

# Master

PORTABLE HEATERS

MODEL B66D

Spec. No. 3182G01

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## OPERATING, MAINTENANCE and SERVICE INSTRUCTIONS with PARTS LIST

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**Koehring**  
**Master Division**

The safety control circuit essentially consists of three parts: a light-sensitive cell (flame sensor), a silicon-controlled rectifier (SRC), and the circuit breaker. The circuit breaker automatically trips if the flame fails, thereby causing the heater to shut down. (See figure 2.)

The flame sensor is used to sense the presence of light due to the flame inside the combustion chamber. It varies its electrical resistance in relation to light rays. When under the influence of light, the cell has very low resistance. The resistance is high when little or no light strikes the light-sensitive surface. The flame sensor's function is to control the trigger voltage of a silicon-controlled rectifier.

The SCR acts as a voltage-operated switch. When the trigger voltage reaches a certain level, the SCR will conduct and allow a current to flow through the heating coil of the circuit breaker. When the voltage drops, such as when the flame sensor senses light and decreases its resistance, the SCR will turn off and block the flow of current.

The circuit breaker is a thermally operated switch. Current flowing through the heating coil will cause it to heat. When a specific temperature of a bi-metal element is reached, the contacts of the breaker will open to interrupt the current flow to the motor and transformer. This action takes approximately 15 seconds at 70 degrees F. The breaker must be manually reset by pressing the red circuit breaker reset button. The flow of current through the heating coil is controlled by the action of the SCR. If ignition takes place before the breaker trips, the flow of current through the coil is virtually stopped, the heating action stops and the contacts remain closed, thus allowing current to continue to flow to the motor and transformer.

The SCR and its circuit are mounted on top of the circuit breaker and is replaceable only as a complete unit.

A thermostat accessory (Model No. HA1200) may be incorporated into the electrical circuit. The accessory can be set to any desired temperature between 35 degrees F. and 95 degrees F. When the temperature of the surrounding air reaches the preset tempera-

ture, the thermostat contacts open to shut down the heater. When the air cools, the contacts close and the heater recycles. To shut down the heater when using the thermostat accessory, place the dial in the "NO HEAT" position.

### C. POWER REQUIREMENTS

The heaters are manufactured for use on 115 volt, 60 cycle power.

### D. SPECIFICATIONS

Output Rating (BTU per hour) .....	63,000
Amperage (During normal run) .....	4.0
Air Pump Pressure (PSI) .....	4+1/4
Weight (Approx.) (Lbs.)	
Shipping .....	60
Dry (net) .....	47
Fuel Tank Capacity, U.S. Gallons ....	4.5
Fuel Consumption, Approx.	
U.S. Gallons per hour .....	0.45
Electrical Requirements	
Voltage .....	115
Cycles (Hz) .....	60
Motor RPM .....	3350
Fuel .....	Kerosene or No. 1 Fuel Oil only
Duct .....	No Duct Recommended

### E. ACCESSORIES

A thermostat control kit, Part No. HA1200 is available as an accessory for use with these heaters. The thermostat can be set for any temperature between 35° and 95° F, and will cycle the heater on and off to maintain the surrounding air at the desired temperature. At its NO HEAT position, the thermostat shuts the heater off.

TROUBLE SHOOTING CHART (Continued)

PROBLEM	POSSIBLE CAUSE	REMEDY	FOR FURTHER DETAILS SEE:
<p>6. <u>Control System Troubles</u></p> <p>a. Heater ignites, but red button of safety control circuit breaker pops out anyway.</p>	<p>a. Defective photo cell.</p>	<p>Check to see if glass face of cell is so dirty it can't "see" the flame; clean glass if dirty.</p> <p>Replace with a cell that is known to be good.</p>	<p>Sec. V, Para. N.</p>
	<p>b. Defective safety control.</p>	<p>Replace with a control that is known to be good.</p>	
	<p>c. Defective electrical connections in circuit through cell and control relay.</p>	<p>Be sure all solder joints and wiring connections are secure. • Check wiring diagram.</p>	
<p>b. Safety Control circuit breaker fails to trip when a no-flame condition exists.</p>	<p>a. Defective circuit breaker.</p>	<p>Replace with a circuit breaker that is known to be good.</p>	
	<p>b. Contacts dirty or defective.</p>	<p>Replace defective contacts with one that is known to be good.</p>	
	<p>c. Photocell electrical leads shorted.</p>	<p>Check photocell leads for shorted leads. Replace photocell if damaged.</p>	
<p>c. Button on safety control circuit breaker won't stay in when pressed.</p>	<p>a. Resetting is tried too soon after the breaker trips.</p>	<p>Wait 5 minutes and try again.</p>	
	<p>b. Defective circuit breaker.</p>	<p>Replace with a circuit breaker that is known to be good.</p>	
	<p>c. Photo cell circuit open.</p>	<p>Check photocell for open condition. Replace if damaged.</p>	

