

PFAFF[®] **481**

Service Manual

PFAFF INDUSTRIEMASCHINEN GMBH KAISERSLAUTERN

Instructions for Adjusting the Pfaff 481

and Illustrated Guide for Tape-Recorded Instructions

Important note

Never use a C-clamp on the needle bar of Pfaff 480 series machines because this would damage its special coating. Furthermore, all adjustments which are to be made at a stitch length of "0" on Model N machines have to be carried out at a stitch length of 1.5 mm and with the reverse-feed control depressed, that means with the machine set for sewing backwards at a stitch length of 1.5 mm.

The machine can be blocked at certain positions by inserting a 5-mm-thick pin in one of the holes in the bearing plate which is located underneath the face cover. When inserting the pin, be sure to push it in until it enters the slot in the disc behind the bearing plate. For easy identification, the individual holes are marked by the numbers 1 to 5 or by the appropriate adjustment data. The abbreviations used in this connection stand for the following:

n. o. T.	= past the top of the needle bar stroke
n. u. T.	= past the bottom of the needle bar stroke
o. T. N.	= top of needle bar stroke
o. T. F.	= top of take-up lever stroke
Schl.-H.	= 1.8 mm past the bottom of the needle bar stroke

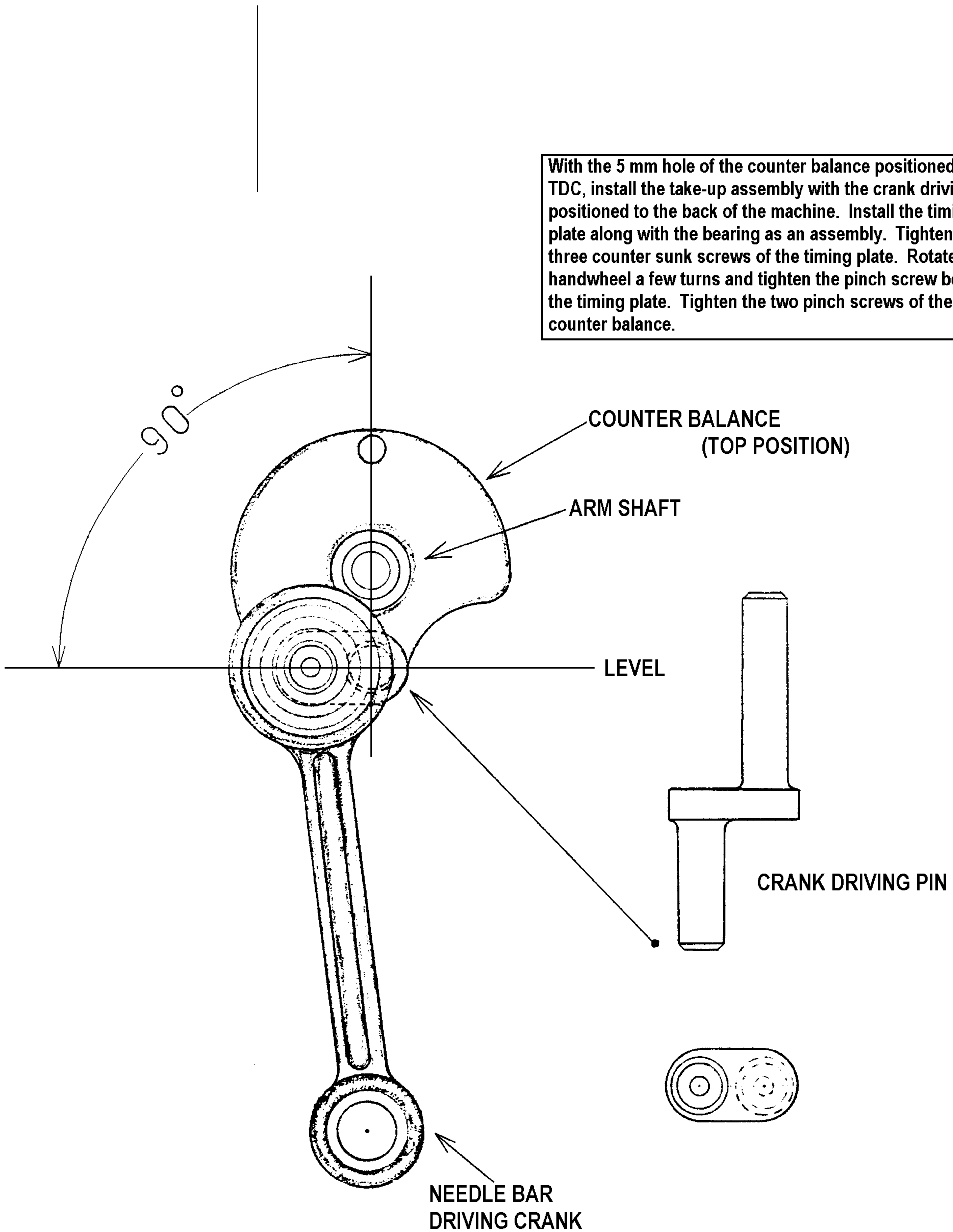
The following tools, gauges and accessories are required for adjusting the Pfaff 481:

- 1 set of screwdrivers with blades from 2–10 mm wide
- 1 set of allen keys ranging from 1.5 to 6 mm
- 1 set of spanners from 7 to 14 mm wide
- 1 22-mm spanner
- 1 metal rule
- 1 cylindrical pin, 5 mm dia., Order No. 13-030341-05
- 1 universal gauge, Order Nr. 61-111642-19
- 1 wrapper with System 134 needles
- 1 strip of white paper, sewing thread and material for testing purposes.

PFAFF INDUSTRIAL OF AMERICA

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With the 5 mm hole of the counter balance positioned at TDC, install the take-up assembly with the crank driving pin positioned to the back of the machine. Install the timing plate along with the bearing as an assembly. Tighten the three counter sunk screws of the timing plate. Rotate the handwheel a few turns and tighten the pinch screw behind the timing plate. Tighten the two pinch screws of the counter balance.



1. Preparations for adjusting

Note:

The machine can be blocked at different positions by inserting the 5-mm-thick pin in the appropriate hole of the bearing plate. For easy identification, the holes in the bearing plate are marked by numbers or the appropriate adjustment data (Fig. 1.0.1.).

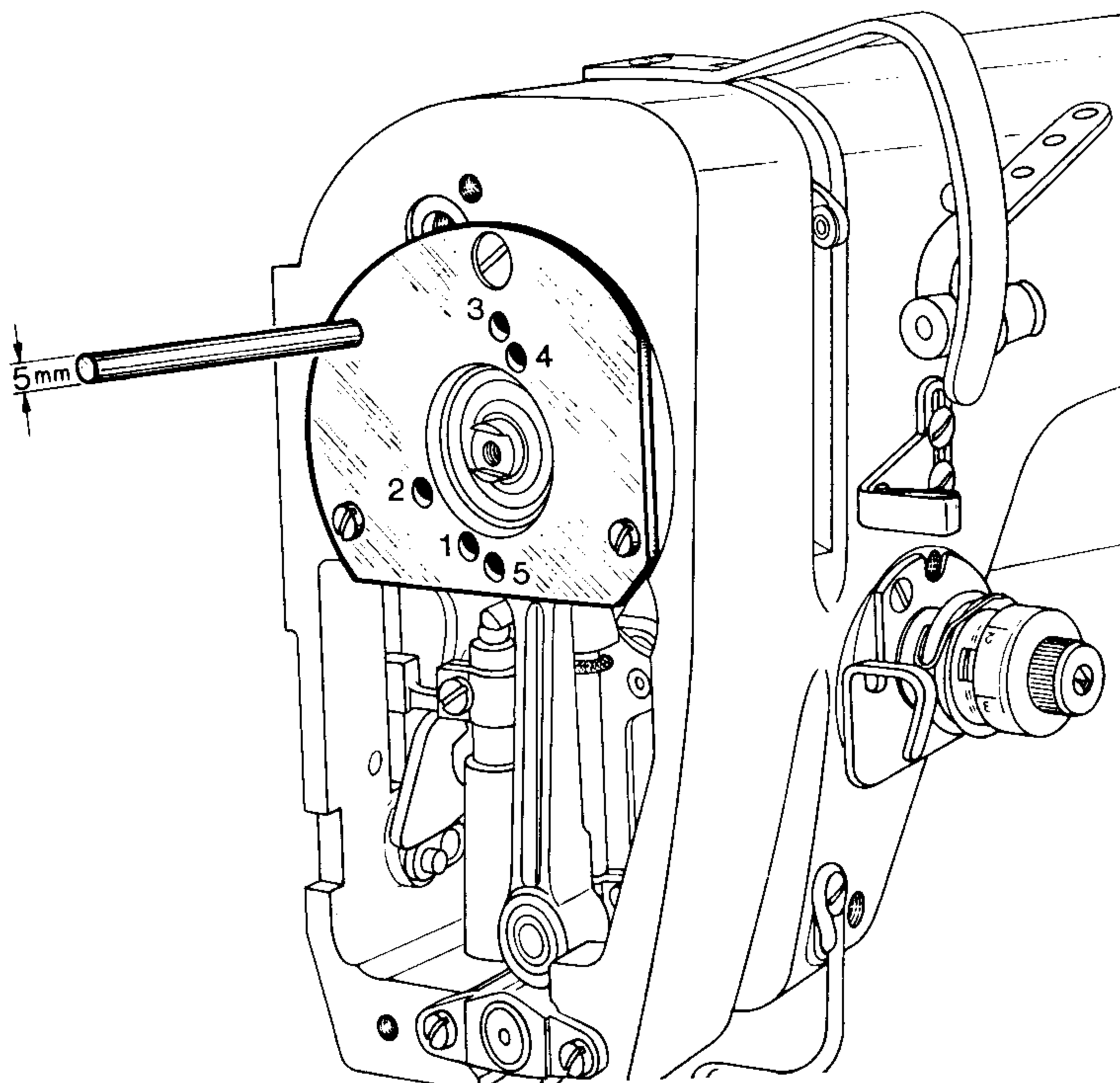


Fig. 1.0.1.

- 1.1. Remove the belt guard.
- 1.2. Take out both screws of the face cover and remove it.
- 1.3. To block the machine at the various positions, proceed as follows:
 - 1.3.1. Turn the balance wheel to bring the needle bar to the desired position.
 - 1.3.2. Push the pin into the hole until it enters the slot in the disc behind the bearing plate.
- 1.4. The function of each of the five holes is as follows:
 - 1.4.1. **Hole 1** (0.6 n. o. T.) = 0.6 mm past the top of the needle bar stroke.
 - 1.4.2. **Hole 2** (o. T. F.) = top of take-up lever stroke.
 - 1.4.3. **Hole 3** (0.6 n. u. T.) = 0.6 mm past the bottom of the needle bar stroke.
 - 1.4.4. **Hole 4** (Schl.-H. 1.8) = 1.8 mm past the bottom of the needle bar stroke.
 - 1.4.5. **Hole 5** (o. T. N.) = top of needle bar stroke.

2. Zeroing the feed motion

Correct setting:

The feed dog must not move when you turn the balance wheel with the stitch length control set at "0".

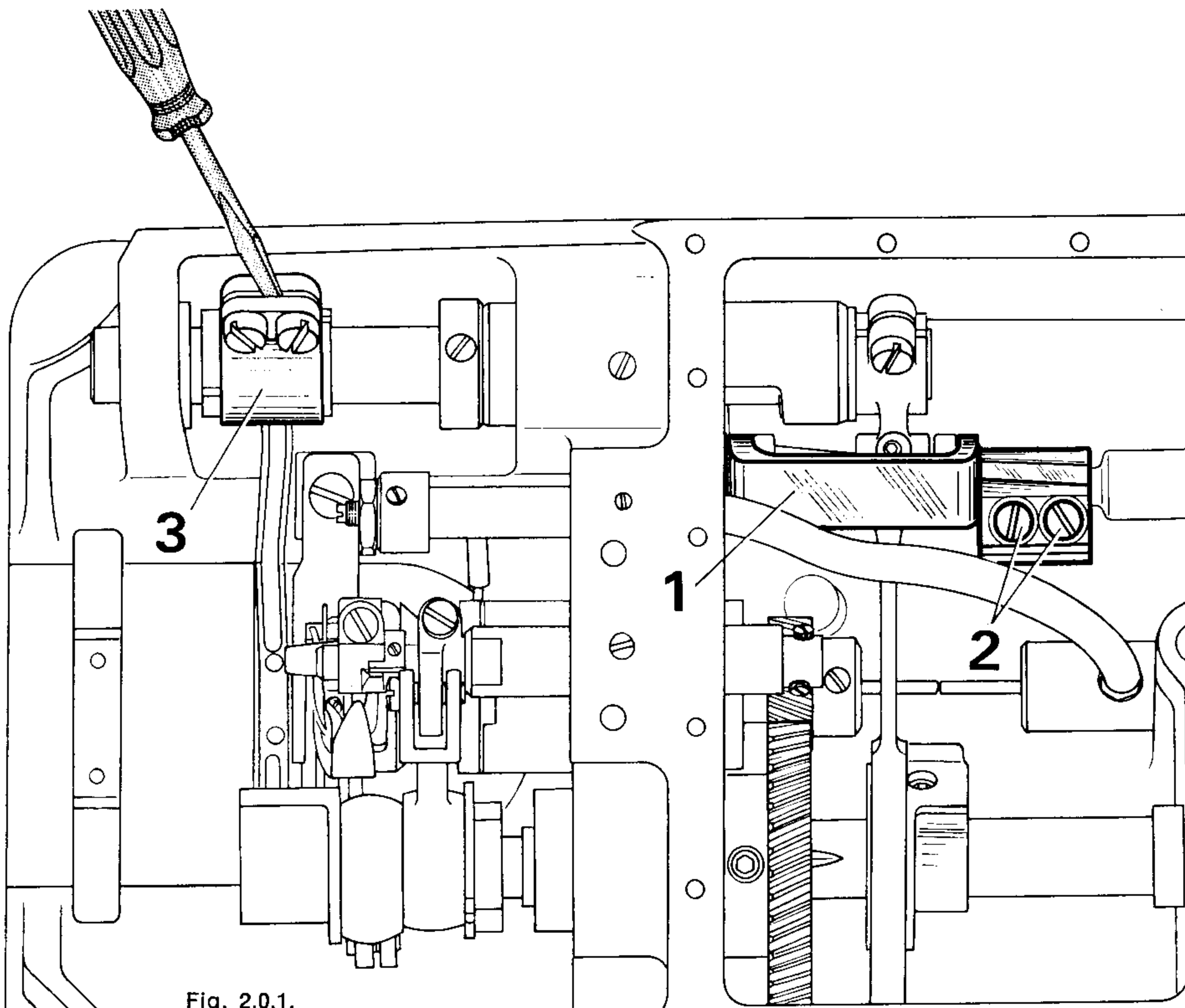


Fig. 2.0.1.

- 2.1. Remove the needle from the needle bar.
- 2.2. Raise the presser bar lifter.
- 2.3. Remove the knee lever together with its joint and tilt the machine back.
- 2.4. Adjustment procedure to be applied when the gearcase is open (Fig. 2.0.1.)
 - 2.4.1. Turn the stitch length control to "0".
 - 2.4.2. Take out the 16 screws of the gearcase cover and remove the cover with its gasket, making sure that the oil, if any, is drained off into a container.
 - 2.4.3. Take the oil sponge out of the gearcase.
 - 2.4.4. Loosen both clamp screws 2 of feed crank 1 just sufficiently to allow the crank to be turned on its shaft against resistance.
 - 2.4.5. To facilitate adjustment, insert a screwdriver in the slot of feed rock shaft crank 3 (see Fig. 2.0.1.).
 - 2.4.6. **Rotate the balance wheel and at the same time adjust feed crank 1 on its shaft until the feed dog (or rather the screwdriver in feed rock shaft crank 3) no longer moves.**
 - 2.4.7. Tighten both clamp screws 2 of feed crank 1.
 - 2.4.8. Check this adjustment (see top of page).

Note: The feed motion can also be zeroed with the gearcase closed (see Fig. 2.0.2.).

