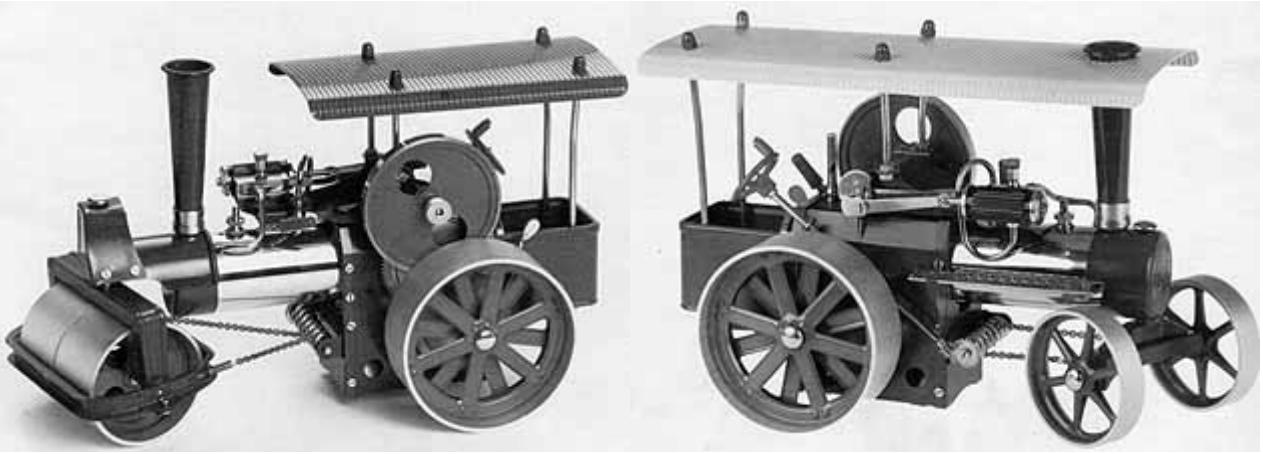
Assembly Instructions

Steam Roller D375, D376, D377 & Traction Engine D415, D416, D417

Overview



Special Notes on the Assembly

1. The assembly takes approx. 3-4 hours. Please allow sufficient time in order to avoid too many interruptions.
2. This is a valuable, demanding model. The assembly requires quiet, concentration and manual dexterity.
3. These instructions are applicable to both the steam engine as well as the traction engine. Please refer to the relevant text/picture.
4. The assembly should be carried out on a clean even table, so that no parts are lost.
5. All parts have been checked several times and fit into each other. If something does not fit, do not use force but study the assembly instructions/illustrations again.
6. Before operating the steam engine, please read and observe the operating instructions carefully.
7. After longer periods of operation, individual screws might need tightening.

Note: Brass and black/brass models. The brass parts are treated with a clear lacquer to prevent tarnishing. After usage and to prevent tarnishing, apply a further coat of clear lacquer.

Text & illustrations: Wilesco Wilhelm Schröder GmbH & Co., Germany

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Steam Roller D375, D376, D377 & Traction Engine D415, D416, D417

Stage 1, Front Part Steam Roller

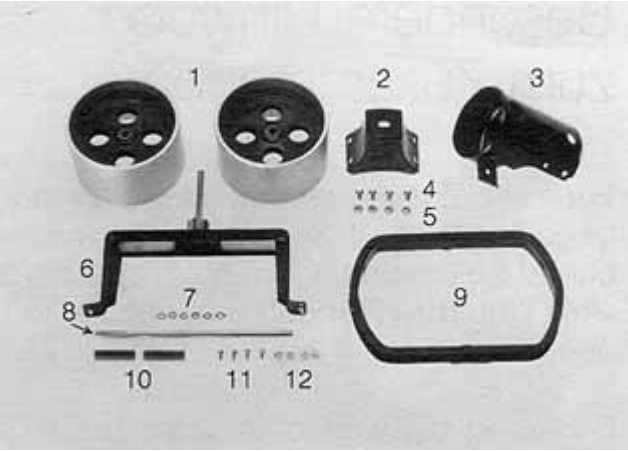

Illustration 1

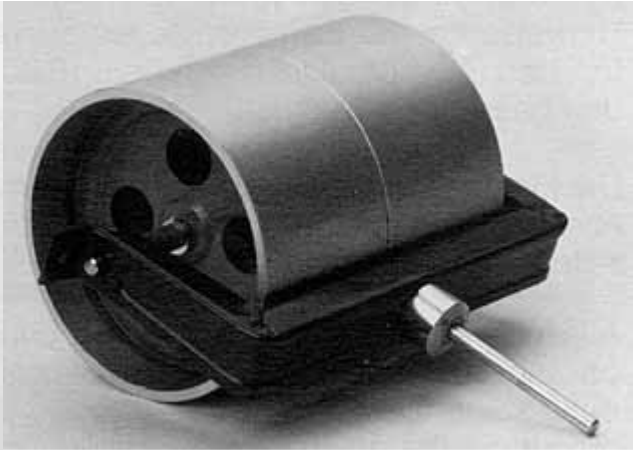

Illustration 2

1	2 x front rollers
2	1 x saddle cam
3	1 x saddle
4	4 x slot bolts M3x4mm
5	4 x hexagonal nuts M3
6	1 x roller bracket
7	6 x washers 8/4.5mm
8	1 x front axle diameter 4x116mm
9	1 x scraper harness
10	2 x spacers, red diameter 6x24mm
11	4 x slot bolts M2x6mm
12	4 x hexagonal nuts M2

Push the two front rollers (1) onto the front axle (8). The pressing nearer the roller-edge faxes outwards. Push on both sides of the front axle (8) washers (7) then a red spacer (10). Assembly of front axle with rollers in the wheel bracket (6). The play between wheel bracket and the front rollers is adjusted by means of washers (7) so that the front rollers move easily.

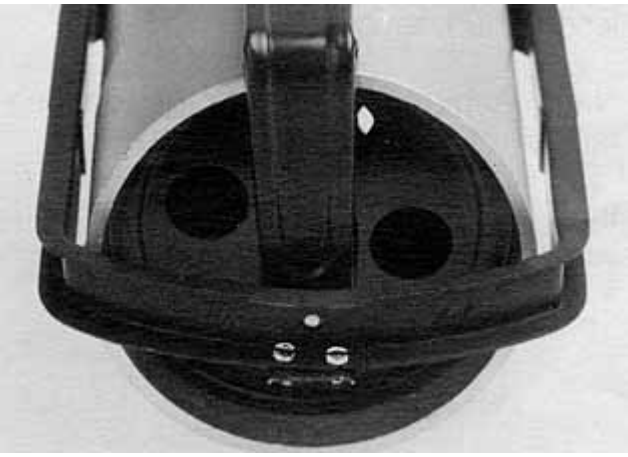

Illustration 3

Fit the scraper harness (9) with 2 slot bolts (11) m2x4mm and nuts (12), each side. Insert screws from either top or bottom and tighten well.

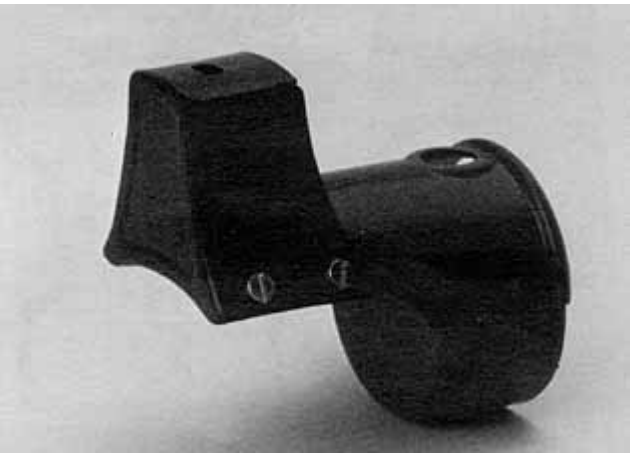

Illustration 4

The saddle cam (2) is fitted with 4 slot bolts (4) M3x4mm and nuts (5) onto the saddle (3). This front part is put to one side and connected with the boiler in stage 8.

Stage 1, Front Part Traction Engine

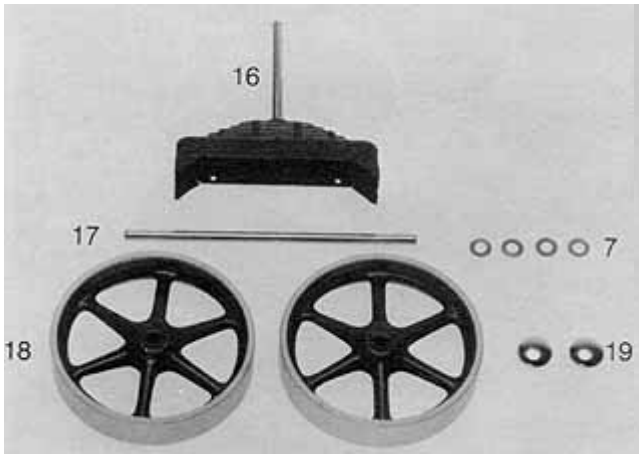

Illustration 1a

16	1 x wheel assembly traction engine
17	1 x front axle ?4 x 104 mm
7	4 x washers 8/4.5mm
18	2 x front wheels
19	2 x wheel locking caps ?4 mm

The front axle (17) is pushed trough the wheel assembly (16). The washers are fitted to both sides

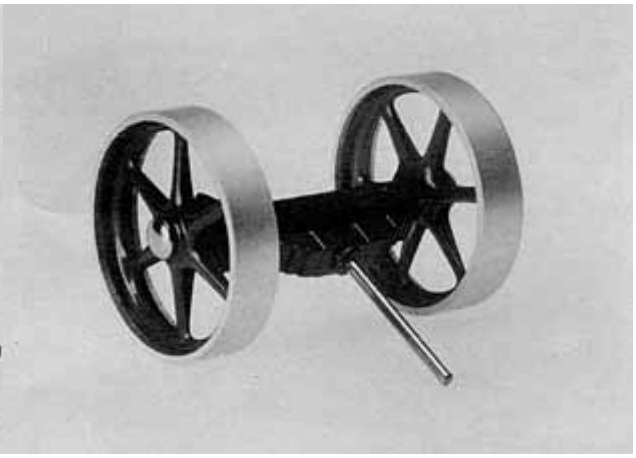

Illustration 2a

One front wheel (18) is fitted to the axle/wheel assembly and is then placed onto the table in such a manner that the front axle is in the vertical position and the wheel is on the table. The other wheel (18) is then fitted. The locking cap (19) is pushed onto the free end of the front axle. Invert the front assembly part and fit the second cap. This front part is put to one side and fitted to the boiler in stage 8.

