

Outline for “Introduction to Watch Repair” and “The Watch Repair Course”

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This detailed video program outline is provided as an index for going forward and back to segments you may want to review.

“Introduction to Watch Repair”

Playing Opening Credits

- 1. How historically watches were made. Watches during the industrial revolution. Uniformity of watches.**
- 2. Tools and books. Inexpensive starter watches. Type of watch to use for practice.**
- 3. How to buy a watch. Manufacture of watches and watch cases.**
- 4. Wristwatches to repair. Why start with a large pocket watches?**
- 5. Watch resources and watch organizations. Access to schools and other courses. Classroom courses verses learning by video.**
- 6. 9 tools to start watch repair.**
- 7. Workbench setup.**
- 8. Type of bench suited for watch repair.**
- 9. Bench or table height for watch repair.**
- 10. Standard chair height for watch repair.**

- 11. Increase the height of a table.**
- 12. Lighting the work space.**
- 13. Types of lighting to use.**
- 14. Table surface types. Good and bad.**
- 15. Prevent parts from rolling off the bench.**
- 16. Work apron.**
- 17. Magnetic parts pick up tool.**
- 18. Watchmakers tool box.**
- 19. Bench plate.**
- 20. Different types of movement holders.**

- 21. Types of magnification for watch repair.**
- 22. Obtain a proper case opener.**
- 23. Types of tweezers used in watch repair.**
- 24. Acceptable tweezers and best tweezers.**
- 25. How to resurface the tweezers.**
- 26. Watch lubricants.**
- 27. Watch parts containers.**
- 28. Developing skill with tweezers. Skill building exercises.**
- 29. Types of cleaning and rinse solutions.**
- 30. Ultrasonic cleaners.**

31. Cleaning solution containers.
32. Using the correct type of screwdrivers.
33. Hobby screwdrivers.
34. Watchmaker screwdrivers.
35. How to properly use the watchmaker screwdrivers.
36. Selecting the correct screwdriver.
37. An improper screwdriver.
38. Resurfacing the screwdriver.
39. Polishing stone.
40. Using screwdriver sharpener tool.

41. Stone lubricant.
42. Resurfacing of a screwdriver blade demonstrated.
43. Finished screwdriver blade.
44. Variations of number of screwdrivers in a set.
45. Use of brass wire in watch repair.
46. Types of gloves used in watch making.
47. Types of watch oilers.
48. Watch oiler substitutes.
49. Names of different types of pocket watches.
50. Gold watches and warranties.

51. Watchmaker markings in the case.
52. The different ways watches wind.
53. The different ways watches are time set.
54. Identify the case parts.
55. Opening different watch cases.
56. The proper way to close a case.
57. How to use a case opener.
58. Swing out movement cases.
59. English Pair case.
60. Types of watch movements.

61. Types of watch crystals.
62. Types and sizes of watch keys.
63. Sizes of watches.
64. Measuring watches.
65. Watch measuring tool and how to use it.
66. Fingerprint problems on watch movements.
67. Using watchmakers paper.

The end

Proceed to "The Watch Repair Course"

Notes:

You need 9 basic tools to get started watch repair.

- 1. Watchmakers screwdriver set**
- 2. Loupe/magnifier 3 – 5 power or visor style**
- 3. Hand remover – Presto style**
- 4. Movement holder – plastic, metal or wood styles**
- 5. Watch oil – Moebius 8000**
- 6. Watch wash and rinse liquids – by L&R #111 & #3**
- 7. Case opener – Bergeon #4932 or similar style**
- 8. Watchmakers tweezers – single or in a set**
- 9. Parts container with lid – with separate compartments**

“The Watch Repair Course”

Play Opening credits

I

- 1. 3 different watches will be used for this part of the course**
-size 18 lever set, size 18 key wind key set and size 16-3 quarter plate pendant wind and set.
- 2. Start with the side winder – 18 lever set.**
- 3. Removing the bezel.**
- 4. Removing the hands using a hand remover.**
- 5. How to selecting the proper hand remover.**
- 6. Different types of hand removers reviewed.**
- 7. Examining the jaws of a remover.**
- 8. Protecting the dial.**
- 9. Hand remover type that is not recommended.**
- 10. Hand removal method not recommended.**

