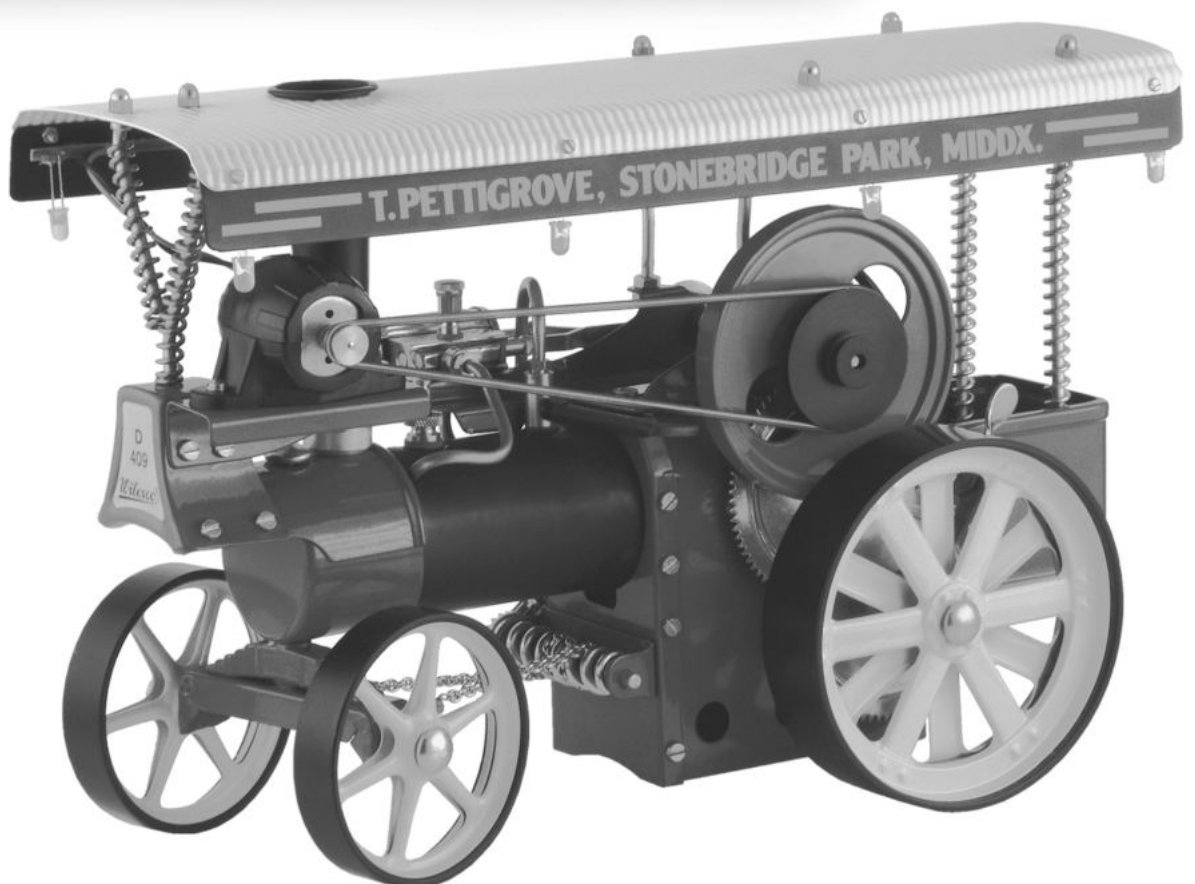


# Assembly Instruction „Showman's Engine“



## D 419



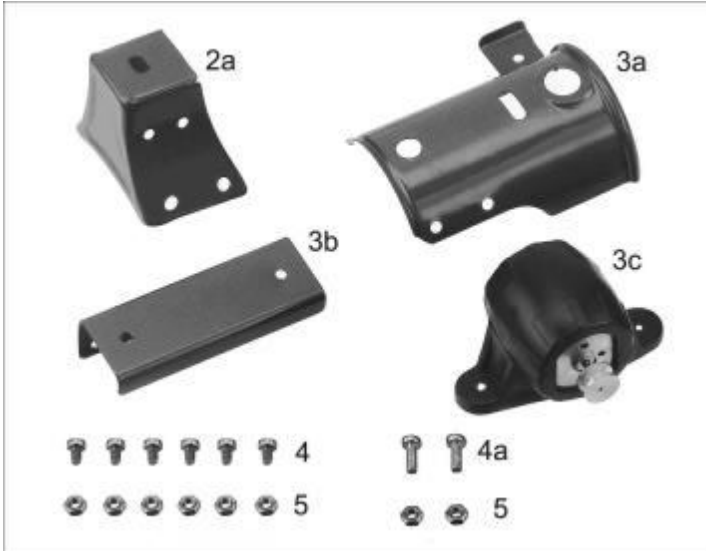


Illustration 1

### Stage 1

#### Front Part:

- 2a 1 x saddle cam
- 3a 1 x saddle
- 3b 1 x dynamoholder
- 3c 1 x dynamo
- 4 6 x slot bolts M3 x 4 mm
- 5 8 x hexagonal nuts M3
- 4a 2 x slot bolts M3 x 8 mm



Illustration 2

The dynamo (3c) is fitted with two M3 x 8 mm bolts and nuts (5) onto the dynamo holder (3b).

The dynamo holder (3b) is now connected to the side of the saddle cam (2a) with two slot bolts (4) M3 x 4 mm and nuts (5).

The saddle cam (2a) is fitted with four slot bolts (4) M3 x 4 mm and nuts (5) onto the saddle (3a).

