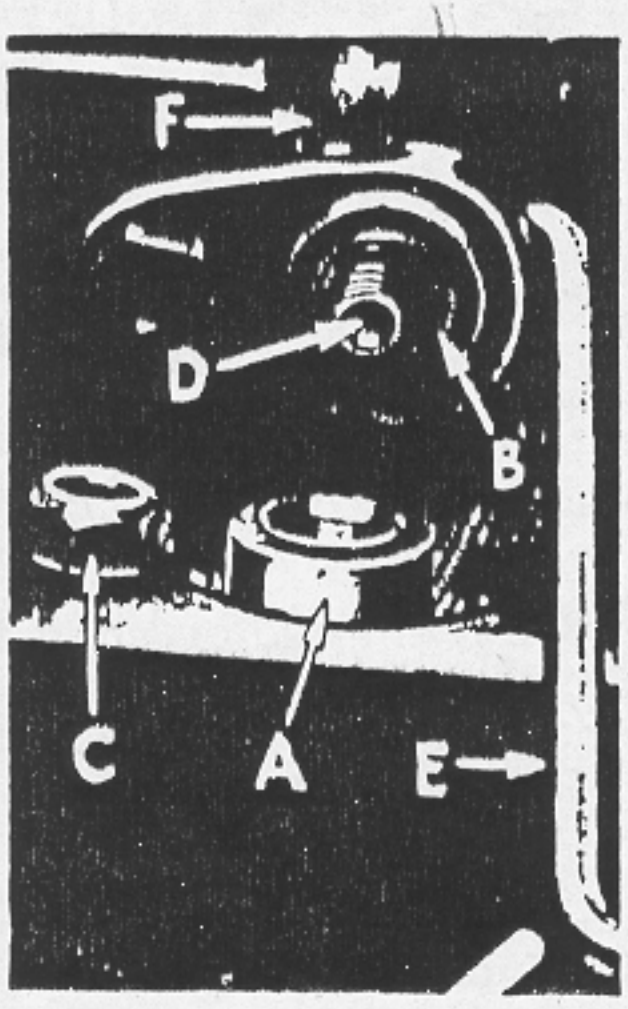


Fig. 16

While sewing on material, check needle thread control as follows: Usually all needle thread is drawn on needle down stroke. At the top of needle stroke, thread should be just tight enough to feed chain off stitch tongue. The stitch tends to pull down slightly if excessive thread is pulled on the up stroke.

503 STITCH LOWER LOOPER THREAD CONTROL

With material under presser foot, set lower looper thread eyelet (M, Fig. 1) back and down far enough so the thread is a little slack when the spreader reaches its extreme left position. Looper thread eyelet (M) should be about horizontal.

Frame looper thread guide (R) should be set with its eyelet approximately 1/8 inch to the right of the heel eyelet of looper (S) at the time the lower looper is at extreme left end of its travel.

THREAD TENSIONS

Before proceeding, balance both tensions to give a normal appearing stitch. Moderate change in these tensions will not markedly affect the purl.

SPECIAL ADJUSTMENTS

SKIPPING: For occasional skipping, check and/or adjust as outlined below:

1. Recheck lower looper - needle setting. See "Setting the Needle", page 8.
2. Recheck spreader - lower looper crossing. See "Setting The Spreader", page 9.
3. Check clearance between needle and spreader. See that spreader moves far enough left past the needle.

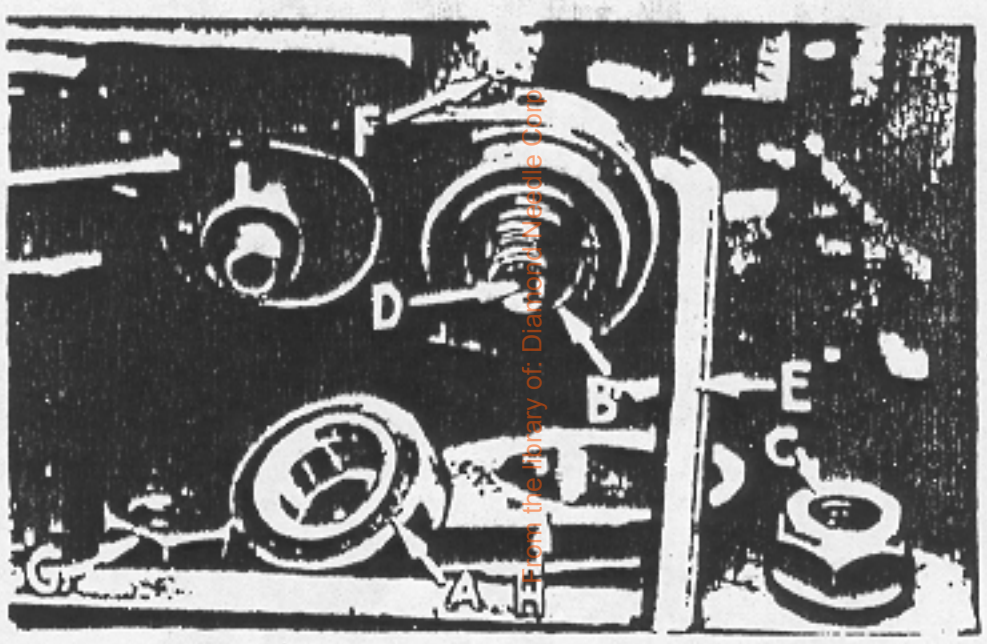


Fig. 17

Fig. 18

Settings 1 and 2 should be made quite carefully. If it can be determined by appearance that skip is definitely not a needle loop skip, reposition looper thread eyelet (M, Fig. 1) by lowering it slightly and bringing eyelet holes in close to bend in looper thread pull-off (N). After this change, increase the looper thread tension as much as possible without distorting the stitch.

CAUTION! As stated before, the looper thread must be slightly slack as spreader reaches its extreme left position or stitch will appear tight on the top side.

STARTING TO OPERATE

Be sure the machine is threaded according to threading diagram (Fig. 1, page 5).

With thread tensions light, set looper thread eyelet (M) about horizontal and in the middle of its front to back location.

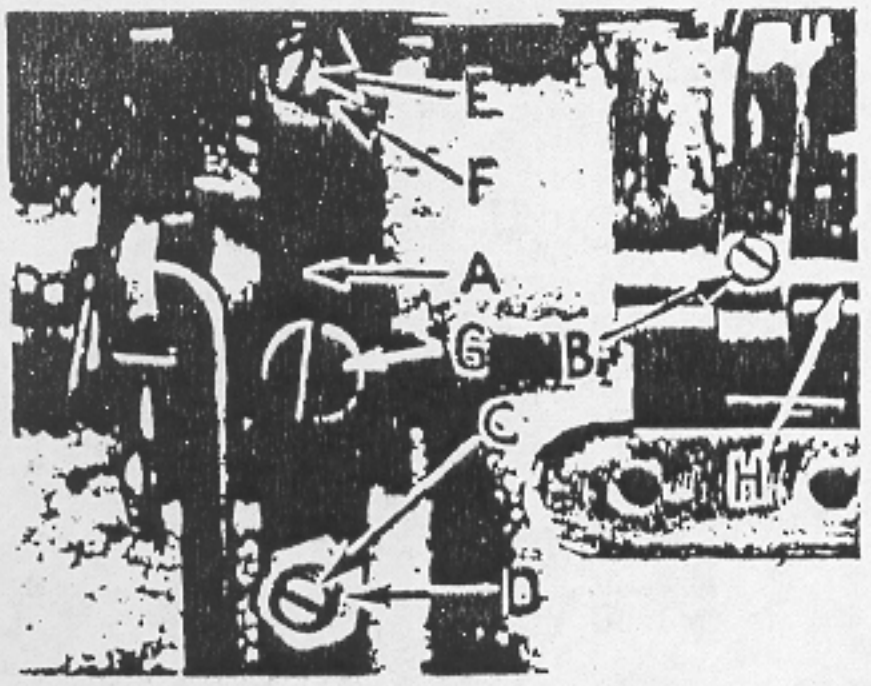


Fig. 19

Operate machine slowly, with presser foot in place. Make sure chain forms and moves off the tongue freely.

SETTING 401 NEEDLE THREAD EYELETS

Bring needle thread through its respective eyelets as shown in Fig. 1 and as described in paragraph "To Thread 401 Needle". Do not thread the needle. Lower needle to bottom of its stroke. Position needle thread pull-off eyelet (W, Fig. 1) so that the thread is at the middle mark of the needle thread pull-off cam (N) and far enough forward to bow the needle thread slightly. When the needle arm is at the top of its stroke, the needle thread will clear the pull-off cam by about 1/32 inch. Set needle thread eyelet (X, Fig. 1) to the rear, against the mounting screw, and then bring it forward 1/8 inch, tilt slightly upward and tighten the screw. This is a starting position for this eyelet. Later it may have to be adjusted slightly as described under "Sewing Off 401 Stitch". The tail of the eyelet may rest on the corner of the bed casting. Thread needle from front to back.

SETTING 401 LOOPER THREAD EYELETS

If looper thread casting-off point has not been timed refer to the paragraph "Timing 401 Stitch Looper Thread Cast-off". Set the looper thread cast-off eyelet (A, Fig. 20) 7/32 inch below crotch of cast-off blade (B). Pull several feet of thread through the looper to provide slack while checking the tension. Turn handwheel in operating direction until the needle is totally raised. Pulling the thread straight toward the operator, over the looper thread eyelet, adjust tension with the knurled nut (AA, Fig. 1) to 1 1/2 to 2 ounces.

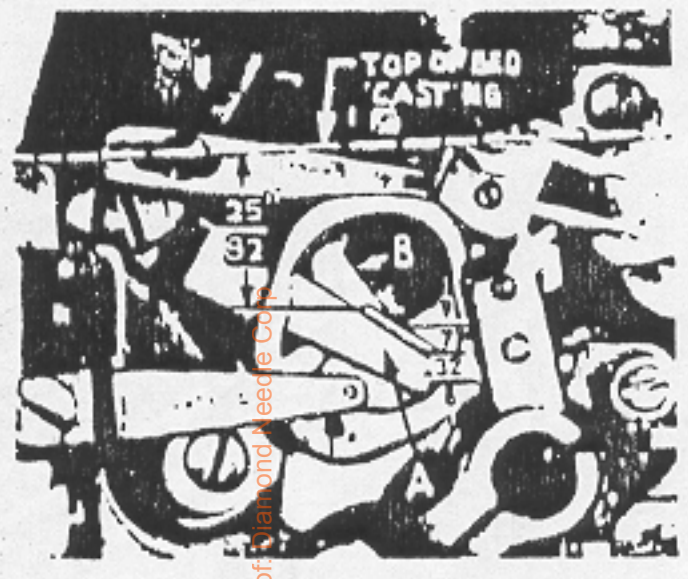


Fig. 20

SEWING OFF 401 STITCH

Final adjustments to the 401 stitch are made while hand turning the machine and observing the stitch formation. Insert two narrow plies of material under presser foot and observe formation of the needle loop upon the rising of the needle. Adjust the needle thread take-up eyelet (W, Fig. 1) by raising or lowering it until the loop formation is as shown in Fig. 21. The loop should not touch the front guard of the overedge needle, yet be round and full. At full speed the loop will tend to become less. To lower the eyelet tap left side; to raise eyelet bring needle arm to top position and insert wide blade screwdriver under eyelet and, using needle arm as support, twist screwdriver to the left. A slight movement, of 1/64 inch or less, will usually produce the desired result. Then retighten the eyelet holding screw.

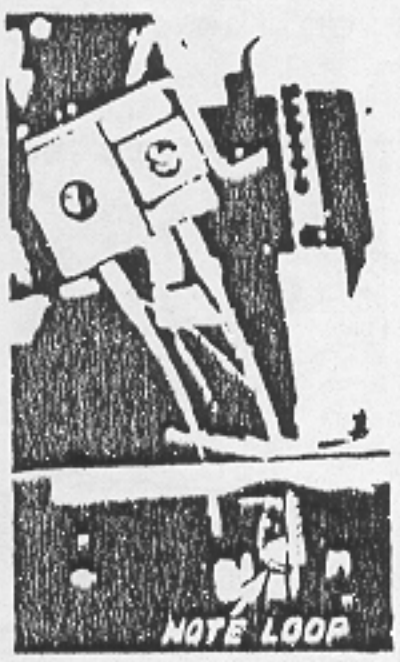


Fig. 21

Needle thread is drawn from the cone on the upstroke only and at two separate times. Thread is first drawn at the high point of the cam as shown between the marks (A, Fig. 22). The second time, needle thread is drawn as the needle reaches the top of its stroke. More needle thread will be drawn the first time, or at point "A". The needle thread becomes slack just before the eye of the needle enters the material. The needle thread should become snug but not tight when the needle reaches the bottom of its stroke, and should

become slack as the needle raises until thread is again drawn from the cone. To obtain this condition it may be necessary to move needle thread frame eyelet (X, Fig. 1) forward or back.

Observe the action of the looper thread take-up at the bottom of the needle stroke. The looper thread is lying across the cam lobes, slack from the previous casting-off. As the needle arm rises to the top, the looper thread will begin to tighten across the cam until at the end of the rise, casting-off will again occur and the looper thread will lie in the crotch of the cast-off blade.

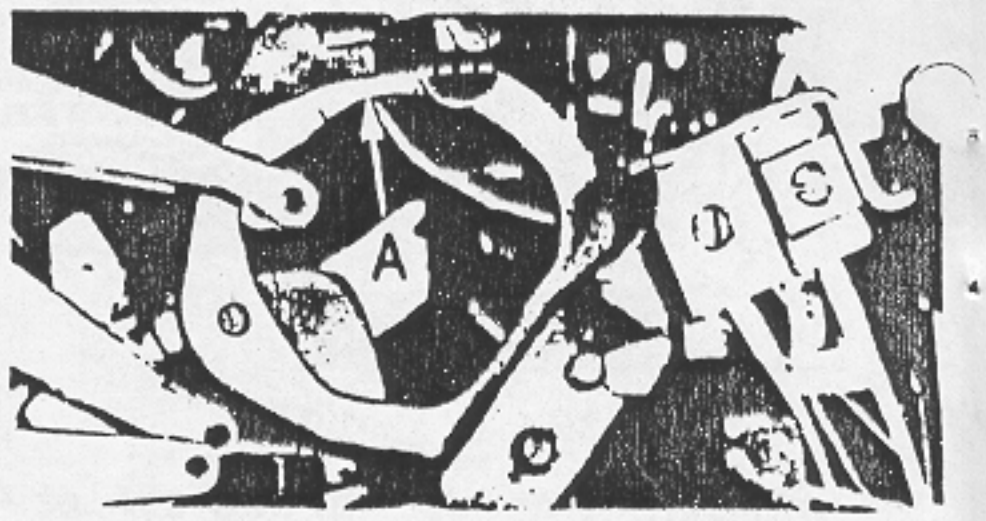


Fig. 22

The tension of the looper thread at this position will be determined by the nature of the material being sewn and the operation performed. To increase the amount of looper thread pull-off move the looper thread cast-off blade (B, Fig. 23) slightly down. Use reverse procedure to obtain less looper thread pull-off. There is a notch in the cast-off blade to facilitate this movement with a screwdriver.

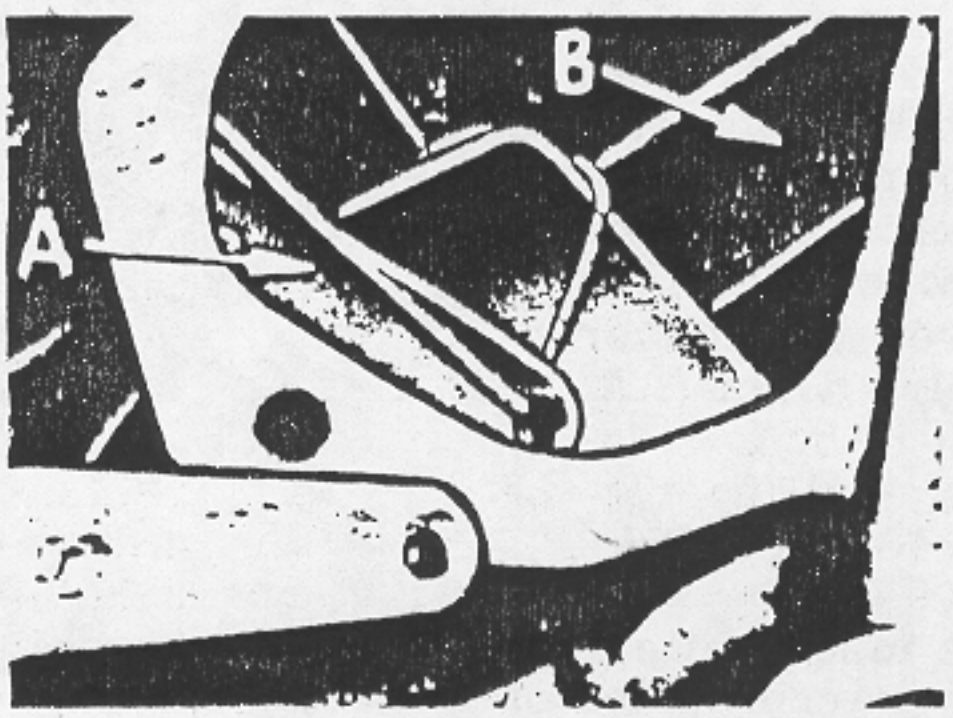


Fig. 23

If a relaxed looper thread in the stitch is required, the looper thread should be slack when the needle is at the top of its travel. At this time the tension in the needle thread, developed at pull-off, is setting the stitch. A tight looper thread will interfere with pulling up needle loop.