Text & illustrations: Wilesco Wilhelm Schröder GmbH & Co., Germany

Stage 2, Burner chamber, rear

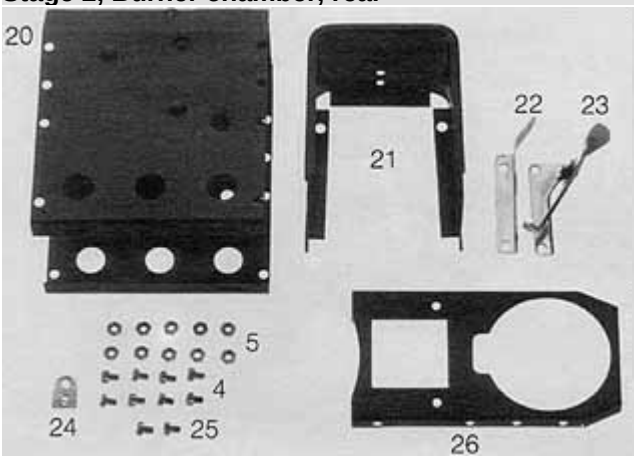

Illustration 5

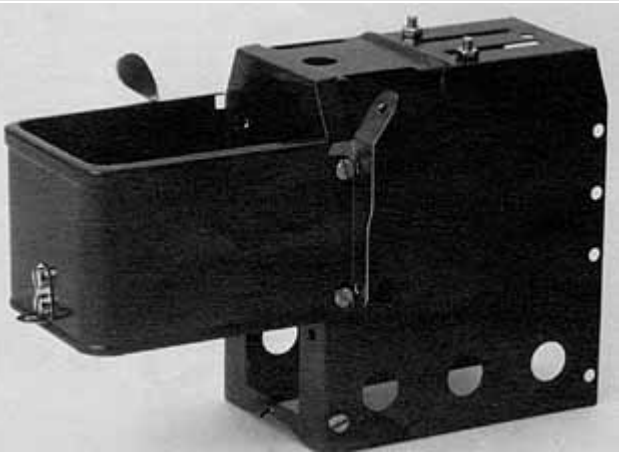

Illustration 6

20	1x burner chamber cover
21	1x control cabin
22	1x steering shaft bracket
23	1x clutch lever
24	1x tow bar
5	10x hexagonal nuts M3
4	8x slot bolts M3x4mm
25	2x slot bolts M3x6mm
26	1x burner chamber rear wall

Fit the tow bar (24) to the control cabin (21) with 2 slot bolts (4) M3x4mm and nuts (5). The two slot bolts (25) M3x6mm are inserted at the top of the burner chamber cover (20) and secured with 2 nuts (5). At a later stage the piston cylinder plate is fitted to these screws.

The rear wall of the burner chamber (26) is fitted to THAT end of the cover, which has the hole on top for the steam whistle. Then the steering shaft bracket (22) is fitted to the right hand side of the cover and driver's cabin, with 2 slot bolts (4) M3x4mm and nuts (5), using the second and fourth hole from the bottom. The steering shaft bracket **has to be mounted between** the rear wall of the burner chamber and the control cabin (see illustration 6). Secure the burner chamber rear wall at the bottom.

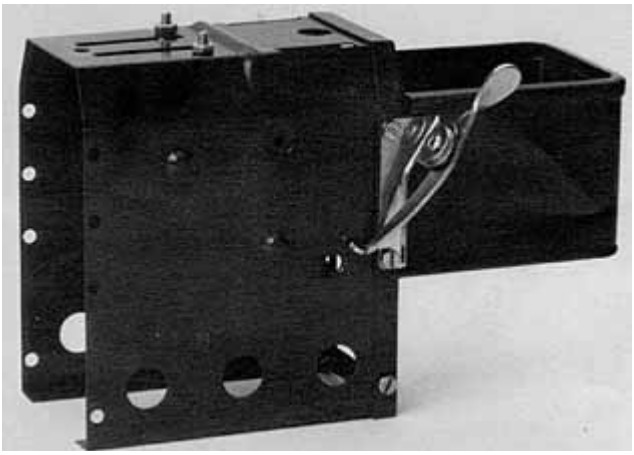

Illustration 7

Insert on the left hand side the clutch lever (23) into the second and fourth hole from the bottom with 2 slot bolts (4) M3x4mm and secure with 2 nuts (5). On completion, all screws should be checked for tightness.

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Stage 3, Burner chamber front

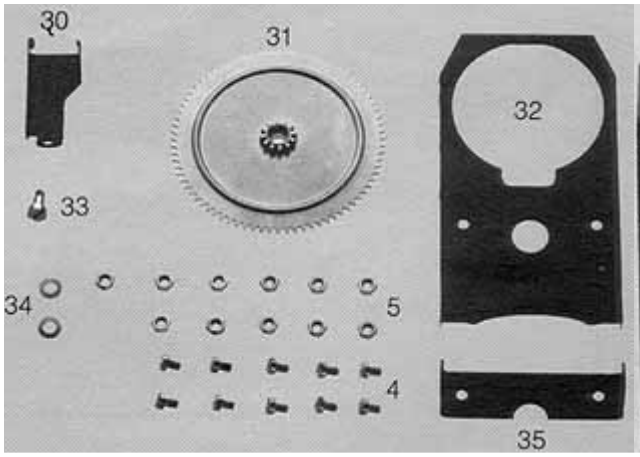

Illustration 8

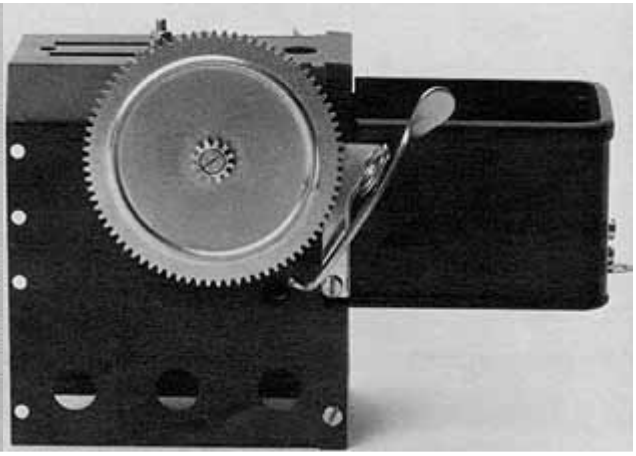

Illustration 9

30	1 x gangway bracket
31	1 x gear wheel, large
32	1 x burner chamber front wall
33	1 x collar screw M3
34	2 x washers diam. 6.7/3mm
5	11 x hexagonal nuts M3
4	10 x slot bolts M3x4mm
35	1 x worm bracket

Fit large gear wheel (31) with collar screw (33) to the outside of the burner chamber (20). Then fit 2 washers (34) and nut M3 (5) to the screw from the inside of the burner chamber (20).
Tighten carefully with the combination spanner. The gear wheel must move freely.

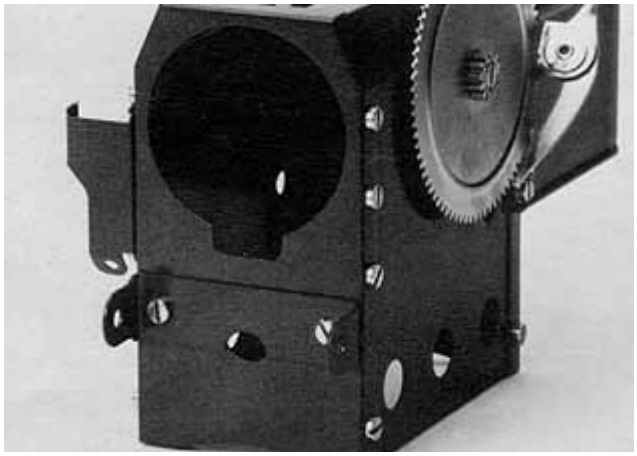

Illustration 10

Fit the worm bracket (35) with the opening facing downwards (because of air circulation) to the chamber front wall (32) with sides facing outwards, tighten well. Place front wall of chamber into position with 2 slot bolts (4) and nuts (5) and using the second and third hole from the bottom fix gangway bracket (30) through front cover onto burner chamber.

Text & illustrations: Wilesco Wilhelm Schröder GmbH & Co., Germany

Stage 4, Flywheel shaft

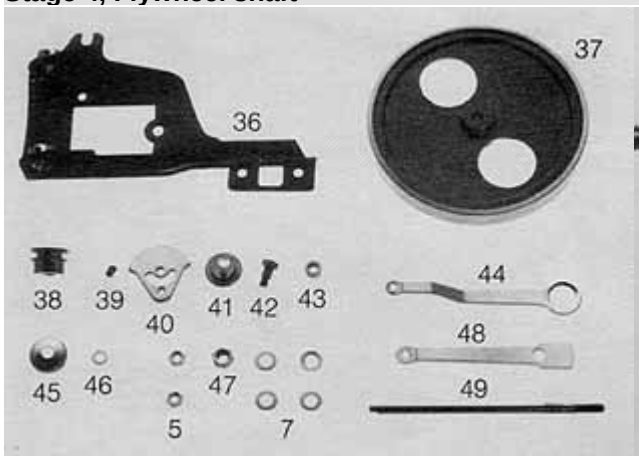

Illustration 11

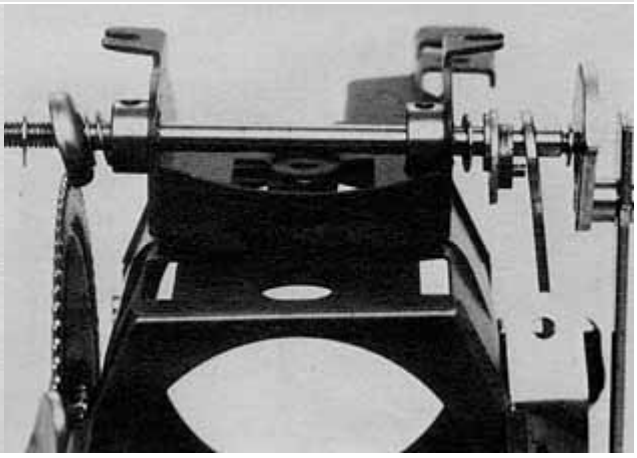

Illustration 12

36	1 x machine plate
37	1 x flywheel
38	1 x pulley
39	1 x grub screw
40	1 x crank disk
41	1 x ex-centre plate
42	1 x collar screw Mw short
43	1 x spacer diam. 6x3mm
44	1 x slide rod
45	1 x brass cap
46	1 x washer 5.6/3mm
5	2 x hexagonal nuts M3
47	1 x hexagonal nut M4
7	4 x washers 8/4.5mm
48	1 x piston rod
49	1 x flywheel shaft

This section must be assembled very carefully, as the functioning of the steam engine is dependent on it. The machine plate (36) is secured loosely with the 2 nuts (5) onto the protruding screws of the burner chamber cover. The fly wheel shaft (49) is pushed through the bearings of the machine plate, with the short thread on the right hand side. Fit 2 washers (7), the brass cap (45), and then a further washer (7) to the left hand side of the shaft. Fit a washer (7), ex-centre plate (41), and slide rod (44) with bend towards the chamber and a further washer (46) to the right hand side of the shaft. Then screw the crank disc (40) onto the right hand side of the shaft, using the middle threaded hole. The piston rod (48) is attached to the crank disc by means of the collar screw (42), with spacer (43) fitted between piston rod (48) and crank disc (40).