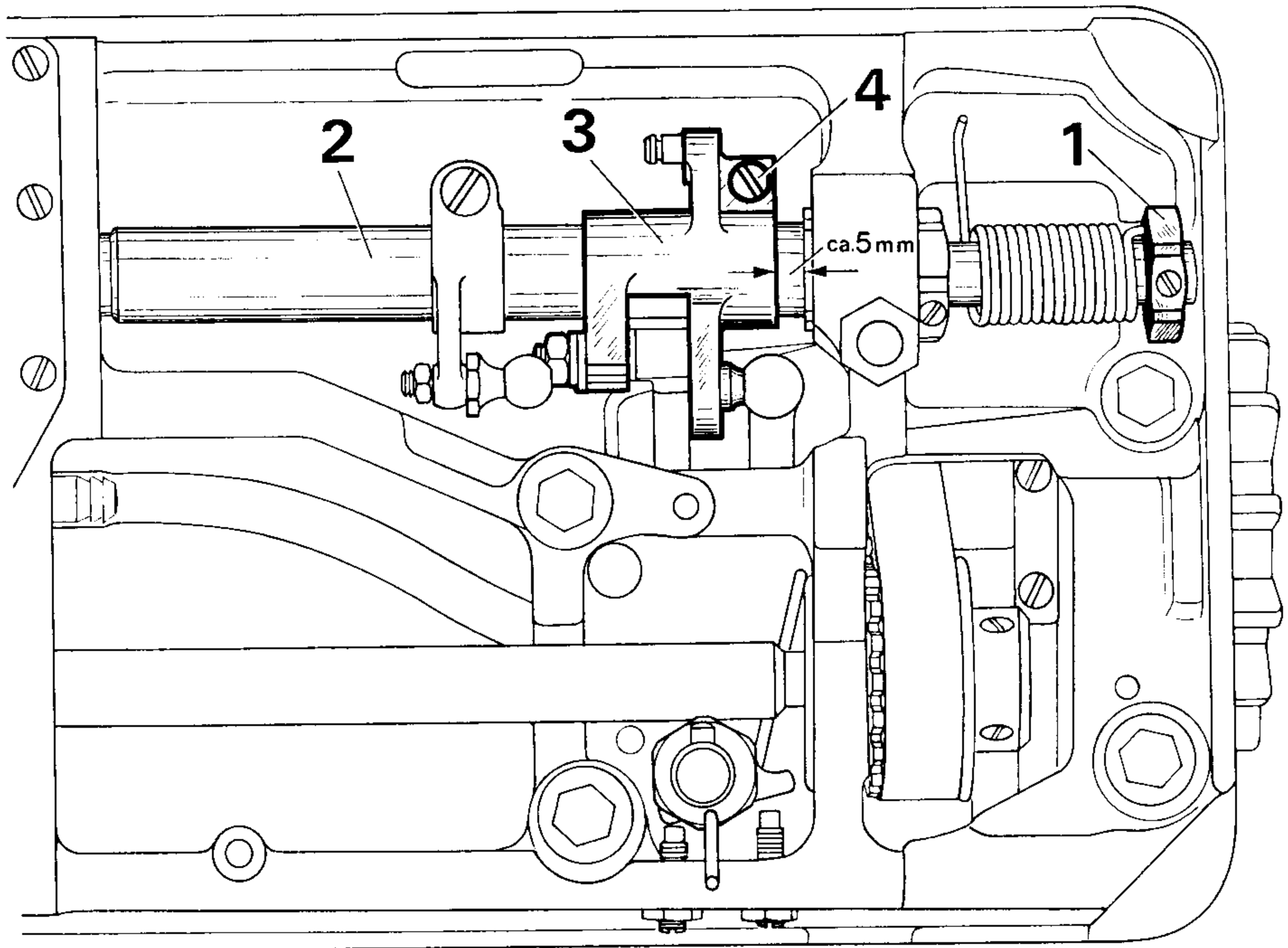


Fig. 2.0.2.

- 2.5. Adjustment procedure to be applied when the gearcase cover is closed (Fig. 2.0.2.).
 - 2.5.1. Turn the stitch length control to "0".
 - 2.5.2. Push a 22-mm open-ended spanner over hexagon tension nut 1 and hold feed regulator shaft 2 fast with it.
 - 2.5.3. Loosen clamp screw 4 of feed regulator crank 3.
 - 2.5.4. **With the aid of the spanner pushed over hexagon tension nut 1 turn feed regulator shaft 2 until the feed dog (or rather the screwdriver in feed rock shaft crank 3) remains absolutely still when the balance wheel is turned.**
 - 2.5.5. Hold the spanner in this position and tighten clamp screw 4, making sure there is a clearance of 5 mm between feed regulator crank 3 and the casting.
 - 2.5.6. Check this adjustment (see top of page 2) and pull the screwdriver out of the slot of the feed rock shaft crank.

3. Feed lifting motion

Correct setting:

The feed dog should be at its highest point when the needle bar is at a position 0.6 mm past the bottom of its stroke (pin in hole 3). In this position, the notch in the feed lift eccentric should be positioned perpendicularly below the center of the shaft (Fig. 3.0.2).

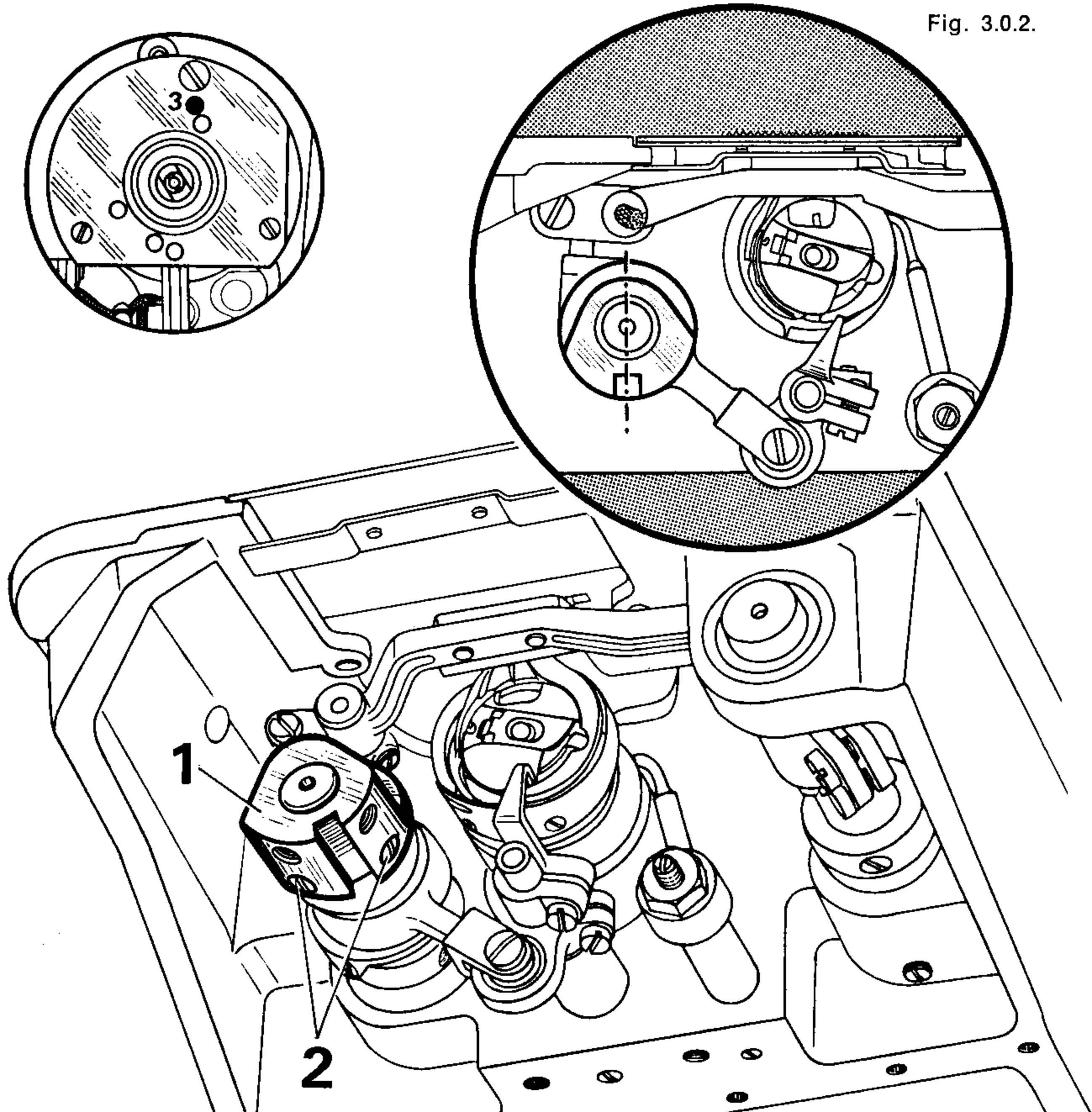


Fig. 3.0.1.

- 3.1. Loosen both screws 2 of feed lift eccentric 1.
- 3.2. Bring the needle bar to a position 0.6 mm past the bottom of its stroke and block the machine in this position by inserting the pin in hole 3.
- 3.3. **Turn feed lift eccentric 1 until its notch points exactly downwards** (see dash-dot line in Fig. 3.0.2.), **i. e. the feed dog is at its highest point.**
- 3.4. In this position, securely tighten both screws 2.
- 3.5. Leave the pin in the hole of the bearing plate.
- 3.6. Check this adjustment (see top of page).

4. Feed dog height

Correct setting:

The feed dog should be positioned in the middle of its slots and contact the gauge throughout its entire length when the stitch length control is set at "0" and the needle bar is at a position 0.6 mm past the bottom of its stroke (pin in hole 3). (Fig. 4.0.2.)

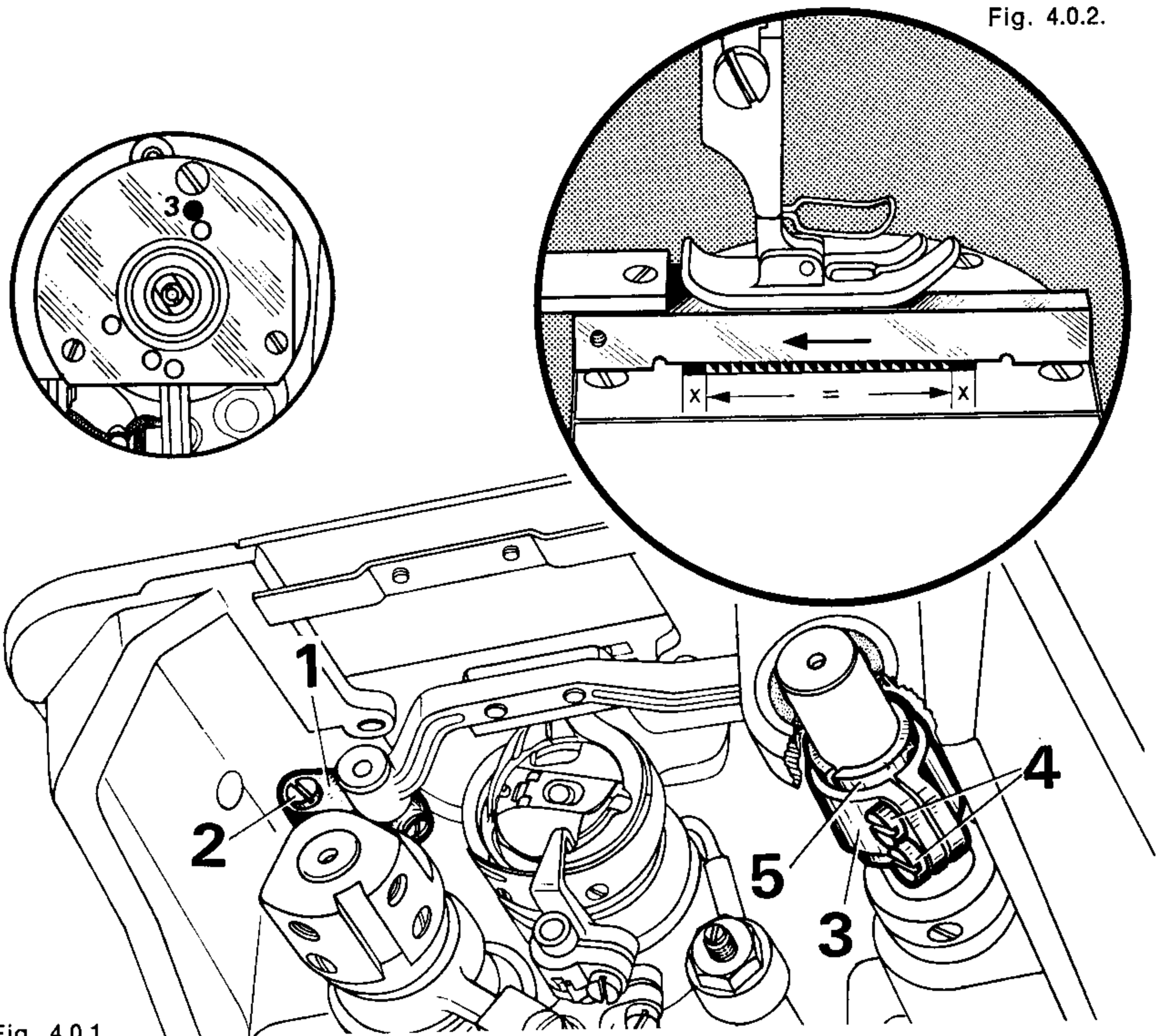


Fig. 4.0.1.

Fig. 4.0.2.

- 4.1. Turn the stitch length control to "0" and check to make sure the pin is inserted in hole 3.
- 4.2. Loosen clamp screw 2 of feed lift crank 1.
- 4.3. Loosen both clamp screws 4 in feed rock shaft crank 3.
- 4.4. Place the universal gauge under the presser foot so that the arrow points in the direction of feed and its front edge is flush with the front edge of the needle plate.
- 4.5. Lower the presser bar lifter to rest the presser foot on the gauge.
- 4.6. **Position the feed dog in the middle of its slots** (Fig. 4.0.2.).
- 4.7. Push the feed bar upwards until the feed dog contacts the gauge and hold the feed dog in this position.
- 4.8. **Turn eccentric bushing 5 underneath feed rock shaft crank 3 until the feed dog is in contact with the gauge throughout its entire length** (Fig. 4.0.2.).
- 4.9. Tighten both clamp screws 4 of feed rock shaft crank 3, making sure that the feed dog is still centered in its slots.
- 4.10. Check to make sure that the feed dog is still in contact with the gauge throughout its entire length and firmly tighten clamp screw 2 of feed lift crank 1.
- 4.11. Raise the presser bar lifter, remove the gauge from under the presser foot, and pull the pin out of the hole in the bearing plate.
- 4.12. Check this adjustment (see top of page).

5. Feed driving motion

Correct setting:

The feed dog should not move when the reverse-feed control is moved up and down with the machine set for its longest stitch and the needle bar set 0.6 mm past the bottom of its stroke (pin in hole 3).