Only enough tension should be carried in the looper thread to resist friction of looper and eyelet system. Thread should be pulled off only during the return travel of the looper from left to right and cease at casting-off.

TIMING 401 STITCH LOOPER THREAD CAST-OFF

When the 401 looper thread cam is correctly positioned on the needle arm shaft the cast-off corner will be 25/32 inch vertically below top surface of the bed when the needle arm is in its highest position (Fig. 20). This adjustment is made at the factory, but if checked and moved, it must be observed that the cam functions as a thrust collar for the needle arm shaft and correct thrust must be maintained. If this setting is correct the casting-off may be timed. On the down stroke of the needle (A, Fig. 24), looper thread should be cast-off when the eye of the looper (B) brings the looper thread against the left side of needle (Fig. 24). At this position the point of the needle will be approximately 1/64 inch below the top of front needle guard (C). To change the time of casting-off, move the cast-off blade (B, Fig. 23) up or down, rotating it about its holding screw.

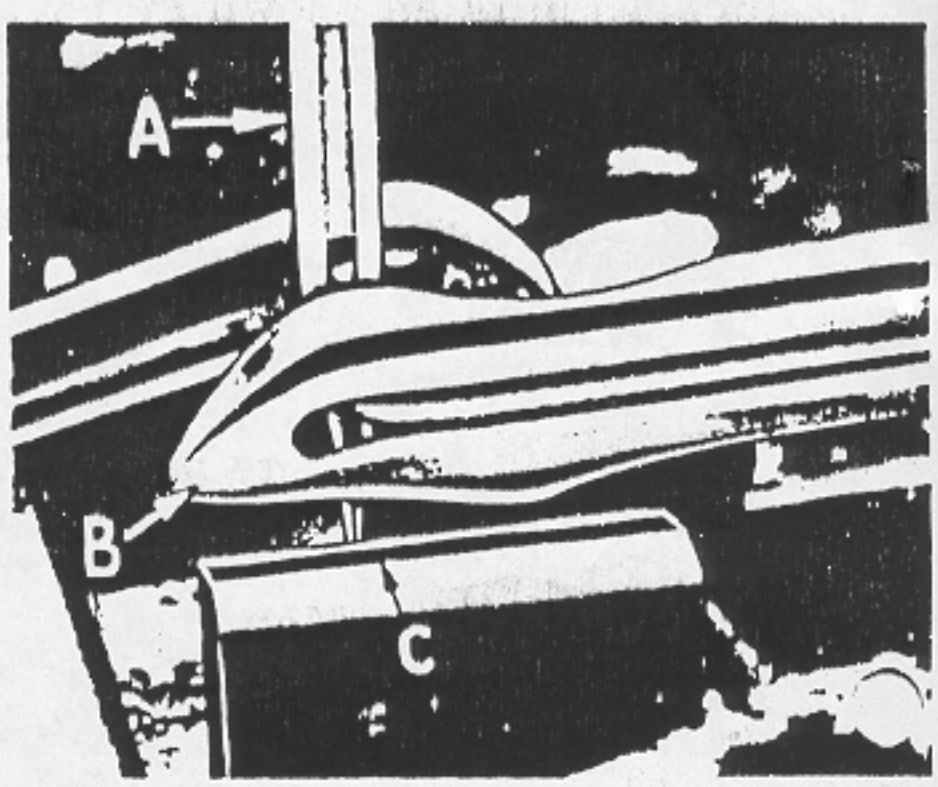


Fig. 24

this catalog to a 504 stitch 39600 machine.

Part No.	Description	Amt. Req.
52 A	Frame Eyelet, for 504 needle thread	1
107	Tension Post Ferrule	1
108	Tension Post Nut	1
109	Tension Disc	2
376 A	Screw, for upper looper thread eyelet (39568 L)	1
21101 H-6	Thread Stand, complete	1
22565 C	Screw, for tension post (35792 H)	1
22768	Screw, for 504 needle thread pull-off eyelet (39663 H)	1
22849	Screw, for 504 frame eyelet (52 A)	1
29477 HU	Upper Knife Driving Arm Thrust Block and 504 Upper Looper Thread Tube	1
35792 H	Tension Post	1
39508 A	Upper Looper	1
39568 E	Auxiliary Eyelet, for 504 upper looper	1
39568 L	Upper Looper Thread Eyelet	1
39663 H	Needle Thread Pull-off Eyelet, for 504 needle thread	1
43139 A	Nut, for upper looper thread eyelet screw (376 A)	1
51292 F-5	Tension Spring, for 504 needle thread	1

ASSEMBLING AND ADJUSTING SEWING PARTS FOR 504 STITCH

The setting and adjustment of the needles, lower looper, front and rear needle guards as described earlier for the 503 stitch are applicable when making similar adjustments for the 504 stitch. Also, the adjusting and setting of the upper looper used in the 504 stitch formation is similar to the setting of the spreader used in the 503 stitch formation. The exception or difference being the measurement of the 5/32 inch dimension from the center line of the needle to the lower point of the 503 stitch spreader (Fig. 10). The 504 stitch measurement is taken from the center of needle to the point of the upper looper (Fig. 10A). The measurement for either the spreader or the upper looper to be taken when they are at the left end of travel.

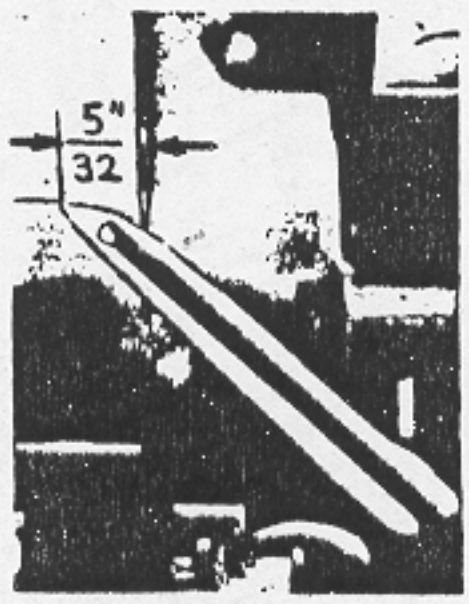
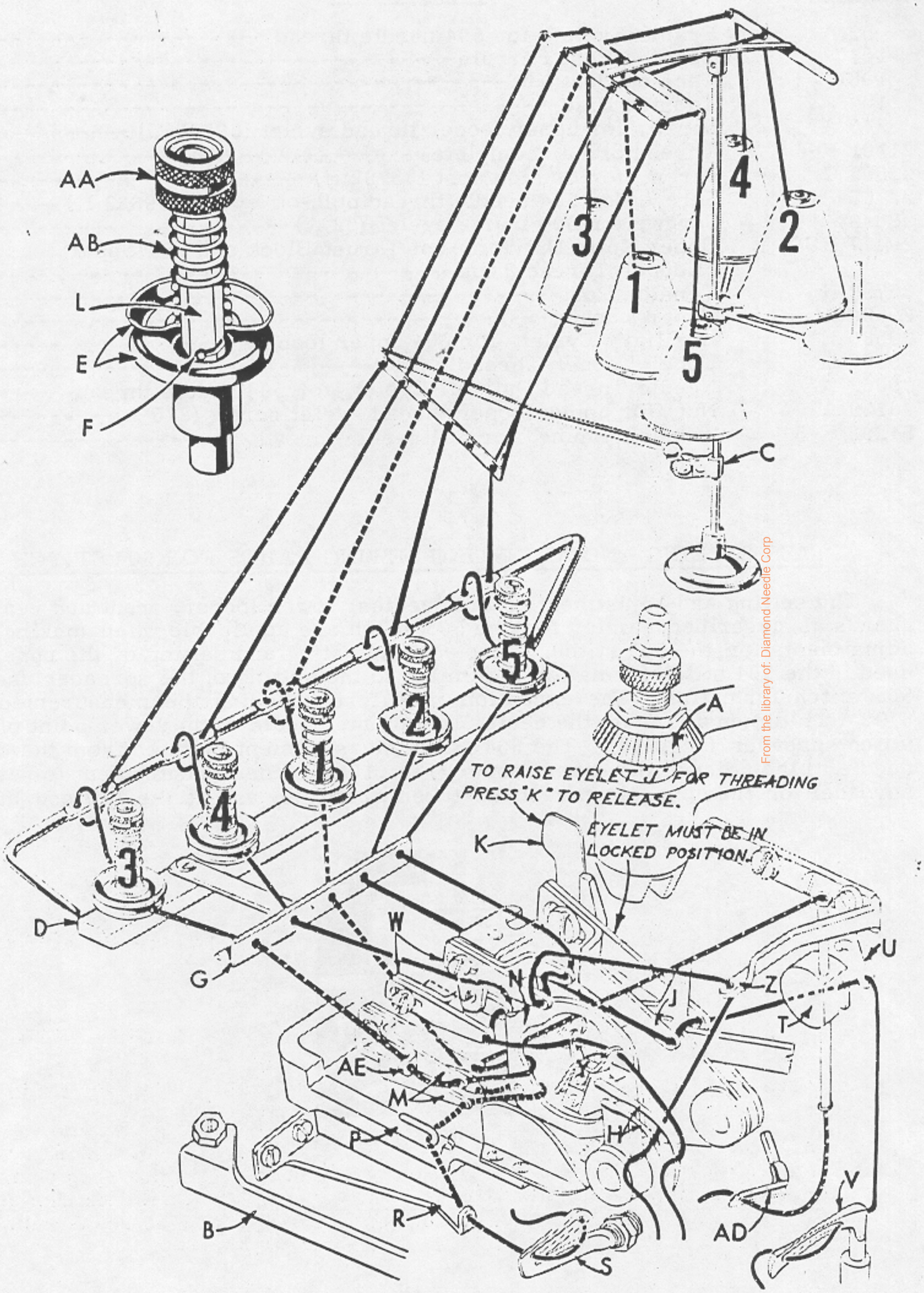


Fig. 10A



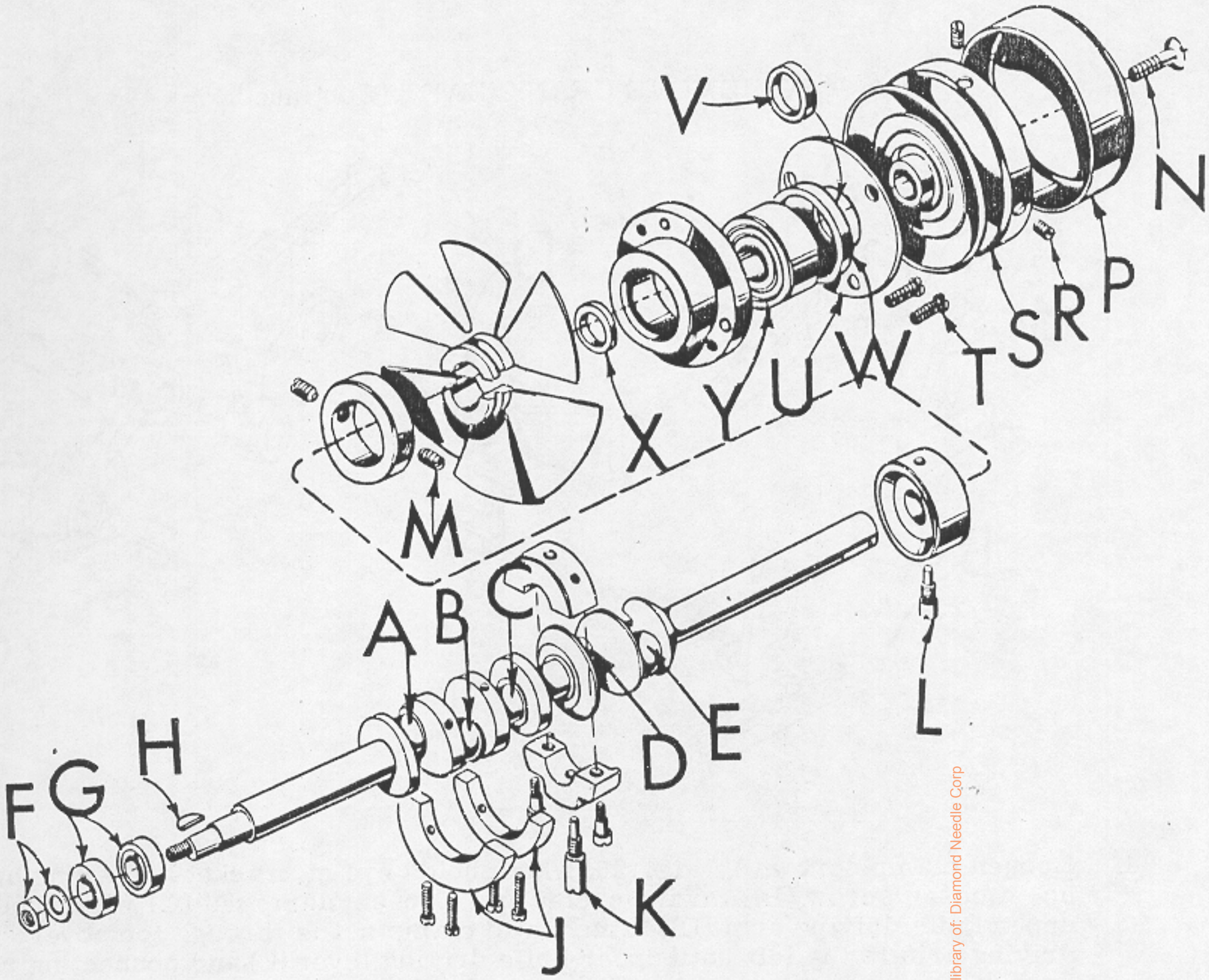


Fig. 25

Crankshaft can be withdrawn more easily if these steps are followed:

1. Drain oil by removing plug screw located on back of machine near bottom edge of base.
2. Remove top and bottom covers of machine.
3. Remove the feed eccentric nut and washer (F, Fig. 25) and, with the aid of the eccentric extractor, slip off the eccentrics (G).
4. Remove key (H).
5. Remove two counterweights (J). Identify these counterweights so that they will be reassembled in the proper place.
6. Remove screw (K) which holds crankshaft split bearing. This screw is reached through bottom of bed casting.
7. Remove caps of bearings on crankshaft at points A, B, D and E. When reassembling bearing caps make sure they are in their original position. Trademarks are stamped on both halves of the caps and both trademarks should be on the same side of the bearings. Also, screws should be reassembled in the same holes from which they were removed.

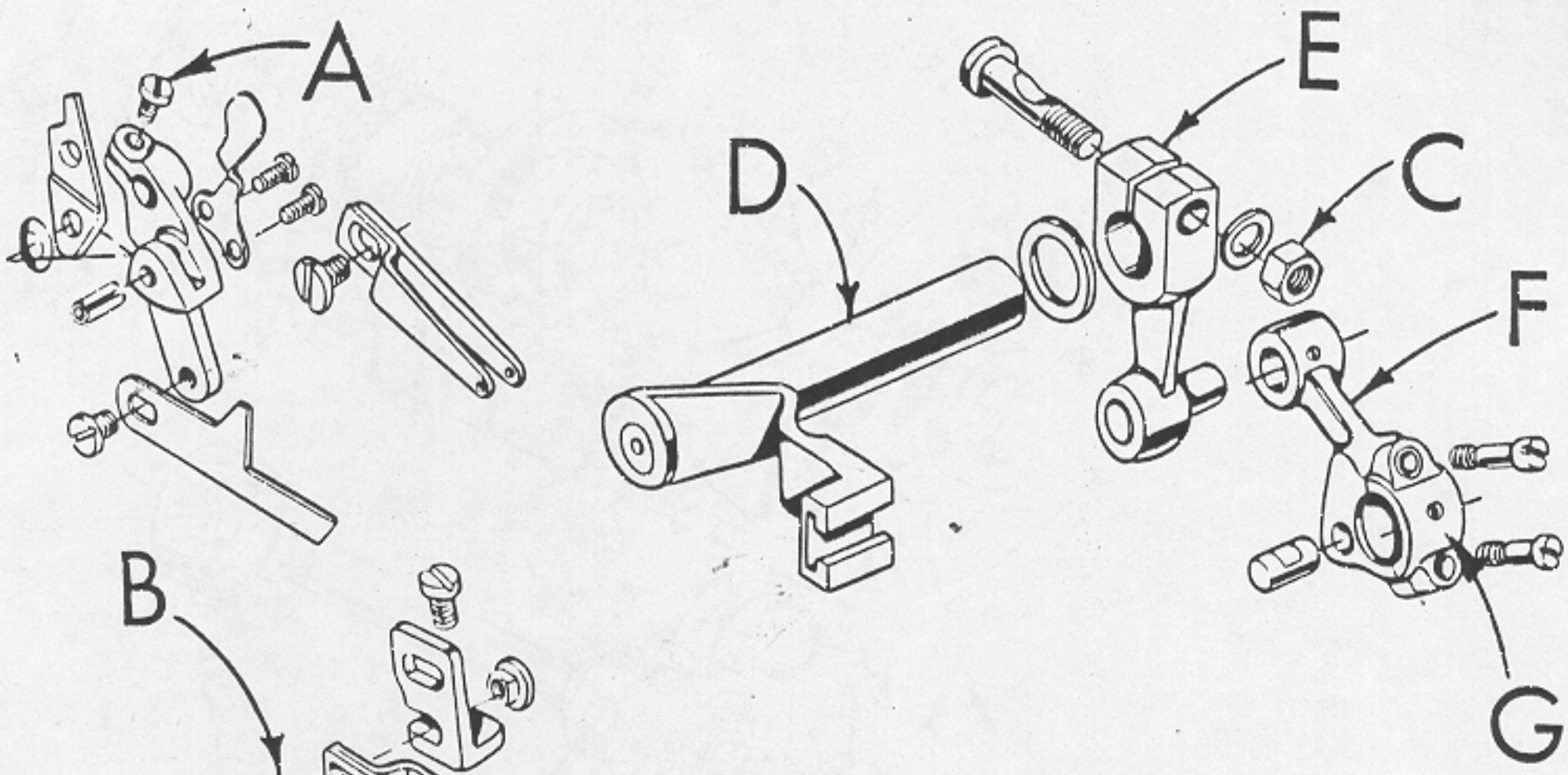


Fig. 26

8. Loosen clamp screw (A, Fig. 26) which holds eyelet bracket and swing bracket up. Loosen screw (B); swing eyelet up. Loosen clamp nut (C) which holds the upper knife driving arm (D). Access to clamp nut is through top cover. Draw driving arm to the left until upper knife driving lever (E) and connecting rod (F) drop, allowing removal of bearing cap (G). This is at bearing point (C, Fig. 25) on crankshaft. Observe same precautions when reassembling cap as described in paragraph 7.