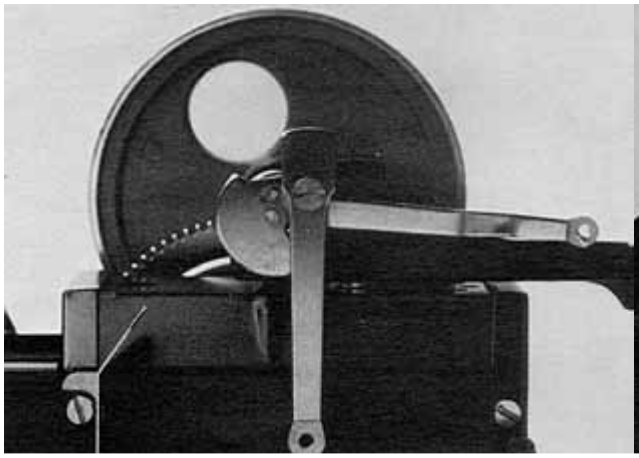

Illustration 13

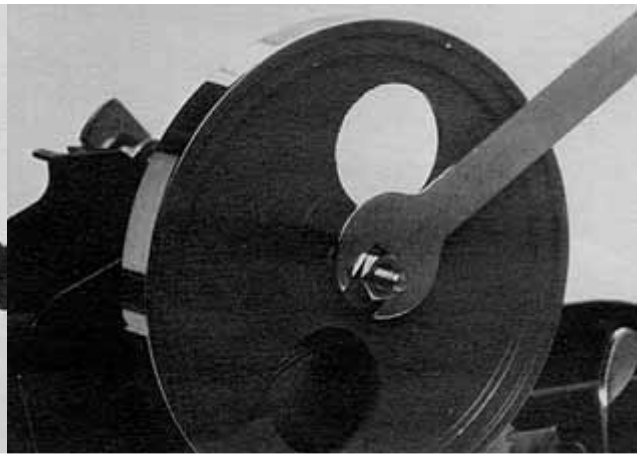

Illustration 14

Now the flywheel (39) is pushed onto the left hand side of the shaft with the pinion inwards. Screw onto the thread a washer (7) and a nut (47) M4 so that the shaft is slightly pulled inwards.
Tighten carefully all parts so that the crank disk is firmly held in place.

IMPORTANT: The small pin of the ex-centre disk (41) must move freely in the oval hole of the crank

Tighten the M4 nut with the combination spanner and move the flywheel along the shaft until the pinion engages with the large gear wheel. Ensure that the shaft is moving freely without the ex-centre pin slipping from the oval hole in the crank disk. Remove the nut M4 and the washer.

disk (40).

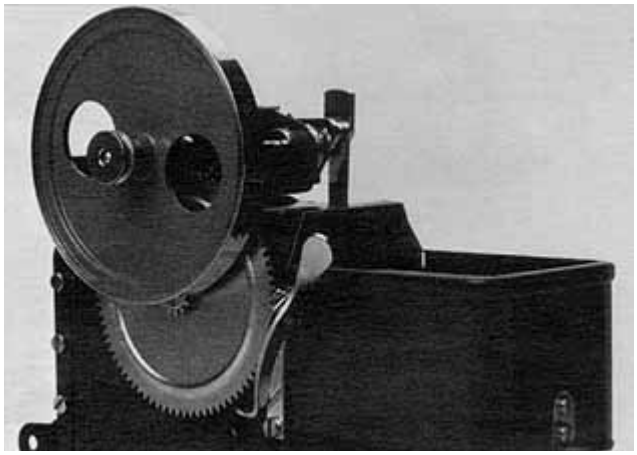

Illustration 15

Fit pulley (38) and tighten by means of the grub screw (39).

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Stage 5, Cylinder

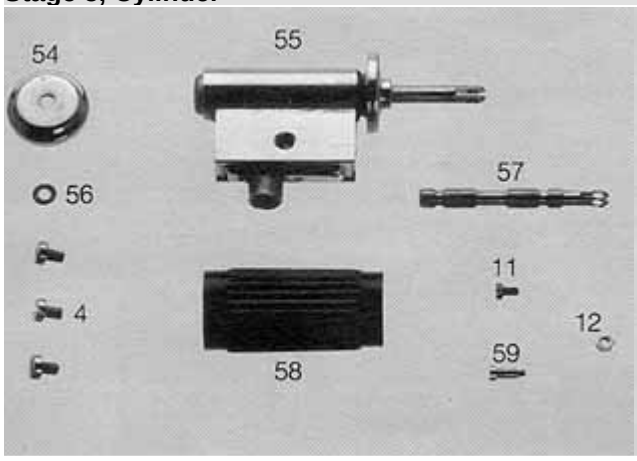

Illustration 16

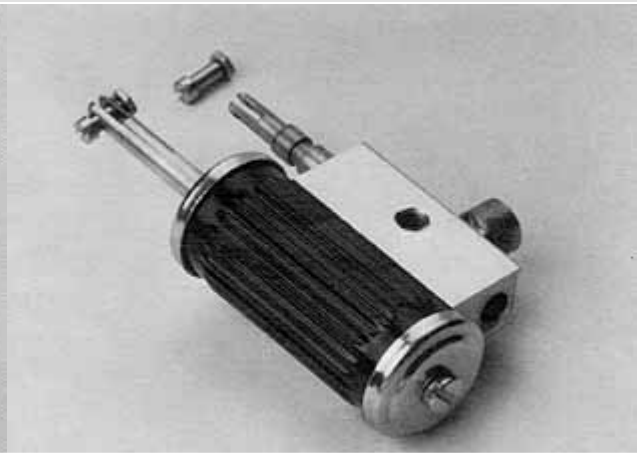

Illustration 17

54	1 x cylinder cap
55	1 x cylinder complete
56	1 x seal diameter 5.5/2.5mm
57	1 x slide valve
4	3 x slot bolts M3x4mm
58	1 x cylinder cover
59	1 x collar screw M2
12	1 x hexagonal nut M2

Push the slide valve (57) into the cylinder (55). Push on black cylinder casing (55) (nose downwards). Place the slot bolts (4) through the casing cap (54) fit seal (56) to inside of cap. Screw on cap.

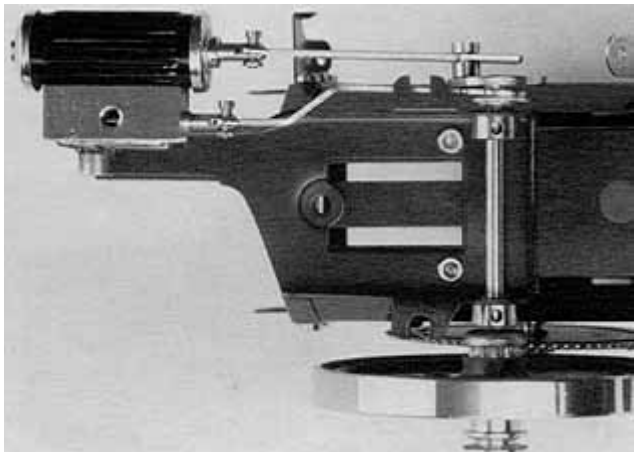

Illustration 18

Screw on cylinder with 2 screws (4) onto the machine plate. **Do not** tighten as the steam pipe must be inserted. Connect piston rod and piston with the collar crew (59) and nut (12). Then connect the slide rod to the slide valve with the slot bolt (11).

Text & illustrations: Wilesco Wilhelm Schröder GmbH & Co., Germany

Stage 6, Boiler Assembly

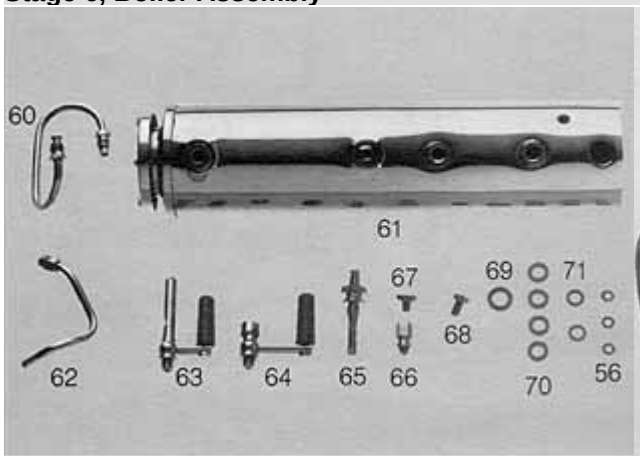

Illustration 19

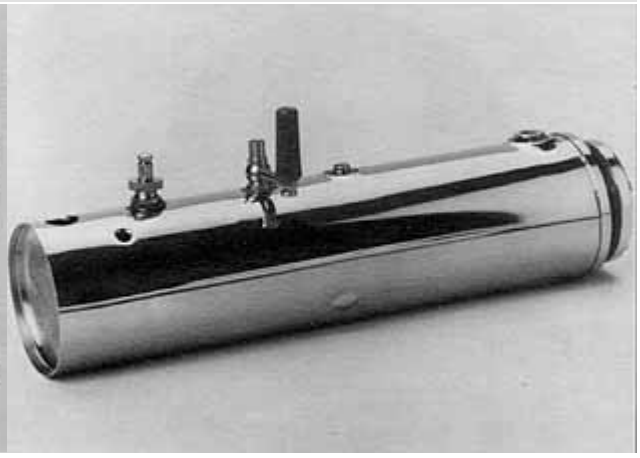

Illustration 20

60	1 x steam supply valve
61	1 x boiler
62	1 x steam exhaust pipe
63	1 x steam whistle
64	1 x steam valve
65	1 x spring loaded safety valve
66	1 x oiler body
67	1 x oiler screw
68	1 x slot bolt M4 x 6mm
69	1 x seal diam. 10/6
70	4 x seals diam. 8/5
71	2 x seals diam. 7/4
56	3 x seals diam. 5.5/2.5

The large seal (69) is placed onto the spring loaded safety valve (65). This is screwed into the boiler. The steam valve (64) is screwed into the boiler (61) with 1 or 2 seals (70) so that the lever is pointing to the left (as seen from the sight glass).
For safety reasons the boiler and the spring loaded safety valve are already assembled. The boiler has been pressure tested in the factory to 4.5 bars.