- 11. Parts container for watch parts.**
- 12. A specific order for parts in the container compartments.**
- 13. Not removing the second hand.**
- 14. Removing the movement from the watch case.**
- 15. Removing screws to the case.**
- 16. Examining case screws on an Elgin 16 watch.**
- 17. Examining case screws on larger Elgin 18 watch.**
- 18. Stopping point to practice assembly and disassembly.**
- 19. Remove the dust band.**
- 20. Removing the dial the proper way.**

21. See damaged watch dials due to improper removal.
22. Examining the removed dial and dial feet.
23. Using a movement holder.
24. Examining watch movement parts under the dial.
25. The parts to be removed first.
26. Examining underneath the dial of another watch. Making comparisons.
27. How the lever set gear system works.
28. Identifying the parts and how they work.
29. How the click and ratchet works.
30. Function of the winding and setting gears examined in 2 different movements.

31. Identifying the parts on the other side of the movement.
32. The balance wheel and the balance spring.
33. Proper method of removing the balance cock.
34. The hairspring stun and removing it.
35. Letting down the power in the mainspring.
36. Letting the power down demonstrated on 2 different movements.
37. Removing the barrel.
38. First remove the barrel bridge.
39. How to let down the power in an Elgin size 16 watch.
40. Why have jewels? – the number of jewels and their purpose.

41. Removing the cannon pinion.
42. Methods of removing the cannon pinion.
43. Preferred method and correct tool to use.
44. Stopping point to practice assembly and disassembly.
45. Comparisons made of an Elgin 16 watch movement.
46. Naming and identifying the parts of a wheel.
47. 2 important pivots that extend out from the movement plate.
48. Center wheel pivot and seconds hand pivot.
49. Removing the top plate.
50. The time gear train.

51. Identifying the train wheels.
52. Removal of the wheels and storage.
53. Removal of the winding and setting gears.
54. Removing winding stem gears.
55. Removing levers and springs.
56. Remove the mainspring from the barrel.
57. How not to open the barrel.
58. Preferred method of removing the mainspring barrel cap.
59. Examining the interior parts of the mainspring barrel.
60. Which way does the spring go?

61. Removal of the barrel arbor.
62. How to remove the mainspring out of the barrel.
63. Examine the mainspring condition.
64. Mainspring duration and power requirements.
65. New mainsprings and how compared to old springs.
66. What is a coned mainspring.
67. Parts of the mainspring.
68. Various mainspring ends types.
69. T end mainsprings.
70. Hole end mainsprings.

71. Combination hole and T end.
72. Methods of measuring mainsprings for replacement.
73. Three measurements of the mainspring.
74. How to measure the length, width & strength of the mainspring.
75. Using the Denison gauge and digital caliper.
76. Finding a mainspring from an Internet supplier.
77. Using the Swigart and BestFit catalogs.
78. How to use a mainspring winder.
79. Requiring a bench vise.
80. Parts of the mainspring winder.

81. Lubricating the mainspring.
82. Which direction to install the mainspring.
83. Placing the mainspring into the winder.
84. Winding in the mainspring.
85. Other types of mainspring winders examined.
86. Pressing in a new mainspring.
87. Using Nye clock oil to lubricate a new spring.

II

1. Lubricating the mainspring while in the barrel.
2. Understanding capillary action.
3. An open new mainspring compared to an old mainspring.
4. Installing the mainspring arbor.
5. Making adjustments to the inner mainspring coils.
6. Testing the arbor to make sure it is pulling the mainspring.
7. Proper alignment of the barrel cap.
8. Visualizing the mainspring T or tang in the barrel.
9. Installing the mainspring cap using a bench block.
10. All the parts divided into the parts container.

11. Parts washing method.
12. Method of replacing the wash and rinse solutions.
13. Stringing up the parts.

14. Dividing parts into cleaning groups.
15. Going through the wash and rinse steps.
16. Balance wheel and hairspring in a different cleaning solution.
17. Small cleaning container for the One-dip solution.
18. Drying the balance wheel and hairspring with a hand blower.
19. Drying the hairspring coils.
20. Taking parts out of the first rinse.