9. Remove screw (L, Fig. 25) which holds inner right crankshaft bearing. This screw is reached through bottom of bed casting.

10. Loosen two screws (M) in fan collar; remove both halves of cooling fan.

11. Remove screw (N); take off pulley cap (P).

12. Loosen two screws (R); remove pulley (S).

13. Remove three screws (T); take off bearing retaining plate (U); also, spacer collars (V) and (W) may be removed at this time.

14. Crankshaft may now be removed.

15. If necessary to replace ball bearing (Y), it can be pressed off shaft on an arbor press. In replacing the bearing it must be pressed on carefully until it seats against ground thrust washer (X).

16. Carefully observing reverse of the foregoing operations should simplify reassembly of crankshaft. Checking exploded view drawings for location of various parts and constant testing for binds during reassembly will also prove helpful.

17. Before reassembling, thoroughly clean and dry the top and bottom covers and gaskets. Before reassembling bottom cover make sure that spring pressed oil wick which lubricates left crankshaft bearing is inserted in hole in casting and that it contacts shaft. The wick stands vertically on its spring against bottom cover. Coat the oil drain plug with a sealing compound before reassembling to prevent oil leakage. No. 1 Crane Lead Seal is recommended.

ILLUSTRATIONS

This catalog has been arranged to simplify ordering repair parts. Exploded views of various sections of the mechanism are shown so that the parts may be seen in their actual position in the machine. On the page opposite the illustration will be found a listing of the parts with their part numbers, description and the number of pieces required in the particular view being shown.

Numbers in the first column are reference numbers only, and merely indicate the position of that part in the illustration. Reference numbers should never be used in ordering parts. Always use the part number listed in the second column.

Component parts of sub-assemblies which can be furnished for repairs are indicated by indenting their descriptions under the description of the main sub-assembly. Example:

25	29126 CG	Spreader Drive Lever and Connecting Rod Assembly ------	1
26	22559 A	Screw, for connecting rod assembly ----------	4

It will be noted in the above example that the ball stud and bearing are not listed. The reason is that replacement of these parts individually is not recommended, so the complete sub-assembly should be ordered.

Where parts for Styles 39600 A and 39600 P are not the same, the difference will be shown in the illustrations or mentioned in the descriptions. When a part is used in all machines covered by this catalog no machine style will be mentioned.

At the back of the book will be found a numerical index of all the parts shown in this book. This will facilitate locating the illustration and description when only the part number is known.

IDENTIFYING PARTS

Where the construction permits, each part is stamped with its part number. Parts too small for a complete catalog stamping are identified by letter symbols which distinguish one part from another that is similar in appearance.

Part numbers represent the same part, regardless of catalog in which they appear.

IMPORTANT! ON ALL ORDERS, PLEASE INCLUDE PART NAME AND STYLE OF MACHINE FOR WHICH PART IS ORDERED.

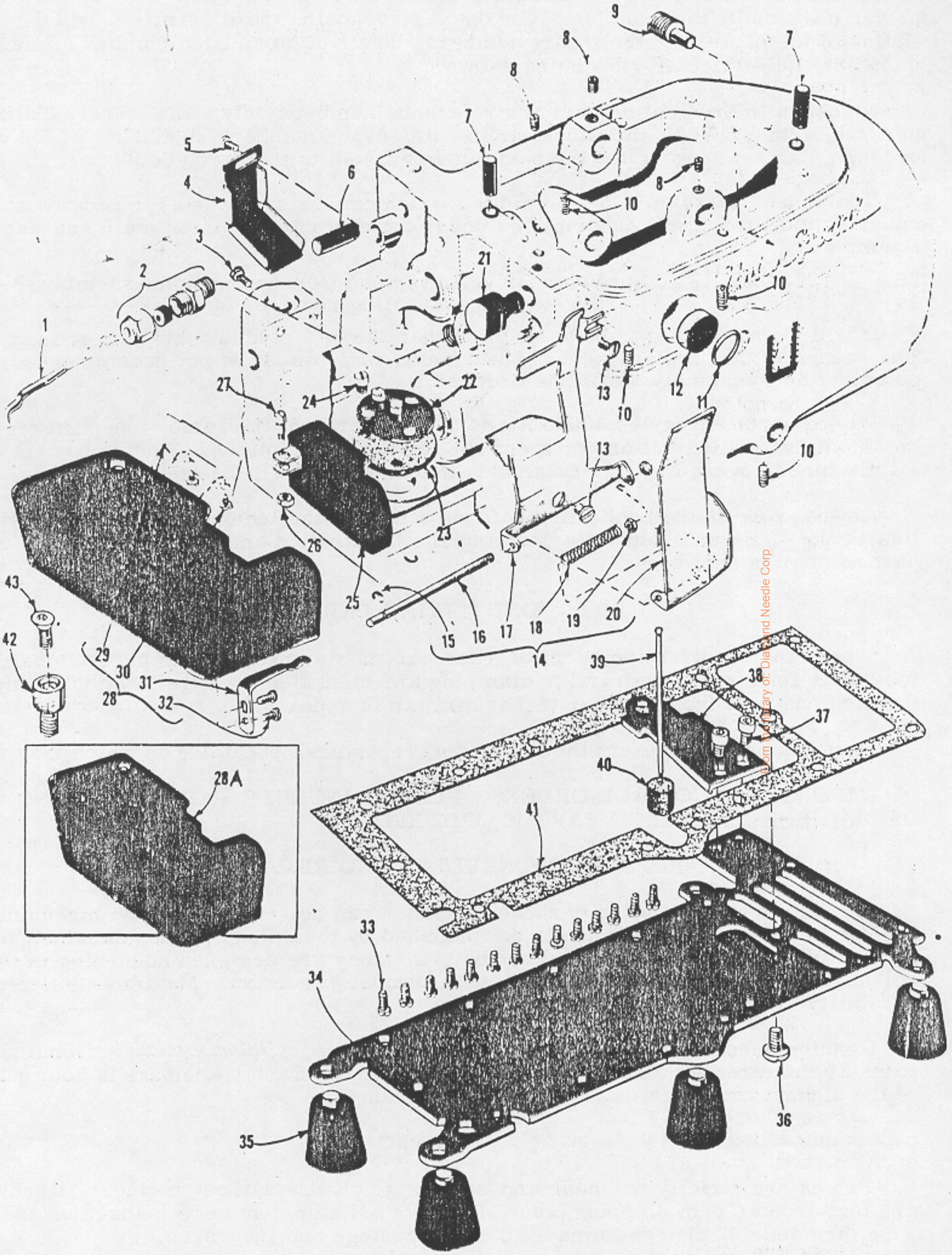
USE GENUINE NEEDLES AND REPAIR PARTS

Success in the operation of these machines can be secured only with genuine Union Special Needles and Repair Parts as furnished by the Union Special Machine Company, its subsidiaries and authorized distributors. They are designed according to the most scientific principles, and are made with utmost precision. Maximum efficiency and durability are assured.

Genuine needles are packaged with labels marked *Union Special*. Genuine repair parts are stamped with the Union Special trademark. Each trademark is your guarantee of the highest quality in materials and workmanship.

TERMS

Prices are strictly net cash and subject to change without notice. All shipments are forwarded f. o. b. shipping point. Parcel Post shipments are insured unless otherwise directed. A charge is made to cover postage and insurance.



Ref. No.	Part No.	Description	Amt. Req.
1	39594	Feed Bar Connecting Rod Oil Tube	1
2	660-234	Oil Tube Coupling	1
3	22569	Screw, for cloth plate stud	1
4	39534 R	Feed Bar Oil Shield	1
5	90	Screw, for feed bar oil shield	1
6	667 H-16	Dowel Pin, for eyelet bracket	1
7	667 D-8	Dowel Pin, for top cover	2
8	22565	Screw, for upper knife holder block	1
-	22565	Screw, for upper looper rocker shaft	2
9	22571 E	Magnetic Oil Drain Plug	1
10	22894 AD	Screw, for lower looper drive lever shaft	2
-	22894 AD	Screw, for lower looper bar driving lever shaft	2
11	660-243	Oil Gauge Seal Ring	1
12	39593 E	Oil Sight Gauge	1
13	22569 D	Screw, for chip guard	2
14	39678 T	Chip Guard Assembly	1
15	660-210	Retaining Ring	1
16	39678 W	Hinge Pin	1
17	39678 U	Chip Guard Base	1
18	39158 U	Spring	1
19	43443 Q	Nut, for hinge pin	2
20	39678 V	Chip Guard Cover	1
21	39673 C	Upper Knife Driving Arm Thrust Block	1
22	39594 G	Oil Filter Screen	1
23	39594 H	Oil Strainer	1
24	22569 A	Screw, for oil filter screen	3
25	39582 D	Feed Mechanism Cover	1
26	41071 G	Nut, for feed mechanism cover	1
27	86 X	Screw, for feed mechanism cover	1
28	39501 AB	Cloth Plate, for semi-submerged installation	1
28A	39501 H	Cloth Plate, for non-submerged installation	1
29	39578 F	Cloth Plate Fabric Guard	1
30	138	Screw, for cloth plate fabric guard	2
31	39532 A	Cloth Plate Latch Spring	1
32	90	Screw, for latch spring	2
33	22569 C	Screw, for bottom cover	14
34	39582 XA	Bottom Cover	1
35	39595	Mounting Isolator, rubber	4
36	22586 R	Screw, for bottom cover	1
37	22653 D-4	Screw, for bottom cover and base plate extension	2
38	39582 F	Bottom Cover and Base Plate Extension	1
39	39593 D	Oil Gauge Indicator	1
40	39593 C	Oil Gauge Float	1
41	39582 Y	Bottom Cover Gasket	1
42	39501 K	Cloth Plate Stud	1
43	22657 D-12	Screw, for cloth plate	1

NEEDLES

Each Union Special needle has both a type and size number. The type number denotes the kind of shank, point, length, groove, finish and other details. The size number, stamped on the needle shank, denotes largest diameter of blade, measured in thousandths of an inch, midway between shank and eye. Collectively, type and size number represent the complete symbol which is given on the label of all needles packaged and sold by Union Special.

Two needles having different lengths are used in this machine. The shorter needle for the overedge stitch, located at the right, is Type 154 GAS. It is a round shank, round point, curved blade, standard length, single groove, struck groove, spotted, chromium plated needle and is available in sizes 022, 025, 027, 029, 032, 036, 040, 044, 049, 054.

The longer needle for the 401 stitch, located at the left, is Type 158 GJ. It is a round shank, round point, curved blade, flat tapered blade, Class "B" length, double groove, milled groove, long spot, government point, chromium plated needle and is available in sizes 029, 032, 036, 040, 044.

To have needle orders promptly and accurately filled, an empty package, a sample needle, or the type and size number should be forwarded. Use description on label. A complete order would read: "1000 needles, Type 154 GAS, Size 032".

Selection of proper needle size is determined by size of thread used. Thread should pass freely through needle eye in order to produce a good stitch formation.

Success in the operation of Union Special machines can be secured only by use of needles packaged under our brand name, *Union Special*, which is backed by a reputation for producing highest quality needles in materials and workmanship for more than three-quarters of a century.

CHANGING NEEDLES

Release pressure on presser foot by turning the presser foot release bushing (A, Fig. 1) and swinging presser arm (B) out of position. Turn handwheel in operating direction (away from operator) until needle holding screws (A, Fig. 2) are just exposed from behind presser spring plunger (B) and accessible to screwdriver. Loosen screw and withdraw needle. When replacing needles observe the position of the flat which is at the left of the shank and be sure the needle is inserted the full depth to the combination eyelet and stop plate (C).

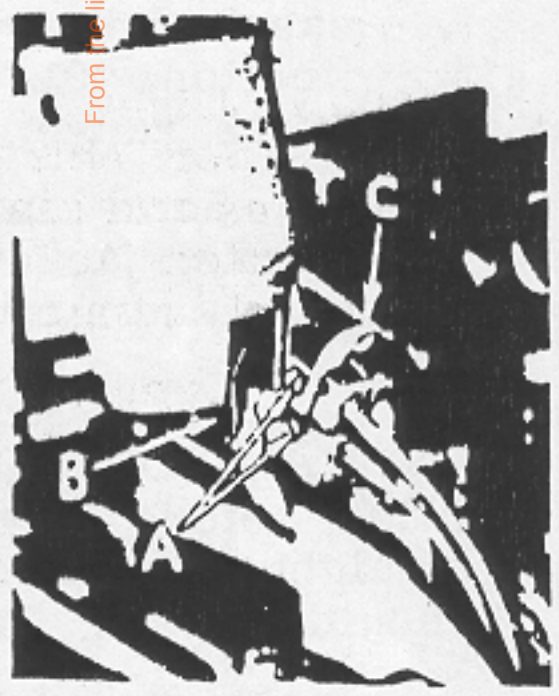


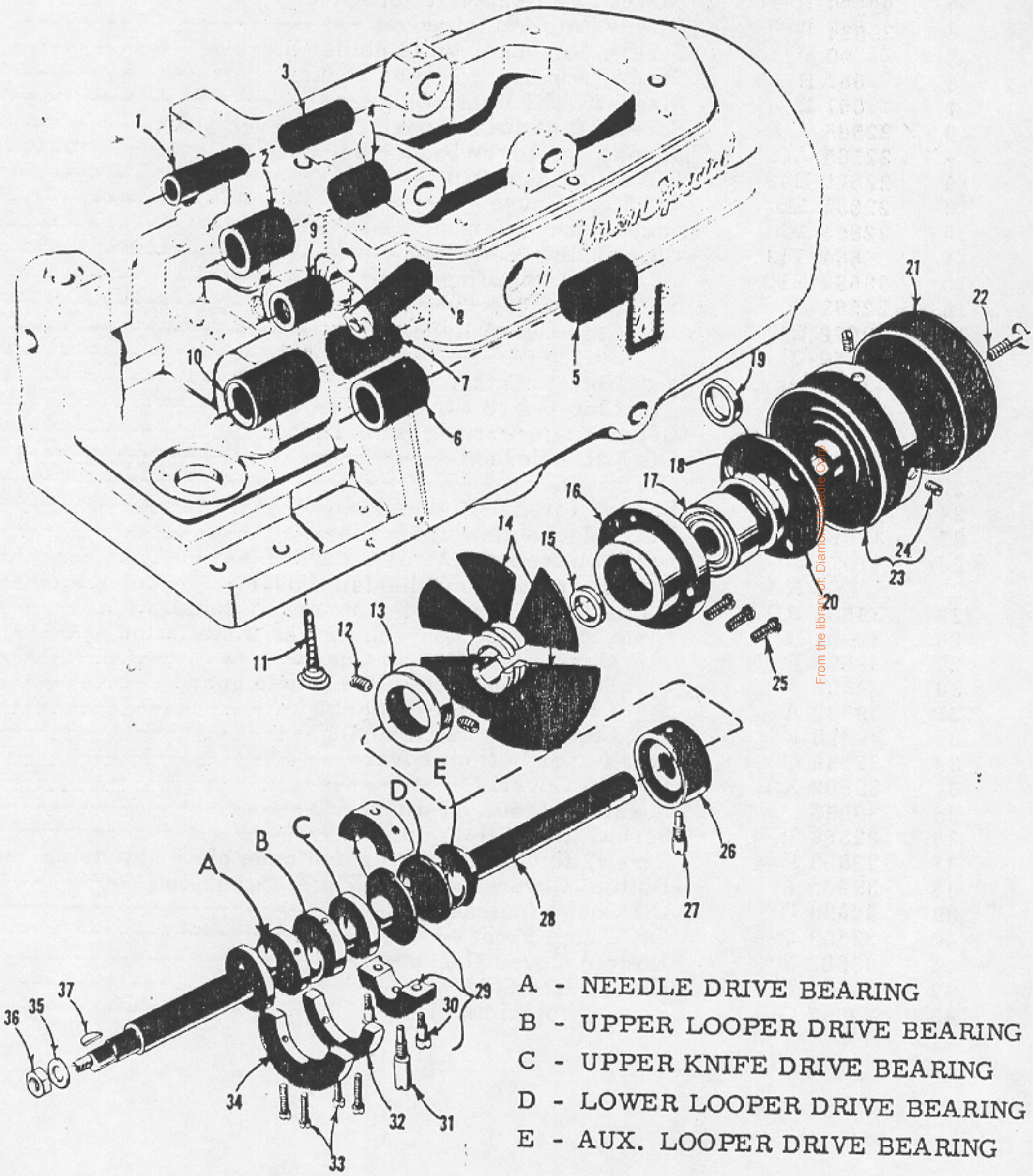
Fig. 2

THREADING

Only parts involved in threading are shown in threading diagram (Fig. 1). Parts are placed in their relative positions for clarity.