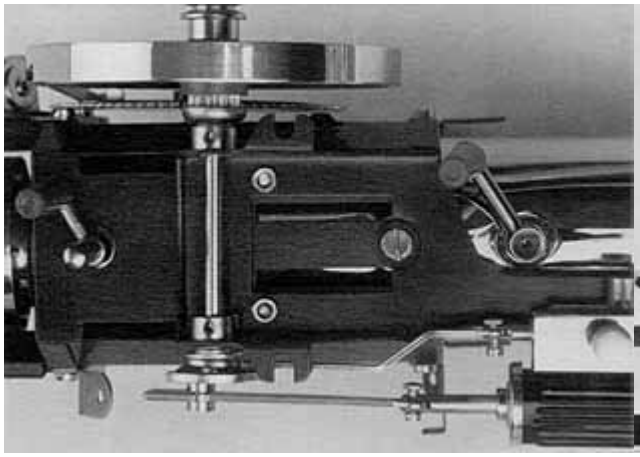

Illustration 21

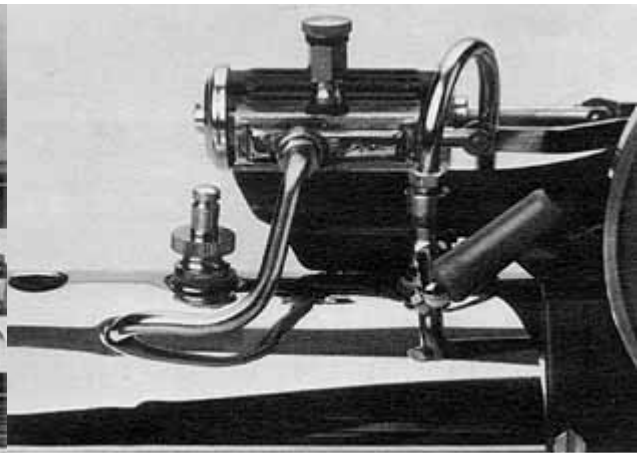

Illustration 22

Then the boiler is pushed into the burner chamber (with the sight glass towards the control cabin) with the valves pointing downwards. When the boiler has been inserted into the chamber, it should be turned, so that the valves point upwards.
The boiler is now fastened by the slot bolt (68)
The steam whistle (63) requires one ore two seals (70) so that the lever is to the rear and can be moved to the left or right. Do no over tighten.

The small seals (56) are places into the opening of the steam valve and lower cylinder. Then the steam supply pipe (60) is screwed in. First of all tighten slightly under the cylinder then at the steam valve. Be carefully to screw-in correctly. Now tighten. Fit the steam exhaust pipe (62) with seal (56) into the cylinder and boiler, and tighten. Finally tighten the cylinder with both slot bolts.

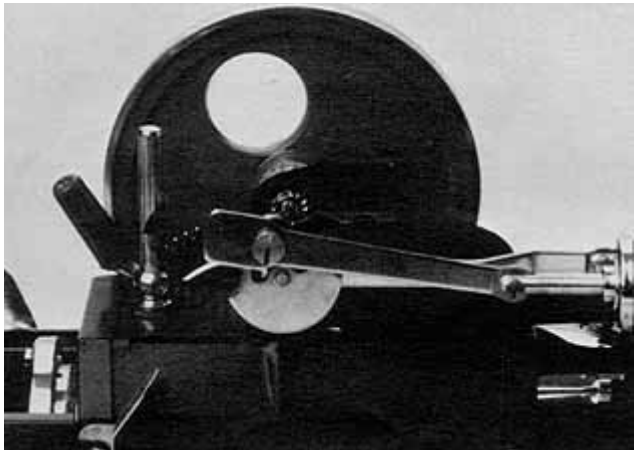

Illustration 23

Tighten the machine plate with the two nuts M3 and the slot bolt (68). Boiler, cylinder, machine plate and steam pipes are now fixed in position. The oiler body (66) requires one seal (71) and is screwed into the top of cylinder. Then the oiler cap (67) is screwed in with a further seal (71).

Text & illustrations: Wilesco Wilhelm Schröder GmbH & Co., Germany

Stage 7, Burner and Connection with cap or front part

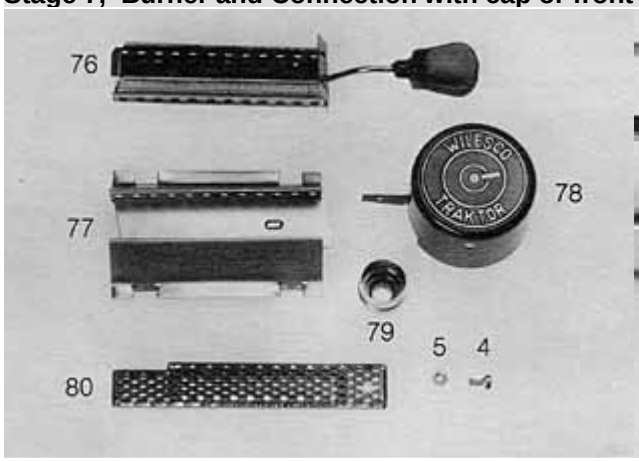

Illustration 24

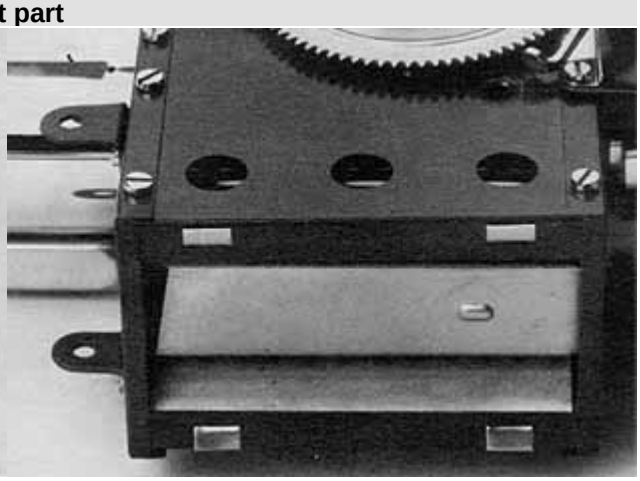

Illustration 25

76 1 x burner slide
77 1 x burner guide
78 1 x cap (only for traction engine)
79 1 x chimney shoulder screw
80 1 x gangway
5 1 x hexagonal nut M3
4 1 x slot bolt M3 x 4 mm

The burner guide (77) is placed into the burner chamber so that the four tabs pint downwards. Apply pressure from the inside with the index finger. Then bend the tabs over with a solid object (hammer handle etc.). The burner (76) can now be pushed in.

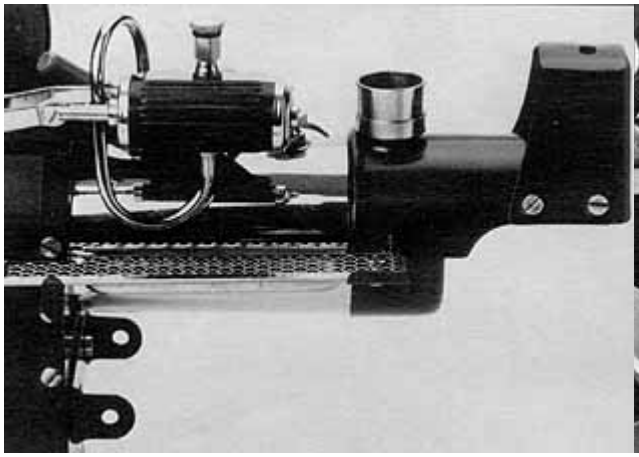

Illustration 26 ONLY FOR STEAM ROLLERS

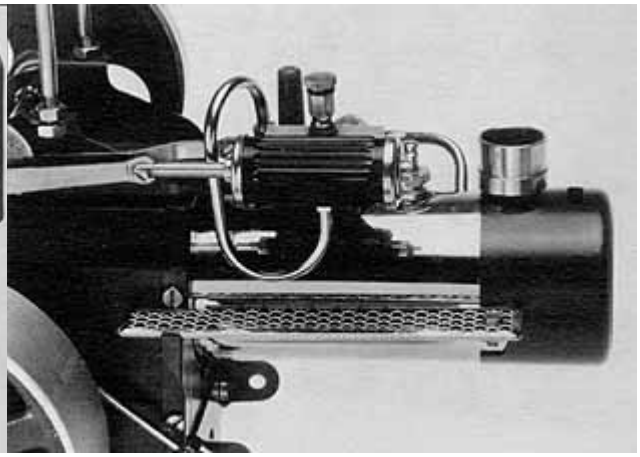

Illustration 26a ONLY FOR TRACTION ENGINES

The saddle from Stage 1 is now pushed onto the boiler and secured with the chimney shoulder screw (79). The gangway (80) is pushed into the gangway bracket, and is secured on the right hand side by means of a slot bolt (4) and nut (5).

Cap (78) is pushed onto the boiler and secured with the chimney shoulder screw (79). The gangway (80) is placed into the gangway bracket and is secured on the right hand side by means of the slot bolts (4) and nut (5).