21. Drying the parts in the parts drying container.
22. Jewels that will need to be removed and cleaned.
23. Demonstration on the function of the jewels to be cleaned.
24. Examples of jewel problems.
25. Close visual examination of single jewels in the plate.

26. Introduction to the jewel pusher.
27. Examining the jewel pusher.
28. Removing the jewels using peg wood and jewel pusher.
29. Examining the jewels.
30. Washing the jewels in the small brass container.

31. Oiling between the jewels.
32. Returning the jewels to the movement plate.
33. Peg out the holes in the movement plate.
34. Replacing a broken jewel setting screw.
35. Sets of replacement screws.
36. Removing the cleaned parts from the wire.
37. Examine the pivots on all the wheels.
38. Clean the pivots in pith wood.
39. How to properly hold the wheel with a tweezers.
40. Reassembly of the winding stem parts on the movement plate.

41. Oiling the parts before installing.
42. Replacing the wheels and gears on the movement plate.
43. Examining and understanding the pallets.
44. Prepare to install the top plate.
45. Protect your movement and parts when leaving the bench.
46. Installing the top plate.
47. Using the #5 tweezers.
48. Understanding how the top plate installs.
49. Complete the top plate installation.
50. Testing the wheels to examine correct installation.

51. Tightening the top plate with caution.
52. Testing the wheels again for proper alignment.

53. Full plate movement verses 3 quarter plate movement regarding wheel installation.

54. Oiling the pivot holes.
55. Selecting the correct oiler.
56. Cleaning the oiler tip.
57. Oiling the pivots on the pillar plate.
58. Study of the balance wheel and the function of its parts.
59. Study of escapement: balance wheel, pallets and escape wheel.
60. View escapement working in the watch.

61. Examine an escapement in a size 16 Elgin watch.
62. View the escapement running in a size 16 Elgin watch.
63. View the escapement running in a Swiss Zenith watch.
64. Alignment of the roller jewel.
65. Making a hairspring collet adjusting tool.
66. Watch “in beat”.
67. How to put the watch in beat.
68. Alignment of the parts to put the watch in beat.
69. Installing the mainspring barrel.
70. Correct direction of the barrel.

71. Returning the barrel bridge to the movement.
72. Oil the barrel pivots.
73. Install the setting and motion works.
74. Installing the ratchet wheel.
75. Installing the click.
76. Installing the winding cock.
77. Installing the intermediate wheel, crown wheel and the spring wheel

78. Removing the spring to the setting spring wheel.

79. Installing the setting bridge. Also known as the winding and setting yoke.
80. Installing the crown wheel hub and hub screw.

81. Checking the winding and setting yoke located under the barrel.
82. Installing the setting wheel spring.
83. Checking the function of the winding and setting parts and gears.
84. Examining the setting wheel function.

III

1. Returning the balance wheel to the balance cock.
2. Placing the hairspring stud back into the balance cock.
3. Tightening the hairspring stud screw.
4. Hairspring passing through the regulator pins.
5. Purpose of the regulator pins.
6. Aligning the balance jewel to fit in to the pallet inside the movement.
7. Important steps when installing the balance cock screw.
8. Test to see that the watch is “in beat”. Self start from a stop.

9. Changing the position of the hairspring collet.
10. Re-test the watch to see if it is in beat.

11. Checking the alignment of the centers of the balance wheel, pallet pivot through the center of the banking pins.
12. Final test for the watch in beat. The movement is starting on its' own.
13. Results showing watch to be in beat.
14. Discussion of the regulator.
15. Setting the regulator.
16. Examining a regulator made for fine tuning.
17. Checking the in beat alignment of a size 16 three quarter plate movement.
18. In beat testing the size 16 three quarter plate movement
19. Checking the in beat alignment of a size 16 three finger movement.
20. Adjusted in 6 positions.

21. Why test in 6 positions?
22. Safety pinion in a watch movement.
23. What is the function of a safety pinion?
24. Oiling the escape wheel.
25. Where to oil on the escape wheel.
26. How to determine the balance jewel is incorrectly set with the pallets.
27. Magnetism in watch repair.
28. Testing for magnetism.
29. Demagnetizers discussed.
30. How to demagnetize.