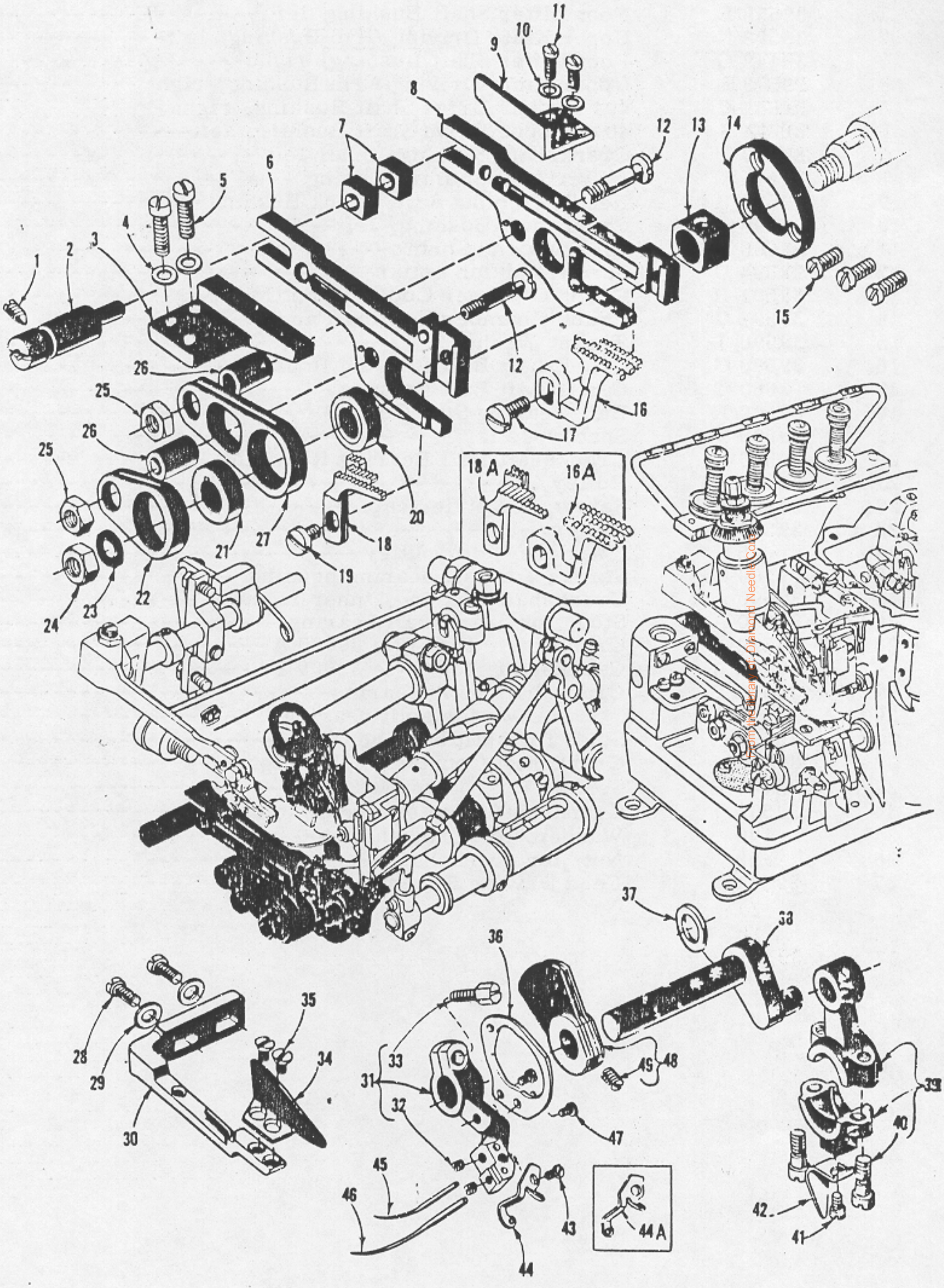
Thread from the thread stand (C) is threaded through each pair of holes in the tension thread guide wire (D), down right hand hole and up through left hand hole. Then thread continues between tension discs (E), through slot (F), and on through thread guide (G).

It will simplify the threading of machine to follow the recommended sequence as designated by the numbers assigned to each thread, starting with thread No. 1. The various eyelets and guides on the machine for each thread have been color-coded to further aid the threading process. Thus the sequence is: thread No. 1, lower looper thread, yellow color code; thread No. 2, 401 looper thread, blue color code; thread No. 3, 401 needle thread, red color code; thread No. 4, overedge needle thread, green color code.



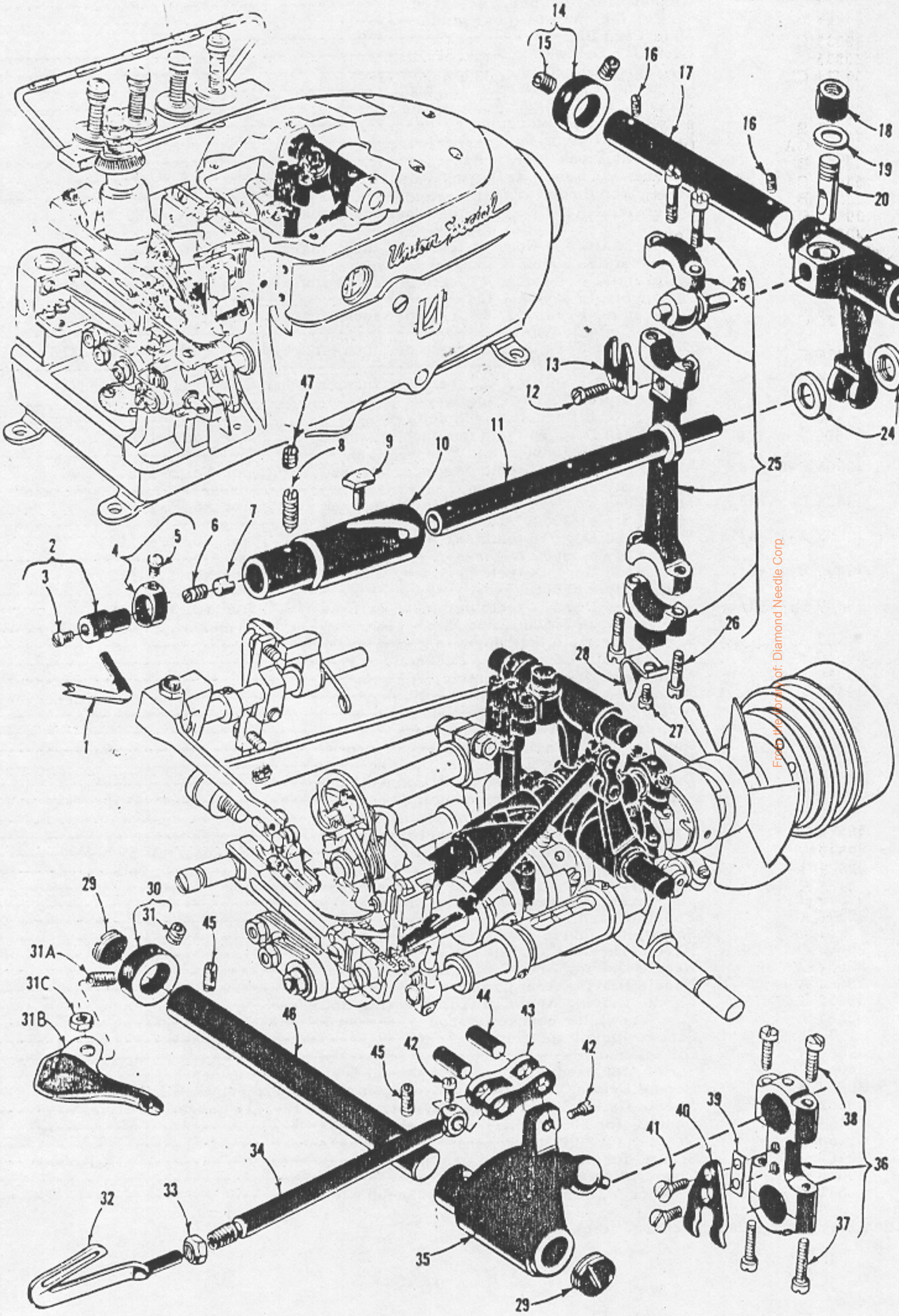
A - NEEDLE DRIVE BEARING
B - UPPER LOOPER DRIVE BEARING
C - UPPER KNIFE DRIVE BEARING
D - LOWER LOOPER DRIVE BEARING
E - AUX. LOOPER DRIVE BEARING

Ref. No	Part No.	Description	Amt. Req.
1	39555 E	Foot Lifter Shaft Bushing, left	1
2	39573 K	Upper Knife Driving Arm Bushing, left	1
3	39142 G	Foot Lifter Shaft Bushing, right	1
4	39573 L	Upper Knife Driving Arm Bushing, right	1
5	39644 C	401 Looper Drive Shaft Bushing, right	1
6	39644 S	401 Looper Drive Shaft Bushing, left	1
7	39590 C	Crankshaft Bushing, inner left	1
8	39544 L	Lower Looper Bar Bushing	1
9	39552 B	Needle Driving Arm Crank Bushing	1
10	39590	Crankshaft Bushing, left	1
11	666-94	Oil Wick and Spring	1
12	22894 D	Screw, for fan collar	2
13	39591 H	Crank Chamber Cooling Fan Collar	1
14	39591 G	Crank Chamber Cooling Fan	1
15	39590 J	Thrust Washer	1
16	39590 G	Crankshaft Ball Bearing Housing	1
17	660-268	Crankshaft Ball Bearing	1
18	39590 R	Ball Bearing Stop Collar	1
19	39590 S	Spacer Collar	1
20	39590 H	Crankshaft Ball Bearing Retaining Plate	1
21	39521 A	Pulley Cap	1
22	22769 A	Screw, for pulley cap	1
23	39521	Pulley	1
24	95	Screw, for pulley	2
25	22569	Screw, for ball bearing housing	3
26	39690	Crankshaft Bearing, inner right	1
27	39690 A	Stud, for crankshaft bearing	1
28	39622	Crankshaft, for Style 39600 A	1
	39622 A	Crankshaft, for Style 39600 P	1
29	39690 B	Crankshaft Split Bearing	1
30	97 A	Screw, for split bearing	2
31	39590 N	Stud, for split bearing	1
32	39691	Crankshaft Counterweight, right	1
33	22747 B	Screw, for counterweights	4
34	39591	Crankshaft Counterweight, left	1
35	20	Washer, for crankshaft	1
36	18	Nut, for crankshaft	1
37	39541	Feed Driving Eccentric Key	1