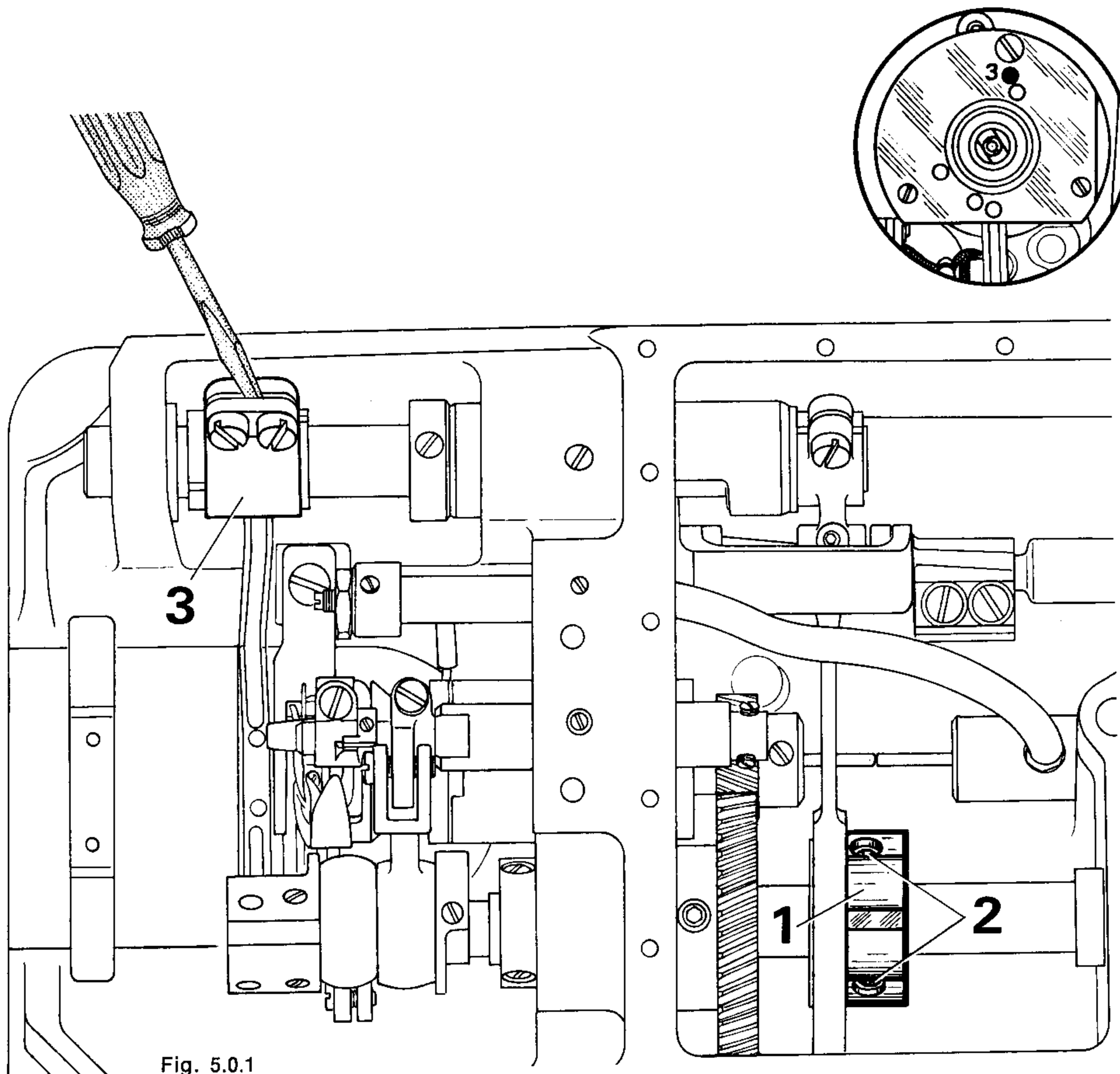


Fig. 5.0.1

- 5.1. Loosen both screws 2 of feed driving eccentric 1.
- 5.2. Bring the needle bar to a position 0.6 mm past the bottom of its stroke and block the machine in this position by inserting the pin in hole 3.
- 5.3. Set the machine for its longest stitch.
- 5.4. To facilitate adjustment, push the screwdriver into the slot of feed rock shaft crank 3 (Fig. 5.0.1.).
- 5.5. **Move the reverse-feed control up and down and simultaneously turn the feed driving eccentric until its notch is visible and the feed dog (or rather the screwdriver in feed rock shaft crank 3) is completely motionless (Fig. 5.0.1.).**
- 5.6. In this position, tighten the accessible screw 2 in feed driving eccentric 1.
- 5.7. Pull the pin out of the hole in the bearing plate and tighten the second screw 2 in feed driving eccentric 1.
- 5.8. Check this adjustment (see top of page).
- 5.9. Pull the screwdriver out of the slot in the feed rock shaft crank.

6. Zeroing the needle feed motion

Correct setting:

The needle bar should make no feed motion when the balance wheel is turned with the stitch length control set at "0".

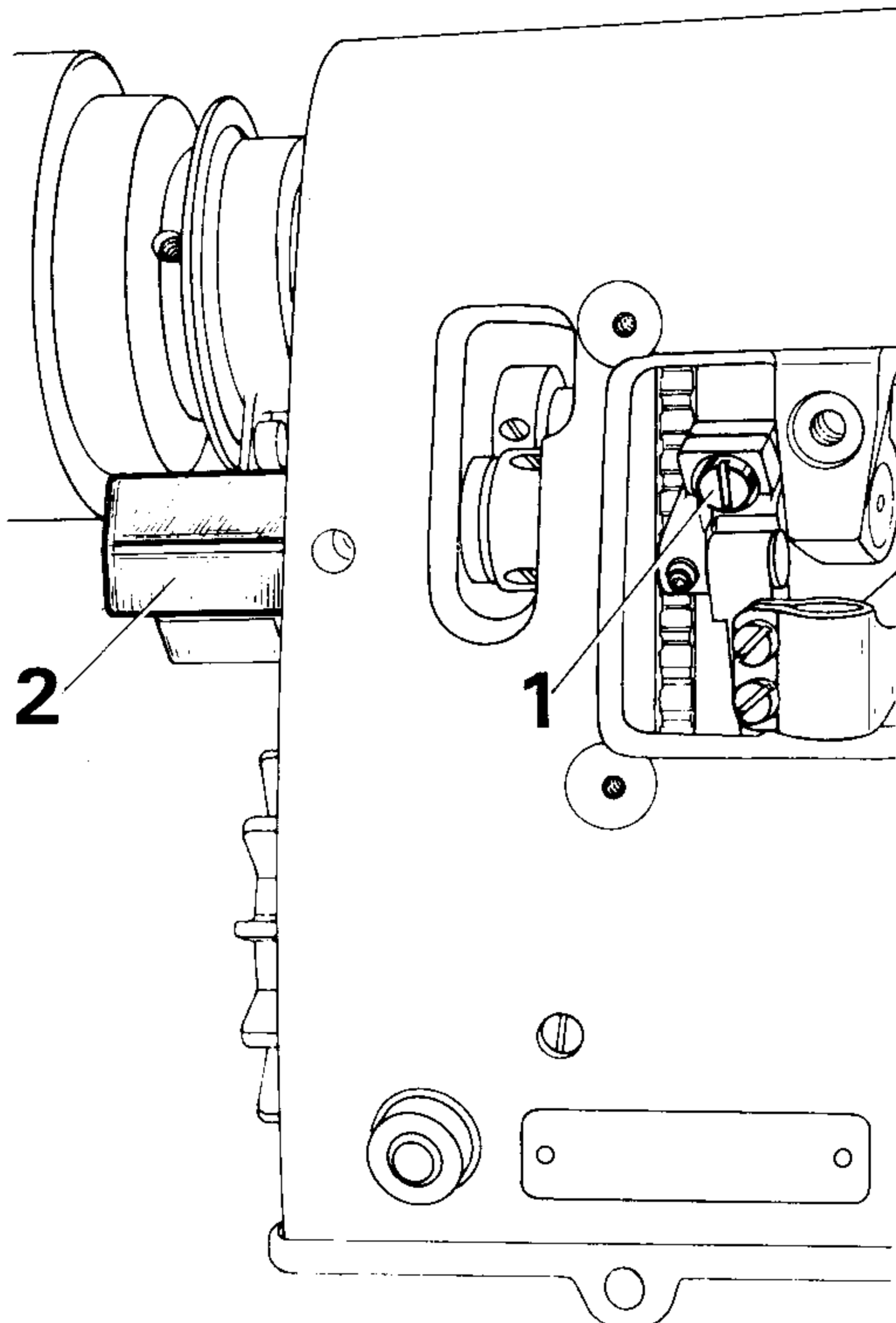


Fig. 6.0.1.

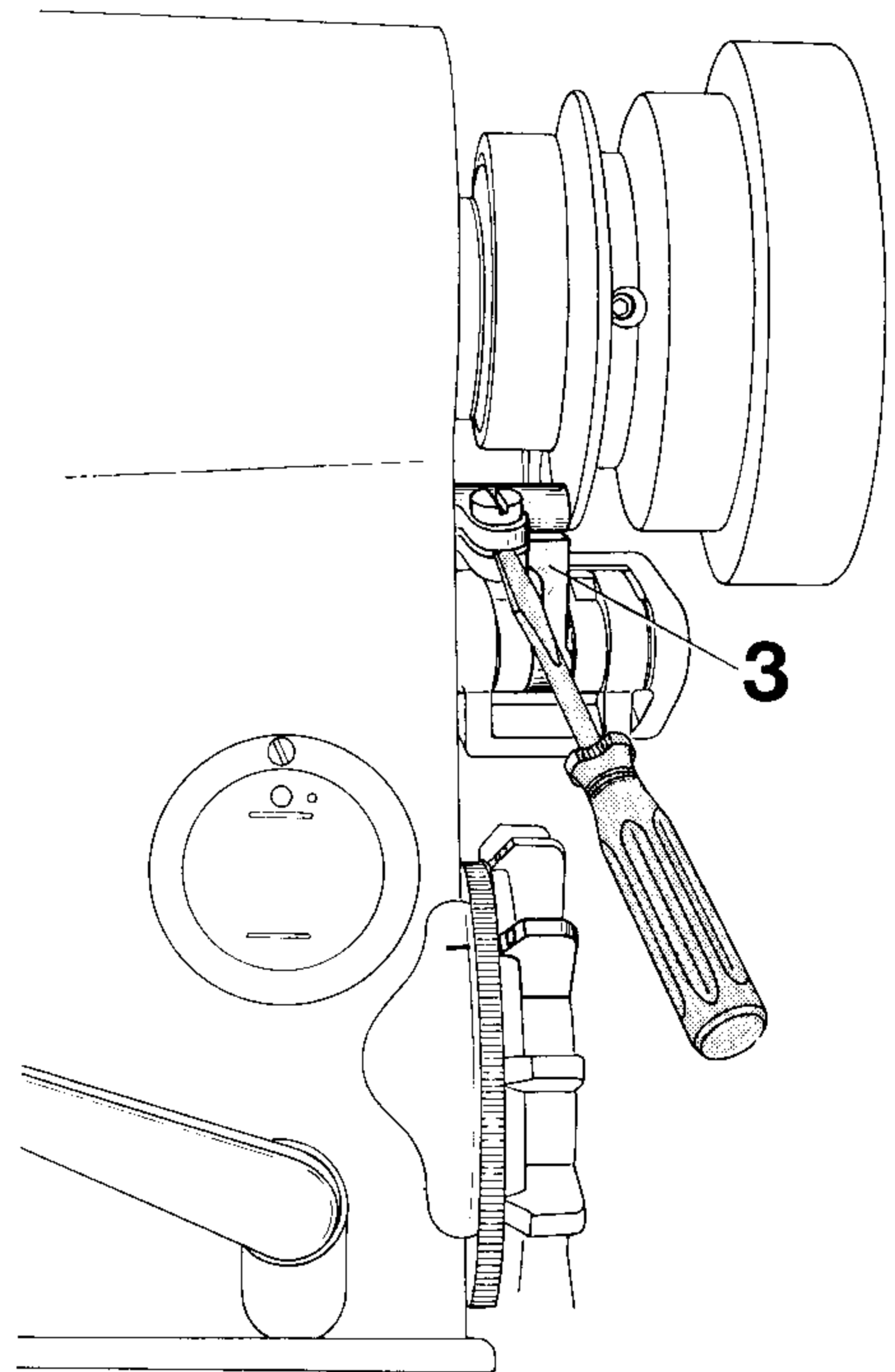


Fig. 6.0.2.

- 6.1. Turn the stitch length control to "0".
- 6.2. To facilitate zeroing the needle feed motion, insert a screwdriver in the slot of needle feed driving crank 3 (Fig. 6.0.2.).
- 6.3. Take out the two screws in the cover at the back of the machine.
- 6.4. Loosen clamp screw 1 of needle feed regulating crank 2 (Fig. 6.0.1.).
- 6.5. **Adjust needle feed regulating crank 2 so that the needle bar makes no feed motion when the balance wheel is turned** (i. e. that the screwdriver in needle feed driving crank 3 remains still).
- 6.6. In this position, securely tighten clamp screw 1 of needle feed regulating crank 2.
- 6.7. Check this adjustment (see top of page).
- 6.8. Leave the screwdriver in the slot of driving crank 3.

7. Timing the needle feed motion

Correct setting:

Both the needle bar and the feed dog should remain motionless when the reverse-feed control is moved up and down with the machine set for its longest stitch and the needle bar set 0.6 mm past the bottom of its stroke (pin in hole 3).

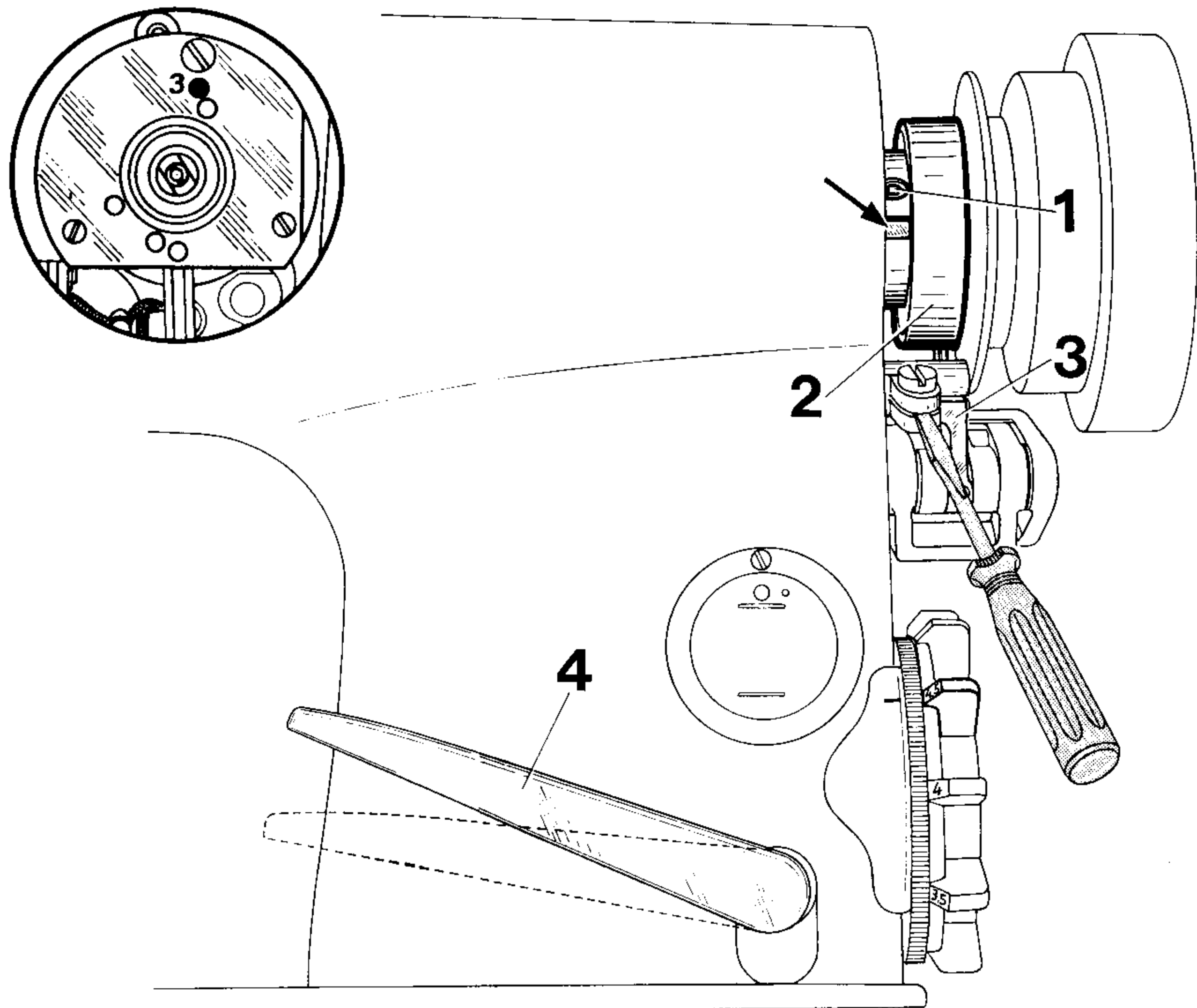


Fig. 7.0.1.

- 7.1. Loosen both screws **1** in needle feed eccentric **2**.
- 7.2. Bring the needle bar to a position 0.6 mm past the bottom of its stroke and block the machine in this position by inserting the pin in hole **3** of the bearing plate.
- 7.3. Turn needle feed eccentric **2** so that its slot points forward (see arrow in Fig. 7.0.1.).
- 7.4. Set the machine for its longest stitch.
- 7.5. **Move reverse-feed control 4 up and down and simultaneously turn needle feed eccentric 2 until the needle bar remains still** (i. e. until the screwdriver in needle feed driving crank **3** is completely motionless).
- 7.6. In this position, tighten the accessible screw **1** in needle feed eccentric **2**.
- 7.7. Pull the pin out of the hole in the bearing plate and tighten the second screw **1** in needle feed eccentric **2**.
- 7.8. Check this adjustment (see top of page).
- 7.9. Remove the screwdriver from driving crank **3**.

8. Centering the needle in the needle hole

Correct setting:

When the feed dog is at its highest point, the needle should be positioned exactly in the middle of the needle hole both lengthwise and crosswise (Fig. 8.0.3.).