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Stage 8, Steering

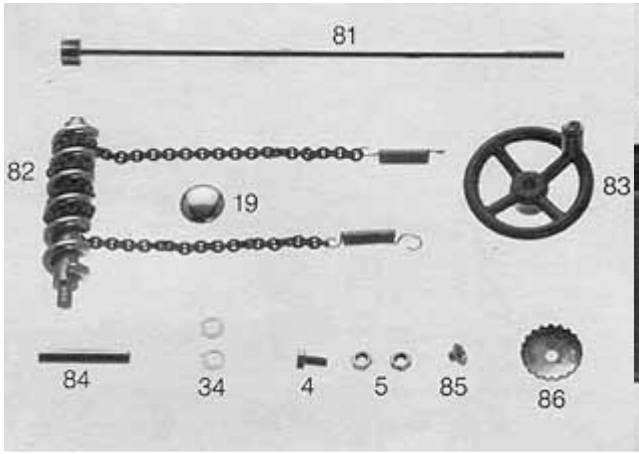


Illustration 27

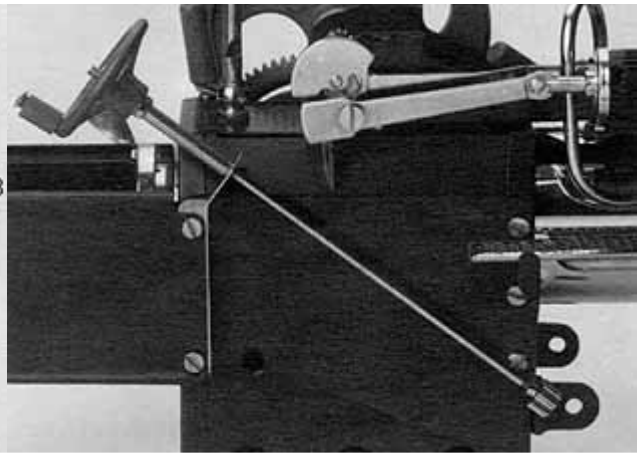


Illustration 28

81	1 x steering column with pinion
82	1 x worm with chain and springs
19	1 x safety cap diam. 4 mm
83	1 x steering wheel
84	1 x spacer, chrome long
34	2 x washers diam. 6.7/3 mm
4	1 x slot bolt M3 x 4 mm
5	2 x hexagonal nuts M3
85	1 x spacer, chrome short
86	1 x crown wheel

The steering column (81) is fitted with the short spacer (85) with the collar pointing upwards. Then it is pushed from underneath through the gangway bracket and the steering bracket. The long spacer (84) is pushed onto the top of steering column. Fit a nut (5) and a washer (34). The steering wheel (83) is pushed over the column and secured by means of a washer (34) and a hexagonal nut (5). Tighten firmly!

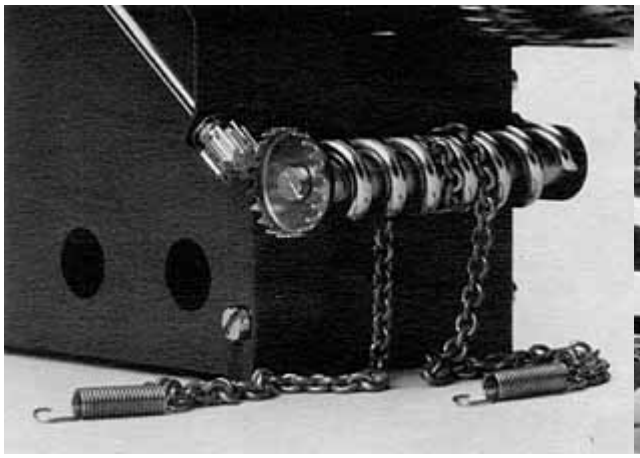


Illustration 29

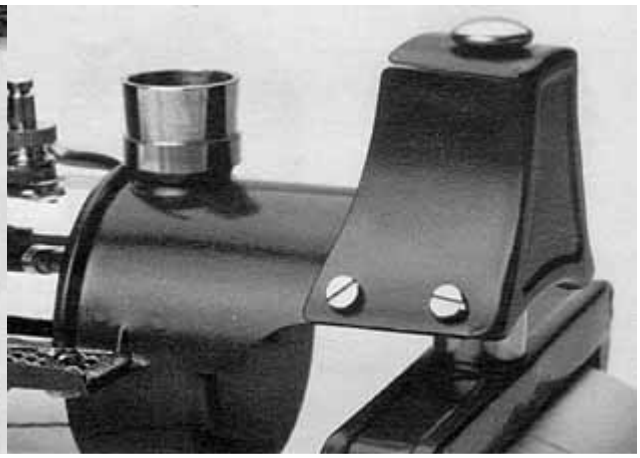


Illustration 30 ONLY FOR STEAM ROLLERS

Now the steering worm is fitted. The chain is wound on both sides around the worm, one side to the left, the other side to the right. The worm (82) is placed into the bracket and secured on the right hand side with crown wheel (86) and slot blot (4). Tighten securely!

The vertical shaft on the front wheel bracket from Stage 1 is placed through the saddle cam and is secured with the locking cap (19) in such a way that the holes of the scraper harness (9) point **forwards.**

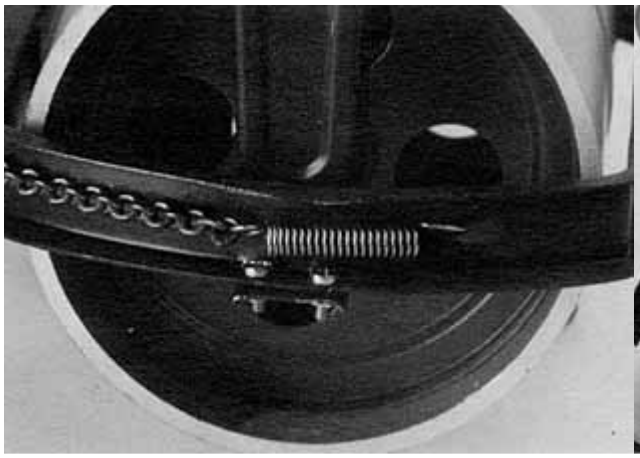


Illustration 31

Place the spring of the steering chain into the scraper harness on the left hand side. Using a strong piece of string for tensioning purposes. Pull the right hand spring and locate into scraper harness.

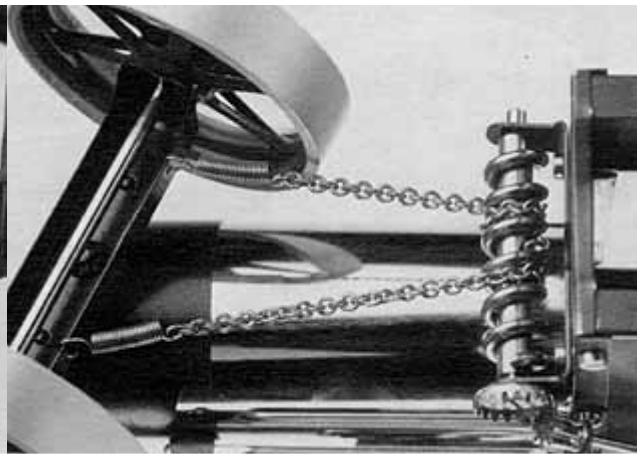


Illustration 31a ONLY FOR TRACTION ENGINES

The vertical shaft on the front wheel bracket from Stage 1 is placed from underneath through the hole in the cap (similar to illustration 30). The two small holes in the wheel bracket must point **rearwards**. The safety cap (19) is placed onto the taper and pushed home.

The photo (illustration 31a) shows the underneath of the traction engine. Place the springs of the steering chain from underneath into the small holes of the wheel bracket. The steering is complete now.

Text & illustrations: Wilesco Wilhelm Schröder GmbH & Co., Germany

Stage 9, Rear Wheels

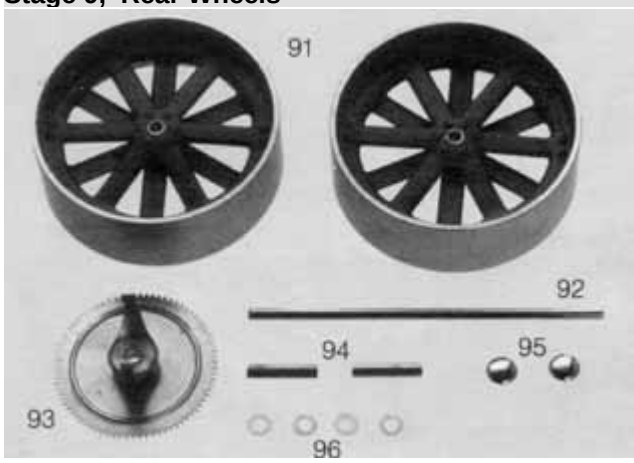


Illustration 32

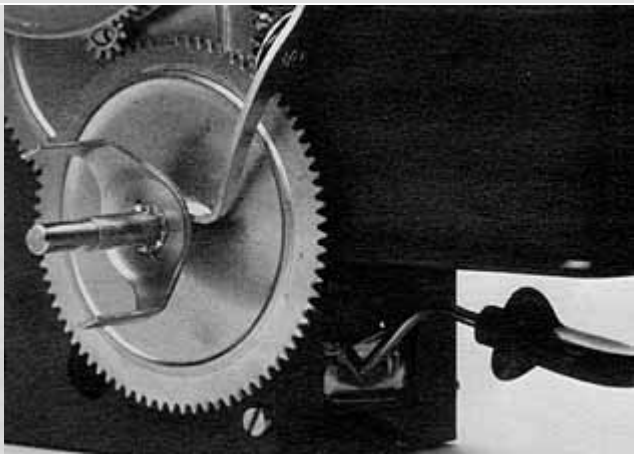


Illustration 33

91	2 x rear wheels
92	1 x rear axle diam. 5/142 mm
93	1 x gear wheel with drive
94	2 x brass spacers diam. 7x29 mm
95	2 x safety caps diam 5mm
96	4 x washers diam. 10/5.5 mm

The rear axle (92) is pushed through the burner chamber housing. One washer (96) is placed on right the hand side and two on the left hand side. On the left hand side the rear axle must not protrude more than approx. 3mm. A spacer (94) is pushed into the cog wheel (93) and both are pushed onto the rear axle. Now the axle is pushed through, so that it protrudes an equal distance on both sides. The clutch lever must be located between the cog wheel and the drive prongs.

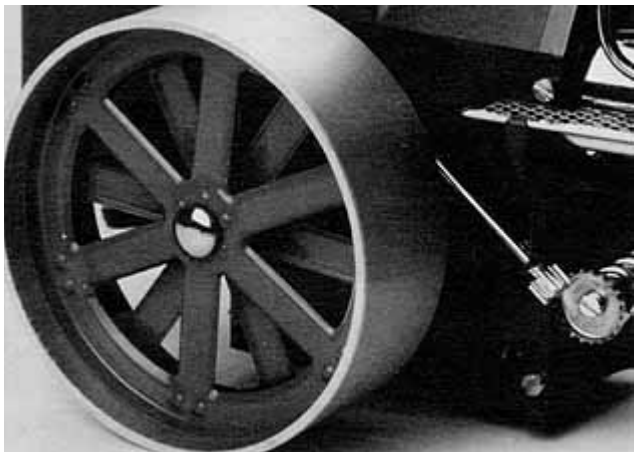


Illustration 34

A rear wheel (91) is pushed on during which the prongs must grip between the spokes of the wheel. Push on wheel locking cap. On the other side, the spacer (94) and wheel (91) are pushed on and secured with the wheel locking cap.