(This part is now put to one side and connected to the boiler in stage 7)

## Stage 1, Traction Engine

### Front Part

- 16 1 x wheel assembly traction engine
- 17 1 x front axle  $\text{Ø } 4 \times 104 \text{ mm}$
- 7 4 x washers  $8/4.5 \text{ mm}$
- 18 2 x frontwheels
- 19 2 x wheel locking caps  $\text{Ø } 4 \text{ mm}$

The front axle (17) is pushed through the wheel assembly (16). Washers (7) are fitted to both sides.



Illustration 3



Illustration 4

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 locking cap. This front part is put to one side and fitted to the boiler in stage 8.

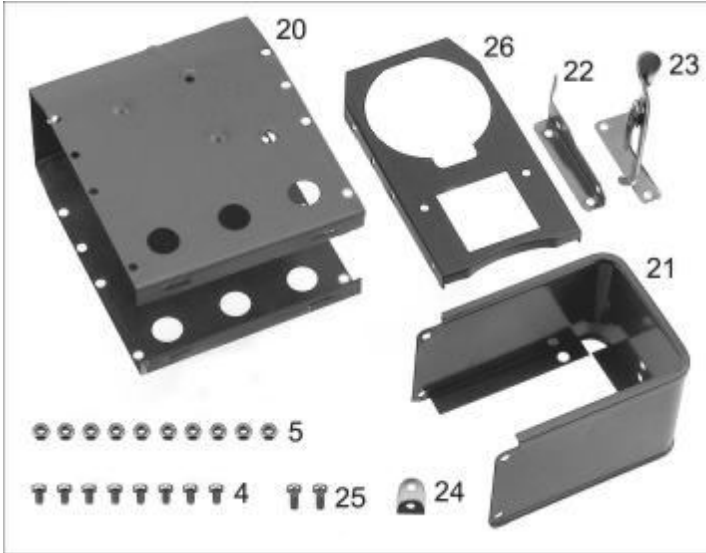


Illustration 5

## Stage 2

### Burner chamber, rear

- 20 1 x burner chamber cover
- 21 1 x control cabin
- 22 1 x steering shaft bracket
- 23 1 x clutch lever
- 24 1 x tow bar
  - 5 10 x hexagonal nuts M3
  - 4 8 x slot bolts M3 x 4 mm
- 25 2 x slot bolts M3 x 6 mm
- 26 1 x burner chamber rear wall



Illustration 6

Fit the tow bar (24) to the control cabin (21) with 2 slot bolts (4) M3 x 4 mm and nuts (5). The two slot bolts (25) M3 x 6 mm 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 the 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) M3 x 4 mm 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) M3 x 4 mm and secure with 2 nuts (5). On completion, all screws should be checked for tightness.

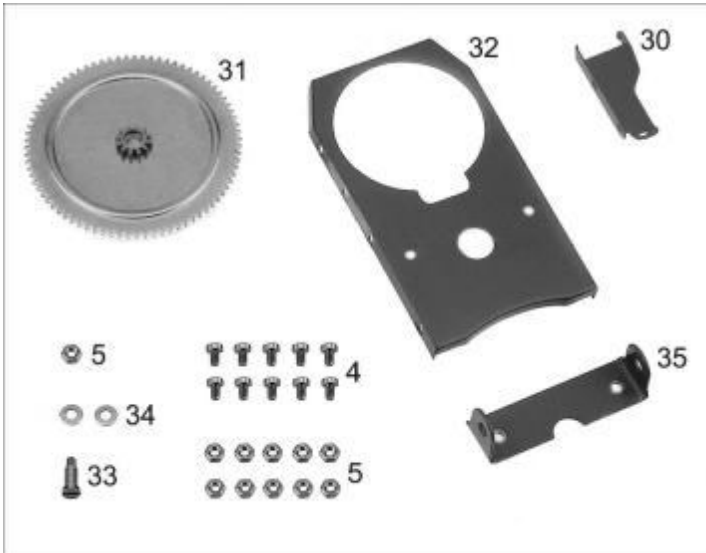


Illustration 8

### Stage 3

#### Burner chamber front

- 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 Ø 6.7/3 mm
- 5 11 x hexagonal nuts M3
- 4 10 x slot bolts M3 x 4 mm
- 35 1 x worm bracket

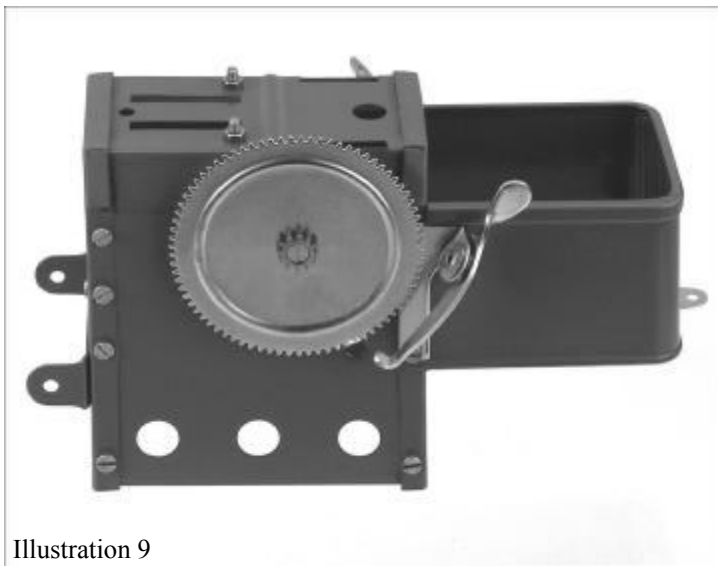


Illustration 9

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.