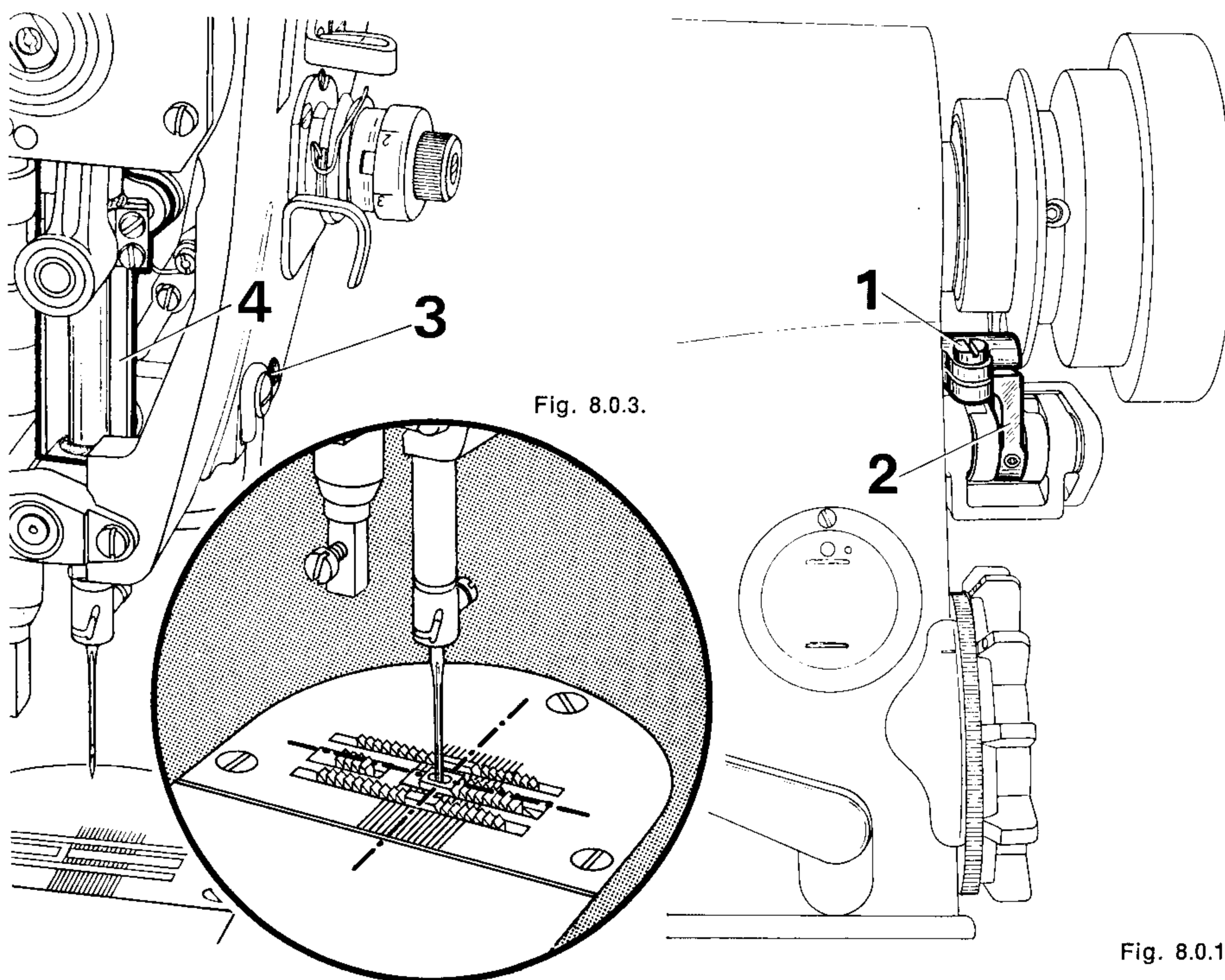


Fig. 8.0.2.

Fig. 8.0.1.

- 8.1. Bring the needle bar to its highest point and remove the presser foot.
- 8.2. Insert a new System 134 needle into the needle bar and push it up as far as it will go, making sure its long groove faces toward the left.
- 8.3. Turn the stitch length control to "0".
- 8.4. Loosen clamp screw 1 of needle feed driving crank 2 (Fig. 8.0.1.).
- 8.5. Loosen screw 3 in the lug of the needle bar frame (Fig. 8.0.2.).
- 8.6. Rotate the balance wheel and simultaneously adjust the position of needle bar frame 4 until the needle enters the needle hole in the feed dog.
- 8.7. **Bring the needle bar to its lowest point and adjust needle bar frame 4 so that the needle is centered exactly in the needle hole, both lengthwise and crosswise of the sewing direction (Fig. 8.0.3.).**
- 8.8. In this position, tighten clamp screw 1 in driving crank 2.
- 8.9. Turn the balance wheel a few turns to ensure that the needle bar is not under stress in needle bar frame 4, and tighten screw 3.
- 8.10. Check this adjustment (see top of page).

9. Eliminating feed differences

Correct setting:

With the machine set for its longest stitch, both the feed dog and the needle should make feed strokes of the same length when the balance wheel is turned.

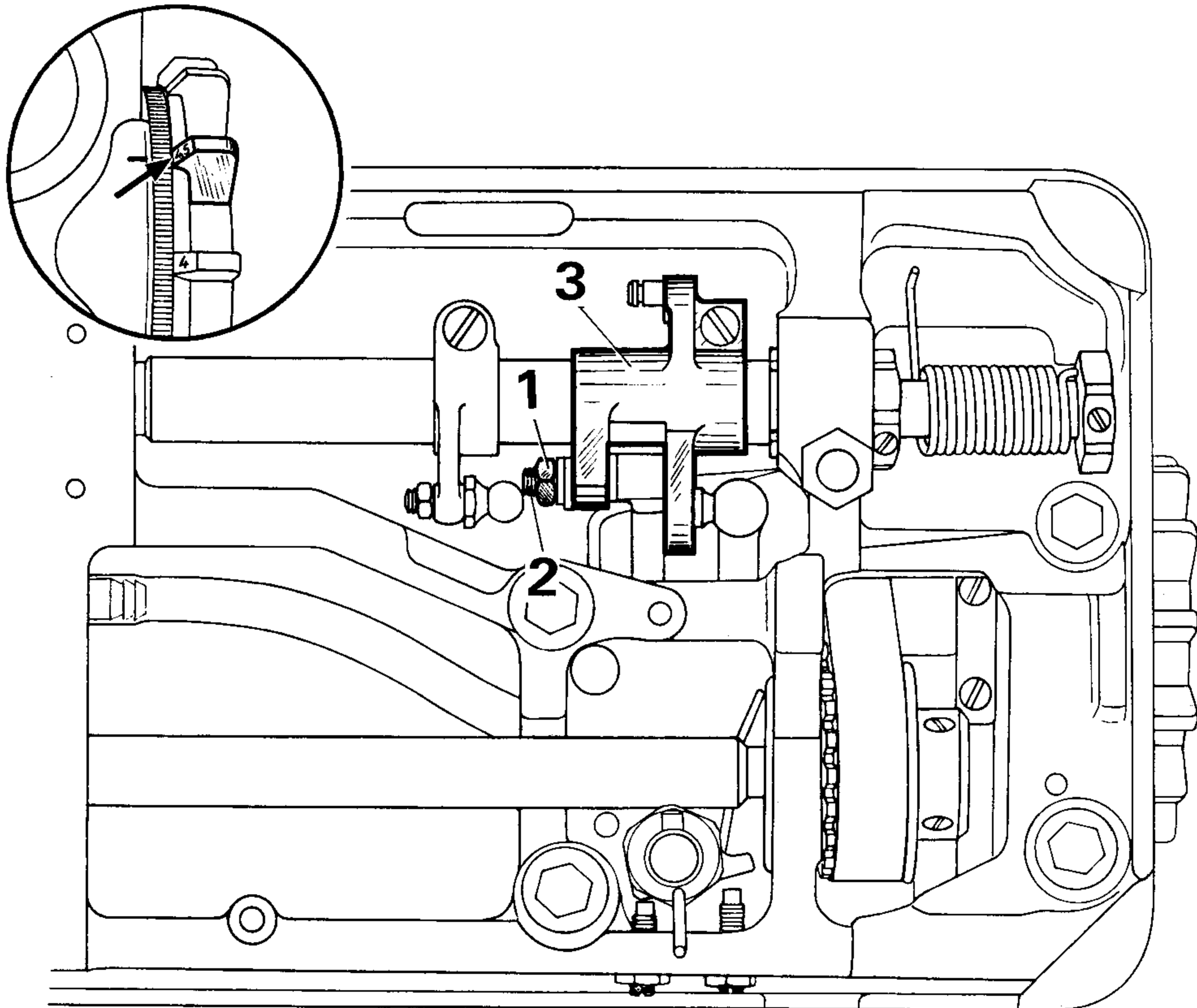


Fig. 9.0.1.

- 9.1. Set the machine for its longest stitch.
- 9.2. Loosen nut 1 on hinge stud 2 of regulating crank 3.
- 9.3. **Move hinge stud 2 in the fork of regulating crank 3, as appropriate. Moving the stud toward the regulating shaft decreases the needle feed stroke, moving it in the opposite direction increases it.**
- 9.4. Tighten nut 1 on hinge stud 2.
- 9.5. Check whether the needle feed is still zeroed properly (see Chapter 6) and adjust, if necessary.
- 9.6. Check this adjustment (see top of page).

10. Hook shaft bearing and gear play

Correct setting:

There should be a clearance of 0.3 mm between sewing hook and oil distributor ring when the hook point is opposite the needle and both these parts are 0.1 mm apart (Fig. 10.0.2.). Also there should be a minimum of play between the gears.

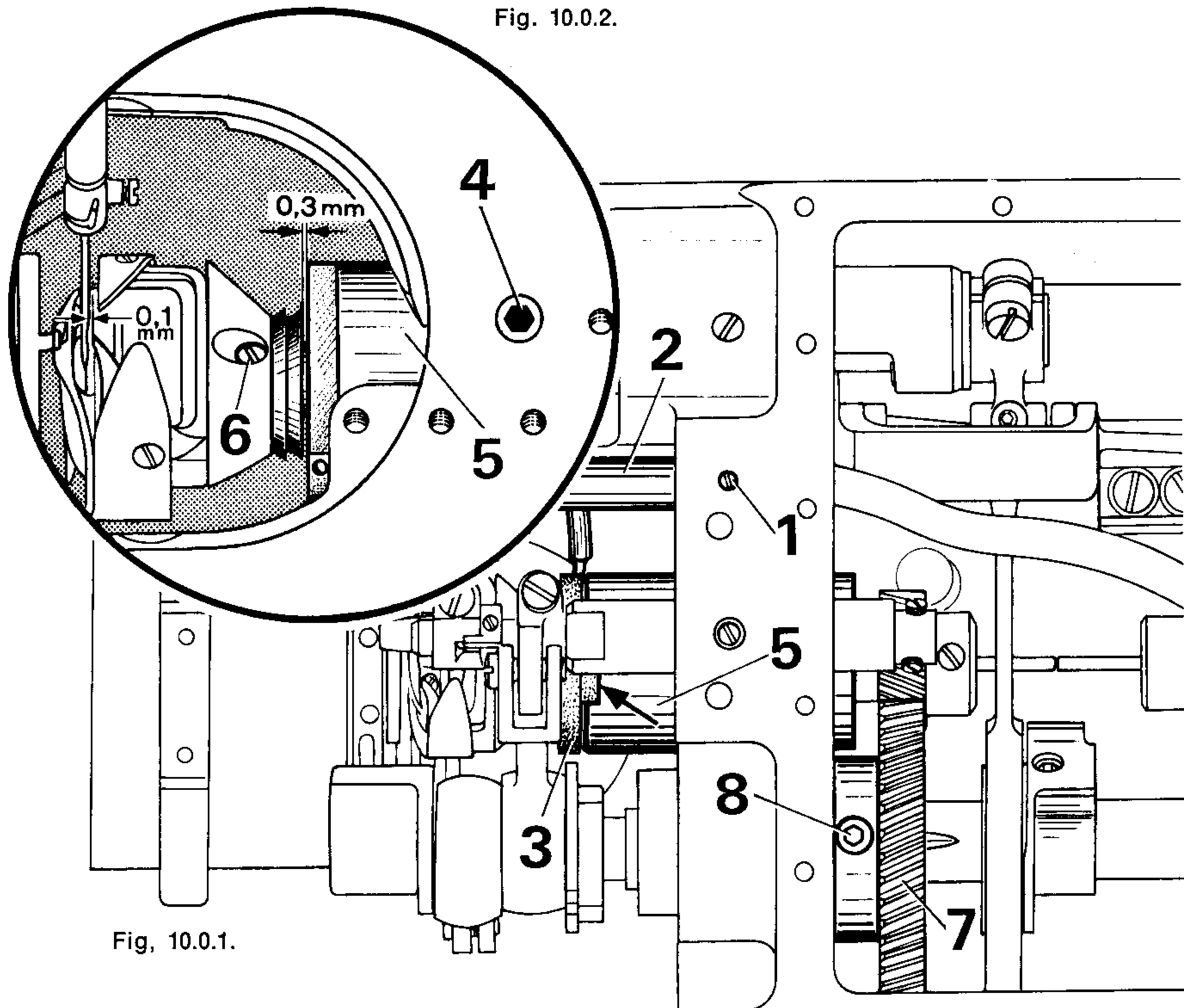


Fig. 10.0.1.

Fig. 10.0.2.

- 10.1. Remove needle plate and feed dog, turn the stitch length control to "0".
- 10.2. Loosen screw 1 of oil regulating valve 2 and swivel the oil tube of valve 2 out of oil distributor ring 3.
- 10.3. Loosen allen screw 4 of eccentric hook shaft bearing 5 on the top surface of the bedplate (Fig. 10.0.2.).
- 10.4. **Turn eccentric hook shaft bearing 5 so that the recess (see arrow in Fig. 10.0.1.) is visible from below and the two spur gears have neither too much play nor stand too close together.**
- 10.5. Loosen both hook set screws 6.
- 10.6. Push the sewing hook against the oil distributor ring.
- 10.7. Bring the needle bar to its lowest point, making sure that the needle does not strike the sewing hook.
- 10.8. **Reposition hook shaft bearing 5 in the casting until there is a clearance of 0.4 mm between hook point and needle.** Make sure however that you do not turn the bearing and that the hook remains in contact with the oil distributor ring.
- 10.9. With the bearing in this position, tighten allen screw 4.
- 10.10. Loosen both screws 8 in large spur gear 7.
- 10.11. Reposition spur gear 7 on its shaft until it is exactly in line with the small spur gear.
- 10.12. Tighten both screws 8 securely, making sure that the second screw of spur gear 7 – as seen in its direction of rotation – is positioned in the groove of the shaft.
- 10.13. Do not tighten hook set screw 6 as yet and leave the oil tube swivelled away.

11. Needle bar height, hook timing and hook-to-needle clearance

Correct setting:

The needle bar should be set vertically so that the top edge of the needle eye is positioned 0.8 mm below the bottom edge of the hook point (Fig. 11.0.2.). The amount of needle rise required to form the loop is 1.8 mm (pin in hole 4), the hook-to-needle clearance 0.1 mm.