Text & illustrations: Wilesco Wilhelm Schröder GmbH & Co., Germany

Assembly Instructions

Steam Roller D375, D376, D377 & Traction Engine D415, D416, D417

Stage 10, Roof and chimney for Steam Roller

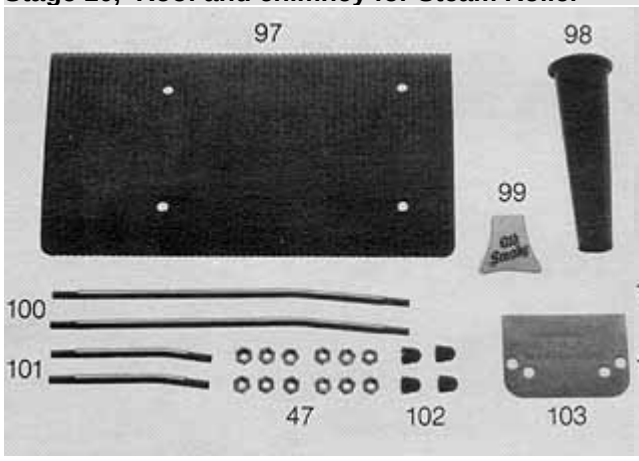


Illustration 35 ONLY FOR STEAM ROLLER

97	1 x roof
98	1 x chimney
99	1 x sticker "OLD SMOKY"
100	2 x roof supports, long
101	2 x roof supports, short
47	12 x hexagonal nuts M4
102	4 x cap screws
103	1 x base plate

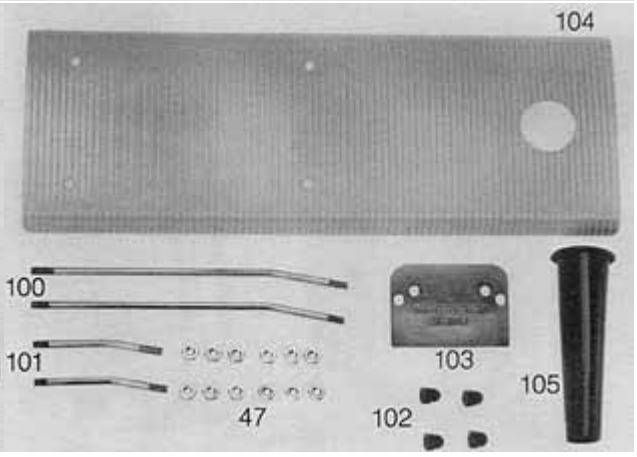


Illustration 35a ONLY FOR TRACTON ENGINES

104	1 x roof
105	1 x chimney
100	2 x roof supports, long
101	2 x roof supports, short
47	12 x hexagonal nuts M4
102	4 x cap screws
103	1 x base plate

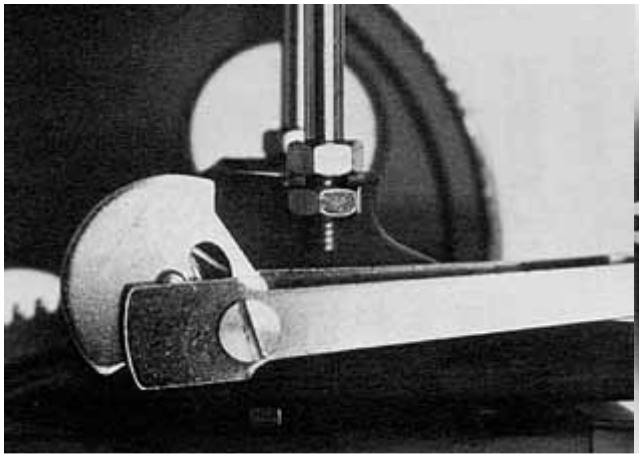


Illustration 36

The short roof supports (101) are loosely fitted to the machine plate on the left and right hand sides. The shorter straight piece is as the bottom.

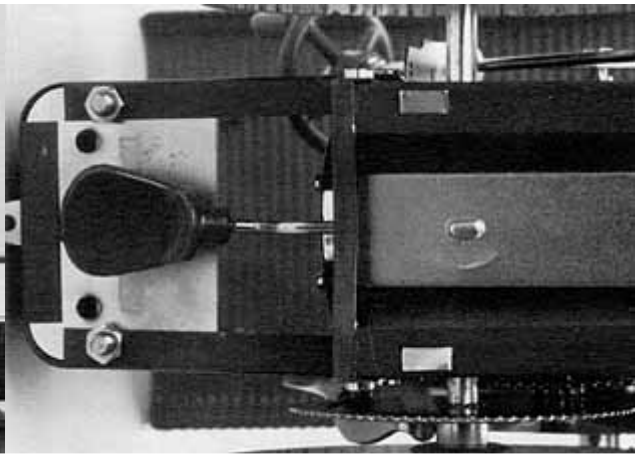


Illustration 37

Fit the base plate (103). Screw nut (47) onto the long roof supports (100) with the long straight part pointing downwards. Now push through the base plate and secure with second nut (47) loosely.

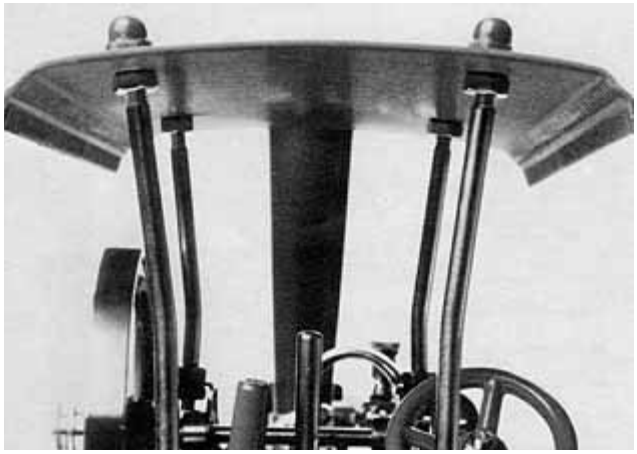


Illustration 38

Screw a nut (47) on the top of the roof support and place the roof (97/104) on the top so that the front protrudes forwards (traction engine only). Fit cap crew (102) and tighten. Not too tight otherwise the thread is damaged. Straighten out roof and tighten all nuts.

Insert chimney (98/105) with fold pointing backwards. Stick the sticker "OLD SMOKY" (99) to the saddle cam of the steam roller.

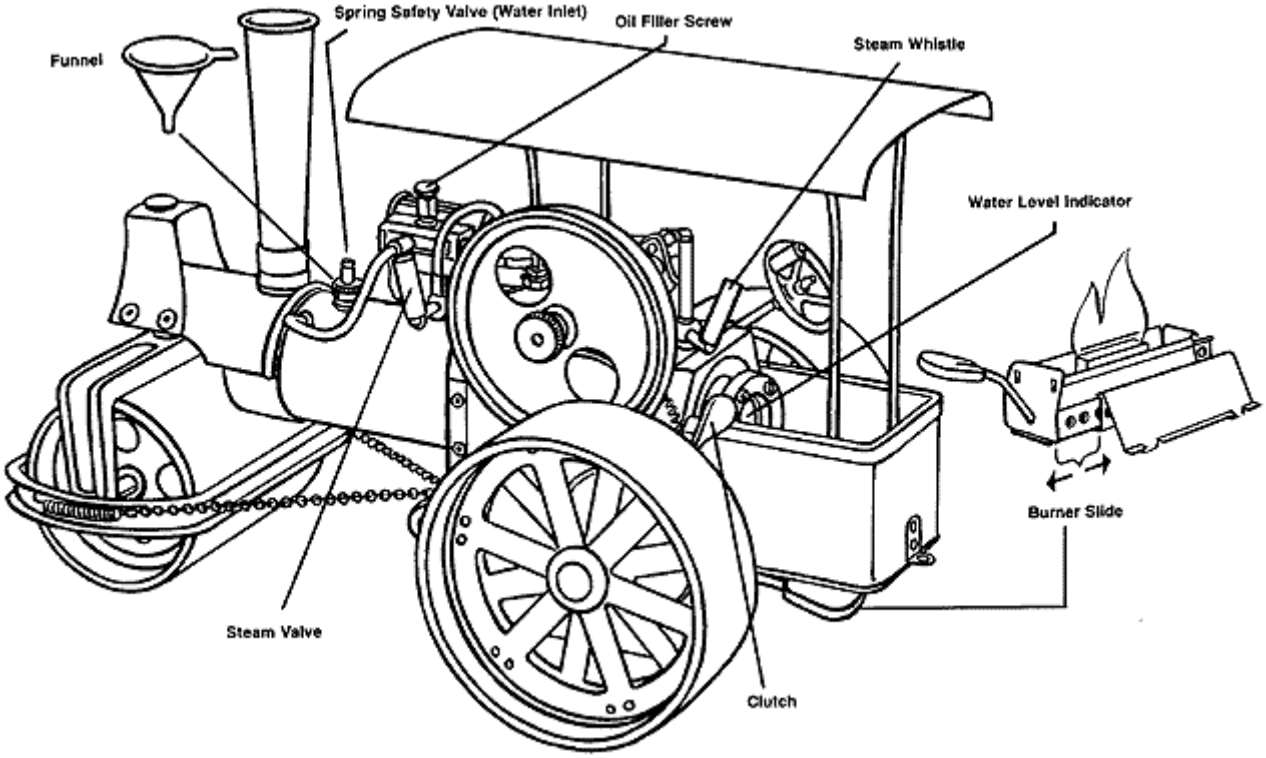
CONGRATULATIONS, YOU HAVE FINISHED!

Text & illustrations: Wilesco Wilhelm Schröder GmbH & Co., Germany

Assembly Instructions

Steam Roller D375, D376, D377 & Traction Engine D415, D416, D417

Operating instructions



Important information and safety precautions!

1. **For safety reasons, children (recommended age: 8 year and above) should only use the Steam engine under adult supervision.** (Because of steam pressure, hot boiler, hot steam pipes and flames etc.) Do not leave the steam engine unattended either during operation or whilst the engine is cooling after operating.
2. If any problem occurs with the steam engine, the matter should only be dealt with by a distributor or the WILESCO factory. Attempts to repair by other persons will invalidate the warranty.
3. Any alteration to the Standard specification carried out by persons (other than WILESCO Agents) will also invalidate the warranty.
4. Only WILESCO genuine parts or accessories should be used (boiler, spring loaded safety valve etc.) as these have been factory tested. For safety reasons, the spring safety valve must not be adjusted. It is illegal to operate a steam engine without a spring safety valve. Always check the valve for correct operation before use.
5. **High temperature:** The principles on which your steam engine operates mean that the burner tray, the boiler housing, the spring loaded safety valve, the steam pipes etc. become very hot. Do not touch, in order to avoid the risk of burns!
6. **Safety precautions:** Do not touch and in particular do not let the children touch any of the moving parts while the steam engine is in operation.
   6a) In the case of an emergency or if the engine has to be moved, the model can be lifted by the roof.
7. **Do not heat the boiler without sufficient water!** Always ensure that the steam engine has sufficient water in the boiler during operations. Also check the water level carefully when adding new dry fuel tablets. The water **must be visible at the lower end of the sight glass (minimum).** If this instruction is ignored the boiler will be damaged and has to be replaced. **We will not accept any claims whatsoever, including consequential damage, in this matter.** If a leak occurs in the boiler, or any other part, stop using the steam engine immediately. Any necessary repairs should only be carried out by trained staff, of at the WILESCO factory.
8. The steam engine meets all safety standards and requirements. Every boiler has been submitted to a bursting pressure and water test of 5 bar (approx. 71 psi). Boiler content 240 ccm, operation pressure 1,5 bar (21 psi).
9. Please keep the instructions in a safe place!