31. How to magnetize.
32. Cleaning the movement case.
33. Disassemble the crown and winding stem.
34. How to remove the crown.
35. The stem and sleeve inside the pendent.
36. Examining the sleeve and stem.
37. Examining and using a sleeve wrench.
38. Part of the sleeve and their function.
39. Separate the sleeve from the stem.
40. Cleaning the crown, stem and sleeve.

41. Cleaning the remaining parts of the watch case.
42. Advice about cleaning the dial.
43. Case parts in the cleaning solution.
44. Rodico to clean the dial.
45. Case parts cleaned.
46. Returning the sleeve to the stem.
47. Returning the sleeve and stem to the watch case pendent.
48. Checking the correct working position of the sleeve.

49. Using a pin vise when adjusting the sleeve.
50. Testing the position of the sleeve.

51. Different variation of crown, stem and sleeve arrangement.
52. Other considerations.
53. Examining other watch cases and the movements contained within.
54. Elgin damaskeened 3 finger movement.
55. Illinois damaskeened bridge movement with gold wheels.
56. Marriage watch.
57. Dating an Elgin size 18 KWKS movement.
58. How to let down the power of a key wind watch movement.
59. Replacing and repairing watch bows.
60. Different types of bow pliers.

61. Tightening a loose bow.
62. Removing a bow.
63. Installing a bow.
64. Replacing a missing bow.
65. Finding and selecting a replacement bow.
66. Examining different crowns.
67. Determining crown to be replaced.
68. Examining the case that will require the new crown.
69. How this movement is removed from this hunter case.
70. The type of stem that uses a detent screw.

71. Having a selection of crowns.
72. Examine the existing crown and needed requirements for a replacement.
73. How to pick an appropriate crown.
74. Modifications to a replacement crown to make a match.
75. Examine 6 different crowns as possible replacements.
76. Crown drill and tap set.
77. Crown expander tool set.
78. Choose the correct tool to expand the crown.
79. How to expand the crown.
80. Testing the finished crown.

81. How to tap and drill the crown.
82. Selecting the correct tap.
83. Placing the crown into the tap and drill fixture.
84. Centering the crown in the fixture.
85. Using spade drills to enlarge the screw hole.
86. Tapping the enlarged screw hole.
87. Crown screwed onto the watch stem.
88. Installing the stem and new crown into the watch case.
89. Final observations of the new crown.
90. Put the movement back into the movement case.

91. **Install cannon pinion.**
92. **Install minute, hour wheel and dial washer.**
93. **Installing the hands using a hand pressing tool.**
94. **Examine correct watch hand placement and clearance.**
95. **Installing the seconds hand.**
96. **Checking completed watch wind and setting ability.**

IV

1. **Replacing the watch crystal.**
2. **Plastic and glass crystals.**
3. **Determining the crystal to buy.**
4. **Type of case for the crystal.**
5. **Measurements of the crystal.**
6. **3 measurements.**
7. **Measure the crystal seat.**
8. **Websites selling watch crystals.**
9. **Selecting the size.**
10. **Crystal ready to be installed.**

11. **Using Naphtha.**
12. **Using UV glue.**
13. **Examining the bezel.**
14. **Where the crystal will go in the bezel.**
15. **Applying the UV glue.**
16. **Setting glue with lamp.**
17. **Cleaning of excess glue.**
18. **Install the new crystal**
19. **Checking the hands for fit.**
20. **Truing and Poising the balance wheel.**

21. **Reasons for balance not poised or true.**
22. **Problems associated with balances not poised and true.**
23. **Truing tools.**
24. **How to place the balance within the tool.**
25. **Balance wrench.**
26. **How to make a balance wrench.**
27. **Caution when using the truing caliper.**
28. **Removing the hairspring.**
29. **Re-install the hairspring.**
30. **Using the caliper indicating arm.**

31. **Truing in the flat.**
32. **Using an artist's brush.**
33. **True in the round.**

34. How to use a balance wrench.
35. Poising the balance.
36. The poising tool.
37. Condition of the balance wheel before poising.
38. How to place the balance wheel in the poising tool.
39. Testing the balance wheel.
40. Examining alterations done by other watchmakers.