## Stage 4

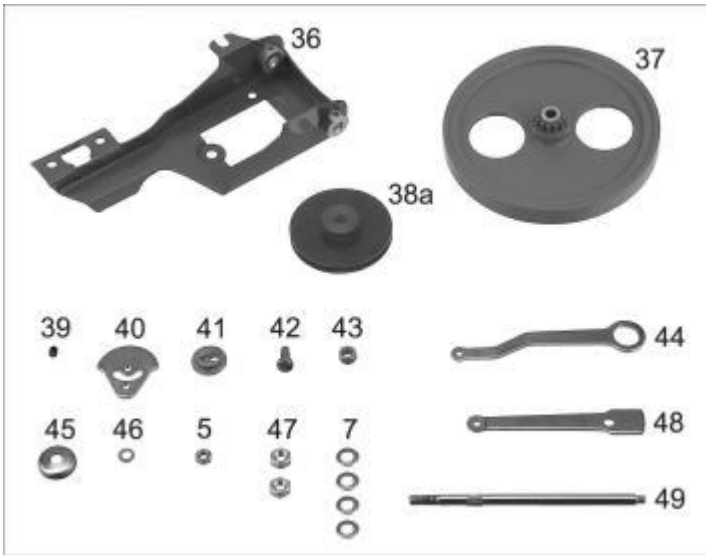


Illustration 11

### Flywheel shaft

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

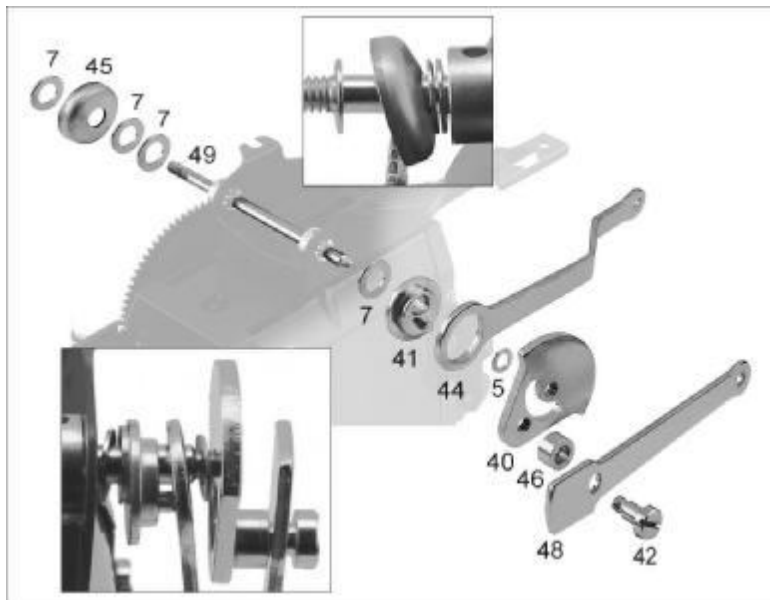


Illustration 12/13

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), then a further washer (7), ex-centre plate (41), 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 disk (40) onto the right hand side of the shaft, using the middle threaded hole. The piston rod (48) is attached to the crank disk by means of the collar screw (42), with spacer (43) fitted between piston rod (48) and crank disk (40).

Now the flywheel (37) 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 disk (40).

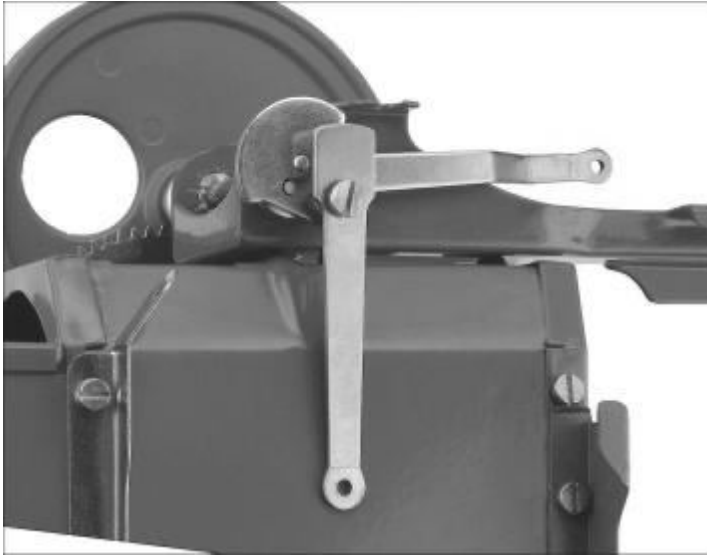


Illustration 14

Now the flywheel (37) 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 disk (40).



Illustration 15

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.



Illustration 16

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

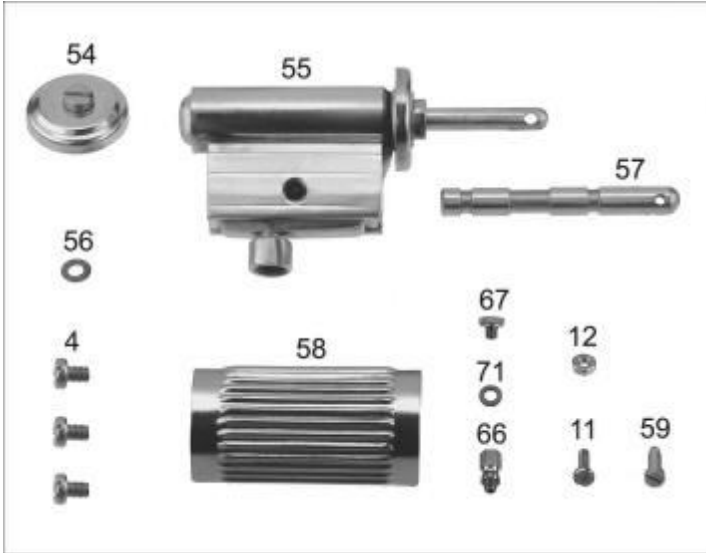


Illustration 17

## Stage 5

### Cylinder

- 54 1 x cylinder cap
- 55 1 x cylinder complete
- 56 1 x seal Ø 5.5/2.5 mm
- 57 1 x slide valve
- 4 3 x slot bolts M3 x 4
- 58 1 x cylinder cover
- 59 1 x collar screw M2
- 12 1 x hexagonal nut M2