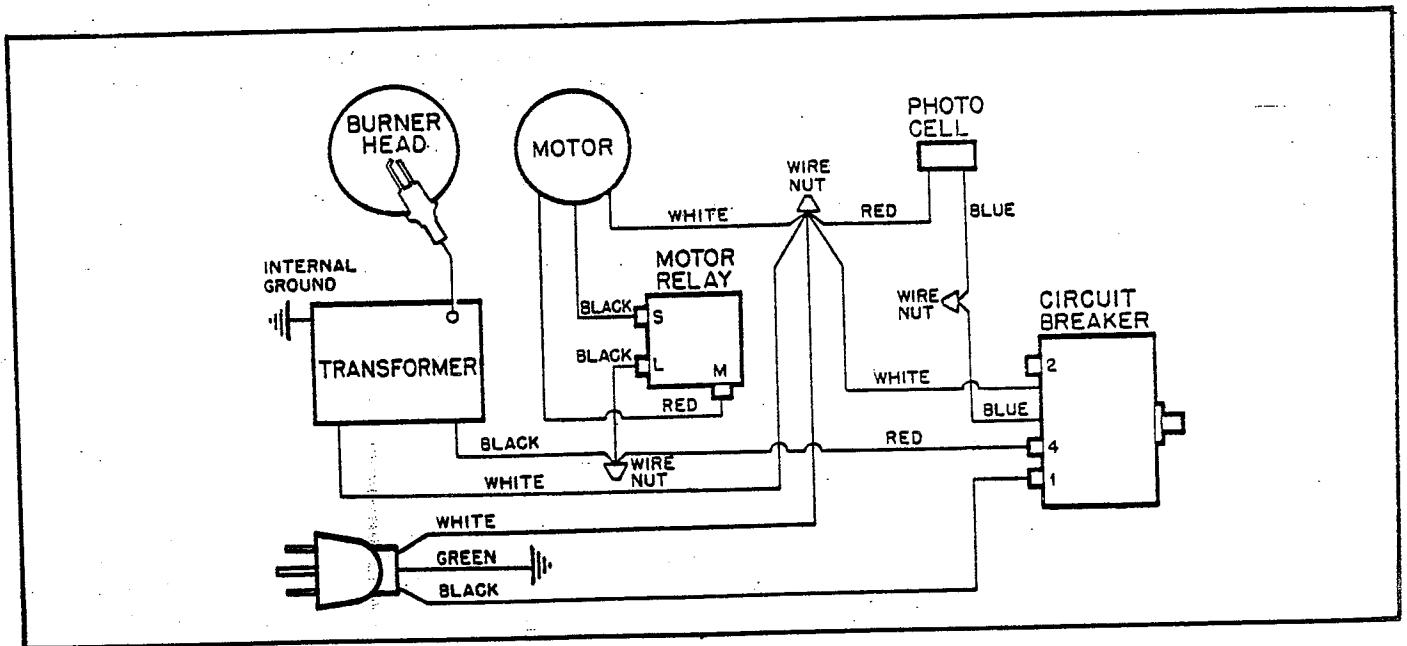


Figure 9. Wiring Diagram

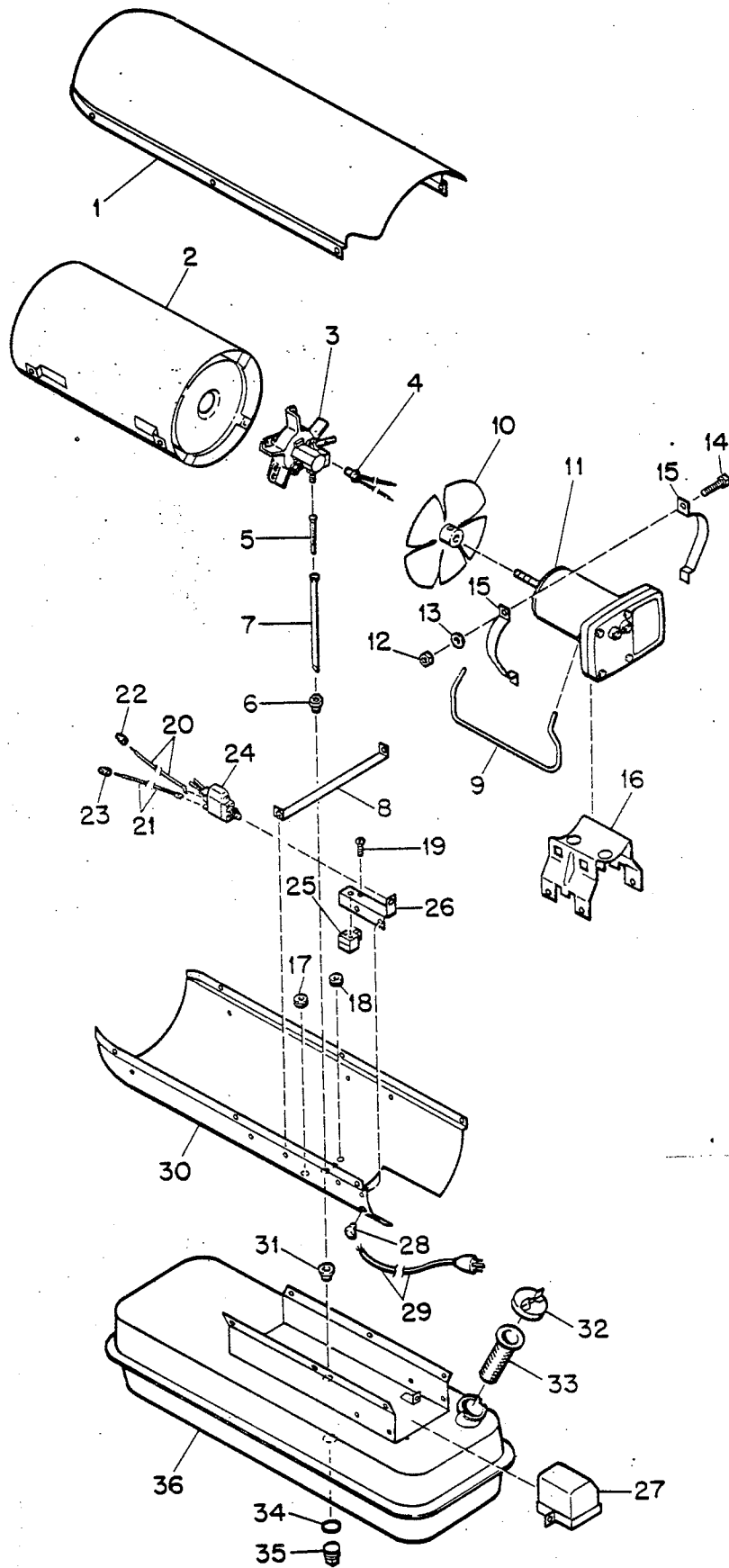


Figure 13. Heater Exploded View

## SECTION VI PARTS LIST

This section lists and illustrates all of the replaceable parts of the heater.

To identify a part, find it on one of the illustrations, and note its index number. Then, in the parts list for that illustration, read across the line of that index number. You will find the part number of the part, its name or description, and the quantity of the part used at that particular location. Attaching hardware is listed immediately after the part it attaches, and are noted by (AP) following the description. Standard hardware are indicated by the symbol

(\*) and can be procured locally.

Order parts by name and part number only. Do not use the index numbers from the illustrations when ordering parts, as these index numbers are intended for your convenience in identifying parts in the list, and they may change from time to time as later editions of this book are issued.

When ordering parts for this heater, be sure to include the serial number and model number of the heater with your order. These can be found on the decal affixed to the heater.