41. Removing a balance screw.
42. Screw undercutting tool explained.
43. Using the undercutting tool.
44. How to handle the balance screw.
45. Balance screw holding tool.
46. How to use the balance screw holding tool.
47. Re-testing the balance wheel.
48. Using balance screw washers.
49. Understanding the balance screw washer charts.
50. Which washers to use.

51. Review of the use of balance screw washers.
52. The English Fusee watch.
53. Explanation of the fusee system.
54. French and English winding methods.
55. Removing a fusee watch from its' case.
56. The different steps to perform when removing from the case.
57. Using pivot wire.
58. The dust cover and how to remove it.
59. Understanding and operating the spring bolt.
60. Remove the watch hands.

61. Remove a fusee watch dial.
62. Parts of the dial.
63. Tapered pins.
64. Examine the wheels under the dial.
65. Remove the cannon pinion.
66. Examining some parts on the outside of the movement.
67. Removing the balance cock.
68. Removing the hairspring from a fusee watch.
69. Measuring the protruding hairspring.
70. Examining the balance wheel.

71. Examining the hair spring collet.
72. Removing the regulator.
73. Movement holder for the fusee movement.
74. Letting down the power.

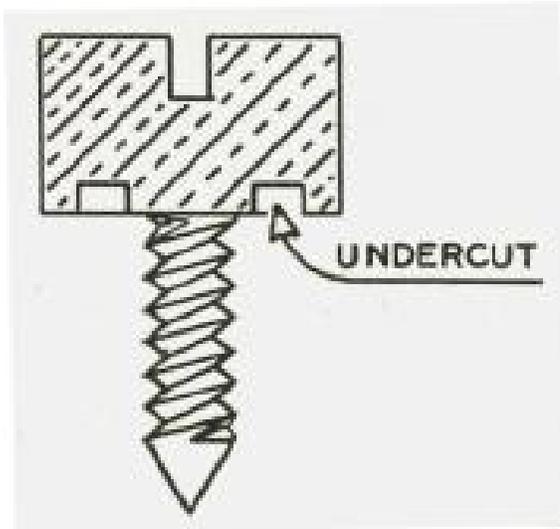
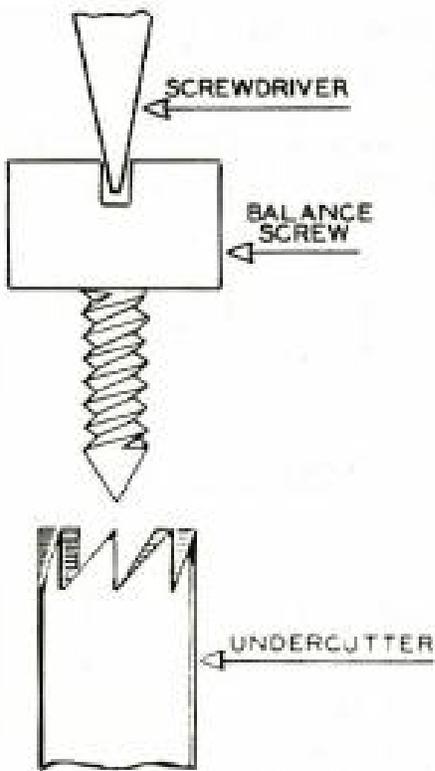
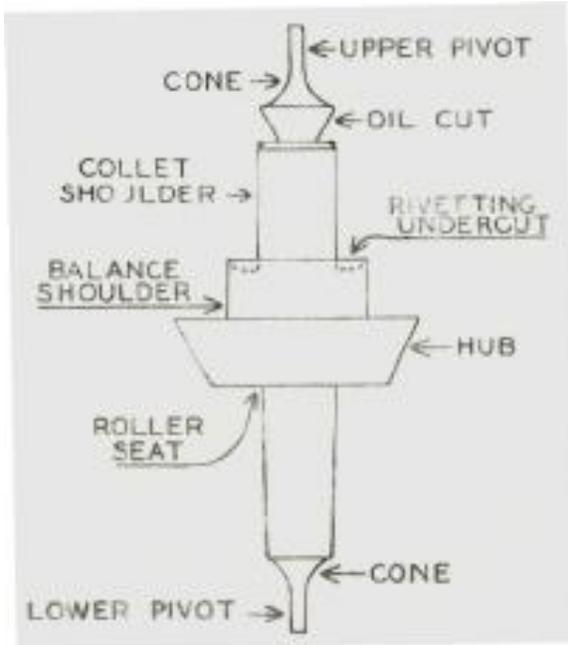
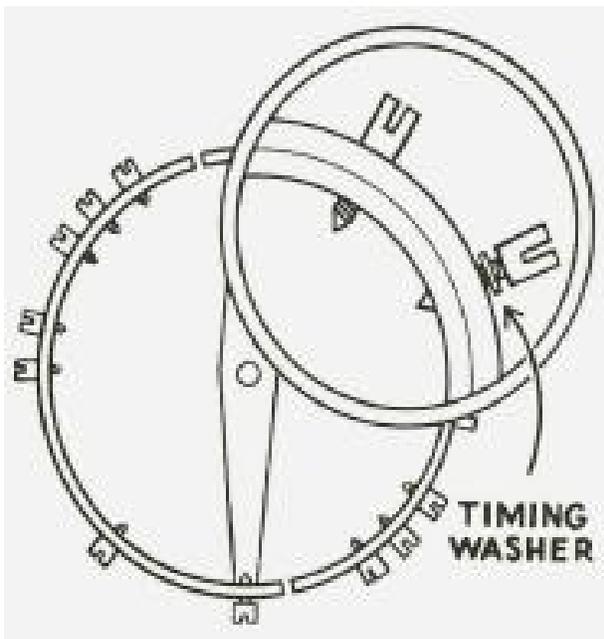
75. Using a pin vise to let down the power.
 76. How to tell all the power is down.
 77. Pin vise assortments.
 78. More terminology for the fusee watch.
 79. Removing the click wheel.
 80. Barrel bridge removed and remove the barrel.