Illustration 18

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



Illustration 19

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



## Stage 6

### Boiler Assembly

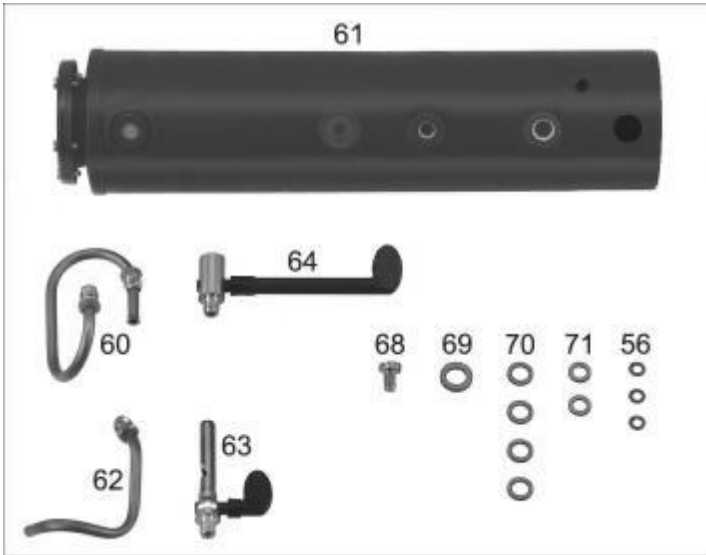


Illustration 20

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



Illustration 21

The large seal (69) is placed onto the sprung 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 sprung safety valve are already assembled.** The boiler has been pressure tested in the factory to 4.5 bar.



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 or two seals (70) so that the lever is to the rear and can be moved to the left or right. Do not overtighten.



Illustration 23

The small seals (56) are placed 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 with both slot bolts.

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).



Illustration 24

Tighten the machine plate with the two nuts M3 on the slot bolt (68). Boiler, cylinder, machine plate and steam pipes are now fixed in position.



Illustration 25

### Stage 7

#### Burner and Connection with Cap or Front Part

- 76 1 x burner slide
- 77 1 x burner guide
- 78a 1 x cap
- 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



Illustration 26

The burner guide (77) is placed into the burner chamber so that the four tabs point 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.

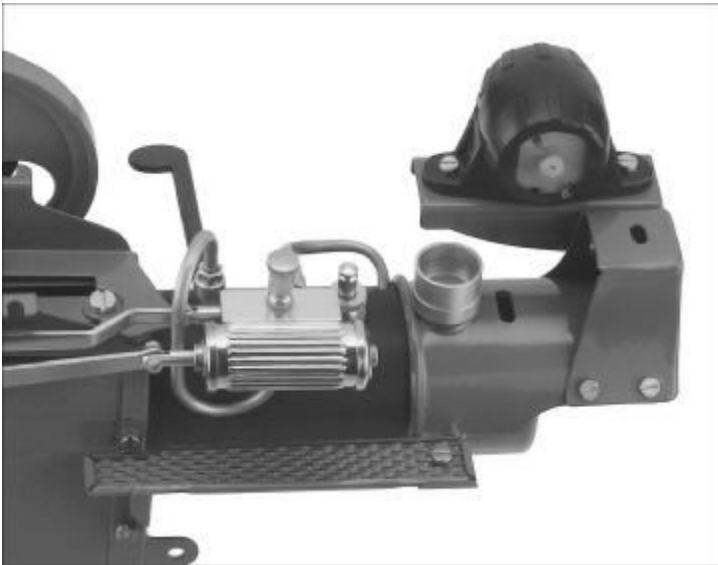


Illustration 27

Cap (78a) 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 bolt (4) and nut (5).

### Stage 8

#### Steering

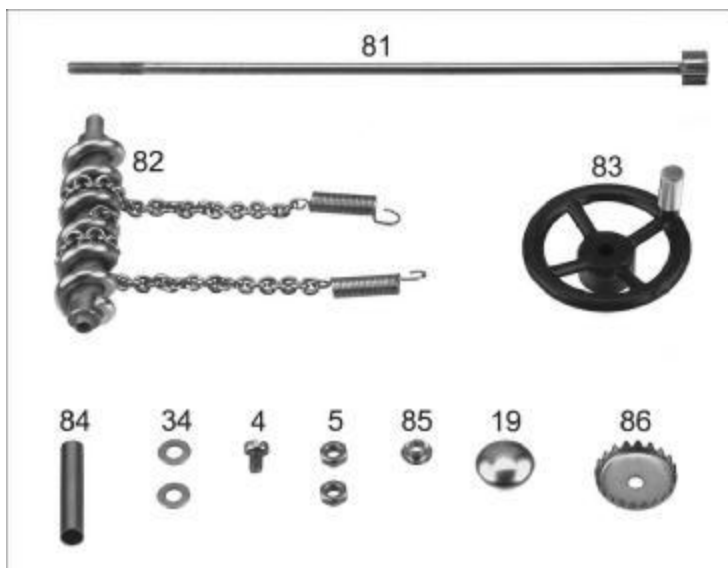


Illustration 28

- 81 1 x steering column with pinion
- 82 1 x worm with chain and springs
- 19 1 x safety cap Ø 4 mm
- 83 1 x steering wheel
- 84 1 x spacer, chrome long
- 34 2 x washers Ø 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