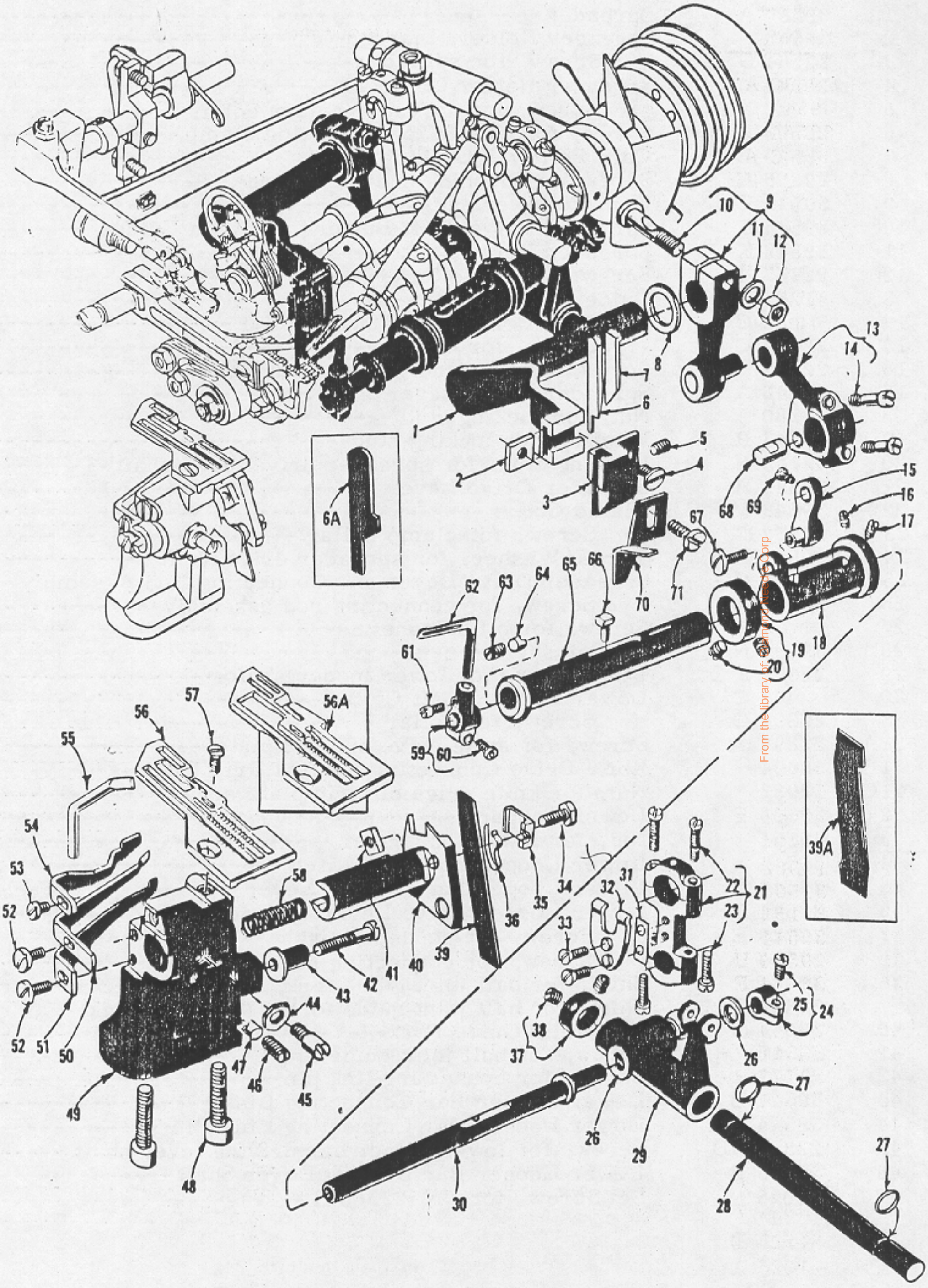


Ref. No.	Part No.	Description	Am. Req.
1	22565 F	Screw, for feed adjusting pin	1
2	39535 C	Feed Adjusting Pin	1
3	39535	Main Feed Bar Guide, left	1
4	53634 C	Washer, for feed bar guide screw	2
5	22569	Screw, for main feed bar guide	2
6	39534	Main Feed Bar	1
7	39535 B	Feed Bar Guide Block	1
8	39534 GA	Differential Feed Bar	1
9	39535 D	Differential Feed Bar Guide, right	1
10	53634 C	Washer, for feed bar guide screw	2
11	22569 B	Screw, for feed bar guide	2
12	39536 B	Feed Bar Driving Stud	1
13	39538	Feed Lift Block	1
14	39534 H	Differential Feed Bar Thrust Washer	1
15	22569 G	Screw, for thrust washer	1
16	39626 D	Differential Feed Dog, 16 teeth per inch, marked "BR"; for No. 5-1/8 gauge Styles 39600 A and P	1
* -	39626 C	Differential Feed Dog, 14 teeth per inch, marked "BP"; for No. 5-1/8 gauge Styles 39600 A and P	1
* -	39626 E	Differential Feed Dog, 22 teeth per inch, marked "BS"; for No. 5-1/8 gauge Styles 39600 A and P	1
16A	39626 F	Differential Feed Dog, 14 teeth per inch, marked "BT"; for No. 12-3/16 gauge Style 39600 P	1
* -	39626 G	Differential Feed Dog, 16 teeth per inch, marked "BU"; for No. 12-3/16 gauge Style 39600 A	1
* -	39626 H	Differential Feed Dog, 22 teeth per inch, marked "BV"; for No. 12-3/16 gauge Styles 39600 A and P	1
17	93	Screw, for differential feed dog	1
18	39605 A-5-1/8	Main Feed Dog, 16 teeth per inch, marked "BC"; for No. 5-1/8 gauge Styles 39600 A and P	1
* -	39605 C-5-1/8	Main Feed Dog, 22 teeth per inch, marked "BW"; for No. 5-1/8 gauge Styles 39600 A and P	1
* -	39605 D-5-1/8	Main Feed Dog, 14 teeth per inch, marked "CA"; for No. 5-1/8 gauge Styles 39600 A and P	1
18A	39605 A-12-3/16	Main Feed Dog, 16 teeth per inch, marked "BF"; for No. 12-3/16 gauge Style 39600 A	1
* -	39605 B-12-3/16	Main Feed Dog, 14 teeth per inch, marked "BH"; for No. 12-3/16 gauge Style 39600 P	1
* -	39605 C-12-3/16	Main Feed Dog, 22 teeth per inch, marked "BX"; for No. 12-3/16 gauge Styles 39600 A and P	1
19	93 A	Screw, for main feed dog	1
20	39540 B-12	Differential Feed Driving Eccentric	1
21	39540 B-12	Main Feed Driving Eccentric	1
22	39536 Z	Main Feed Bar Driving Connection	1
23	20	Washer, for feed driving eccentric	1
24	18	Nut, for feed driving eccentric	1
25	39536 E	Nut, for feed bar driving stud	1
26	39536 C	Feed Bar Driving Connection Bushing	1
27	39536 A	Differential Feed Bar Driving Connection	1
28	22569 B	Screw, for fabric guard mounting bracket	2
29	8372 A	Washer, for fabric guard mounting bracket	2
30	39578 P	Fabric Guard Mounting Bracket	1
31	39652-5	Needle Driving Arm, marked "E-5"; for No. 5-1/8 gauge, all Styles	1
	39652-12	Needle Driving Arm, marked "E-12"; for No. 12-3/16 gauge, all Styles	1
32	28 B	Screw, for needles	2
33	22519 H	Screw, for needle driving arm	1
34	39578 M	Fabric Guard	1
35	87	Screw, for fabric guard	2
36	39663 D	Needle Thread Cam Pull-off	1
37	39552 C	Needle Driving Arm Crank Thrust Washer	1
38	39552 A	Needle Driving Arm Crank	1
39	39552 E	Needle Driving Arm Crank Connecting Rod	1
40	22587 J	Screw, for connecting rod	2
41	77	Screw, for oil splasher	1
42	39594 N	Oil Splasher	1
43	605	Screw, for needle driving arm thread eyelet	1
44	39652 B	Needle Driving Arm Thread Eyelet, for No. 5-1/8 gauge, all Styles	1
44A	39652 C	Needle Driving Arm Thread Eyelet, for No. 12-3/16 gauge, all Styles	1
45	154 GAS	Needle, for 503 stitch	1
46	158 GJ	Needle, for 401 stitch	1
47	22768 B	Screw, for needle thread cam pull-off	2
48	39668 A	Looper Thread Take-up Cam	1
49	531	Screw, for looper thread take-up cam	1

* Available as extra send and charge item.

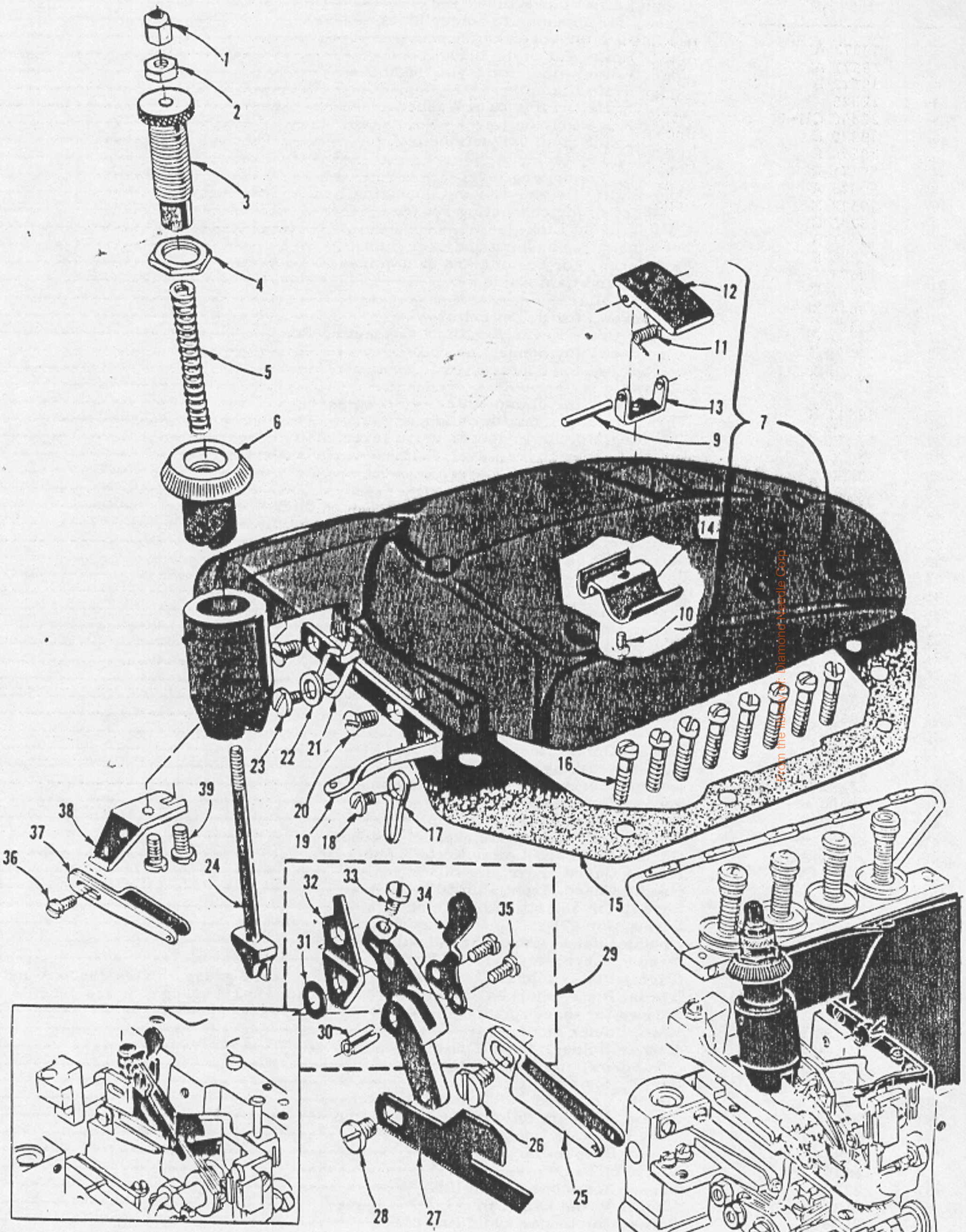


Ref. No.	Part No.	Description	Amt. Req.
1	39560 A	Spreader	1
2	39543	Spreader Holder, marked "J"	1
3	22564 G	Screw, for spreader	1
4	39543 A	Spreader Holder Collar	1
5	22 KH	Screw, for spreader holder collar	1
6	22503 F	Screw, for cam follower locking clamp	1
7	39543 E	Cam Follower Locking Clamp	1
8	22565 H	Screw, for bushing and cam guide	1
9	39543 T	Cam Follower	1
10	39543 S	Spreader Drive Shaft Bushing and Cam Guide	1
11	39543 K	Spreader Drive Shaft	1
12	22747	Screw, for guide fork	1
13	41255 B	Guide Fork	1
14	482 C	Spreader Drive Lever Shaft Collar	1
15	22894 C	Screw, for collar	2
16	22565	Screw, for spreader drive lever shaft	2
17	7446 A	Spreader Drive Lever Shaft	1
18	1280	Nut, for locking stud	1
19	39543 R	Washer, for locking stud	1
20	43143 N	Locking Stud, for spreader drive lever shaft	1
21	39543 H	Spreader Drive Lever	1
22	39543 M	Clamp Collar	1
23	22562 A	Screw, for clamp collar	1
24	39543 P	Thrust Washer, for spreader drive shaft	2
25	29126 CG	Spreader Drive Lever and Connecting Rod Assembly	1
26	22559 A	Screw, for connecting rod assembly	4
27	77	Screw, for oil splasher	1
28	39594 N	Oil Splasher	1
29	22539 K	Plug Screw, for lower looper shaft	2
30	482 C	Lower Looper Shaft Collar	1
31	22894 C	Screw, for collar	2
31A	22894 J	Screw, for knife drive oil drip plate	1
31B	39694	Knife Drive Connecting Rod Oil Drip Plate	1
31C	12982	Nut, for knife drive oil drip plate screw	1
32	39508 B	Lower Looper	1
33	39151	Nut, for lower looper bar	1
34	39544	Lower Looper Bar (503 stitch)	1
35	39544 U	Lower Looper Bar Driving Lever	1
36	39644 F	Lower Looper Drive Lever Connecting Rod	1
37	22729 E	Screw, for connecting rod	2
38	22729 D	Screw, for connecting rod	2
39	39644 R-2	Shim, for ball joint guide fork, .002 inch thick	as required
	39644 R-5	Shim, for ball joint guide fork, .005 inch thick	as required
40	39644 J	Ball Joint Guide Fork	1
41	538	Screw, for ball joint guide fork	2
42	77	Screw, for connecting link pin	2
43	39544 B	Lower Looper Bar Connecting Link	1
44	39544 D	Lower Looper Bar Connecting Link Pin	2
45	22894 AD	Screw, for lower looper bar driving lever shaft	2
46	51235 B	Lower Looper Bar Driving Lever Shaft	1
47	1025 L	Set Screw, for No. 22565 H	1



UPPER AND LOWER KNIFE MECHANISM

Ref. No.	Part No.	Description	Amt. Req.
1	39673 A	Upper Knife Driving Arm	1
2	39571 A	Upper Knife Clamp Nut	1
3	39572 B	Upper Knife Holder Block	1
4	22829	Screw, for upper knife holder block	1
5	22650 CB-4	Set Screw, for upper knife	1
6	39270 D	Upper Knife, for Style 39600 A	1
6A	39270 E	Upper Knife, wide, for Style 39600 P	1
7	39571 E	Upper Knife Clamp	1
8	39573 A	Upper Knife Driving Arm Washer	1
9	39573 E	Upper Knife Driving Lever	1
10	55235 D	Locking Stud, for driving lever	1
11	6042 A	Washer, for driving lever	1
12	55235 E	Nut, for driving lever	1
13	39673	Upper Knife Driving Lever Connecting Rod	1
14	22587 E	Screw, for connecting rod	2
15	39644 M	Looper Avoid Link	1
16	22565 C	Set Screw, for bushing and cam guide	1
17	22565 L	Spot Screw, for bushing and cam guide	1
18	39644 K	Bushing and Cam Guide	1
19	39644 P	Thrust Collar	1
20	98	Screw, for thrust collar	2
21	39644 H	Looper Drive Lever Auxiliary Connecting Rod	1
22	22729 E	Screw, for connecting rod	2
23	22729 D	Screw, for connecting rod	2
24	39543 M	Clamp Collar	1
25	22562 A	Screw, for clamp collar	1
26	39543 P	Thrust Washer, for lower looper bar	2
27	660-206	"O" Ring, for lower looper drive lever shaft	2
28	39644 N	Lower Looper Drive Lever Shaft	1
29	39644	Lower Looper Drive Lever	1
30	39644 A	Lower Looper Bar (401 stitch)	1
31	39644 R-2	Shim, for ball joint guide fork, .002 inch thick	as required
	39644 R-5	Shim, for ball joint guide fork, .005 inch thick	as required
32	39644 J	Ball Joint Guide Fork	1
33	538	Screw, for ball joint guide fork	2
34	22588 A	Screw, for lower knife clamp	1
35	39550 L	Lower Knife Clamp	1
36	39550 M	Lower Knife Clamp Spring	1
37	482 C	Lower Looper Drive Lever Shaft Collar	1
38	22894 C	Screw, for collar	2
39	39549 P	Lower Knife, for Style 39600 A	1
39A	39649	Lower Knife, wide, for Style 39600 P	1
40	39650	Lower Knife Holder	1
41	39650 A	Lower Knife Clamp Screw Nut	1
42	22729 B	Screw, for lower knife holder locating stud	1
43	39550 C	Lower Knife Holder Locating Stud	1
44	14077	Nut, for locking screw	1
45	22892	Locking Screw, for lower knife holder	1
46	22503 F	Screw, for needle guard	1
47	39543 E	Needle Guard Locking Clamp	1
48	22653 B-12	Screw, for throat plate support bracket	2
49	39580 AC	Throat Plate and Lower Knife Support Bracket	1
50	39525 A	Needle Guard, rear, for 503 stitch	1
51	39625 B	Needle Guard, front, for 503 stitch	1
52	22585 A	Screw, for 503 stitch needle guards	2
53	90	Screw, for 401 stitch front needle guard	1
54	39625 A	Needle Guard, front, for 401 stitch	1
55	39625	Needle Guard, rear, for 401 stitch	1
56	39624 C-5-1/8	Throat Plate, marked "BL-5-1/8"; for No. 5-1/8 gauge, Styles 39600 A and P	1
56A	39624 C-12-3/16	Throat Plate, marked "BL-12-3/16"; for No. 12-3/16 gauge, Styles 39600 A and P	1
57	22524	Screw, for throat plate	1
58	39550 E	Knife Holder Spring	1
59	39644 E	Looper Holder, for 401 stitch looper	1
60	22653 J-4	Screw, for looper holder	1
61	22564 D	Screw, for 401 stitch looper	1
62	39608 C	Looper, marked "CR", for 401 stitch	1
63	22503 F	Screw, for cam follower locking clamp	1
64	39543 E	Cam Follower Locking Clamp	1
65	39644 B	Lower Looper Bar Sleeve	1
66	39644 L	Cam Follower	1
67	22775	Screw, for looper avoid link	1
68	41336 C	Looper Avoid Link Pin	1
69	22781	Screw, for looper avoid link pin	1
70	39678 P	Chip Deflector	1
71	187 A	Screw	1



Ref. No.	Part No.	Description	Amt. Req.
1	39557 B	Presser Spring Plunger Cap Nut	1
2	39557 E	Presser Spring Plunger Lock Nut	1
3	39557 C	Presser Spring Plunger Adjusting Screw	1
4	39557 F	Lock Nut, for plunger adjusting screw	1
5	39557	Presser Spring	1
6	39556 A	Presser Foot Release Bushing	1
7	39582 Z	Top Cover	1
9	51-103 Blk.	Hinge Pin	1
10	22562 A	Screw, for hinge bracket	1
11	39582 V	Spring, for oil filler cover	1
12	39582 L	Oil Filler Cover	1
13	39582 AG	Hinge Bracket	1
14	39582 W	Oil Guard	1
15	39582 AA	Top Cover Gasket	1
16	22541	Screw, for top cover	8
17	39668 D	Looper Thread Eyelet	1
18	22825	Screw, for looper thread eyelet	1
19	39663 J	Top Cover Needle Thread Eyelet	1
20	22757 E	Screw, for top cover needle thread eyelet	2
21	51758	Needle Thread Eyelet	1
22	53678 N	Washer, for needle thread eyelet screw	1
23	90	Screw, for needle thread eyelet	1
24	39557 A	Presser Spring Plunger	1
25	39668 E	Take-up Eyelet	1
26	22829	Screw, for take-up eyelet	1
27	39668 BA	Cast-off Blade	1
28	22570 B	Screw, for cast-off blade	1
29	39668 C	Eyelet Bracket	1
30	660-219 N	Roll Pin, for arm	1
31	39668 H	Spring Washer, for arm	1
32	39668 F	Arm	1
33	22570 A	Screw, for clamping bracket	1
34	39668 G	Latch Spring	1
35	605	Screw, for latch spring	2
36	87 U	Screw, for needle thread pull-off eyelet	1
37	39663 H	Needle Thread Pull-off Eyelet	1
38	39663 K	Top Cover Eyelet Bracket	1
39	22569 C	Screw, for top cover eyelet bracket	2

Before beginning to thread, swing cloth plate open, turn handwheel in operating direction until the needles (H) are at their highest position, release pressure on presser foot by turning presser foot release bushing (A), and swing presser arm (B) out of position.

RAISE 401 LOOPER THREAD TAKE-UP EYELET (J) BY RELEASING EYELET LATCH (K) AND RAISING EYELET.

Be sure the threads, as they come from the tension thread guide, are between tension discs (E) and in diagonal slots (F) in tension posts (L).

TO THREAD LOWER LOOPER (Thread No. 1 - Yellow Color Code)

Double end of lower looper thread (#1) and lead it through both eyes of lower looper thread eyelet (M) from right to left. NOTE: Thread must pass through inside of needle thread cover pull-off (N). Lead thread back under hook of fabric guard bracket (P) and through eye of frame looper thread guide (R). Turn handwheel in operating direction until heel of lower looper (S) is all the way to the left; then thread through left eye, entering from the rear, and then through right eye, entering from the front. Left eye of lower looper can be threaded easily if tweezers are held with left hand.

TO THREAD 401 LOOPER (Thread No. 2 - Blue Color Code)

Double end of 401 looper thread (#2) and lead it through both eyes of looper thread take-up eyelet (J) from left to right, when the eyelet is in raised position. Return eyelet to lower position by pressing down. When eyelet is in correct position latch will snap into place. Pass thread under knife arm, into the groove of the upper knife support block (T), and over hook (U). Bring needle arm to bottom of stroke. Insert double end of thread in right eye of 401 looper (V) and push through an inch or so of thread. Holding tweezers in left hand insert doubled end of thread into left eye, using about 3/16 inch projection of thread from point of tweezers. DO NOT THREAD LOOPER WITH NEEDLE LOOP AROUND LOOPER. REMOVE LOOP, OTHERWISE MACHINE WILL NOT SEW!