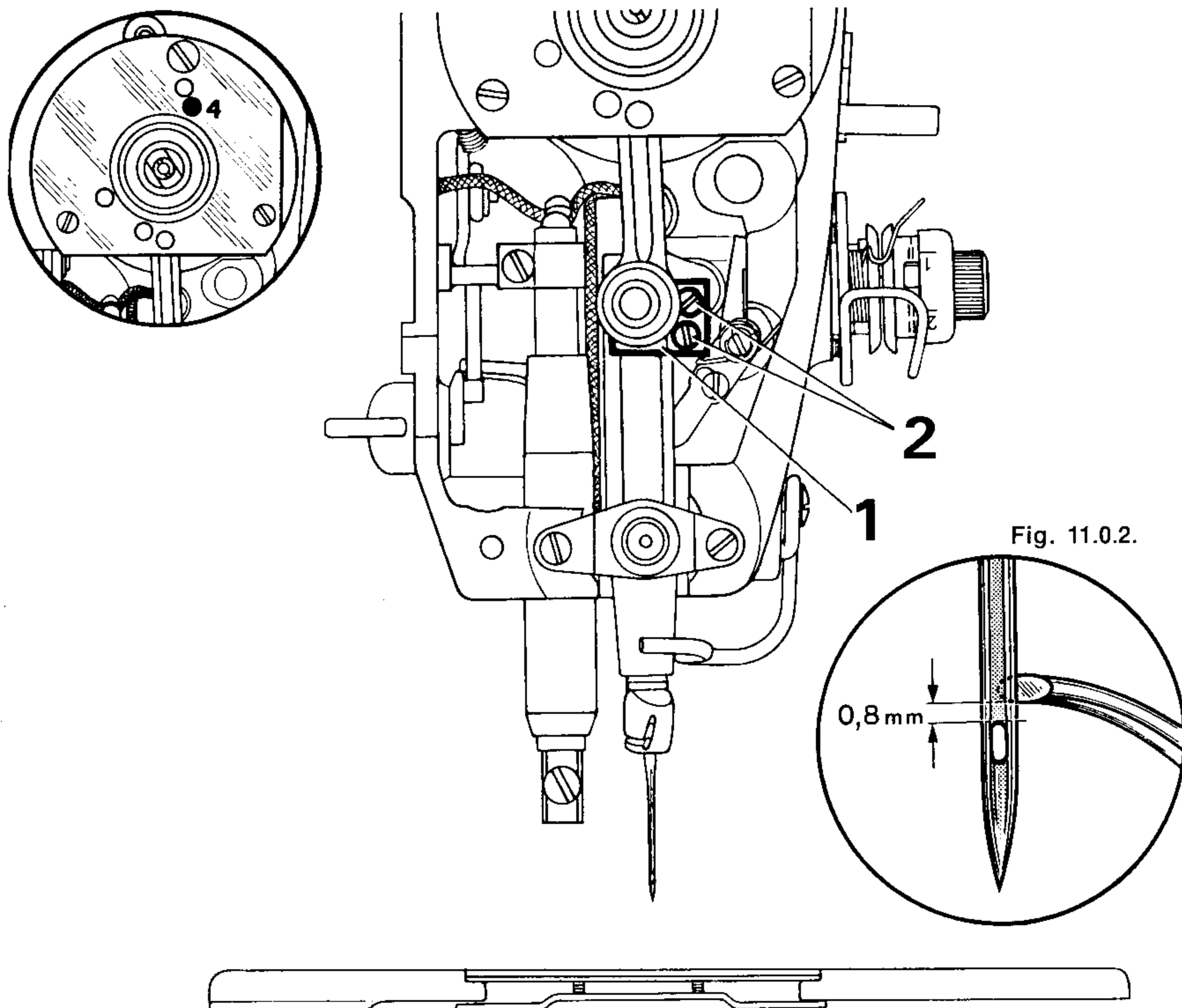


Fig. 11.0.1.

- 11.1. Bring the needle bar to a point 1.8 mm past the bottom of its stroke, making sure though that the needle does not strike the sewing hook. Block the machine in this position by inserting the pin in hole 4.
- 11.2. Make sure the stitch length control is set at "0".
- 11.3. Loosen both clamp screws 2 in needle bar connecting stud 1.
- 11.4. Turn the sewing hook on its shaft until its point is exactly opposite the center line of the needle.
- 11.5. **Move the needle bar up or down until there is a clearance of 0.8 mm between the top edge of the needle eye and the bottom edge of the hook point** (Fig. 11.0.2.); the hook point is now positioned approximately in the middle of the needle scarf.
- 11.6. In this position, tighten both clamp screws 2, making sure that the needle set screw points exactly to the right.
- 11.7. Adjust the sewing hook until there is a clearance of 0.1 mm between its point and the needle (center of scarf); make sure that the position finger is still in the slot of the bobbin case.
- 11.8. In this position, tighten the accessible hook set screw.
- 11.9. Pull the pin out of the hole in the bearing plate and tighten the second hook set screw.
- 11.10. Check this adjustment (see top of page).

12. Vertical position of bobbin case opener

Correct setting:

When at its left point of reversal, bobbin case opener finger **3** should be positioned vertically so that it is exactly opposite the lug of bobbin case base **4** (Fig. 2.0.2).

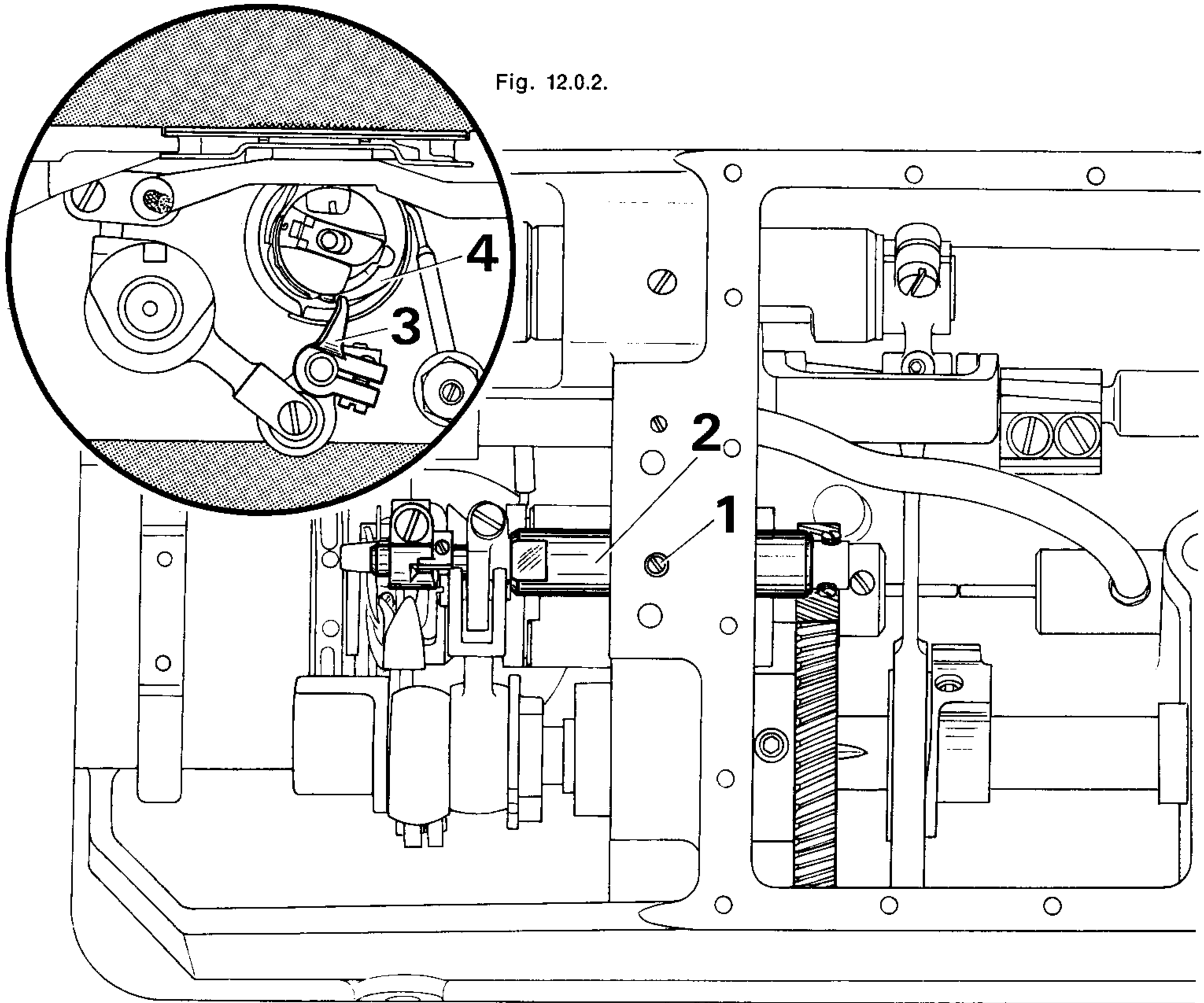


Fig. 12.0.1.

- 12.1. Loosen screw 1 of eccentric bobbin case opener shaft bushing 2.
- 12.2. Turn the balance wheel to bring the opener finger to its left point of reversal.
- 12.3. **Turn bushing 2 until opener finger 3 is exactly opposite the lug of bobbin case base 4.**
- 11.4. In this position, tighten screw 1 of bushing 2.
- 12.5. Check this adjustment (see top of page).

13. Position of bobbin case opener

Correct setting:

There should be a clearance of 0.8 mm between bobbin case opener finger 1 and bobbin case base 5 (Fig. 13.0.2.). Furthermore, when opener finger 1 is at the left of its stroke, there should be a clearance of 0.3 mm between position finger 6 and bobbin case base 5 (Fig. 13.0.3.). In this position, the lug on collar 4 should be up against the stop of opener finger 1 (Fig. 13.0.1.).

Fi. 13.0.1.

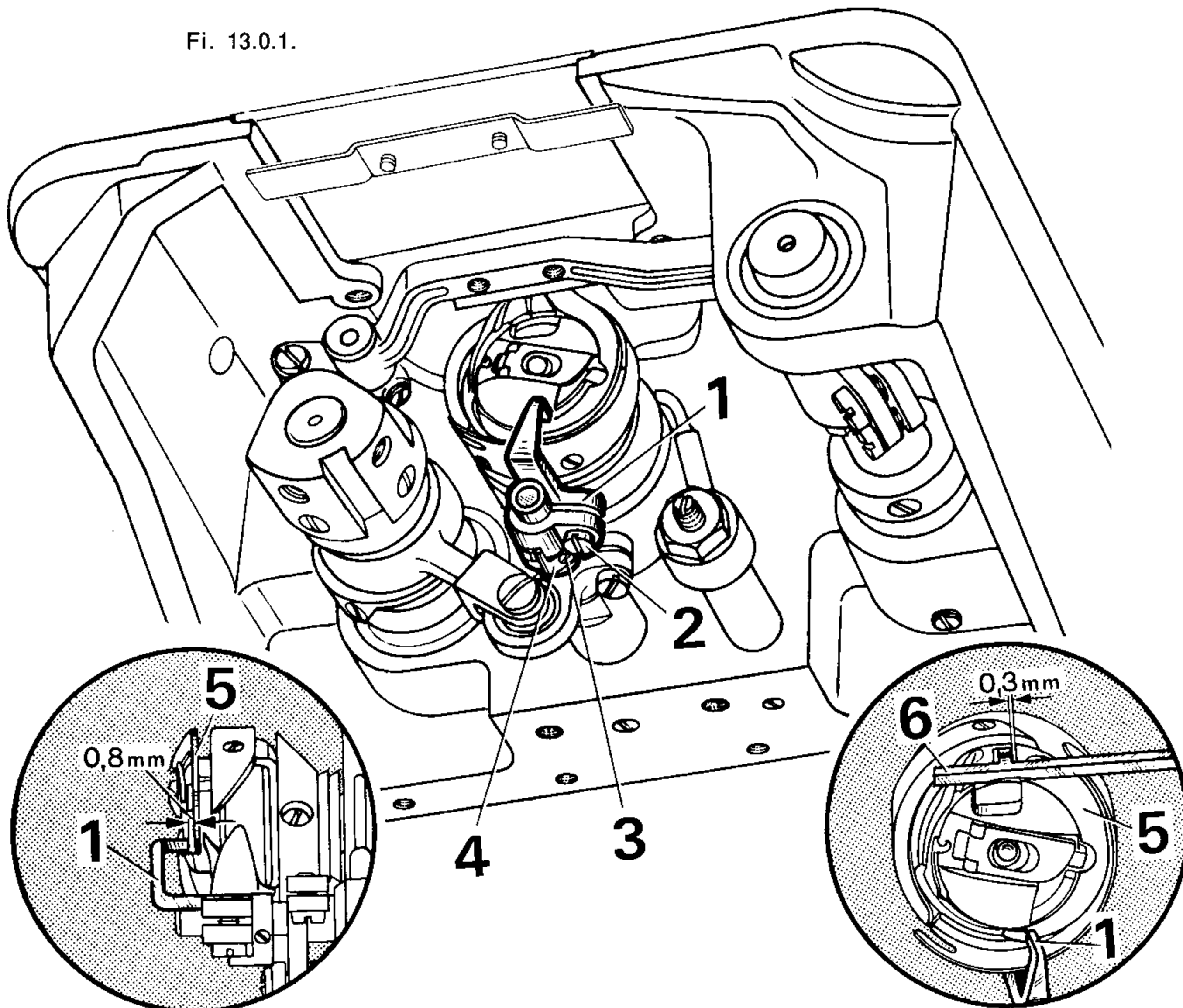


Fig. 13.0.2.

Fig. 13.0.3.

- 13.1. Loosen screw 3 of collar 4.
- 13.2. Loosen clamp screw 2 of opener finger 1 just sufficiently to allow it to be turned on its shaft against resistance.
- 13.3. **Reposition opener finger 1 on its shaft until there is a clearance of 0.8 mm between it and bobbin case base 5 (Fig. 13.0.2.).**
- 13.4. Rotate the balance wheel until opener finger 1 is at the left of its stroke.
- 13.5. **Turn opener finger 1 until there is a clearance of 0.3 mm between position finger 6 and the right wall of the position slot in the bobbin case base when opener finger 1 contacts the lug of bobbin case base 5 (Fig. 13.0.3.).**
- 13.6. In this position, tighten clamp screw 2 of opener finger 1.
- 13.7. Push collar 4 up against opener finger 1 and turn it so that its lug is up against the stop of opener finger 1.
- 13.8. In this position, tighten screw 3 of collar 4.
- 13.9. Check this adjustment (see top of page).

14. Timing the bobbin case opener

Correct setting:

When the needle bar has risen 1.8 mm from the bottom of its stroke (pin in hole 4), opener finger 3 should be at the right of its stroke (Fig. 14.0.2).

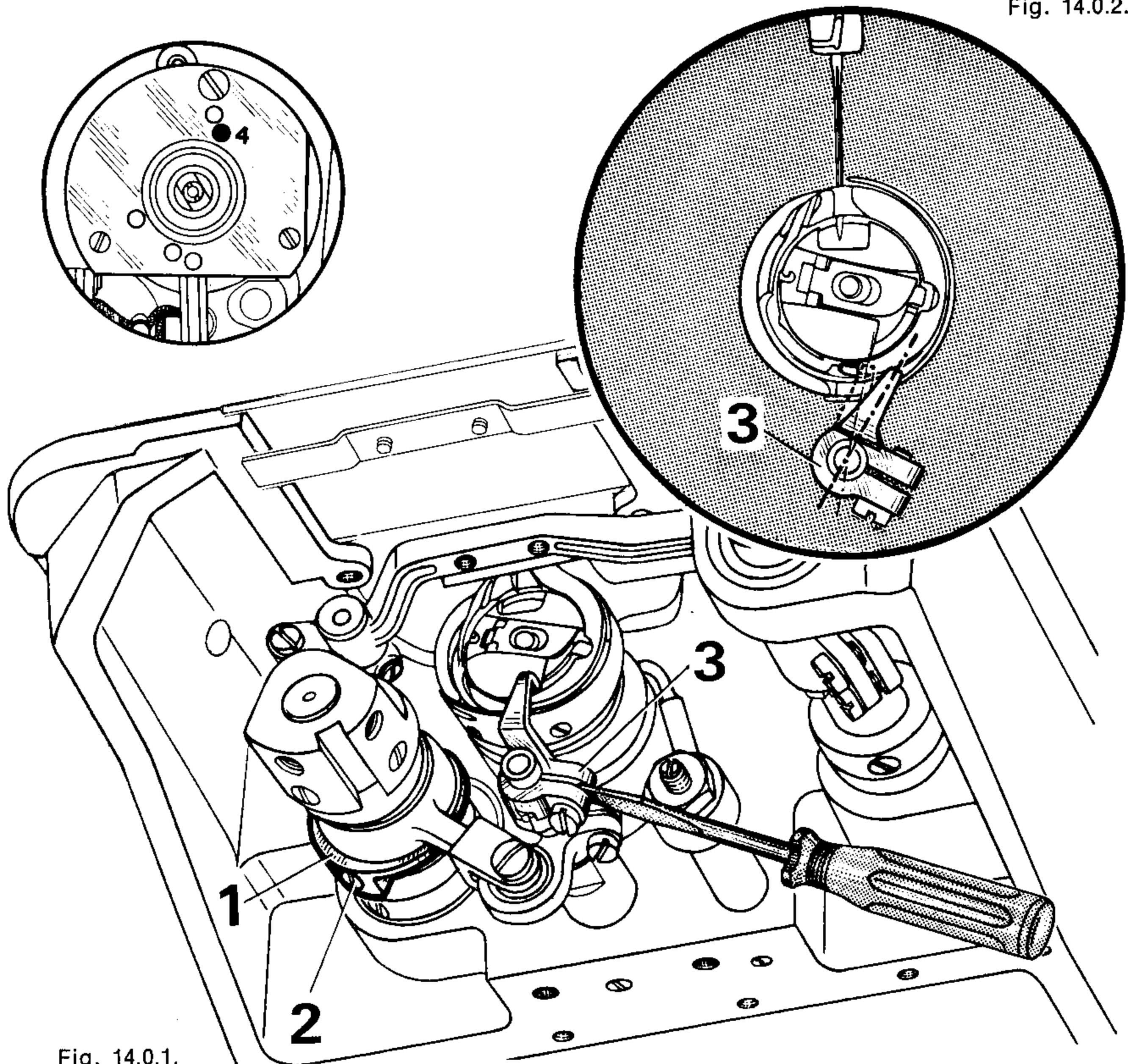


Fig. 14.0.1.