Operating instructions:

10. Unscrew the spring loaded safety valve and, using the funnel, fill the boiler approx. full (upper level to the sight glass) with hot water if possible. Raise the funnel slightly when pouring in the water so that the air can escape from the boiler. Use boiled water or rain water if possible (low chalk content).
11. **Note:** The steam whistle can be used to check for any overpressure in the boiler or, before oiling, to check whether the boiler is still under pressure.
12. Close the steam cut-off valve before oiling the cylinder. The valve is closed when the lever is below approx. 45 deg pointing backwards (towards sight glass) and open when the lever is below approx. 45! Pointing forwards (towards smoke stack). Now unscrew the oil filler screw and fill with WILESCO steam engine oil or car engine oil while turning the flywheel several times so that the oil is drawn in. Oil frequently so that the piston does not seize. 2-3 drops of oil are sufficient for approx. 10 minutes operating time. For safety reasons the steam cut-off valve must be closed when oil is being added. There must not be any steam pressure in the boiler. Lightly oil all the bearings and linkages. Before refilling the boiler with water, the pressure in the boiler has to be released by opening the steam whistle.
13.  Place two layers of ESBIT fuel tablets in the burner slide, the lower tablets flat and the upper tablets on their sides. Then light the tablets. Never use more than 4 fuel tablets at a time. Use only the original WILESCO burner slide. **Caution: Because of the risk of danger from an open flame, always take the necessary safety precautions.** The burner slide is adjustable. The oxygen supply and the flame height can be adjusted by moving the burner slide in relation to the air holes (see illustration). Before adding new fuel tablets always check the water level and refill the boiler with water to ensure that the boiler does not run dry. The ratio of fuel tablets to the amount of water in the boiler is designed so that the boiler cannot run dry without fuel tablets being added. The fuel slide must be completely pushed in. **Important:** After completing the heating process, **remove the burner slide from the guide whilst it is still hot,** otherwise unburned fuel may cause the slide to jam. If the slide becomes jammed, it can be removed by tilting it slightly to the left or right. Widen the guide slightly using a standard pair of flat pliers.
Note: ESBIT tablets require plenty of oxygen to burn properly. **This means if used indoors the room should be well ventilated.** To prevent unpleasant smells, the fuel tablets should be allowed to burn out they should not be blown out. If there is insufficient water in the boiler, place the burner slide on a metal plate until the tablets have burned out completely.
14. Disengage the gears next to the driver cab, by moving the clutch lever sideways. When the water starts to bubble open the steam valve and turn the flywheel by hand, so that the condensation in the pipe and cylinder can escape. Engage clutch and put steam engine into operation, by gently spinning the flywheel. The flywheel can be started-up in either direction, which enables forward and reverse movement. The speed can be adjusted by means of the steam stop valve.
15. The exhaust steam which does not escape through the chimney collects as water-oil-condensation in the container under the chimney, which is why the steam pipe is not soldered, since no pressure develops in the condensation container (separate from the boiler). After using, remove the chimney and remove the condensation through the chimney hole, by banging lightly.
16. The Steam Roller (and Traction engine) can, with the clutch disengaged, be used as a stationary steam engine. By using the belt drive on the flywheel, the WILESCO range of driving models can be operated. When the Steam Roller is used as a stationary engine the clutch must always be disengaged.
17. After use, remove any water left in the boiler. **Be very careful if the water is still hot!** Any water left in the boiler cannot do any damage, but might leave sediment on the sight glass. Any soot formation on the lower surface of the boiler can be removed with a brush, e.g. an old toothbrush. Finally, dry the model using a clean cloth. **Never** remove chalk residues on the sight glass with vinegar.

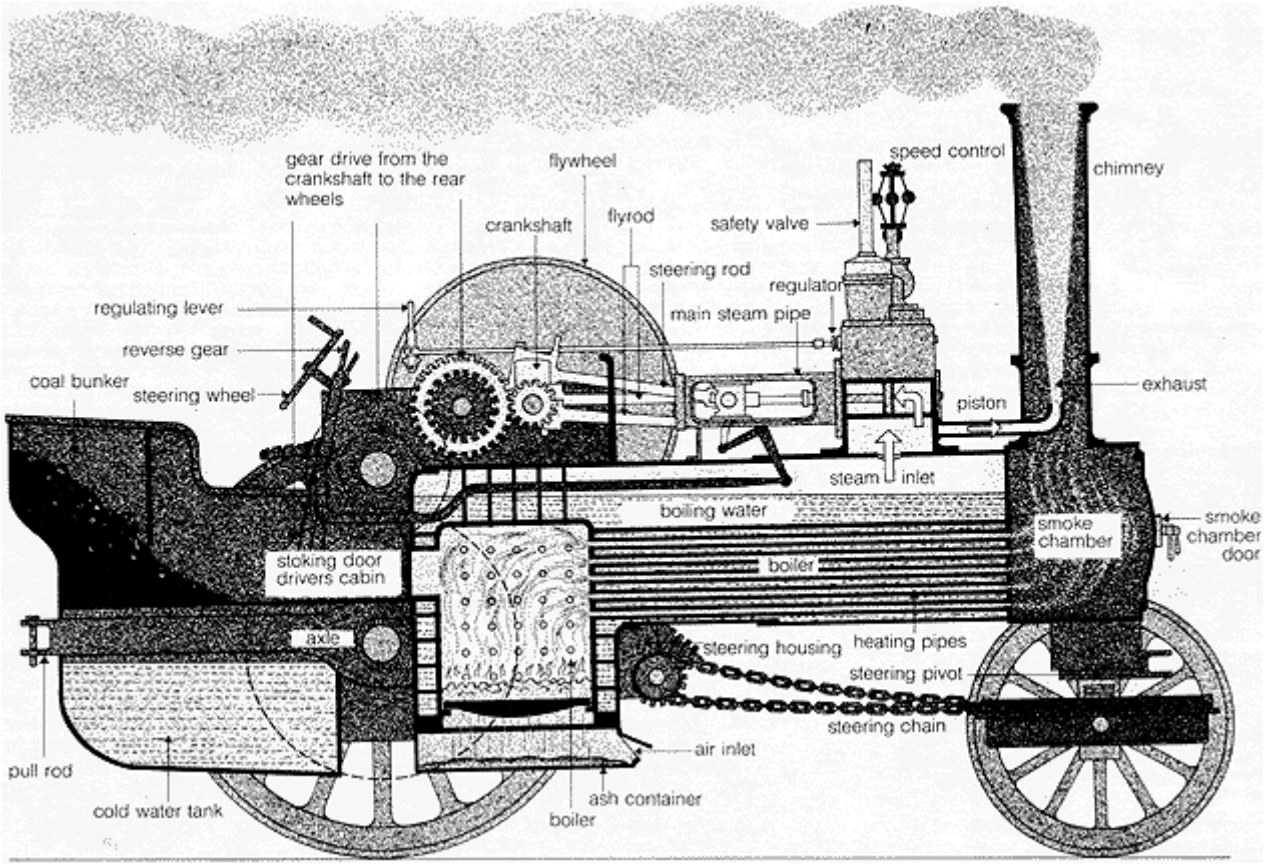
Warranty:

18. Finally, a few comments on the warranty. All WILESCO steam models are carefully checked before leaving the factory. However, if a problem arises, we will be happy to assist, or carry our repairs. You can return the steam engine directly to WILESCO or to the distributor. **We are sure you will appreciate fired models cannot be exchanged, but we undertake to repair any fault.** The above information has been given for you to obtain the maximum enjoyment from your steam engine WILESCO wishes you lots of fun, and Full steam ahead?

Remote control is available for fitting to the steering wheel of the Steam Roller and Traction engine; the part no. is **Z361** and can be ordered via your WILESCO retailer.

Text & illustrations: Wilesco Wilhelm Schröder GmbH & Co., Germany

The Functioning of the Original Steam Engine



The driver of the steam engine or stoker shovels the coal through the stocking door into the boiler. The coal is being burnt.

The boiler/firing chamber is supplied with fresh air via the air supply from underneath. The combustion air which is heated to high temperatures moves from the boiler through the steam tubes of the boiler (water tank) into the combustion chamber and from there to the chimney. This is how the steam pressure which accumulates in the enclosed boiler is transferred in the cylinder into motional energy. The exhaust steam (condensation) is led via the exhaust into the chimney. The evaporated water is replaced by fresh water from the cold water tank. The motion of the piston rod is transferred by means of the crankshaft and the gear wheels onto the large rear wheels. Every steam engine has, as opposed to a steam locomotive, a large flywheel.