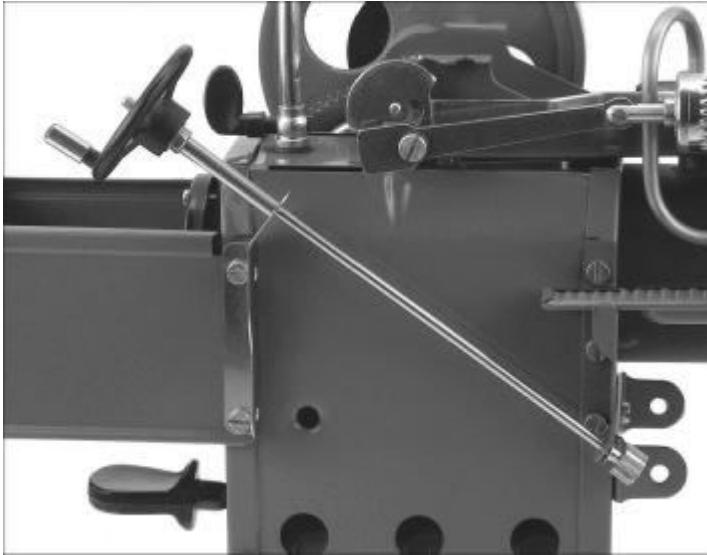


Illustration 29

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 30

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 bolt (4). Tighten securely!

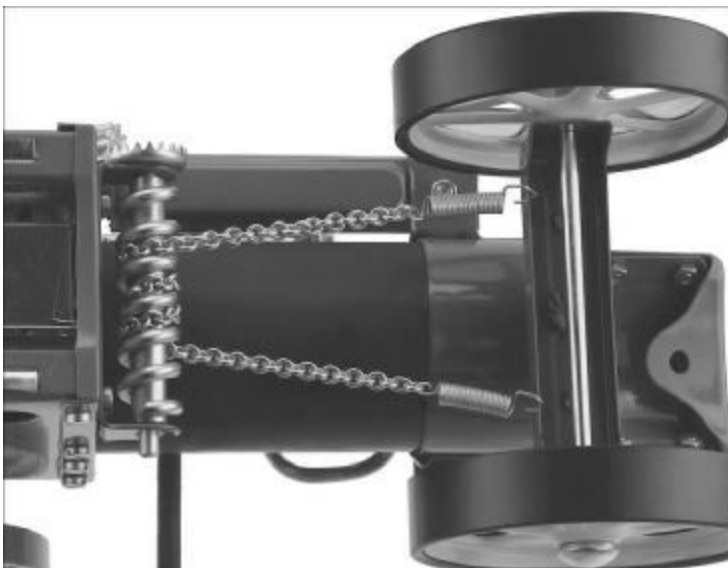


Illustration 31

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 **rewards**. The safety cap (19) is placed onto the taper and pushed home.

The photo (illustration 31 a) 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 now complete.



### Stage 9

#### Rear Wheels

- 91 2 x rear wheels
- 92 1 x rear axle  $\text{\O} 5/142 \text{ mm}$
- 93 1 x gear wheel with drive
- 94 2 x brass spacers  $\text{\O} 7 \times 29 \text{ mm}$
- 95 2 x safety caps  $\text{\O} 5 \text{ mm}$
- 96 4 x washers  $\text{\O} 10/5.5 \text{ mm}$