TO THREAD 401 NEEDLE (Thread No. 3 - Red Color Code)

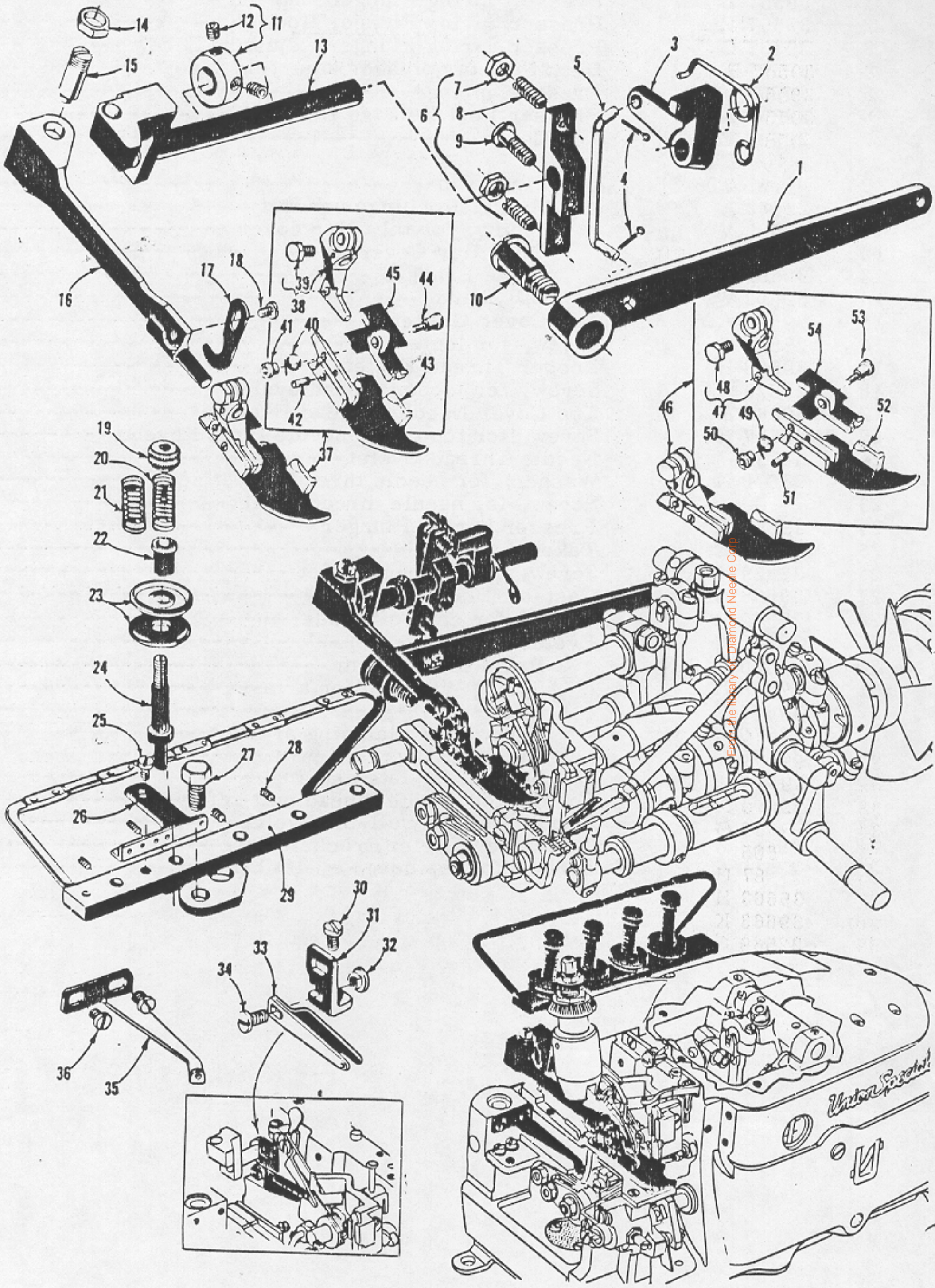
Lower needle arm to bottom of stroke, turning handwheel in operating direction. Threading from left to right, pass the doubled end of the 401 needle thread (#3) through both eyes of needle thread pull-off eyelet (W), passing over the outside of the needle thread cam pull-off (N), then through needle thread frame eyelet (X) and back to the left to the top eye of needle arm eyelet (Y) into lower eye and finally to eye of needle. Raising needle by rotating handwheel in operating direction, thread needle (H) from front.

TO THREAD OVEREDGE NEEDLE (Thread No. 4 - Green Color Code)

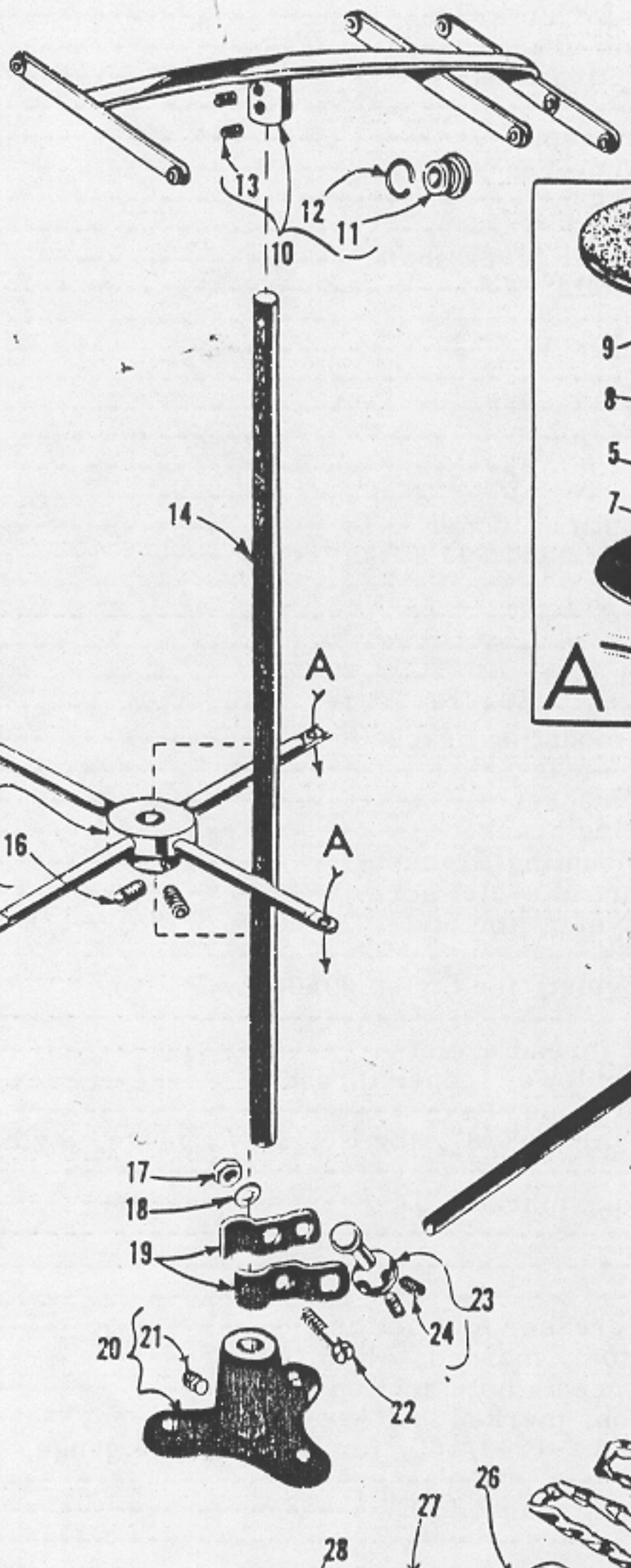
Turn handwheel in operating direction until the needle is at its highest position. Pass overedge needle thread (#4) under overhanging arm of top cover and down through hole in top cover needle thread eyelet (Z). Thread needle (H) from front.

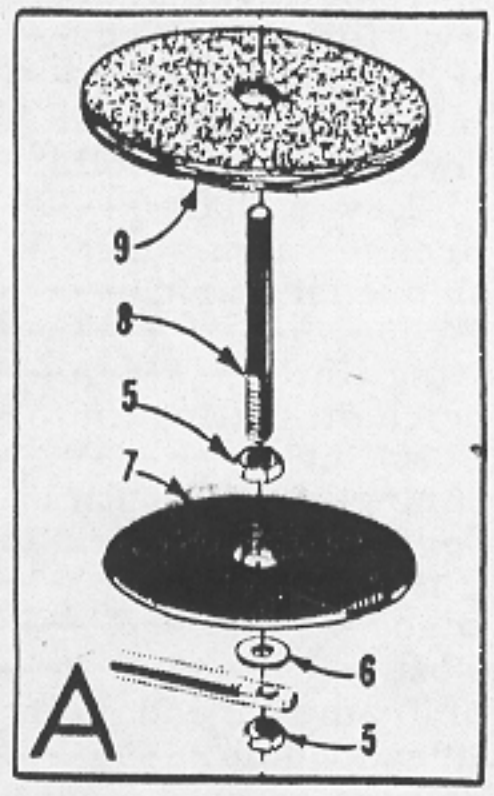
THREAD TENSION

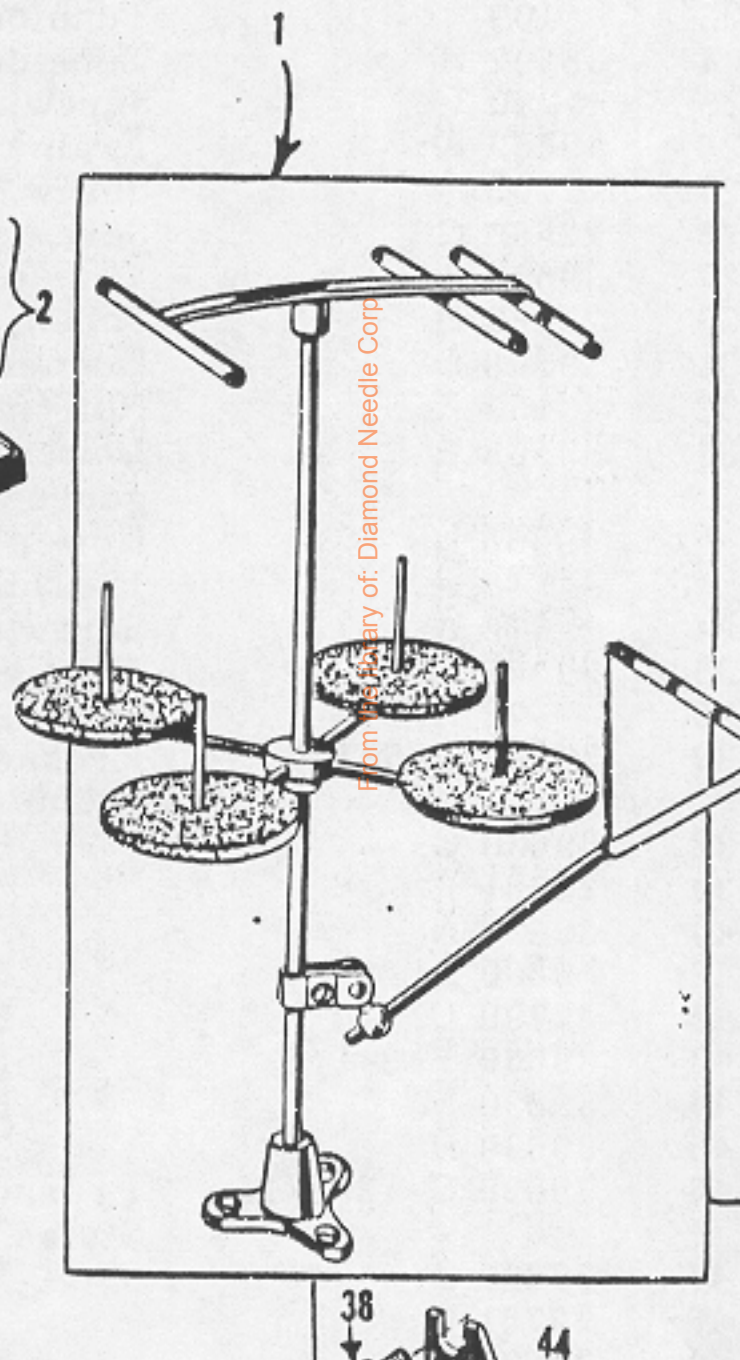
The amount of tension on the needle and looper threads is regulated by the knurled tension nuts (AA, Fig. 1). Tension on the threads should be only enough to secure proper stitch formation. Using a postal scale, the measurements are taken

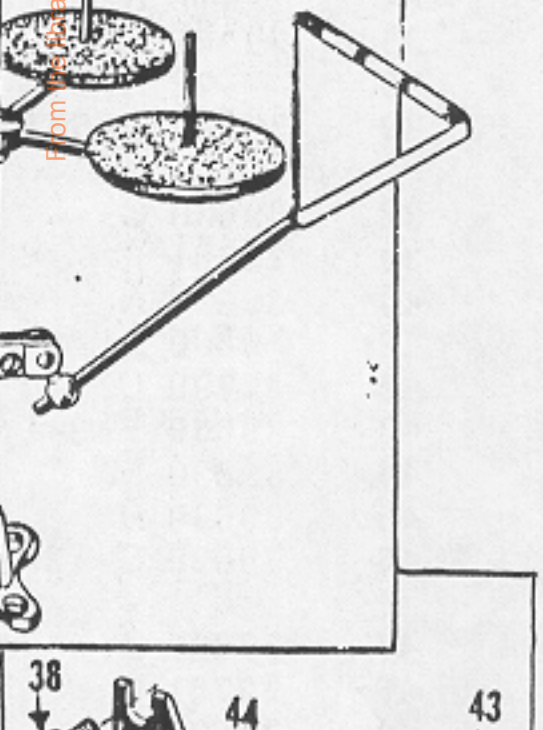


Ref. No.	Part No.	Description	Amt. Req.
1	39555	Foot Lifter Lever	1
2	39555 B	Foot Lifter Lever Spring	1
3	39555 D	Foot Lifter Intermediate Lever	1
4	660-142	Cotter Pin, for connecting link	2
5	39555 F	Foot Lifter Lever Connecting Link	1
6	39555 C	Foot Lifter Lever Arm	1
7	12538	Lock Nut, for lever arm	2
8	22597 E	Screw, for lever arm	2
9	627	Screw, for lever arm	1
10	22566 B	Screw, for foot lifter lever	1
11	12865	Thrust Collar, for foot lifter lever shaft	1
12	88	Screw, for thrust collar	2
13	39655	Foot Lifter Lever Shaft	1
14	258 A	Nut, for presser arm screw	1
15	22791 H	Screw, for presser arm	1
16	39656 B	Presser Arm	1
17	39656 A	Chain Cutting Knife	1
18	605	Screw, for chain cutting knife	1
19	108	Tension Post Nut	4
20	51292 F-2	Tension Spring, for 401 stitch looper	1
21	51292 F-5	Tension Spring, for needles and 503 stitch looper	3
22	107	Tension Post Ferrule	4
23	109	Tension Disc	8
24	35792 H	Tension Post	4
25	90	Screw, for frame thread guide	1
26	39663 A	Frame Thread Guide	1
27	BP108	Screw, for tension post mounting bracket	1
28	22565 C	Screw, for tension post	4
29	39692	Tension Post Mounting Bracket	1
30	22569 B	Screw, for eyelet mounting bracket	1
31	39568 D	Looper Thread Eyelet Mounting Bracket	1
32	43139 A	Nut, for lower looper thread eyelet screw	1
33	39568 B	Lower Looper Thread Eyelet, for Styles 39600 A, P, No. 5-1/8 gauge	1
-	39568 L	Lower Looper Thread Eyelet, for Styles 39600 A, P, No. 12-3/16 gauge	1
34	376 A	Screw, for lower looper thread eyelet	1
35	39568 W	Frame Thread Guide, for lower looper thread	1
36	73 X	Screw, for frame thread guide	2
37	39620 C-5-1/8	Presser Foot, marked "AK-5-1/8", for No. 5-1/8 gauge, Styles 39600 A and P	1
38	39630 G	Presser Foot Shank, marked "D"	1
39	22781	Clamp Screw	1
40	39630 N	Spring	1
41	39630 L	Lock Nut	1
42	22799 U	Hinge Screw, for presser foot bottom	1
43	39630 F-5-1/8	Presser Foot Bottom, marked "AK-5 1/8"	1
44	39630 M	Hinge Screw, for needle hole section	1
45	39630 H	Needle Hole Section, marked "AP"	1
46	39620 C-12-3/16	Presser Foot, marked "AK-12-3/16", for No. 12-3/16 gauge, Styles 39600 A and P	1
47	39630 J	Presser Foot Shank, marked "E"	1
48	22781	Clamp Screw	1
49	39630 N	Spring	1
50	39630 L	Lock Nut	1
51	22799 U	Hinge Screw, for presser foot bottom	1
52	39630 F-12-3/16	Presser Foot Bottom, marked "AK-12-3/16"	1
53	39630 M	Hinge Screw, for needle hole section	1
54	39630 K	Needle Hole Section, marked "AR"	1