Fig. 14.0.2.

- 14.1. Loosen both screws 2 of bobbin case opener eccentric 1.
- 14.2. Bring the needle bar to a position 1.8 mm past the bottom of its stroke and block the machine in this position by inserting the pin in hole 4.
- 14.3. To facilitate determining the exact point of reversal insert a small screwdriver in the slot of the clamp of opener finger 3.
- 14.4. **Turn opener eccentric 1 until opener finger 3 is at its right point of reversal.**
- 14.5. In this position, tighten the accessible screw 2 of opener eccentric 1.
- 14.6. Pull the pin out of the hole in the bearing plate and tighten the second screw 2 also.
- 14.7. Pull the screwdriver out of the clamp slot and check this adjustment (see top of page).

15. Oil tube in oil distributor ring

Correct setting:

Oil tube 1 should be positioned in the hole of oil distributor ring 2 (Fig. 15.0.2.).

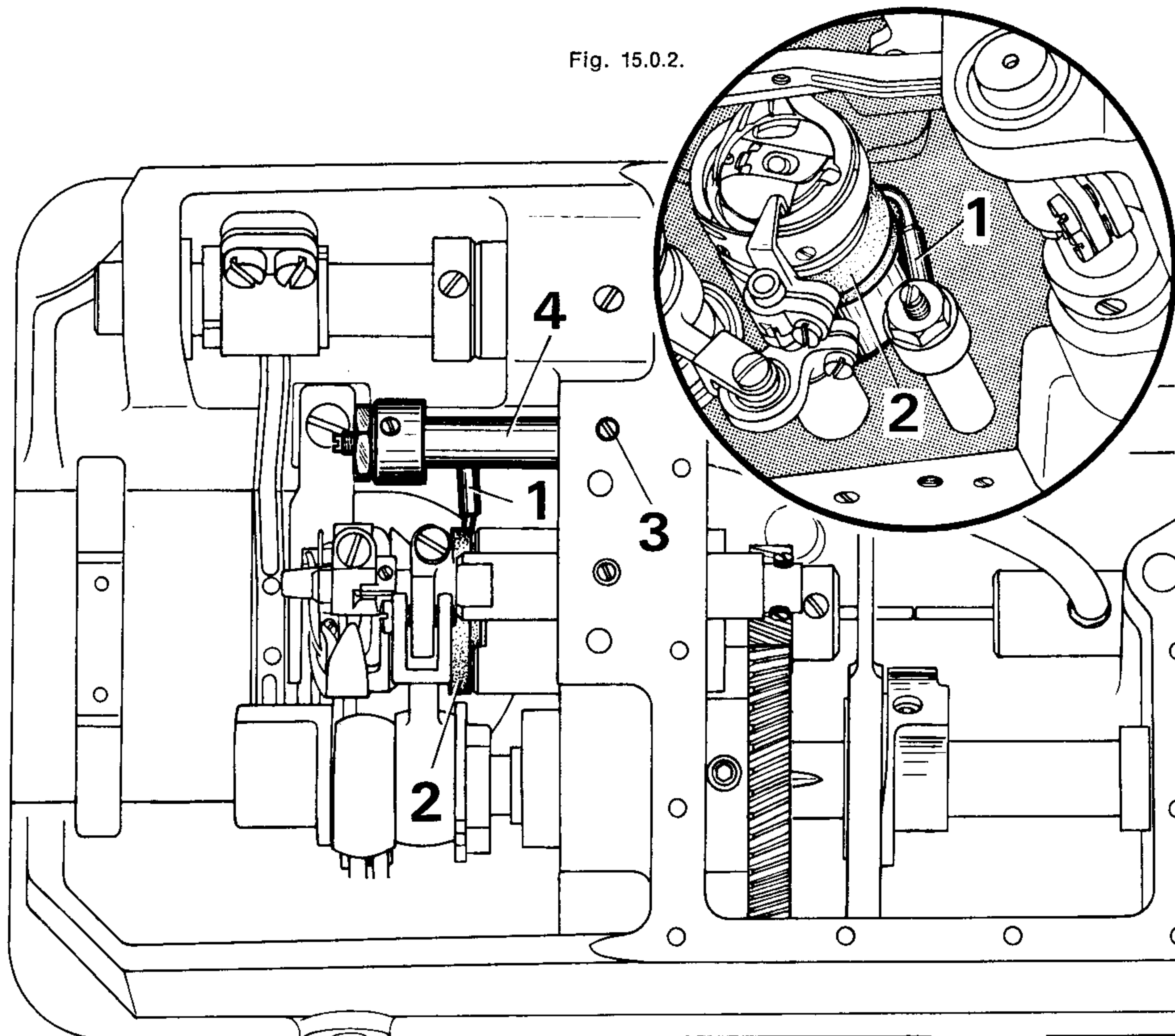


Fig. 15.0.1.

- 15.1. **Insert oil tube 1 into the hole of oil distributor ring 2 (see arrow in Fig. 15.0.2.); if necessary, turn the oil distributor ring accordingly.**
- 15.1.1. On subcl. -900 machines the oil distributor ring cannot be turned until you have loosened the three screws on the front side of the hook shaft bearing.
- 15.2. Tighten screw 3 of oil regulating valve 4 (Fig. 15.0.1.).

16.

Oil check valve

Correct setting:

There should be a clearance of 1.0 mm between actuating rod 3 of the centrifugal governor and push rod 4 of the oil check valve (Fig. 16.0.2.).

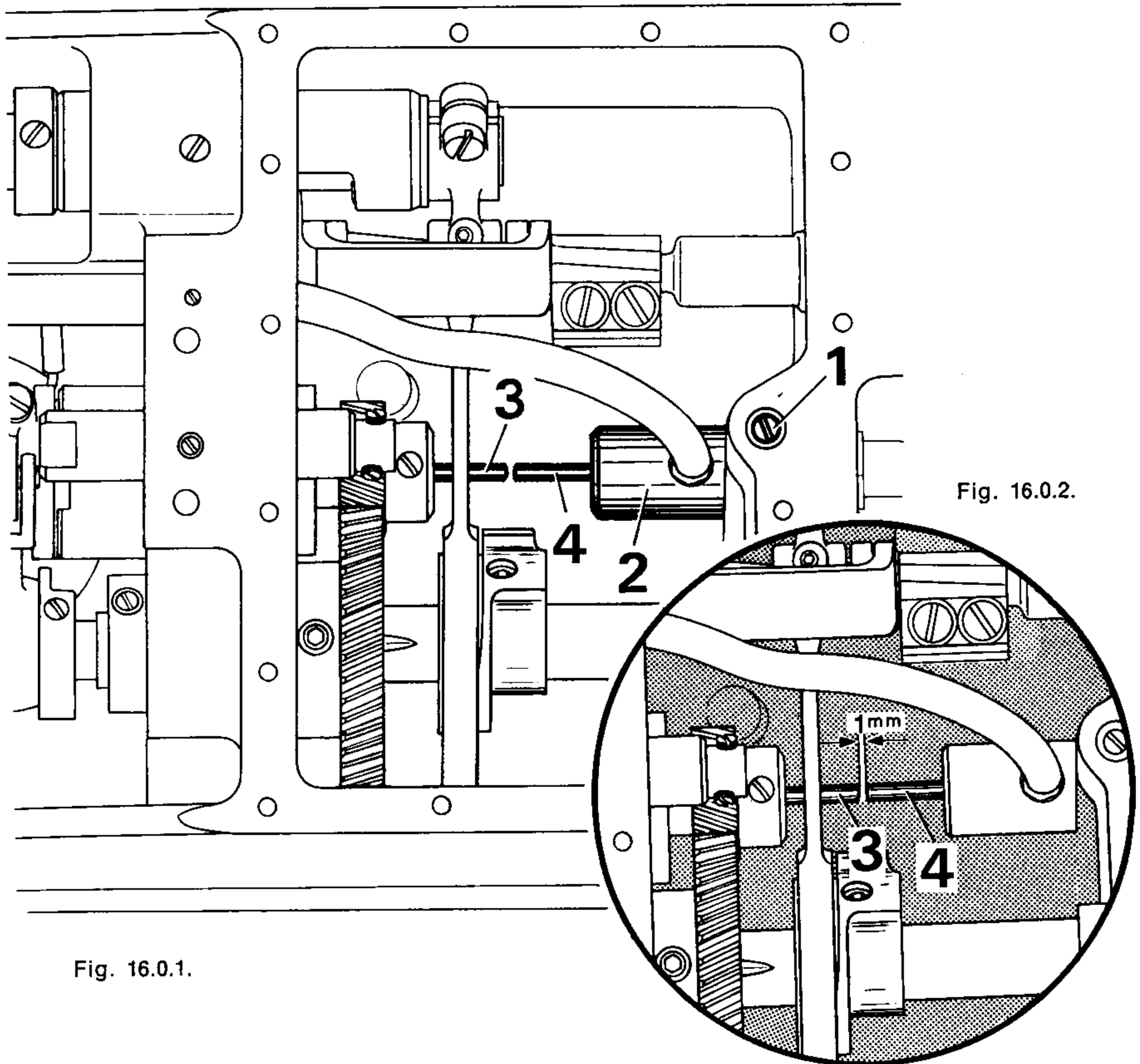


Fig. 16.0.1.

Fig. 16.0.2.

- 16.1. Loosen screw 1 of oil check valve 2.
- 16.2. Push actuating rod 3 to the left as far as it will go.
- 16.3. Push push rod 4 into oil check valve 2 until a resistance is felt.
- 16.4. **Reposition oil check valve 2 until there is a clearance of 1.0 mm between actuating rod 3 and push rod 4.**
- 16.5. In this position, tighten screw 1 of oil check valve 2.
- 16.6. Check this adjustment (see top of page).
- 16.7. Soak the oil sponge with oil and replace it in the gearcase so that its large recess is at the bottom left and the oil tube is placed on top of it.
- 16.8. Clean the gasket face on the gearcase and the gasket of the gearcase cover.
- 16.9. Replace the gearcase cover and simultaneously screw on the two machine legs, tightening the screws of the cover crosswise.

17. Hook lubrication

Correct setting:

After the machine has run at full speed for about ten seconds, a fine trace of oil should appear on a piece of paper placed over the needle plate cutout above the hook raceway.

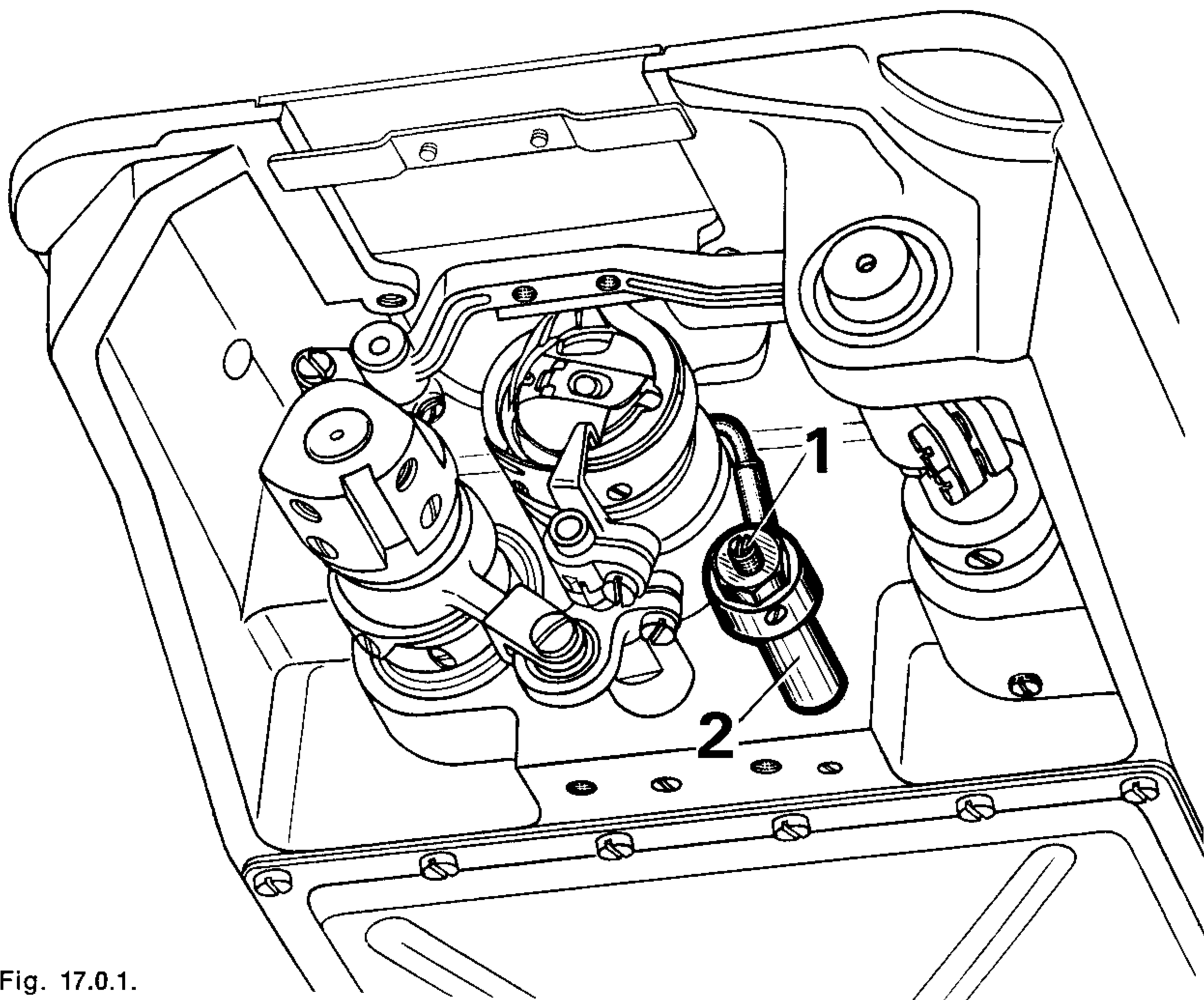


Fig. 17.0.1.

- 17.1. Turn in regulating screw 1 of oil regulating valve 2 as far as it will go, and then back about three turns.
- 17.2. Switch on the machine and run it until the sewing hook starts emitting oil.
- 17.3. Turn regulating screw 1 in completely and then out half a turn.
- 17.4. Let the machine run about one minute.
- 17.5. Place a piece of white paper over the needle plate cutout.
- 17.6. Let the machine run about ten seconds. Then check to see if a fine trace of oil has appeared on the paper opposite the hook raceway.
- 17.7. **If too much oil is emitted, turn regulating screw 1 in a little; or if too little oil is emitted, turn it out somewhat.**
- 17.8. Check this adjustment (see top of page).

18.

Clearance between presser foot and needle plate

Correct setting:

When the presser bar lifter is raised there should be a clearance of 7.0 mm between presser foot and needle plate (Fig. 18.0.2.).