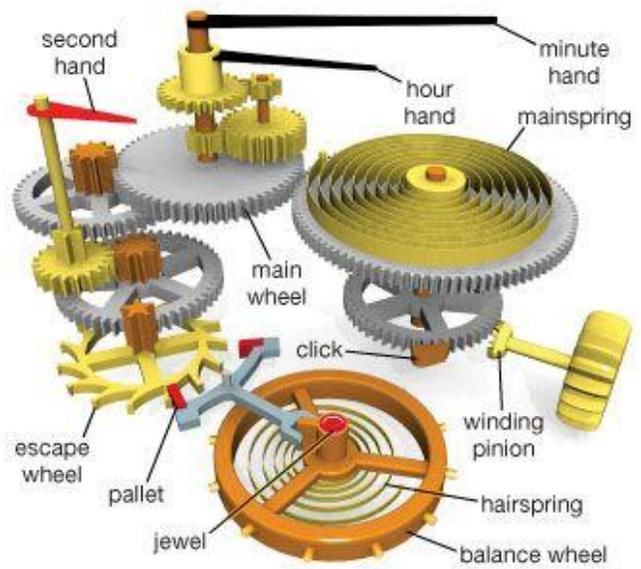
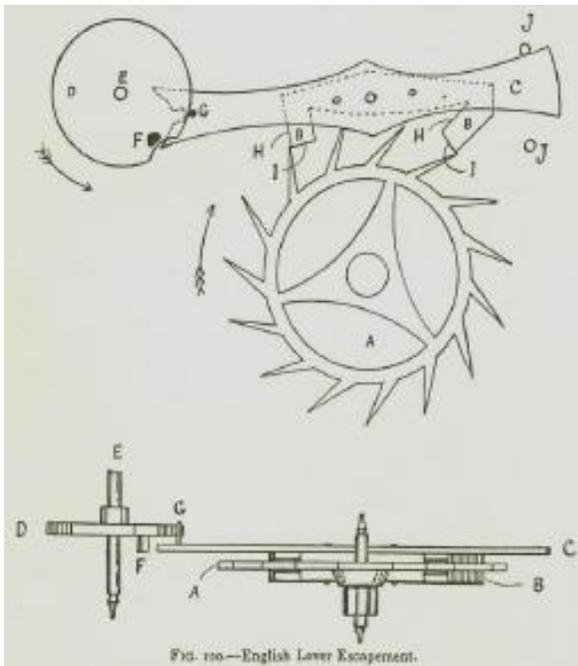
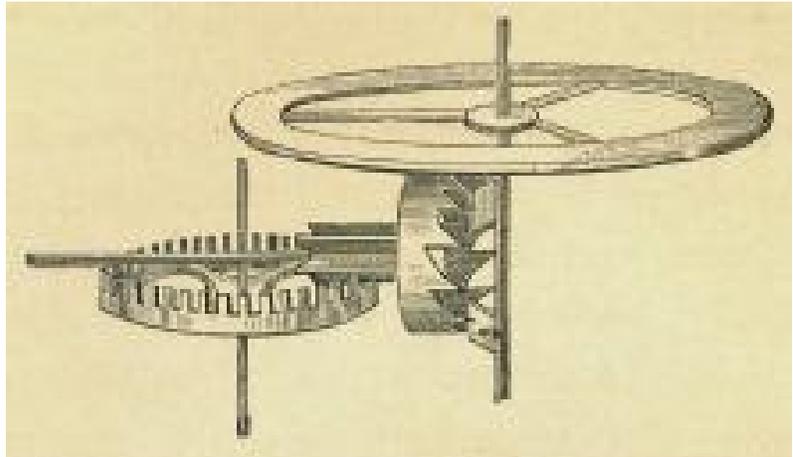
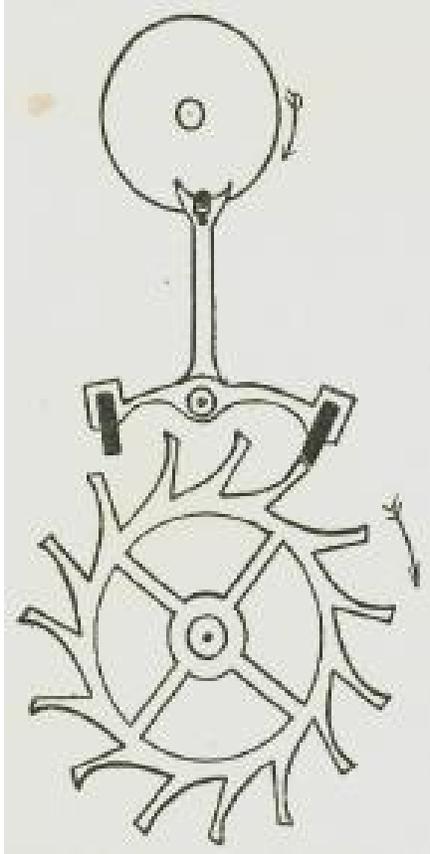
 81. Pulling out the fusee chain.
 82. Removing the movement plate.
 83. Caution about movement plate pins.
 84. How to remove stubborn pins.
 85. Identifying the movement parts between the plates.
 86. The fusee click spring.
 87. Examining other springs and bridges.
 88. Examining the fusee chain.
 89. Removing the chain from the fusee wheel.

 90. Examining function and parts of the fusee.
 91. Disassembling the fusee.
 92. Examining the disassembled parts of the fusee.
 93. Oiling the parts of the fusee.
 94. Re-assemble the fusee.
 95. Viewing the fusee on the movement plate.
 96. The fusee stop explained.
 97. Reassembly of the movement.
 98. Discuss reattach the chain to the fusee.
 99. Replacing the top plate.
 100. Checking the pillar pins under the barrel bridge.

 101. Lubricating the fusee chain.
 102. Fusee chain lubricating joint jig.
 103. Reattachment of the fusee chain to the fusee.
 104. Pull the chain behind the pillar.
- DVD Chapter 21
105. Method of holding the chain and attaching to the barrel.
 106. Method of winding the chain onto the barrel.
 107. Adding tension to the fusee chain.
 108. Returning the regulator to the movement plate.
 109. Returning the balance wheel and pinning the hairspring.
 110. Check the roller jewel in the pallet horns.

 111. Install the balance cock.
 112. Winding the fusee.
 113. Examine the running movement.





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