THREAD STAND AND ACCESSORIES

Ref. No.	Part No.	Description	Amt. Req.
1	21101 H-4	Thread Stand, complete	1
2	21114 S-4	Lead Eyelet	1
3	21114 L	Eyelet	4
4	21114 M	Eyelet Locking Ring	4
5	258 A	Nut	8
6	652-16	Washer	4
7	21114	Spool Seat Disc	4
8	21114 W	Spool Pin	4
9	21104 V	Pad, for thread cone	4
10	21114 H-4	Eyelet Support	1
11	21114 L	Eyelet	8
12	21114 M	Eyelet Locking Ring	8
13	22651 CD-4	Screw	2
14	21104 B-24	Thread Stand Rod	1
15	21114 D-4	Spool Seat Support	1
16	22651 CD-5	Screw	2
17	21104 H	Nut	1
18	652-16	Washer	1
19	21114 U	Lead Eyelet Ball Split Socket	2
20	21114 A	Thread Stand Base	1
21	22651 CD-4	Screw	1
22	22810	Clamp Screw	1
23	21114 T	Lead Eyelet Socket Ball	1
24	22651 CD-4	Screw	2
25	421 D-34	Foot Lifter Treadle Chain, 34 inches long	1
26	21388 AU	Socket Wrench, for 3/8 inch hexagonal nut holding feed eccentric	1
27	21388 W	Wrench, curved, double end, 9/32 inch opening	1
28	21227 BF	Feed Eccentric Extractor Hook	1
*29	21209 K	Hexagon Socket Bit, 7/64 inch hexagonal (for use with handle No. 21209 G)	1
*30	21225-3/64	Looper Gauge, 3/64 inch, for 401 stitch	1
*-	21225-1/8	Looper Gauge, 1/8 inch, for 503 stitch	1
*31	21227 CR	Needle Height Setting Gauge, for 401 stitch	1
32	660-272	Thread Tweezers	1
33	21207 A	Screwdriver, 1/8 inch diameter blade, 4 3/32 inches long	1
34	660-264	"S" Hook, for treadle chain	1
35	WR64	Wrench, 3/32 inch hexagonal	1
36	WR70	Wrench, 7/64 inch hexagonal	1
*37	29481 J	Edge Guide Assembly	1
38	22569 C	Screw, for edge guide mounting bracket	2
39	604	Screw, for edge guide	2
40	39503 A	Edge Guide	1
41	39603 A	Edge Guide Swinging Arm	1
42	12957 E	Spring Washer	1
43	22758 E	Screw, for edge guide swinging arm	1
44	39603	Edge Guide Mounting Bracket	1

* Available as extra send and charge item.

NUMERICAL INDEX OF PARTS

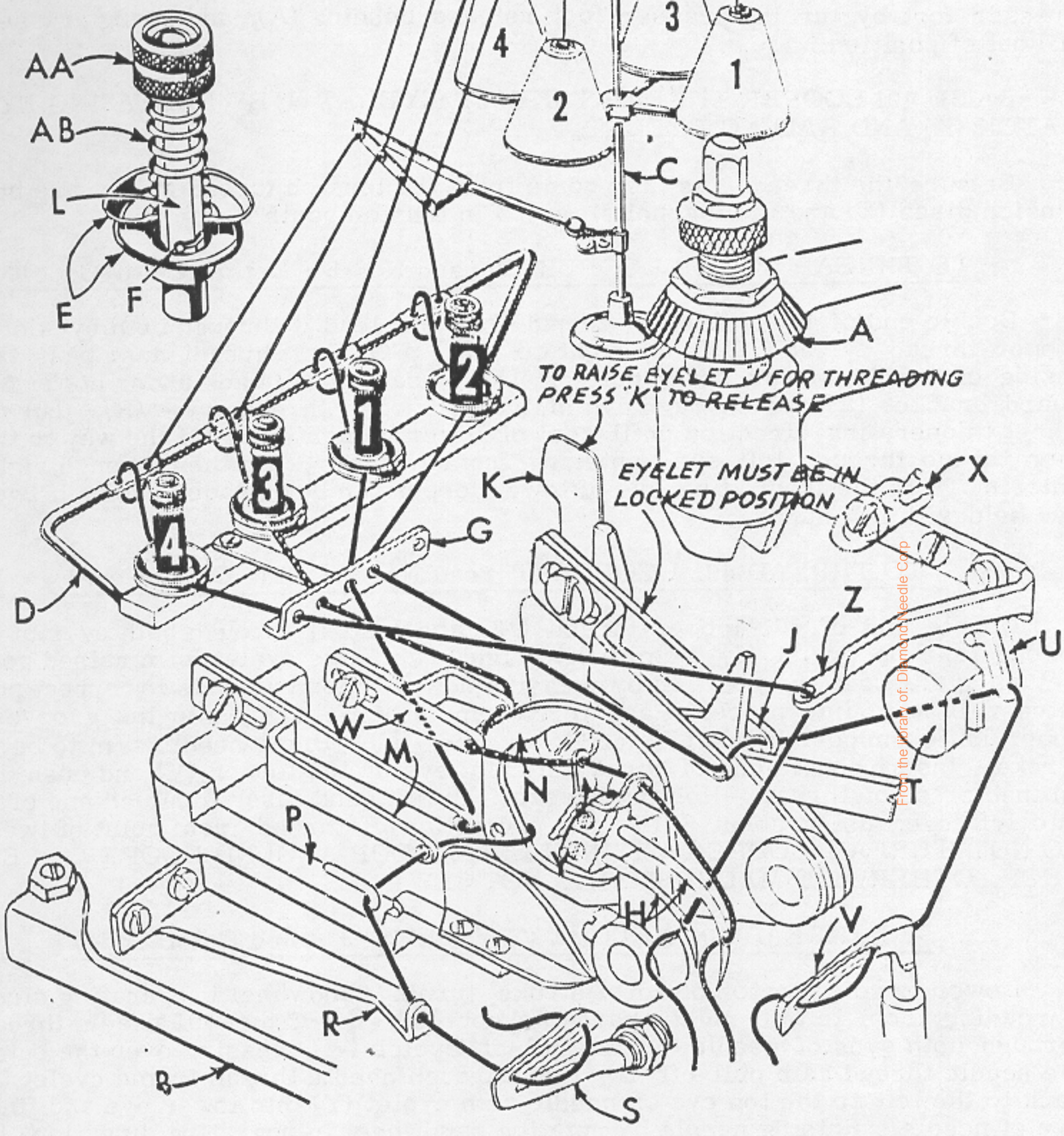


Fig. 1

with the needles at the top of their stroke and pulled in the direction as indicated. As a start the tensions may be as follows:

401 needle thread; 3 1/2 oz. straight out of lower eye of needle arm eyelet (Y).

Overedge needle thread; 1 to 1 1/2 oz. straight out of thread guide (G).

401 looper thread; 1 1/2 to 2 oz. straight out of looper thread eyelet (U).

Lower looper thread; 4 to 4 1/2 oz. straight out of frame looper thread guide (R).

Further refinement in tension adjustment is discussed at the conclusion of the adjusting instructions.

PRESSER FOOT PRESSURE

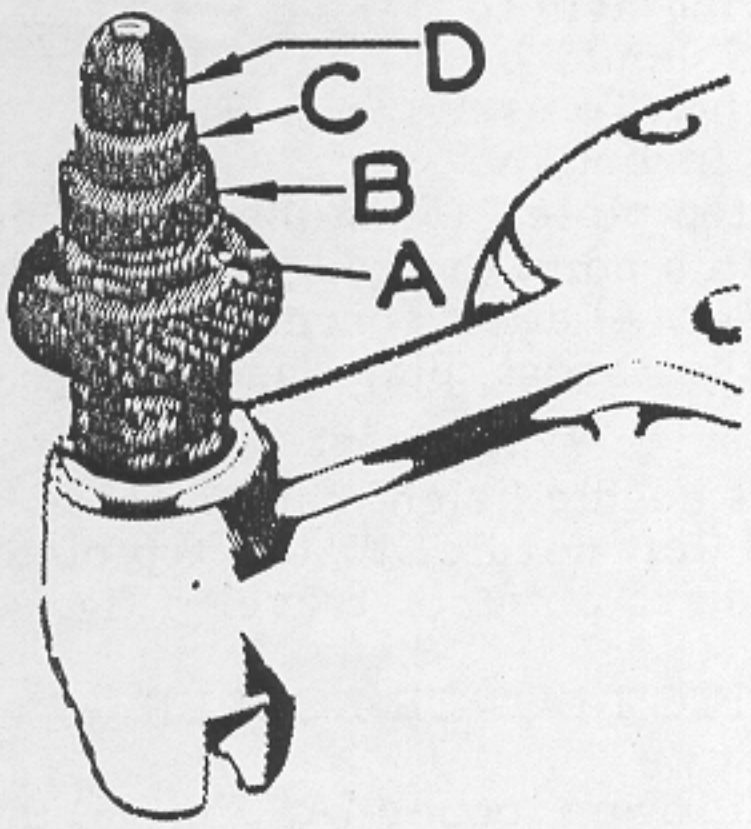


Fig. 3

Sufficient pressure to feed work uniformly should be maintained. Should it be necessary to increase or decrease amount of pressure on presser foot, loosen lock nut (A, Fig. 3) and turn the adjusting screw (B). Adjusting screw has a right hand thread so tightening increases the pressure, loosening decreases pressure. When pressure adjusting screw (B) has been properly set, tighten lock nut (A). With presser foot resting on the throat plate, position locking nut (C) so that its under surface is approximately 1/32 inch to 1/16 inch from the top surface of adjusting screw (B). Set the cap (D) against the locking nut (C).

FEED ECCENTRICS

Feed eccentrics used in this machine have been selected to produce approximately 12 stitches per inch. It will be noted that the part number of both the main feed and the differential feed eccentric is No. 39540 B-12. Minor numbers of the part symbol indicate approximately the number of stitches obtainable when using that eccentric. Unless otherwise specified, machine will be shipped with above eccentrics.

Generally speaking, differential (right hand) feed eccentric determines the number of stitches produced; the main (left hand) feed eccentric is selected in relation to the degree and direction of stretch of material being sewn, or the type of operation.

The following stitch number feed eccentrics are available under No. 39540 B: 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 40. Only two eccentrics are supplied with each machine. Additional eccentrics may be ordered separately. To order an eccentric, use No. 39540 B with a minor number suffixed to indicate number of stitches desired. Example: "39540 B-12".

ASSEMBLING AND ADJUSTING SEWING PARTS

It is suggested that the following sequence be followed. Before assembling the sewing parts, remove cloth plate, fabric guard, chip guard, upper knife assembly and lower knife holder assembly.

SETTING THE NEEDLES

Release the pressure on presser arm and swing arm out of position. Insert both needles (Type 158 GJ for the 401 stitch and Type 154 GAS for the overedge stitch) into the left and right holes, respectively, of the needle driving arm (A, Fig. 4), so that the butt ends contact the stop plate. Secure needles in this position with clamp screws (A, Fig. 2).

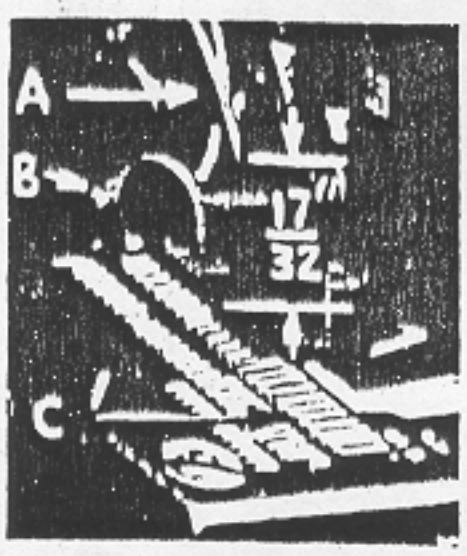


Fig. 4

With throat plate assembled in position, the needles should center in the throat plate needle holes. To align the needles, loosen clamp screw (B, Fig. 4) and move needle driving arm to the left or right as required. Gauge No. 21227 CR should be used to set the needle driving arm at the correct height. To use this gauge remove the left needle (401 stitch) and insert the gauge in its place. Be sure gauge seats against the stop plate. Turn the handwheel until needle driving arm is at its lowest position, at this point the gauge should just contact the throat plate. Tighten clamp screw (B, Fig. 4) after correct height has been obtained and needles have been centered in the throat plate needle holes. Remove throat plate.

If gauge No. 21227 CR is not available the correct needle height can be obtained by measuring 17/32 inch from the 401 needle point (left needle) to the top of the throat plate, when needle driving arm is at its highest point of travel (Fig. 4).

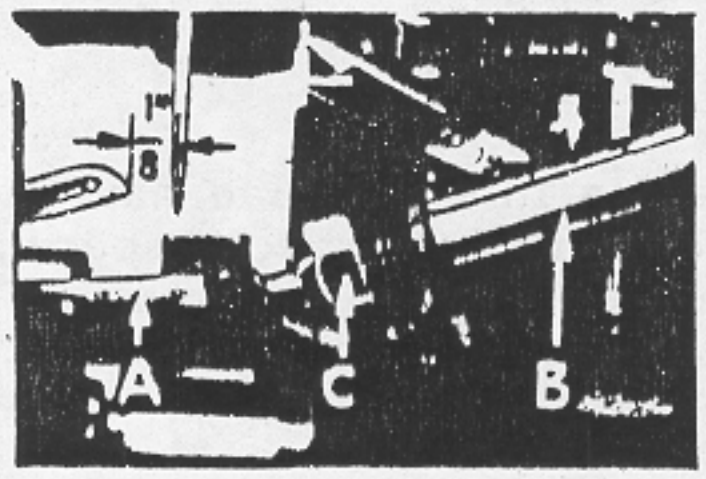


Fig. 5

SETTING 503 STITCH LOWER LOOPER

Insert the 503 stitch lower looper (A, Fig. 5) into bar (B). With lower looper at left end of its stroke set looper point 1/8 inch from center of needle (Fig. 5) using looper gauge No. 21225-1/8. Do not have lower looper deflecting needle. Do not lock looper nut (C) because the looper point will have to be set to the needle scarf after the rear needle guard has been assembled and positioned. (See paragraph under "Final Setting of Lower Looper.)

SETTING 503 STITCH REAR NEEDLE GUARD

Set the rear needle guard (A, Fig. 6) as high as possible without interfering with either the lower looper or movement of the lower knife holder, but still in position to deflect the needle forward .002 to .004 inch. Screw (B) is used to set rear needle guard. Make sure there is no interference between rear needle guard and lower looper.

FINAL SETTING OF 503 STITCH LOWER LOOPER

Now finish lower looper adjustment. As lower looper moves to the right its point should be set into the needle scarf (A, Fig. 7) until the needle springs forward from the rear needle guard surface another .002 to .004 inch. This setting is obtained by rocking the looper forward or backward around its shank. Recheck the 1/8 inch looper gauge setting and tighten nut (C, Fig. 5).

SETTING 503 STITCH FRONT NEEDLE GUARD

Assemble front needle guard (C, Fig. 6). When lower looper is springing needle off back guard, set front needle guard as close as possible to needle without touching. Screw (D) is used to adjust and set front needle guard. After this setting make sure there is no interference between needle guards and differential feed dog.

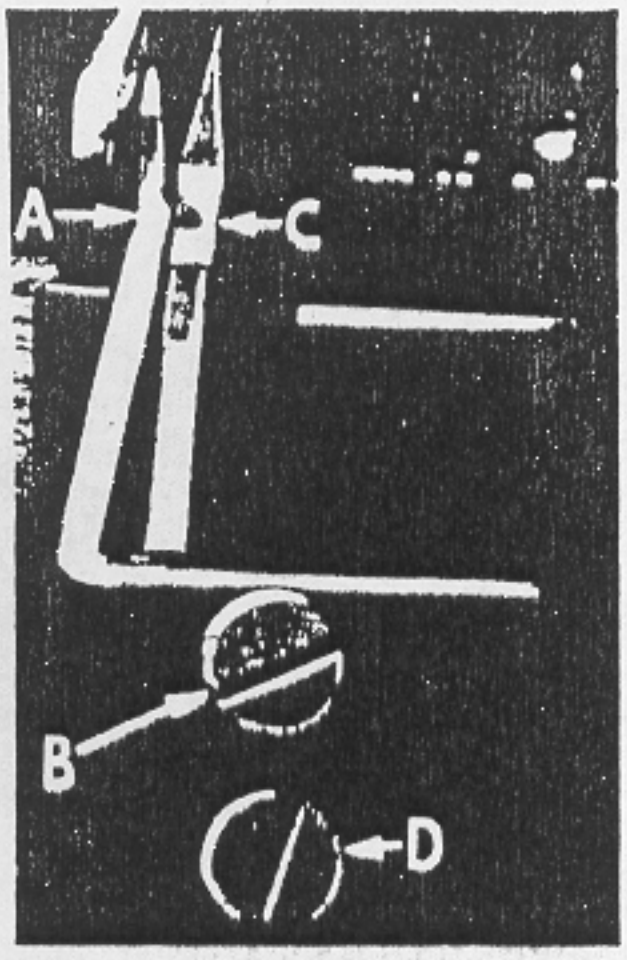


Fig. 6

Insert spreader (A, Fig. 8) in its holder. Screw (B) holds the spreader in its holder and permits spreader to be pushed in or out, or turned around its shank. Screw (C) on the collar holds spreader holder in the shaft, and allows the holder to be rotated or adjusted laterally.