Fig. & Index No.	Part Number	Part Name	Qty.
13-1	M26207A	Shell, Upper	1
-	M11084-26*	Screw, Hex hd., No. 10-12 x 3/8 in. (AP)	6
-	M11271-6*	Nut, Tinnerman	6
2	M25019-1	Combustion Chamber Assy	1
3	M23443-3	Burner Head Assembly (For details see Figure 14)	NA
4	M16656-3	Photocell and Bushing Assy	1
5	M19630	Filter, Fuel	1
6	M13849	Nut, Flared	1
7	M16790-14	Tube Fuel Filter	1
8	M25645	Strap, Retainer	1
9	M25021	Air Line	1
10	M25727	Fan, 25/32 pitch	1
-	SF4-2-1/2K*	Setscrew, Socket Hd., cup pt., 1/4-28 x 5/16 (furnished with fan)	2
11	M25023-1	Motor Package Assembly (For details see Figure 15)	1
12	NPC-4*	Nut, Plain, Hex, 1/4-20 (AP)	2
13	WLM-4*	Lockwasher, 1/4 in. (AP)	2
14	HC4-10C*	Screw, Hex hd., 1/4-20 x 1-1/4 in. (AP)	2
15	M16661	Clamp, Motor	2
16	M25059	Bracket, Support	1
-	M11084-27*	Screw, Hex hd., No. 10-12 x 1/2 in. (AP)	4
17	1000576	Grommet	2
18	1000577	Grommet	2

Fig. & Index No.	Part Number	Part Name	Qty.
19	ST2-2AC*	Screw, Rd. hd., No. 8-15 x 1/4 in. (Grounding)	1
-	M11084-26*	Screw, Hex hd., No. 10-12 x 3/8 in. (Relay Bracket)	2
20	M16841-15	Wire Assembly	2
21	M16841-16	Wire Assembly	2
22	M13942-2	Connector, Wire	2
23	M13942-4	Connector, Wire	2
24	M24982-5	Safety Control Assy	1
25	M25061-1	Relay, Motor Start	1
-	RC2-2C*	Screw, Rd. hd., 8-32 x 1/4 in. (AP)	2
26	M25035	Bracket, Relay	1
27	M25024-1	Transformer Assembly	1
-	M11084-27*	Screw, Hex hd., 10-12 x 1/2 in. (AP)	2
28	M11143-1	Bushing, Strain Relief	1
29	M10812-38	Extension Cord Assembly	1
30	M26208A	Lower Shell Assembly	1
-	M11084-26*	Screw, Hex hd., 10-12 x 3/8 in. (AP)	6
31	M10990-3	Bushing	1
32	M23284	Cap, Filler Neck	1
33	M18053	Screen, Filler Neck	1
-	M25374-1	Drain Plug Assembly	1
34	M25375	O-Ring	1
35	M25277	Plug, Drain	1
36	M26224-1A	Fuel Tank Assembly	1

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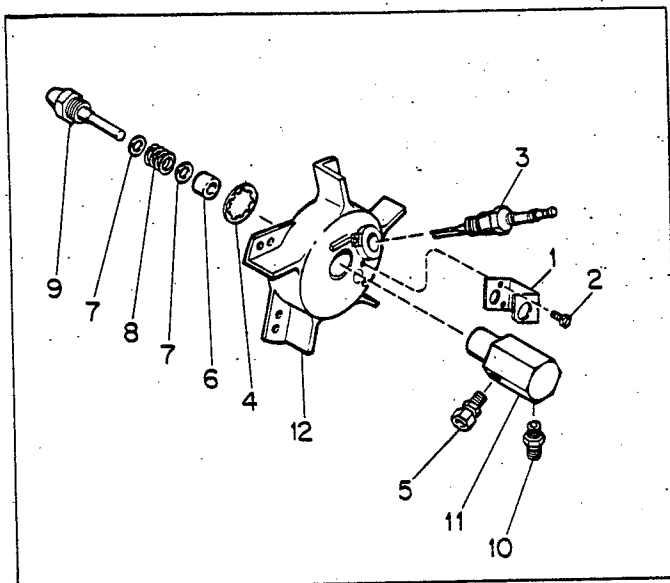