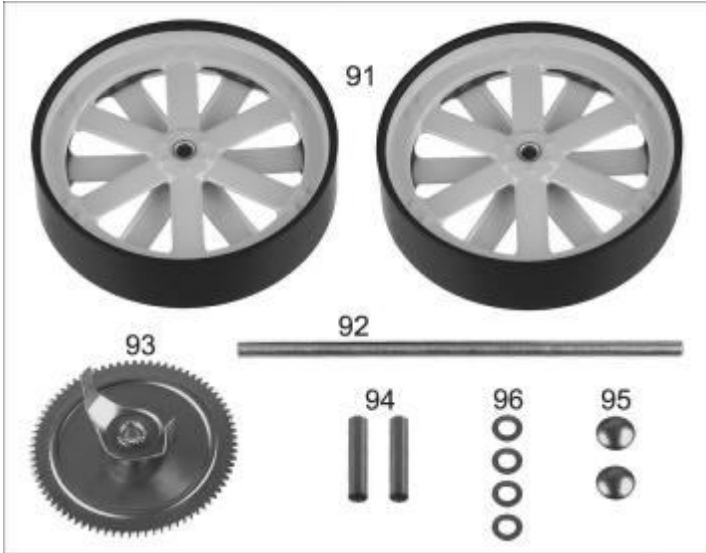


Illustration 32

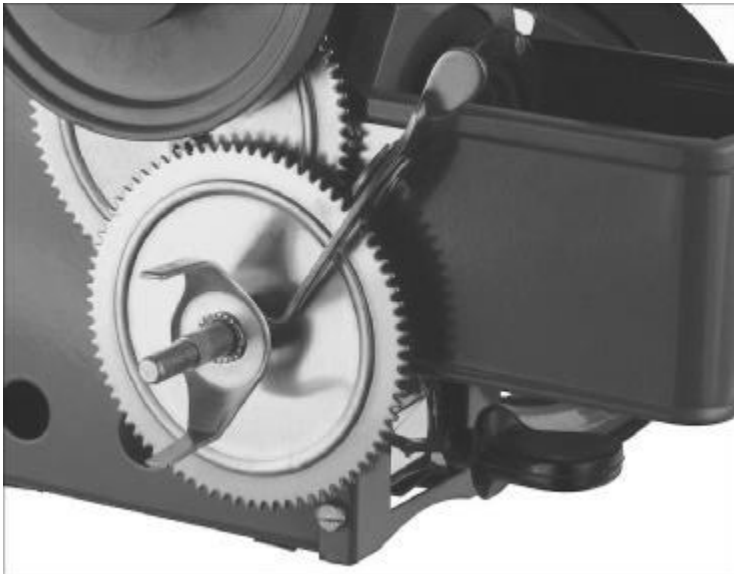


Illustration 33

The rear axle (92) is pushed through the burner chamber housing. One washer (96) is placed on the right hand side and two on the left hand side. On the left hand side the rear axle must not protrude more than approx. 3 mm. 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.

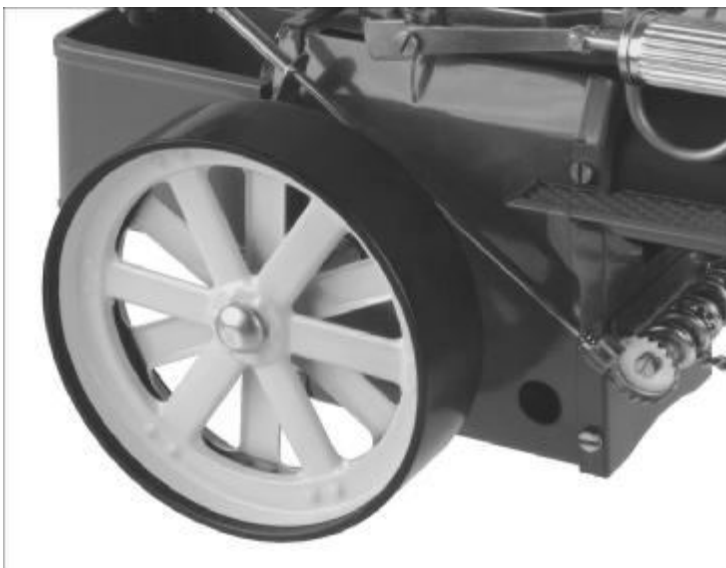


Illustration 34

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.



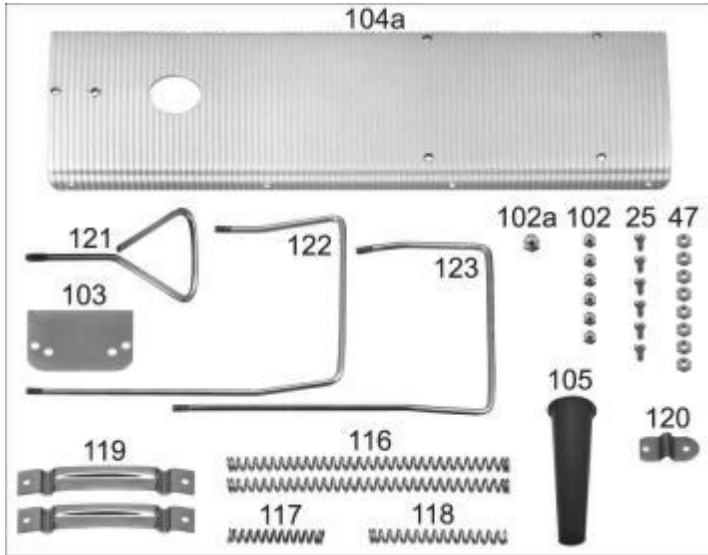


Illustration 35

## Stage 10

### Roof and Chimney

- 104a 1 x roof
- 105 1 x chimney
- 122 1 x roof holder right
- 123 1 x roof holder left
- 103 1 x base plate
- 102a 1 x cap screw M4
- 102 6 x cap screws M3
- 25 6 x slot bolts M3 x 6 mm
- 47 8 x hexagonal nuts M4
- 116 2 x springs Ø 4 x 137 mm
- 117 1 x spring Ø 4 x 49 mm
- 118 1 x spring Ø 4 x 66 mm
- 119 2 x roof bracket
- 120 1 x roof holder bracket
- 121 1 x roof holder

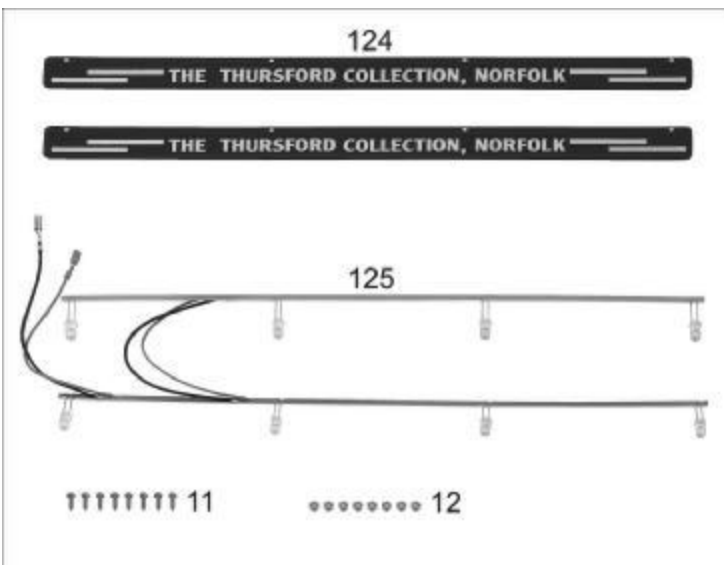
Slide (117) spring #4 x 49 mm over roof holder (121) and (118) #4 x 66 mm (see illustration 39 page 14). Fasten roof holder (121) to the canopy with the roof holder bracket (120) use M3 slot bolts pushed through the bottom of the canopy and tighten at the top with (102) M3 cap screws.

