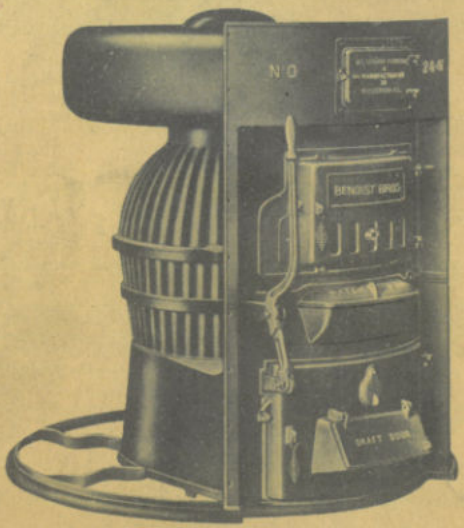
BENOIST BROS. FURNACES

CIRCULATORS, TANK HEATERS AND LAUNDRY STOVES

CATALOGUE
NUMBER ONE



MT. VERNON

BENOIST BROS.

ILLINOIS

Our Business Policy

IT IS OUR policy to be fair and conscientious in all transactions and business relations.

Your confidence in us is well founded. We will not make a promise unless we know it will be fulfilled, nor will we enter into any agreement or contract in which we cannot hold up our end or adhere to the stipulated provisions.

Pleasantness in all business dealings is necessary in the commercial world today. We are doing all in our power to promote cheerfulness and good will among all men and business enterprises with whom we have relations, whether transactions be large or small.

We solicit business on the merits and reputation of our products, prompt and conscientious service, and fair and trustworthy business principles.

We are always ready to co-operate with and help along all moves in the advancement of this warm air heating industry.

Dealers in our products have our full co-operation and we are always ready to give them any assistance possible.

BENOIST BROS.

Mt. Vernon, Illinois

BENOIST Quality

The name BENOIST bears the reputation of high quality. All of the BENOIST BROS. products are of time-proven and tested merits.

The men at the head of our furnace and foundry organization and directing its affairs and policies have spent their lifetime in the furnace industry. The present BENOIST lines embody the principles developed in these years of experience in building heating appliances.

BENOIST BROS. Furnaces, Circulators, and Tank Heaters are all designed by our engineers. They are designed to give the utmost in heating efficiency and performance.

The BENOIST BROS. is a high grade furnace, which can be sold at an attractive price, and it is well worth any dealer's efforts to push as a leading line of heating appliances. A good and efficient warm air heating system is a necessity to home comfort and the BENOIST will provide this comfort at a price within the reach of every home owner.

BENOIST BROS.

Mt. Vernon, Illinois

Superior Furnace Construction

The iron put into BENOIST BROS. Furnaces is specially selected for its durability. It is accurately analyzed so as to maintain the same durable quality in all castings.

In designing BENOIST BROS. Furnaces careful consideration was given to the distribution of weight. The weight and thickness of the different castings is in direct proportion to the heat strain to which these castings are subjected.

All BENOIST BROS. Furnaces are completely assembled, mounted and carefully fitted before they are shipped. The installer will not have trouble with ill-fitting parts when on the job. We guarantee all BENOIST BROS. Furnaces to fit perfectly.

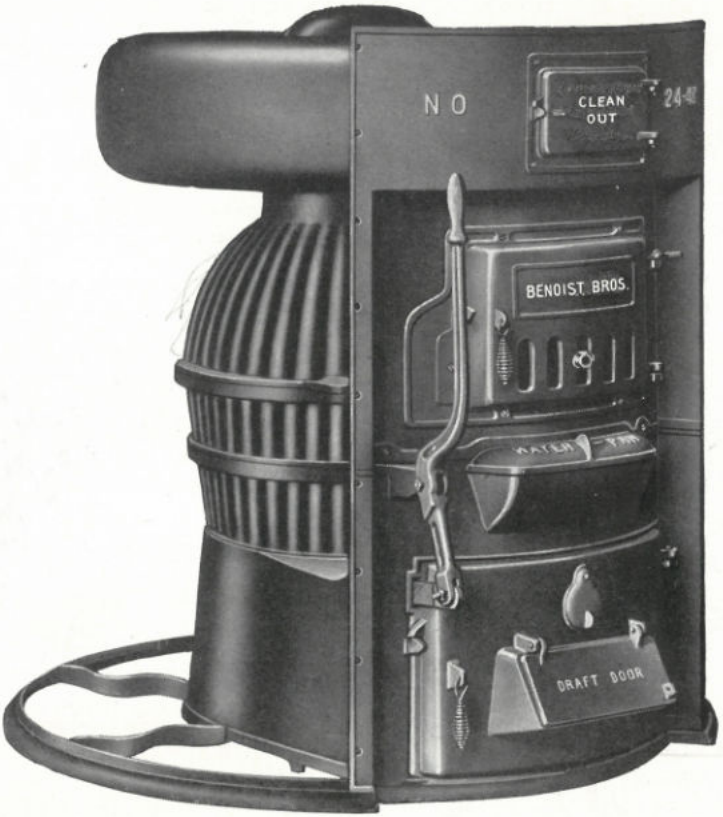
Another time-saving feature for the installer is the concentric notch arrangement in the grooves of the joints. This provides automatic alignment of the castings when erecting, and this facilitates putting on the casing.