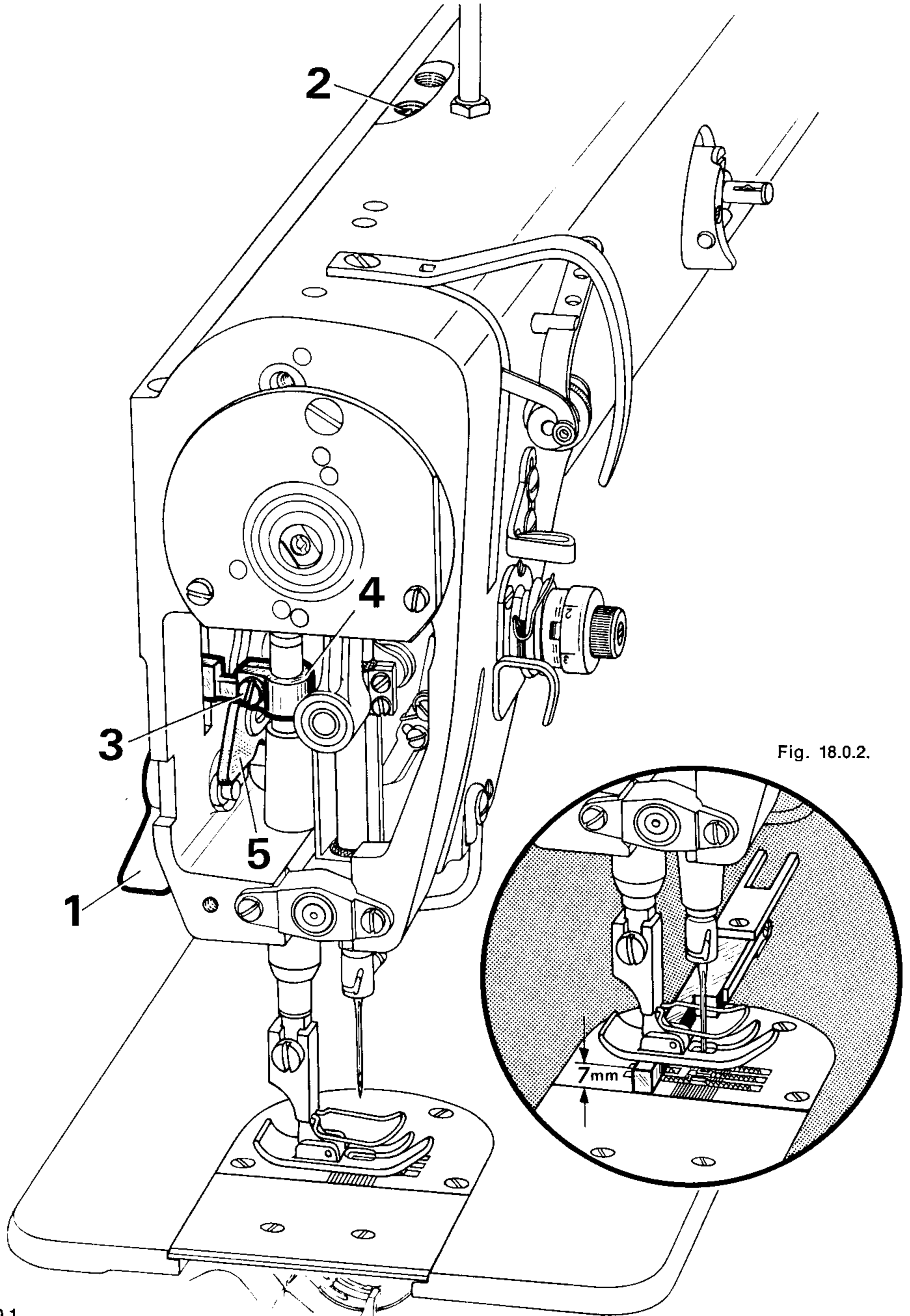


Fig. 18.0.1.

- 18.1. Replace the feed dog.
- 18.2. Screw on the needle plate, making sure that the feed dog moves freely in its slots.
- 18.3. Replace the presser foot.
- 18.4. Lower the presser foot onto the needle plate by operating presser bar lifter 1.
- 18.5. Reduce the pressure of the presser bar by turning out regulating screw 2 until the presser foot is pressed against the needle plate only slightly.
- 18.6. Push the 7-mm-thick blade of the universal gauge under the presser foot from the rear until it is positioned below the presser foot fulcrum.
- 18.7. Loosen clamp screw 3 of presser bar lifting bracket 4 inside the front end of the machine arm.
- 18.8. Raise presser bar lifter 1.
- 18.9. Turn the balance wheel until the needle is down in the needle hole.
- 18.10. Adjust the position of the presser foot so that the needle is centered exactly in its needle hole.
- 18.11. **Press presser bar lifting bracket 4 downwards onto the raised lifting lever 5 and tighten clamp screw 3 securely.**
- 18.12. Remove the gauge from under the presser foot and lower the foot onto the needle plate.
- 18.13. Rotate the balance wheel to see whether the needle is centered correctly in the needle hole of the presser foot, i. e. whether the sides of the foot are parallel to the edges of the feed dog.
- 18.14. Check this adjustment (see top of page).

19. Tension release mechanism

Correct setting:

When the presser bar lifter is raised both tension discs should be at least 0.5 mm apart (Fig. 19.0.2.).

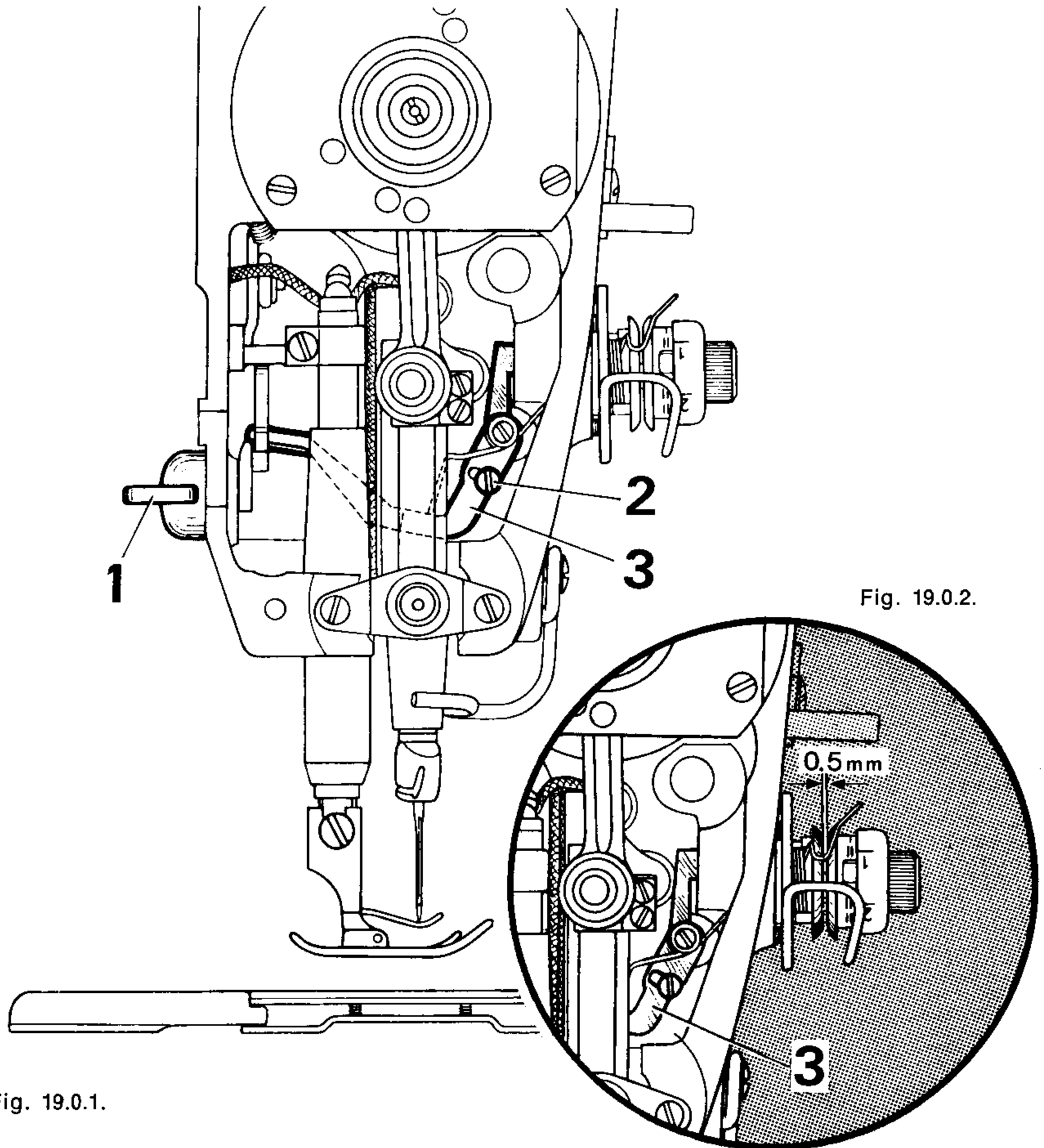


Fig. 19.0.1.

Fig. 19.0.2.

- 19.1. Operate presser bar lifter 1 to raise the presser foot.
- 19.2. Loosen screw 2 of tension release lever 3.
- 19.3. **Adjust tension release lever 3 so that there is a clearance of at least 0.5 mm between both tension discs when the presser bar lifter is raised.**
- 18.4. In this position, tighten screw 2 of tension release lever 3 securely.
- 18.5. When the presser foot is lowered onto the needle plate, the tension should be fully activated.
- 19.6. Check this adjustment (see top of page).

20. Thread check spring and thread regulator

Correct setting:

The stroke of thread check spring 4 should be about 7.0 mm (Fig. 20.0.2.). The position of thread regulator 6 is dependent on the type of thread and material used and should be adjusted according to the appearance of the seam.

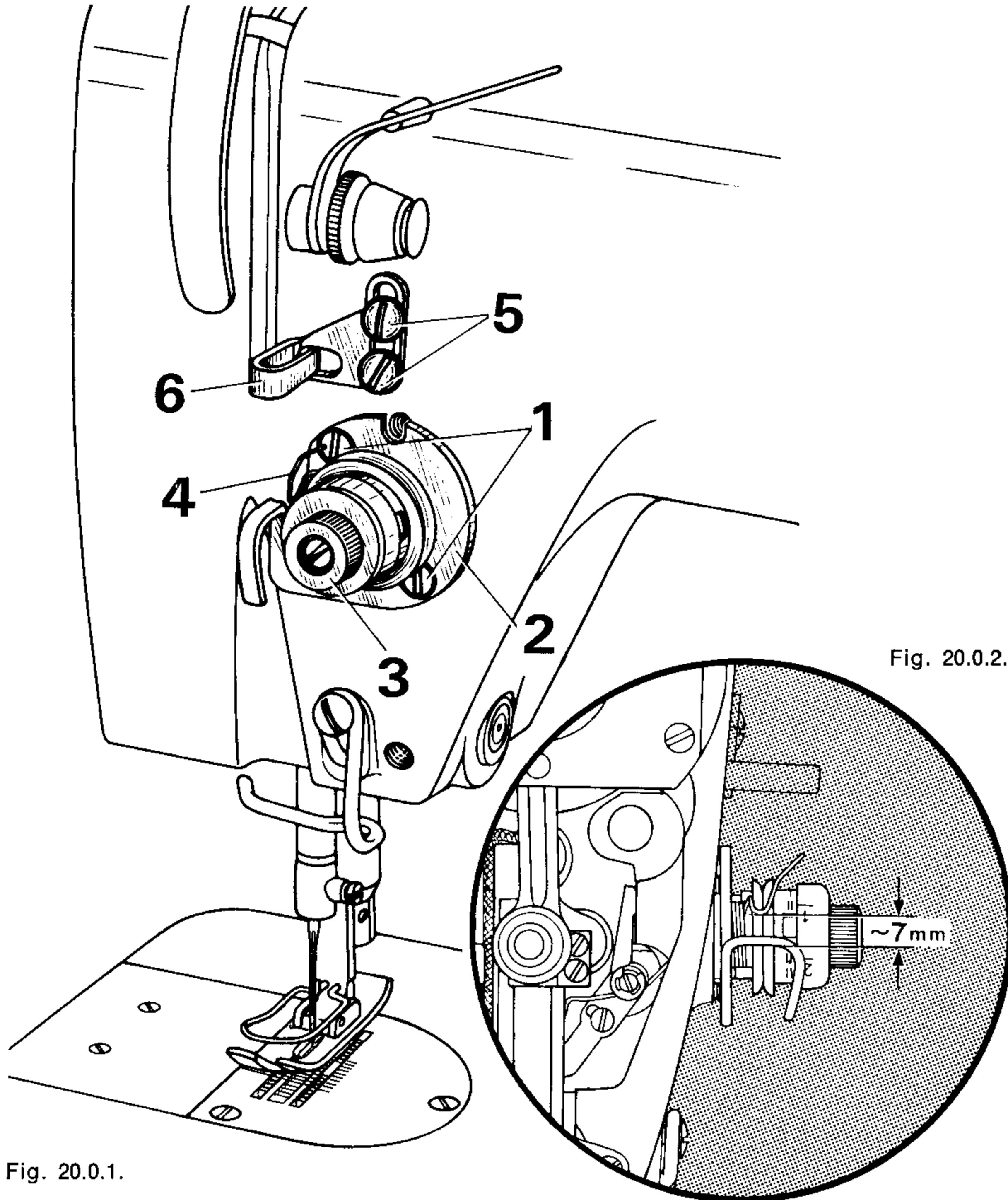


Fig. 20.0.1.

Fig. 20.0.2.

- 20.1. Loosen both screws 1 of thread tension flange 2 just sufficiently to allow tension barrel 3 to be turned in the tension flange.
- 20.2. **Turn tension barrel 3 until the stroke of the thread check spring amounts to about 7.0 mm** (Fig. 20.0.2.).
- 20.3. In this position, tighten both screws 1 of tension flange 2 evenly (by tightening them alternately). Special sewing operations may make it necessary to set the thread check spring for a shorter or longer stroke.
- 20.4. Check this adjustment (see top of page).
- 20.5. Loosen both screws 5 of thread regulator 6.
- 20.6. **Push thread regulator 6 up as far as it will go** (Fig. 20.0.1.).
- 20.7. In this position, tighten both screws 5. (The position of the thread regulator is dependent on the type of thread and material used and should be adjusted according to the appearance of the seam.)

21. Knee lever rest position

Correct setting:

When at rest, knee lever connecting rod **1** should extend at right angles to the front edge of the bedplate (Fig. 21.0.2.).

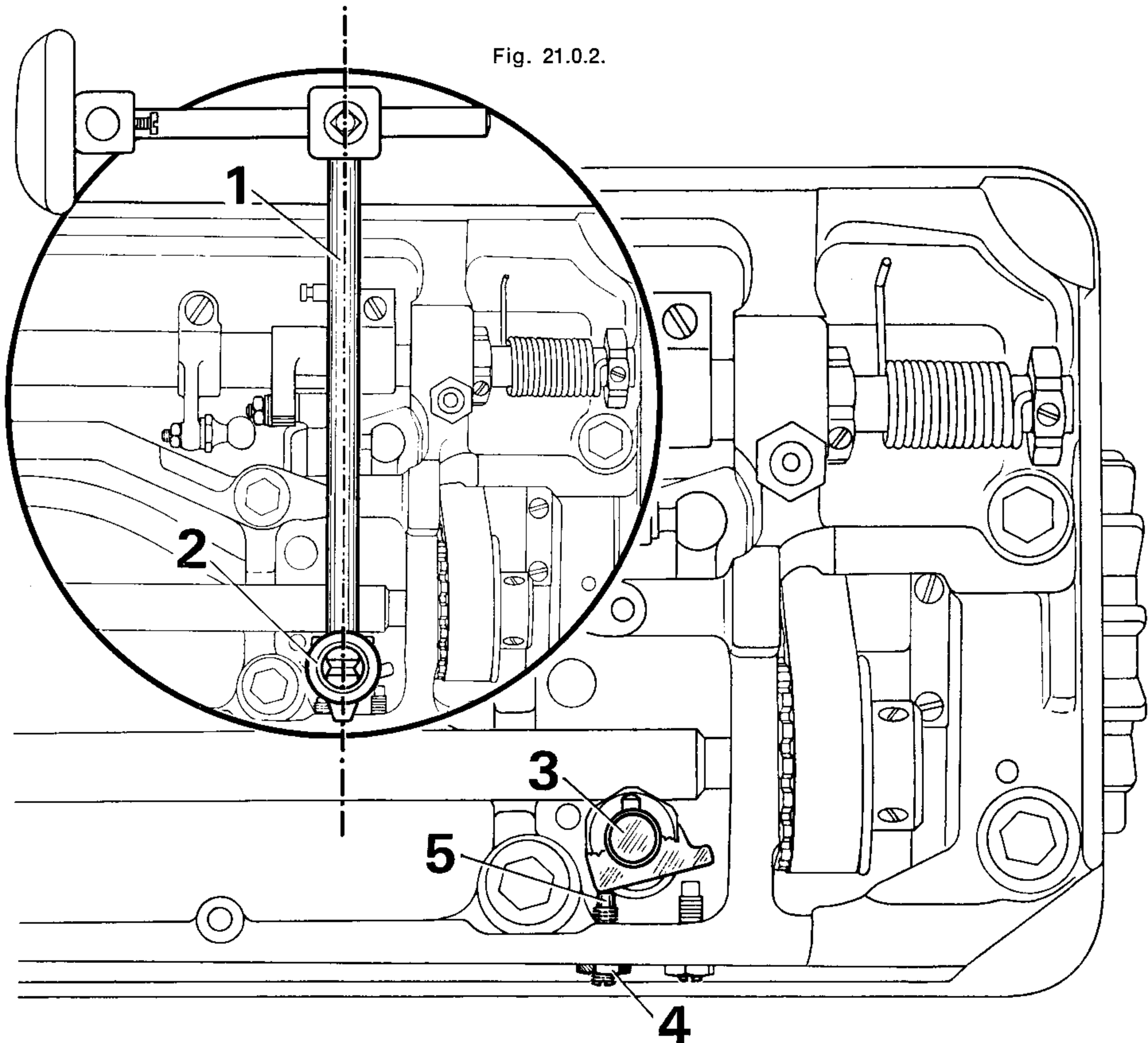


Fig. 21.0.1.