Figure 14. Burner Head Assembly

Index No.	Part Number	Part Name	Qty.
14-	M23443-3	Burner Head Assembly	Re
1	M16660	. Bracket, Photo Cell	1
2	*M10908-1	. Screw, Hex hd., Self-tapping, No. 6-32 x 1/4 (AP)	2
3	M10962-2	. Spark Plug	1
4	M16741-18	. Ring, Retaining	1
	M23151-4	. Nozzle Adapter Assembly	1
5	M5976	. Connector, Male	1
6	M8882	. Sleeve, Nozzle Seal	1
7	M10659-1	. Washer, Nozzle Seal	2
8	M10809-1	. Spring, Nozzle Seal	1
9	M26316	. Nozzle, Aspirating	1
10	M16791	. Connector, Male	1
11	M16535	. Adapter, Nozzle	1
12	M25020	. Body, Burner Head	1

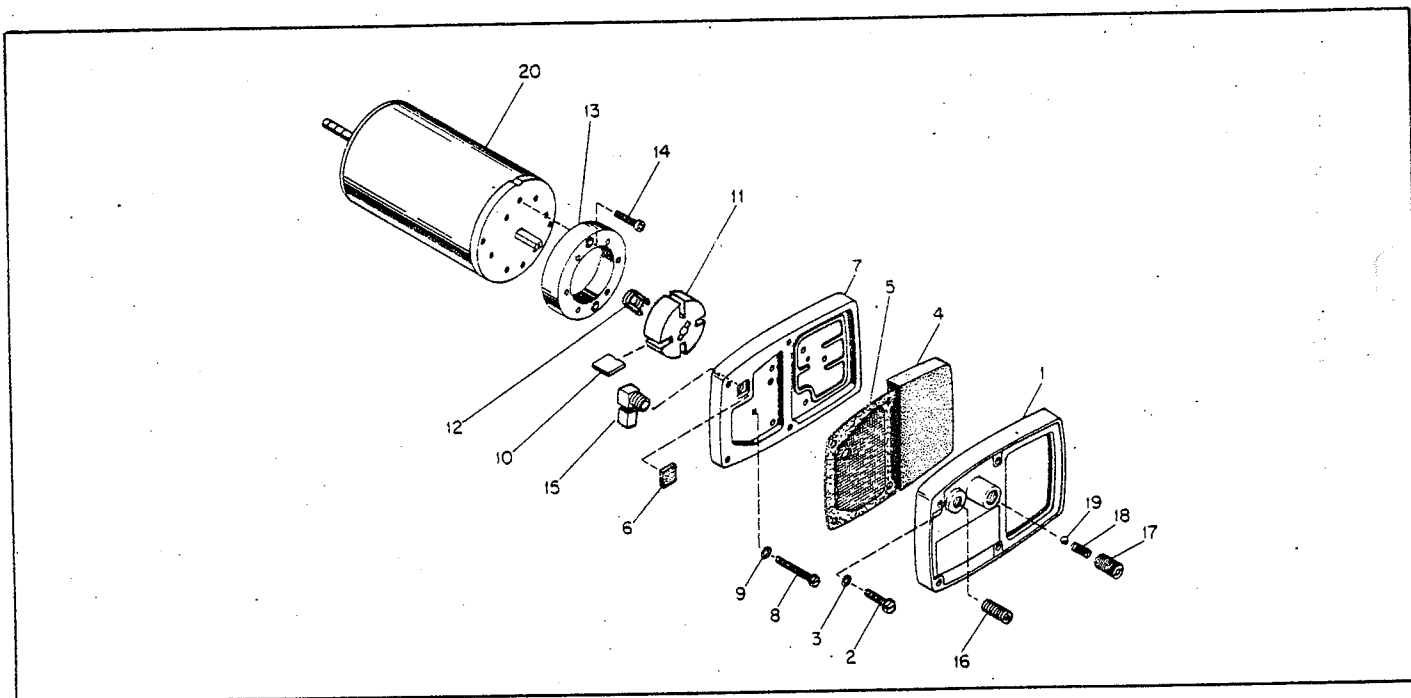


Figure 15. Motor Package Assembly

Index No.	Part Number	Part Name	Qty.
15-	M25023-1	Motor Package Assembly (See figure 13)	Ref.
1	M16545	. End Cover, Filter	1
2	*M12461-31	. Screw, Hex hd. No. 10-32 x 1 (AP)	4
3	*WLI-3	. Lockwasher, Internal No. 10 (AP)	4
4	M12179	. Intake Air Filter	1
5	M12244-1	. Output Filter Assy	1
6	M11637	. Filter, Lint	1
7	M12233	. Front Cover, Pump (Port Plate)	1
8	*M12461-32	. Screw, Hex hd, No. 10-32 x 1-1/8 (AP)	6
9	WLI-3	. Lockwasher, Internal No. 10 (AP)	6