Preliminary Setting: When spreader is at the right end of its stroke, spreader holder should be set to position the spreader shank about vertical (Fig. 8). The top end of the spreader shank should extend approximately 5/64 inch above holder (Fig. 8).

Set spreader to pass just behind eye of lower looper, with approximately .002 inch clearance between spreader and lower looper (Fig. 9).

Next, turn handwheel until spreader is at left end of its travel: check the setting so lower point of spreader extends about 5/32 inch to the left of needle (Fig. 10).

Now check setting between spreader and needle. If needle rubs the back of spreader, pull spreader out of its holder slightly and rotate the spreader holder forward a short distance. These same adjustments, in opposite movement, will reduce the clearance between spreader and needle. Reset to lower looper (Fig. 9).

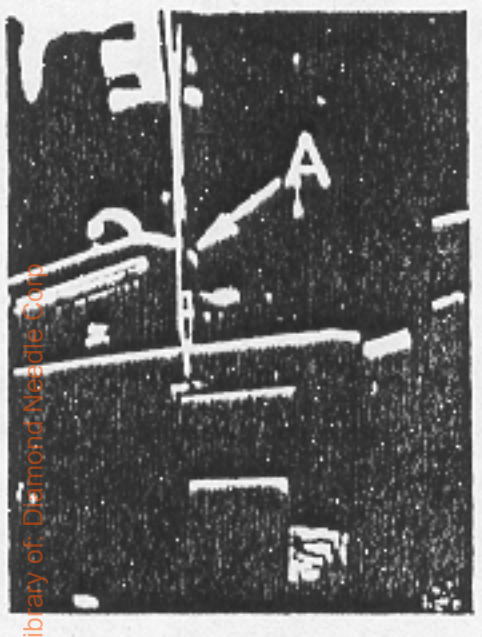


Fig. 7

SETTING 401 STITCH REAR NEEDLE GUARD

Insert rear needle guard into the hole in the throat plate support bracket. Set height of guard (A, Fig. 11) approximately 1/4 inch below the throat plate seat. Bring the 401 needle down until its point is 1/64 inch below the high point of the guarding surface. Then bring the guard forward to deflect the needle forward from .003 to .005 inch. Then lock the guard in place with set screw (B, Fig. 11).

SETTING 401 STITCH LOOPER

Insert 401 stitch looper into looper holder and presses down until the butt end of the shank strikes the looper shaft. Looper will be at correct height. Tighten the looper clamp screw while working looper point to and fro to secure accurate seating of clamp screw against flat on shank.

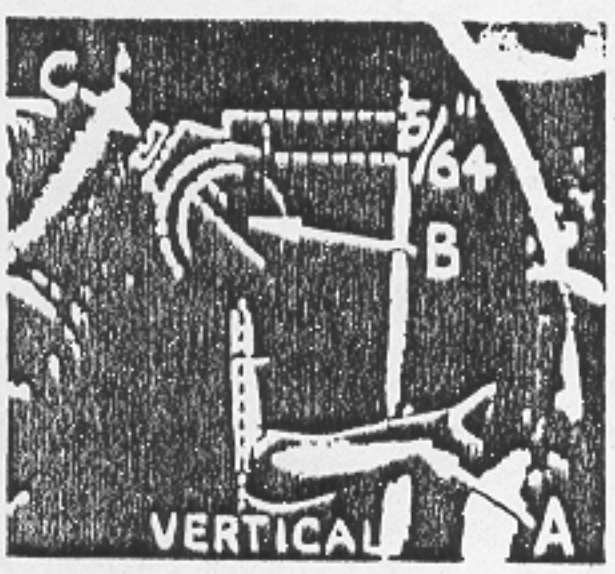


Fig. 8

With looper at right end of its stroke, set looper 3/64 inch from center of needle (Fig. 12) using looper gauge No. 21225-3/64. Loosen looper holder binder screw with a 7/64 inch hexagonal allen key to position the looper.

Looking at left end of machine, set the looper point to lie in the scarf of the needle within..002 inch clearance (Fig. 13).

While hand turning machine through cycle observe the action of the needle with relation to the looper. As needle rises from bottom of its stroke the looper will approach the needle from right side and pass behind at top of needle

scarf without striking. Further rising of the needle will result in the looper point entering the scarf. Furthermore, since the needle point is coming off the rear guard the needle will resume its normal position by moving to the rear, resulting in a close relation of the needle and looper, or actual contact, until scarf passes looper. On the down stroke the needle should pass behind the looper without the point glancing off the guarding surface of the looper.

Fig. 9

Set front needle guard as close as possible to the needle when looper point is behind the needle and flush with the left side of needle. Also, front needle guard should be set so there is from 1/64 to 1/32 inch clearance between it and bottom of looper blade. Turn handwheel in operating direction, making complete revolutions to check whether needle is disturbed or pinched.

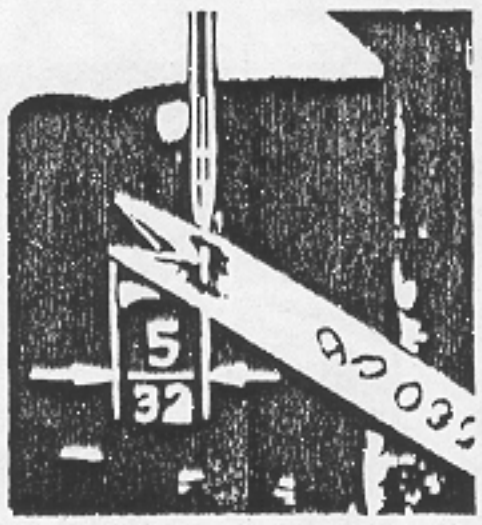


Fig. 10

For convenience the looper may now be threaded as shown in Fig. 1 and as described under paragraph "To Thread 401 Looper". Replace differential feed dog, throat plate, lower knife holder and reset upper knife. Check cutting action with thread.

SETTING THE FEED DOGS

Assemble main and differential feed dogs (A, B, Fig. 14).

Feed dogs should be leveled with the throat plate surface by rotating feed tilting adjusting pin (D). This pin raises or lowers the back end of feed bar. Feed dogs should be set level at the time teeth first appear above the throat plate. Screw (E) locks the feed tilting adjusting pin in place. Now set feed dogs at highest point of travel. Main and differential feed dog teeth should be set 3/64 inch above the throat plate.

SETTING THE LOWER KNIFE

Replace lower knife holder assembly. In replacing lower knife holder assembly, tighten screw (A, Fig. 15) so that when the face of the flange on sleeve (B) seats against throat plate mounting bracket (C) a free lateral motion of the lower knife and holder assembly is obtained when the knife is manually pressed at its upper corner. Lower knife (D) should be set with cutting edge flush with throat plate surface. Adjustments are made with hexagonal head screw (E) which holds the lower knife. Lower knife is spring pressed against the upper knife, so no lateral adjustment is necessary when the width of trim is changed.

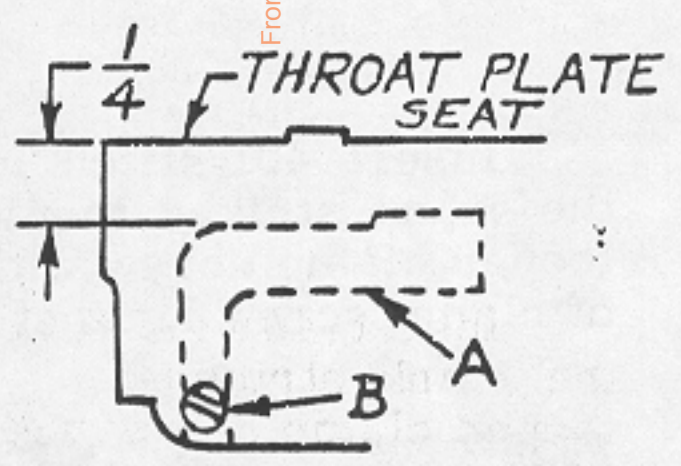


Fig. 11

Lower knife may be secured in any position by tightening screw (F) against the knife holder shaft.

Set the desired width of trim by measuring from the right edge of lower knife to needle. Lock lower knife holder shaft with screw (F).

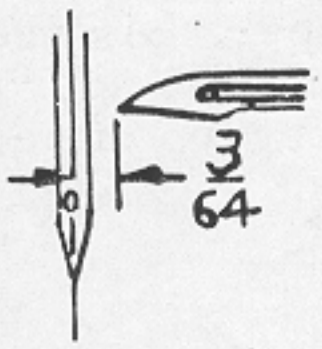


Fig. 12

SETTING THE UPPER KNIFE

Replace upper knife assembly. Clamp upper knife (G, Fig. 15) in position, setting allen screw (H) to hold clamp (J) against the upper knife. At bottom of its stroke, front cutting edge of upper knife should extend not less than 1/64 inch below cutting edge of the lower knife.

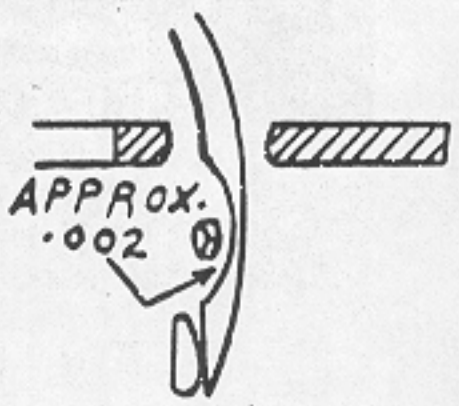


Fig. 13

After upper knife has been set for proper width of trim, screw (K) should be tightened to lock upper knife holding block (L) in place.

SETTING THE STITCH LENGTH

Length of stitch is determined by the combination of feed eccentrics used. The outer (left) eccentric (A, Fig. 16) actuates the main (rear) feed dog, while the inner (right) eccentric (B) actuates the differential (front) feed dog.

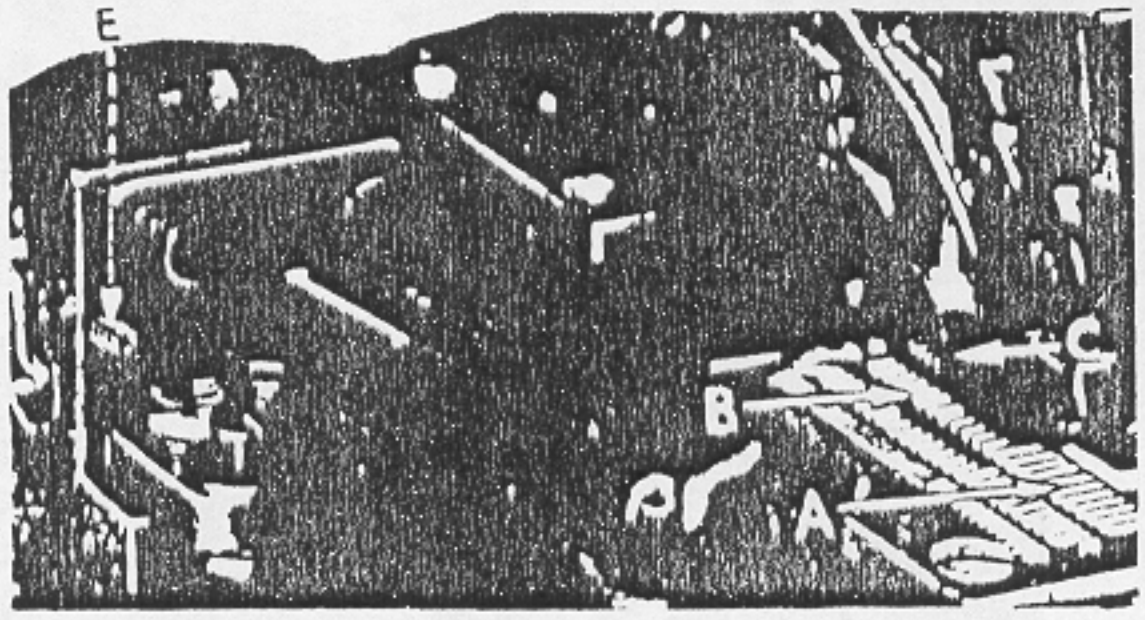


Fig. 14

In assembling feed eccentrics, be sure hubs are facing each other. Be careful not to damage shaft or key. Tighten nut (C) securely. Be sure wool yarn in oil tube (F) touches feed eccentric connections.

To change feed eccentrics, remove nut and washer (C) from end of shaft (D). Turn handwheel in operating direction until key slot in eccentric is toward front. Using hooked eccentric extractor (E), supplied with machine, reach behind eccentric as shown and withdraw eccentrics. It may be necessary to move handwheel back and forth slightly during extraction.

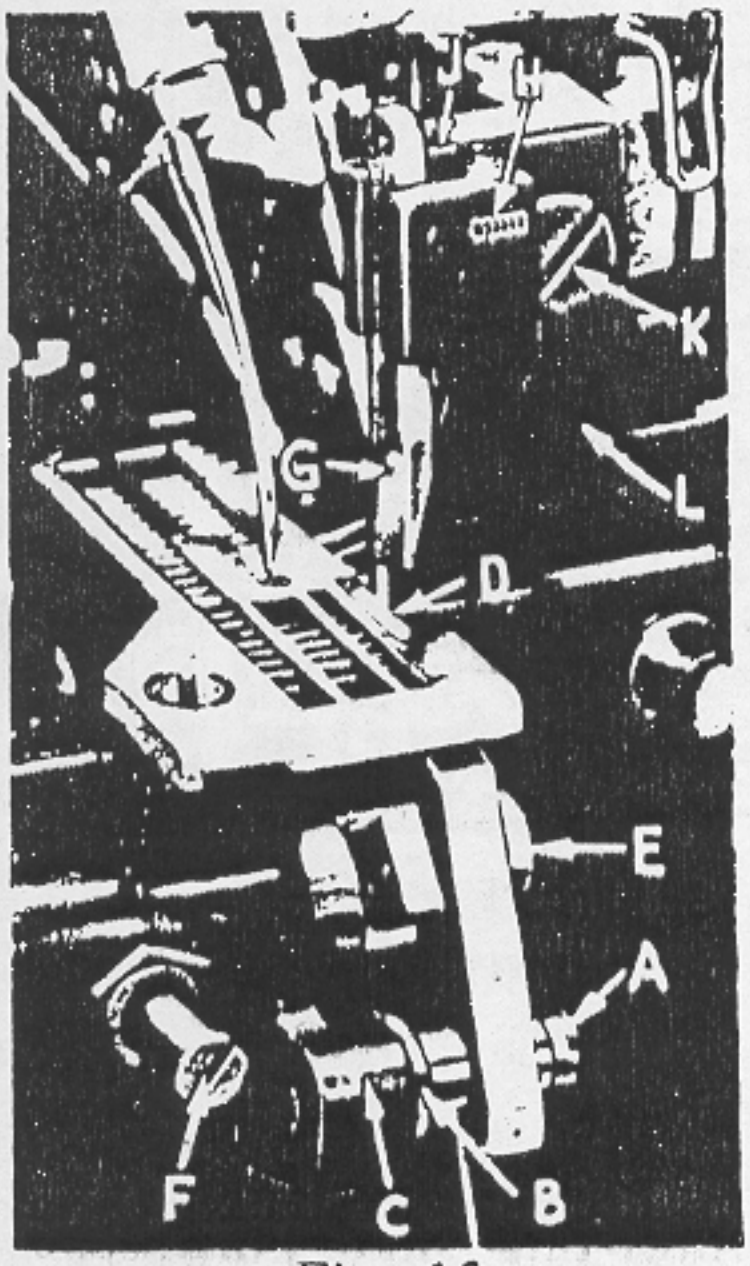


Fig. 15

If eccentrics are unusually tight fitting, in addition to removing nut (C, Fig. 17) from shaft (D) it may be helpful to remove nut (G) and feed driving connection (H). Then continue as originally suggested.

SETTING THE PRESSER FOOT

Assemble the presser foot to presser arm. With needle in high position, swing presser arm into sewing position and set the presser foot to align needle holes (front and back) and flat on throat plate. The front edge of needle hole in presser foot must be aligned with front edge of needle hole in throat plate. It is also important that the bottom of the presser foot be flat on the throat plate. To change presser foot setting loosen screw (A, Fig. 18) and move foot forward or backward on presser arm as required to align needle holes, or move foot left or right around presser arm until foot is flat on throat plate. Retighten screw. If necessary, presser foot can be realigned with throat plate slots by shifting the foot lifter lever shaft (H, Fig. 19). To move the shaft, loosen collar screws (B, Fig. 19) and clamp screw (G) and then shift the foot lifter lever shaft to the left or right as required. Retighten collar screws and clamp screw.

The foot lifter lever arm (A, Fig. 19) and the collar (B) secure the shaft. Be sure the presser arm does not bind and rise when presser foot release bushing is unlocked.

Adjust lifter lever stop screw (C) so that presser foot can be raised no higher than upper spreader will permit: then lock the nut (D). There should be from 1/16 to 1/8 inch free motion of foot lifter lever before the presser foot begins to rise. This adjustment should be made with screw (E) and locked with nut (F). Reassemble the chip guard, fabric guard and cloth plate.