Connect (122) roof holder right and (123) roof holder left in the same way using two (119) roof brackets.

Place two (116) spring #4 137 mm over the left and right roof holders and put (47) hexagonal nuts M4 on each of the four threads (see illustration 39 Page 14).



Illustration 36



- 124 2 x roof band
- 125 1 x roof lighting
- 11 8 x slot bolts M2 x 6 mm
- 12 8 x hexagonal nuts M2

Illustration 37



Illustration 38

Glue the light track to the inside of the roof bands and place the positive (+) and negative (-) wire as is shown in illustration 39.

Connect the roof band onto the roof with the eight x M2 x 6 mm slot bolts and nuts.



Illustration 39

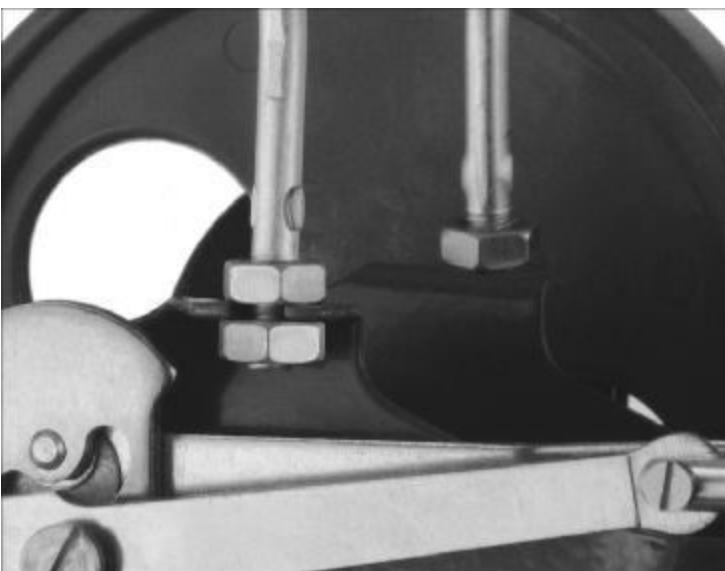


Illustration 40

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

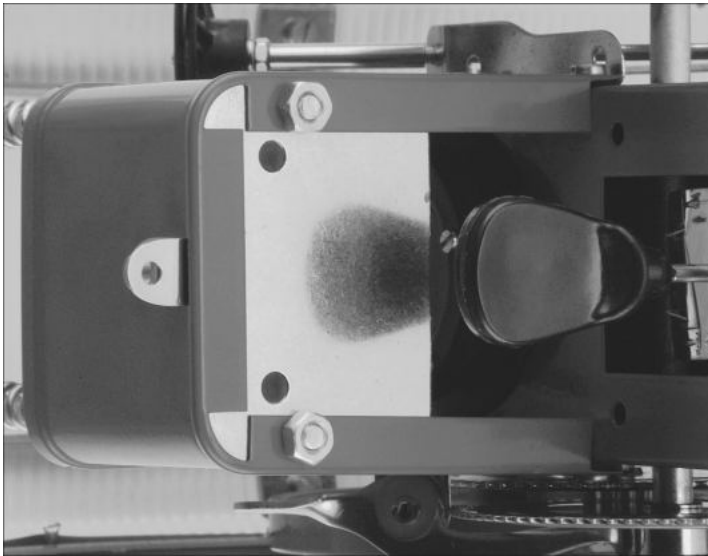


Illustration 41

Fit the brass plate (103). Now push through the long rear roof support and front support through the saddle cam. Secure the rear with a second nut (47) loosely and use (102a) M4 screw cap for the front support. Attach the two middle supports using the (47) nuts the tighten all up.



Illustration 42

Insert the chimney (105) with the fold pointing backwards. Stick the sticker (126) to the middle of the saddle cam.

Attach the positive (+) and negative (-) to the dynamo.

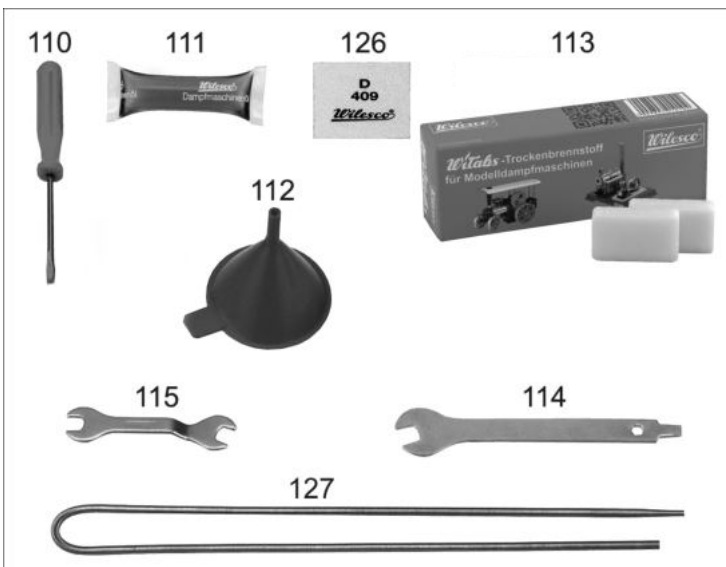


Illustration 43

### Accessories

- 110 1 x screwdriver
- 111 1 x cylinder oil
- 112 1 x funnel
- 113 1 x dry fuel Witabs
- 114 1 x combination spanner
- 115 1 x small spanner
- 127 1 x drive belt Ø 2,5 x 260 mm
- 126 1 x sticker D409

Please read first the operating instructions before going „FULL STEAM AHEAD!“

Congratulations, you have finished.