Index No.	Part Number	Part Name	Qty.
10	M8643	. Blade, Pump	4
11	M22456-1	. Rotor, Pump	1
12	M22009	. Insert, Rotor	1
13	M8645	. Pump Body	1
14	*FHPP3-4C	. Screw (Pump Body to Motor)	2
15	69248	. Elbow, 90°	1
16	M22997	. Plug	1
17	M23105	. Screw, Pressure Adjustment	1
18	M10993-1	. Spring, Compression (Pressure Relief)	1
19	M8940	. Ball, 1/4 in. dia.	1
20	✓ M25022-1	. Motor	1

AP Indicates attaching parts.  
\* Standard hardware. Purchase locally.

Fig. & Index No.	Part Number	Part Name	Qty.
1	M26204A	Handle, Rear	1
2	M26203A	Handle, Front	1
3	M26205A	Frame, Wheel Support	1
4	M12345-33*	Screw, Oval hd., 10-24 x 1-3/4 in.	8
5	NTC-3C*	Nut, Torque lock No. 10-24	8
6	M16741-15	Ring, Retaining	2
7	WP-8C*	Washer, Flat 1/2 inch	2
8	M26306	Wheel	2
9	M16801-6	Axle	1

DECALS

M17137	Decal, Tradename	1
M17081	Decal, Atomaster	1
M18196	Decal, Mfg. by	1
M26324-1	Decal, Model	1
M22743	Decal, Warning	1
M22898	Decal, N. P.	1
M24687	Decal, Wiring	1
M25325	Decal, Reset	1

TOUCH-UP PAINT

M23353-6	Paint, Yellow, Aerosol Can
M23353-10	Paint, Black, Aerosol Can

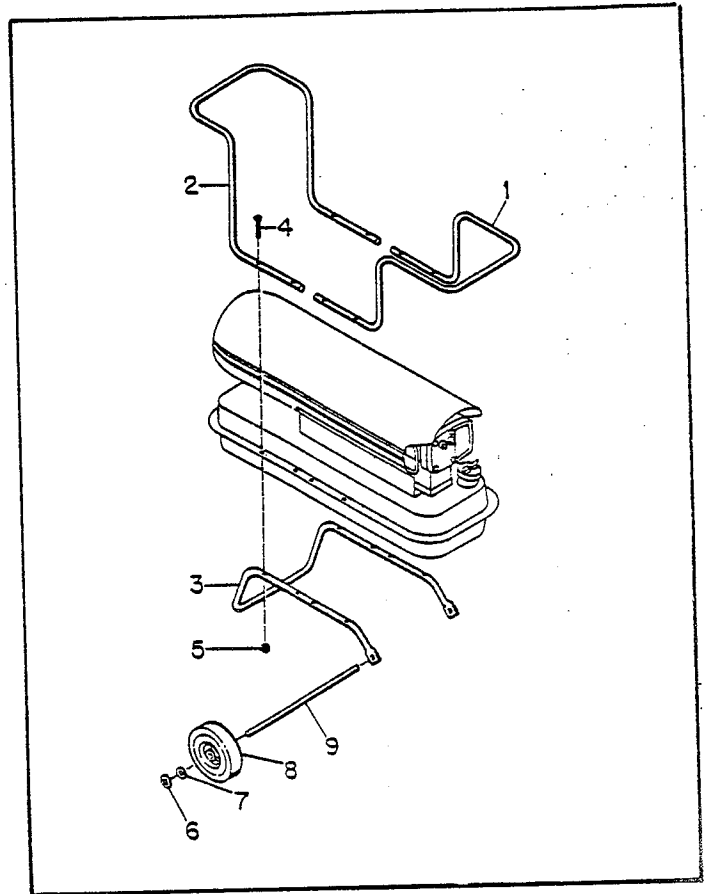


Figure 16. Handles and Wheels