The deep cup joints have a cast iron covering flange which holds the cement intact, thereby making these joints perfectly tight and leak-proof.

Two grate constructions. There is the choice of the upright lever shaker handle with the ball bearing, round grate construction, or the duplex, anti-clinker, triangular bar type grate.

BENOIST BROS. Furnaces are measured by the official measurer of the National Warm Air Heating and Ventilating Association and rated in accordance with the Standard Code.

No. 2000 Series BENOIST BROS. Pipe Furnace



Dimensions of No. 2000 Series BENOIST BROS. Pipe Furnaces

Number of Furnace	Casing Diameter	Inside Diam. of Fire Pots	Depth of Fire Pots	Diameter of Grate	Offi. Meas'd Grate Area	Heat. Surface Offi. Measure	Size of Fire Door	Size of Ash Door	Size of Smoke Collar	Height of Castings	Hgt. of Fur. Cased Up	Stand Code Rating Warm Air Pipe Area	Heating Cap. in Cubic Feet	Width Lower Casing Sheet	Width Upper Casing Sheet	Length of Upper and Lower Casing	Height of Reg. Canopy	Ship. Weight of Furnace	Size of Water Pan
	In.	In.	In.	In.	S. In	S. In	In.	In.	In.	In.	In.	S. In		In.	In.	Ft. In.	In.	Lbs.	In.
1838	38	18	12	15	177	3781	11x13	17 x13	8	47	61	318	11000	21	24	7. 9	13½	800	8x15x5
2040	40	20	12	17	227	4181	11x15	18 x13	8	47	63	385	14000	21	24	8. 1¾	15½	910	8x15x5
2244	44	22	12½	19	280	5180	11x15	19½x13½	8	49	65	475	19000	23	24	8. 9	15½	1095	8x15x5
2448	48	24	13	21	330	6180	11x15	21 x14	8	51	67	562	29000	23	26	9.11	15½	1330	8x15x5
2652	52	26	13½	23½	433	7121	11x15	23 x14	9	54	71½	705	43000	26	26	10. 8⅜	17	1525	8x15x5

Officially Measured — Standard Code Rated

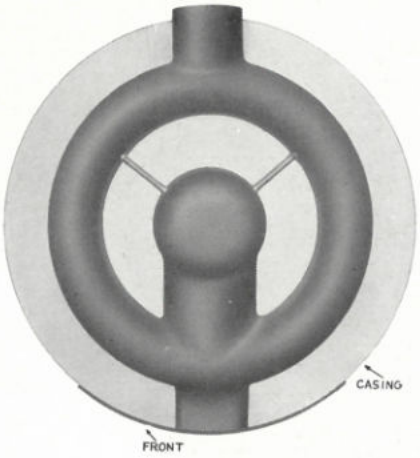
List Prices

	No. 1838	No. 2040	No. 2244	No. 2448	No. 2652
Furnace, complete	$149.44	$175.81	$211.46	$253.54	$323.60
Furnace, less casing	132.37	159.69	192.97	231.82	297.00

Above prices include poker, regulator chain and plate, shaker, pulleys, bolts, furnace cement, and all other accessories.

If upright lever shaker handle is wanted as illustrated above specify the initials "R. G." after the furnace number.

BENOIST BROS. One Piece Radiator Furnaces



This **one piece cast radiator** is scientifically designed so as to give the proper free air space insuring correct circulation. The illustration shows this proportioning clearly.

The **careful design** of this new radiator makes for maximum heating efficiency. The burning fumes are forced to pass completely around it before going up the flue. In this way practically all of the heat units are utilized in warming the circulating air as it passes over the extra large surface of the radiator.

The **large oval shape** is entirely free from sharp angles, seams and joints, leaving no place for soot or dust to accumulate—nothing can impede radiation or choke off the draft.

The construction is such that the smoke exit may be placed in any position convenient for connecting with the flue.

Because of its extremely large radiating surface and full measurements throughout, the BENOIST BROS. has a much greater heating capacity than the average furnace of its type.

The **Combustion Section** is built extra heavy to withstand the constant strain of hard usage. The opening at the top is large enough to admit the passing of the burning gases into the radiator and yet not so large as to allow the gases to rush out unconsumed. A pocket is cast into the side of the feed section so that the water coil when installed will not interfere with firing.