- 21.1. Raise the presser foot.
- 21.2. Push knee lever connecting rod **1** together with joint **2** on knee lever shaft **3** and turn it slightly until it snaps in place.
- 21.3. Loosen locknut **4** of stop screw **5** (Fig. 21.0.1.).
- 21.4. **Turn stop screw **5** until knee lever connecting rod **1** extends at right angles to the front edge of the bedplate.**
- 21.5. In this position, lock stop screw **5** by tightening nut **4**.
- 21.6. Pull knee lever connecting rod **1** out of joint **2**.

22. Knee lever play

Correct setting:

When the presser foot is down on the needle plate and the feed dog is positioned below the needle plate, there should be a clearance of about 1.3 mm between lifting lever 1 and lifting bracket 2 (Fig. 22.0.2).

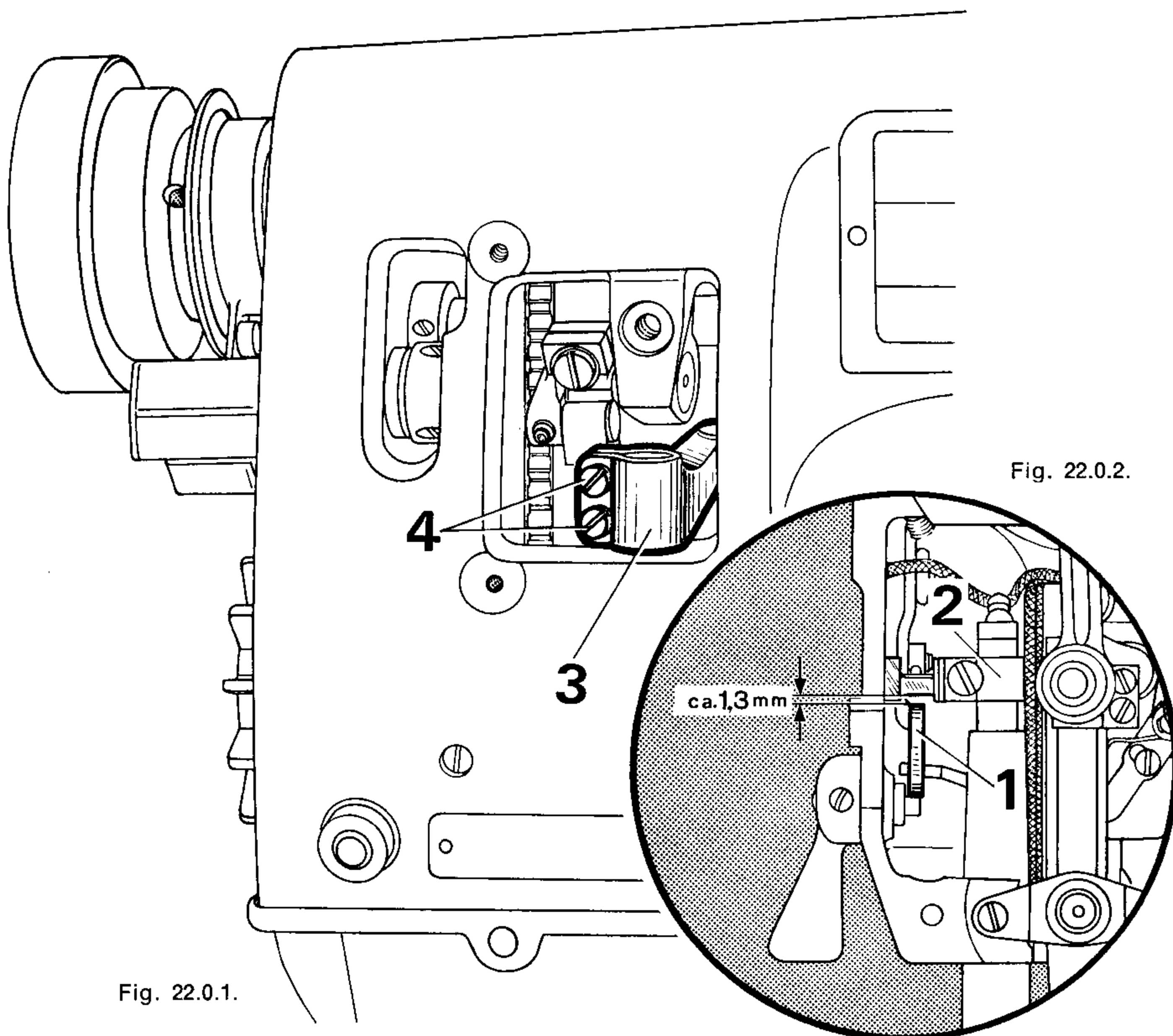


Fig. 22.0.1.

Fig. 22.0.2.

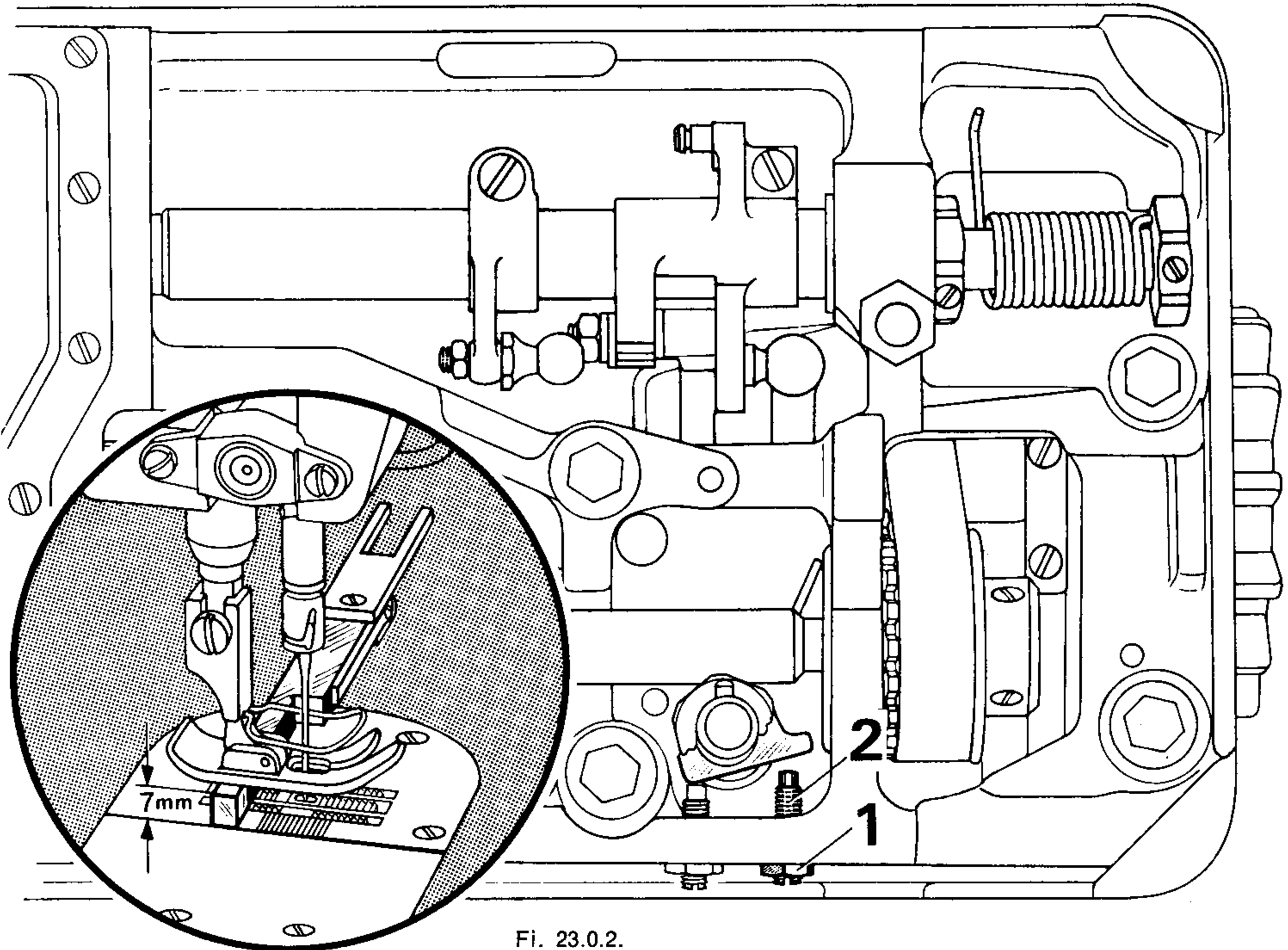
- 22.1. Lower the feed dog below the needle plate and let the presser foot down on the needle plate.
- 22.2. Loosen both clamp screws 4 of crank 3 on the vertical knee lever shaft.
- 22.3. **Adjust crank 3 so that there is a clearance of about 1.3 mm between lifting lever 1 and lifting bracket 2.** (Use the gauge for this adjustment.)
- 22.4. In this position, tighten both clamp screws 4, making sure the vertical knee lever shaft has no end play.
- 22.5. Pull out the gauge and insert the knee lever connecting rod into its joint.
- 22.6. Check this adjustment (see top of page).
- 22.7. Pull the knee lever connecting rod out of its socket.

23. Adjusting the knee lever motion

Correct setting:

When the knee lever is at the extreme right of its travel, the presser foot should have risen at least 7.0 mm above the needle plate and the presser bar lifter should have dropped down by its own weight.

Fig. 23.0.1.



Fi. 23.0.2.

- 23.1. Insert the knee lever connecting rod in its socket.
- 23.2. Loosen locknut **1** of stop screw **2** (Fig. 23.0.1.).
- 23.3. Turn stop screw **2** out a few turns.
- 23.4. Raise the presser bar lifter, place the 7-mm-thick blade of the universal gauge under the presser foot and lower the presser bar lifter again (Fig. 23.0.2.).
- 23.5. Push the knee lever to the right until a noticeable resistance is felt; during this motion, the presser foot must not yet lift off the gauge.
- 23.6. **Hold the knee lever in this position and turn in stop screw 2 as far as it will go, then out again by half a turn. Lock stop screw 2 by tightening nut 1.**
- 23.7. Pull out the gauge and draw the knee lever out of its socket.
- 23.8. Let the machine down again, replace the knee lever and check this adjustment (see top of page).

When the bobbin winder is engaged, the winder spindle should be driven reliably; when the bobbin winder is disengaged, however, friction wheel 3 must not contact drive wheel 1. The bobbin winder should stop automatically when the thread wound on the bobbin has reached a point about 1.0 mm below its rim (Fig. 24.0.2.).

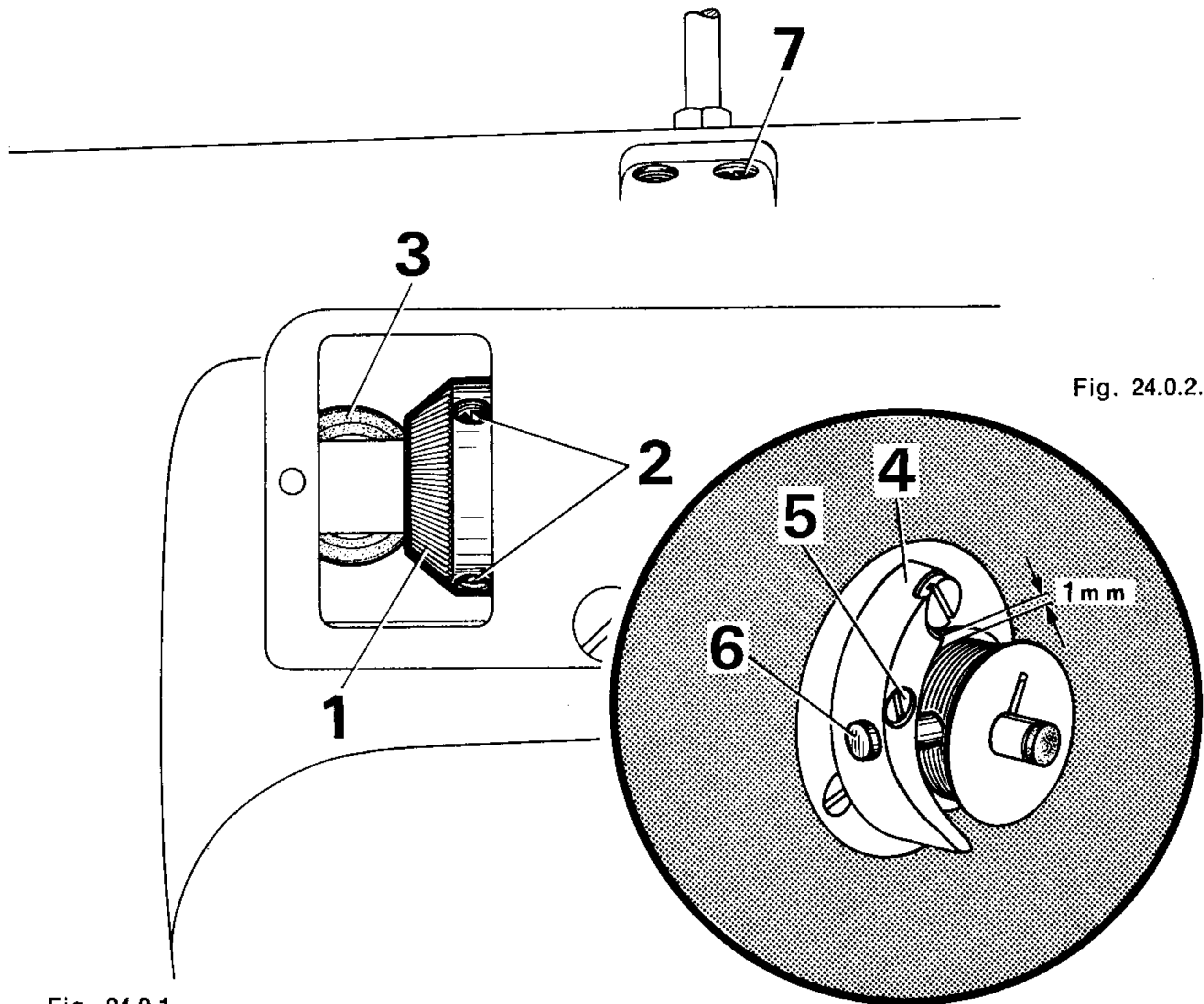


Fig. 24.0.1.

Fig. 24.0.2.

- 24.1. Take out the three screws retaining the rear arm cover.
- 24.2. Raise the presser bar lifter and engage the bobbin winder.
- 24.3. Loosen both screws 2 in drive wheel 1.
- 24.4. **Set drive wheel 1 so close to friction wheel 3 that friction wheel 3 will be driven reliably when the bobbin winder is engaged, but will not be driven when the bobbin winder is disengaged.**
- 24.5. Tighten both screws 2 of drive wheel 1.
- 24.6. Place a bobbin on the winder spindle, thread the machine for bobbin winding and engage the bobbin winder by pushing against its spindle. Then start the machine.
- 24.7. If the bobbin winder stops too early or not at all, loosen screw 5 of regulating stud 6 in stop latch 4.
- 24.8. **If the bobbin is too full, push regulating stud 6 toward the bobbin, if it is not full enough, push it away from the bobbin. Then tighten screw 5 of stop latch 4.**
- 24.9. If the thread piles up on one side of the bobbin, adjust the thread guide on the machine arm accordingly.
- 24.10. Check this adjustment (see top of page).

25. Presser foot pressure and final worksteps

- 25.1. Replace and screw on the face cover, both rear arm covers and the belt guard.
- 25.2. Thread the machine, place a piece of fabric under the presser foot and lower the presser foot onto it.
- 25.3. **Turn in pressure regulating screw 7 (Fig. 25.0.1.) until proper feeding of the material is ensured even at top speed.**
- 25.4. Test-sew on the machine.

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