## Operation of the Steamengine

### The Steam Engine

The Steam engine was the beginning of a new industrial era in the second half of the 18th century. James Watt invented the steam engine between 1768 to 1782, after this, there were various other power engines on the market. Terrific developments: In Industry, Agriculture and Traffic would follow.

WILESCO Steam Engines are toys with tradition. They convert water (steam) into mechanical energy just like the originals. This energy can be used to drive our models.

Today turbines and petrol engines have replaced the steam engine, nevertheless they still hold the interest of young and old alike. WILESCO-Engines cater for this ageless interest in demonstrating the basic principles of changing heat and water into mechanical power. That's the reason why everybody can learn a lot from the steam engine.

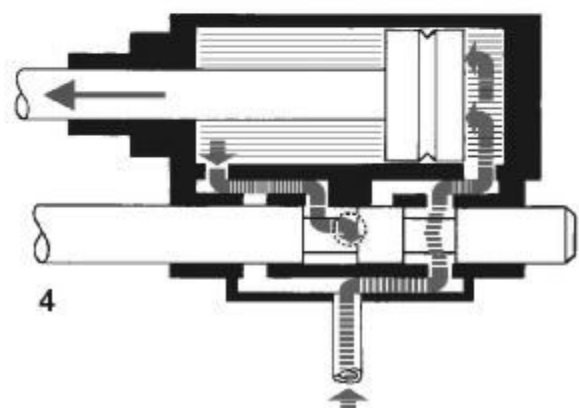
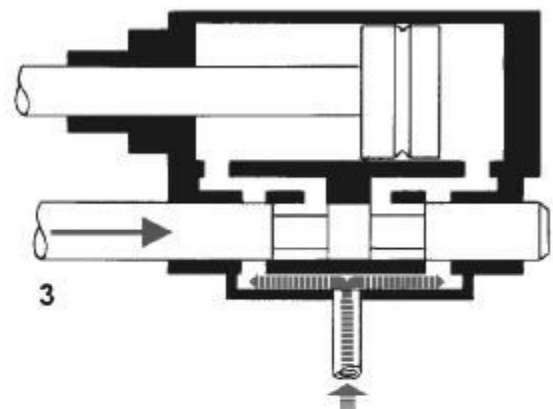
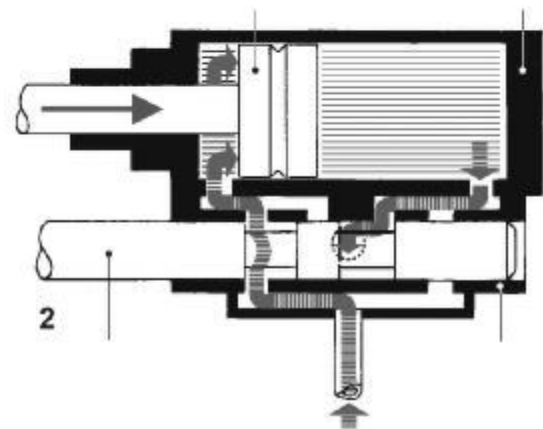
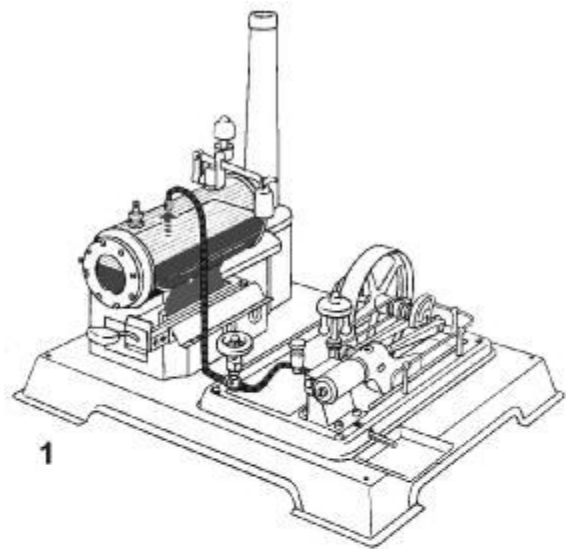
#### Key to the diagrams:

1. The water in the boiler is heated by the fire, this generates steam and because it is trapped in the boiler pressure builds up. Steam can pass, however, to the cylinder (blue dotted lines) via the slide valves.

2. In the second 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 previous stroke is directed, by the other port on the slide valve, out into the atmosphere, having done its work, (dotted green line).

3. Just before the piston reaches the end of its 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.

4. 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.



## Accessories: Remote Control and Trailer



### 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. Colour red.

Length approx. 100 cm

Order Code No. 00361



### Sprinkler

A beautiful sprinkler as trailer, very strong, finished in metal, with stop cock and tow bar.

Size 25 x 9 x 11 cm

Order Code No. 00385 (painted) / 00386 (black/brass)



### Long Wood Transporter

The chassis is finished in metal and is loaded with 15 logs in natural wood, having diameter of 16 mm x 22 cm long.

Size 33 x 11 x 13 cm

Order Code No. 00425 (blue) / 00426 (black/brass)