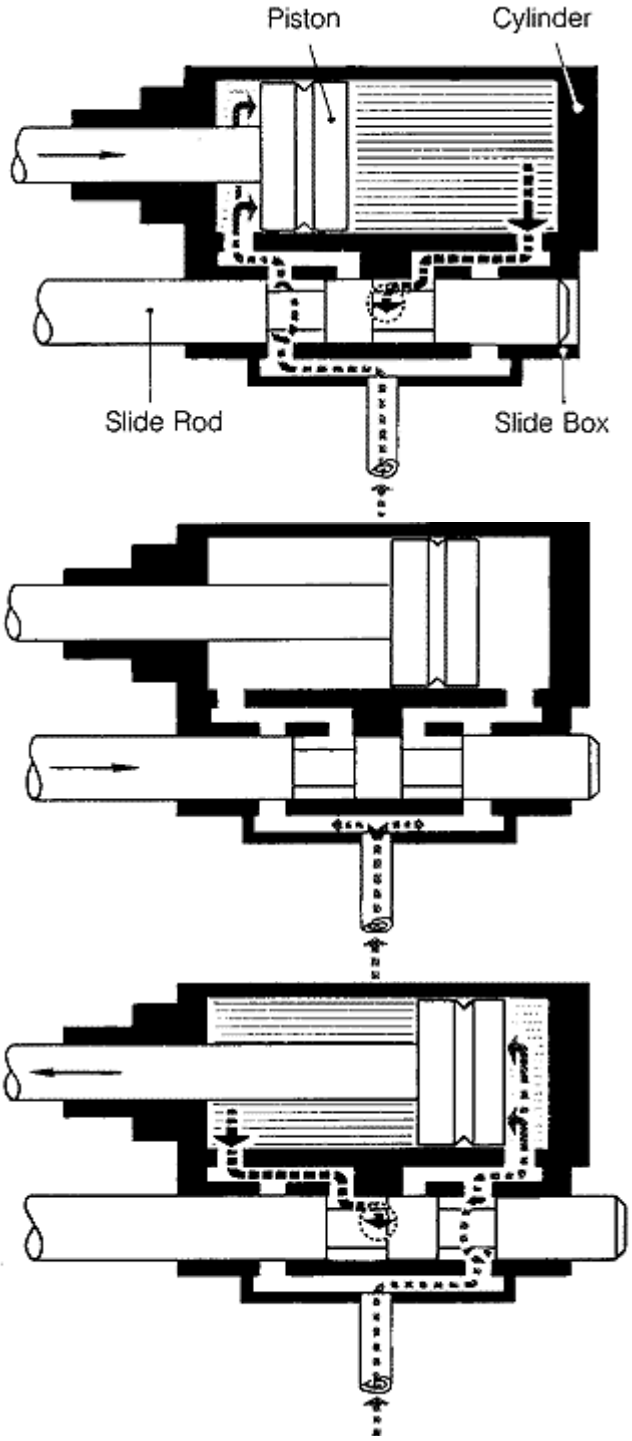
The flywheel is needed in order to overcome the dead center of the piston in the cylinder and serves also as energy storage to absorb load surges. In contrast to the steam engine the steam locomotive has two or more cylinders whereby the offset piston arrangement overcomes the dead center and for that reason a flywheel is not required.

The WILESCO-steam engines/traction engines work on the same principal as the old originals. However, instead of burning coal or coke a dry fuel tablet is used to heat the boiler.

Text & illustrations: Wilesco Wilhelm Schröder GmbH & Co., Germany

The Energy Transformation in the Cylinder

The diagrams on the right show what actually happens inside the power converting system (piston and cylinder) when fire and water are brought together to produce mechanical energy, energy to drive a drilling machine, a saw, locomotive or steam roller.



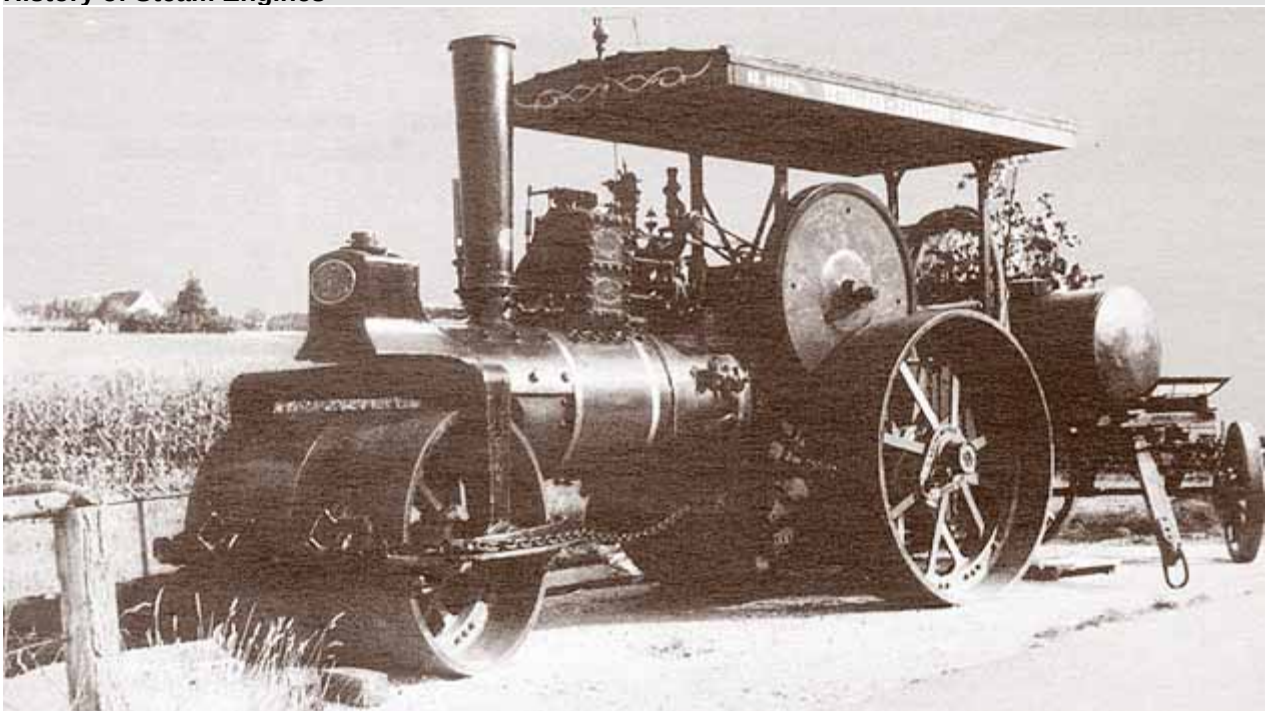
In the first diagram the steam can be seen passing to the left side of the piston, pushing the piston to the right. At the same time the exhaust steam from the previous stroke is directed, by the other port on the slide valve, out into the atmosphere, having done its useful work.

Just before the piston reaches the end of it 뭩 travel, on the extreme right, the slide valve cuts off the steam from the boiler. This is the point, where the crank is at the limit of its movement and is known as Top-dead-centre or Bottom-dead-centre? Referring to the two possible geometric positions. The flywheel carries the crank over this critical position by the energy it has stored from previous power strokes.

The slide valve continues to move in the same direction this time opening the inlet port to admit steam to the right hand side of the piston, again pushing the piston but now to the left, exhausting the steam through the left hand port. The whole cycle being repeated when the Dead centre is reached once more.

Text & illustrations: Wilesco Wilhelm Schröder GmbH & Co., Germany

History of Steam Engines



Approx. 1705	Papin/Newcomes built the first machine operated by steam.
Approx. 1765	Watt built the first industrial steam engine.
Approx. 1800	Use of steamships, steam locomotives, heavy goods vehicles, road rollers, fire engines and widely used in factories to drive machines.
Up to Approx. 1960	Use of steam for road rollers in Europe.
	Nowadays steam engines have mainly been replaced by diesel or electro-motors (stationary).
	Nowadays we find steam engines in museums or at collectors.
	In the veterans display at Dissen in the Teutoburger Wald you will find this steam engine.

Text & illustrations: Wilesco Wilhelm Schröder GmbH & Co., Germany

Accessories

Illustration 39

Following items are included:

110 1 x screwdriver
111 1 x cylinder oil
112 1 x funnel
113 1 x dry fuel ESBIT
114 1 x combination spanner
115 1 x small spanner

Additional Options:
Remote Control and Trailers

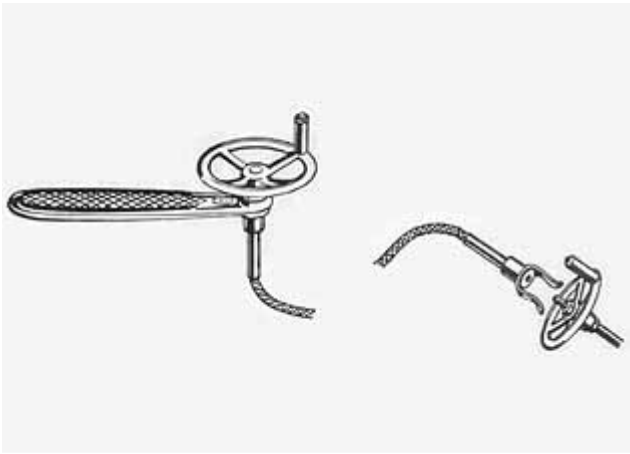


Illustration 40
Remote Control
Very suitable for all steam roller/steam tractors. An extension to the steering wheel by means of a strong Bowden cable which is fitted to the steering wheel by means of a spring. Color red.
Length approx. 100cm
Item-No. Z361

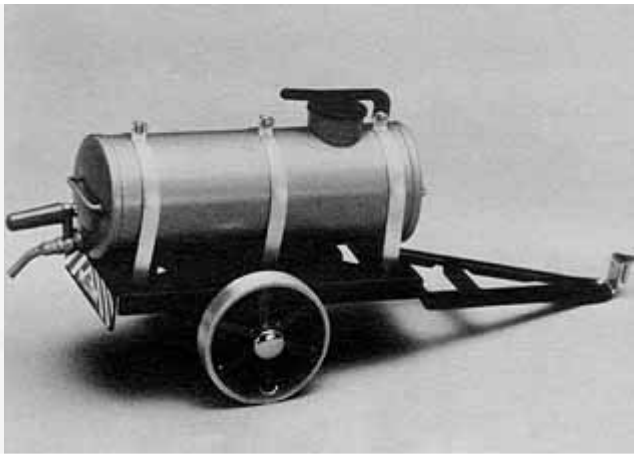


Illustration 41
Water-Cart
A beautiful sprinkler as trailer, very strong, finished in metal, with stop cock and tow bar.
Size 25 x 9 x 11cm
Item-No.: A385 (painted)
Item-No.: A386 (black/brass)
Item-No.: A387 (brass)
Item-No.: A388 /black/nickel)

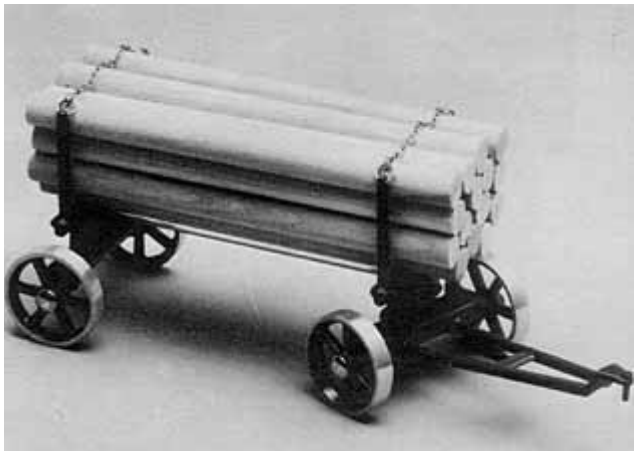


Illustration 42
Lumber Wagon
The chassis is finished in metal and is loaded with 15 logs in natural wood, having a diameter of 16mm x 22cm long.
Size 33 x 11 x 13cm
Item-No.: A425 (blue)
Item-No.: A426 (black/(brass)