The **Two-Piece Fire Pot** allows for expansion and contraction. It is made extra heavy and corrugated to give increased radiation surface. The lock-cup joints are deep and are permanently sealed with asbestos cement when erected.

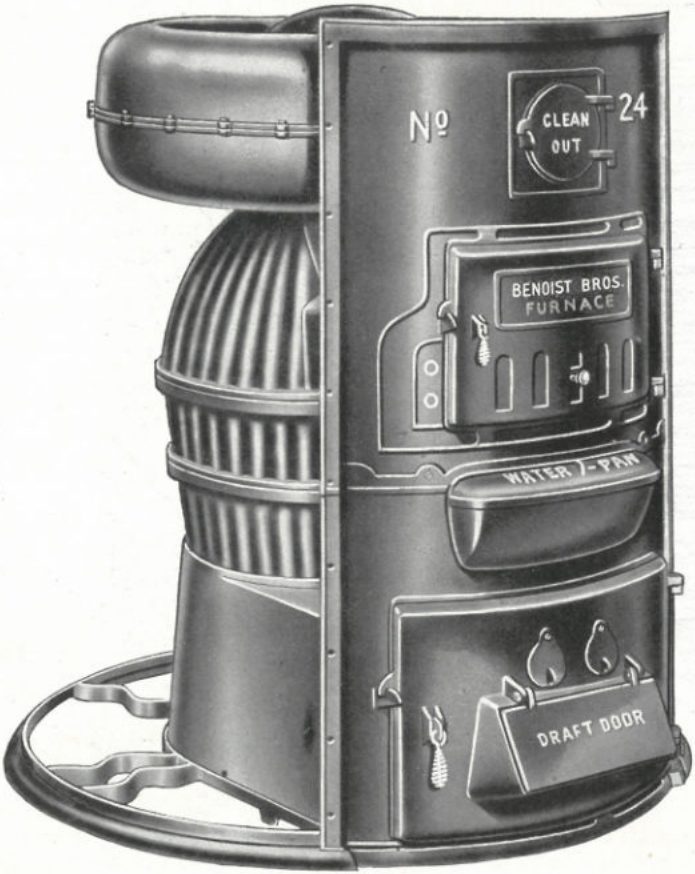
The **Water Pan** is of ample capacity, so placed that the water evaporates rapidly. This produces a balmy warm air conducive to health and comfort. It is handy to fill.

The **Fire Door** is extra large so as to permit firing of large chunks of coal and wood. The Ash Door is made the full width of the ash pit for the convenient removal of ashes. Both the fire door and ash door are ground and fitted so as to make a snug, tight joint.

The **upright lever handle** is a popular feature. This is furnished with the ball bearing, round grate illustrated at the right. The steel ball bearings make this grate very easy to operate. The upright shaking lever eliminates stooping. The center dump makes the removal of clinkers an easy matter.

This **ball bearing round grate** can be supplied on all BENOIST BROS. Furnaces with the exception of the No. 30. It is designated by the initials "R. G." placed after the furnace number.

No. 20 Series BENOIST BROS. Pipe Furnace



(Showing Casings Removed)

Dimensions of No. 20 Series BENOIST BROS. Pipe Furnaces

Number of Furnace	Casing Diameter	Inside Diam of Fire Pots	Depth of Fire Pots	Diameter of Grate	Offi. Meas'd Grate Area	Heat. Surface Offi. Measure	Size of Fire Door	Size of Ash Door	Size of Smoke Collar	Height of Castings	Hgt. of Fur. Cased Up	Stand Code Rating Warm Air Pipe Area	Heating Cap. in Cubic Feet	Width Lower Casing Sheet	Width Upper Casing Sheet	Length of Upper and Lower Casing	Height of Reg. Canopy	Ship. Weight of Furnace	Size of Water Pan
	In.	In.	In.	In.	S. In	S. In	In.	In.	In.	In.	In.	S. In		In.	In.	Ft. In.	In.	Lbs.	In.
18	34	18	12	15	177	3781	11x13	17 x13	8	46	58½	318	11000	22	22	7.	12	735	8x15x5
20	36	20	12	17	227	4276	11x15	18 x13	8	46	58½	388	14000	22	22	7. 2	12	800	8x15x5
22	39	22	12½	19	280	5190	11x15	19½x13½	8	48	60½	475	19000	24	22	7.10¾	12	1000	8x15x5
24	44	24	13	21	330	6120	11x15	21 x14	8	50	63	560	29000	24	24	8.11	12	1210	8x15x5
27	52	27	13½	24	448	7396	11x15	23 x14	10	52	69½	738	45000	26	24	10. 8⅝	17	1690	8x15x5
30	60	30	15½	27	573	8941	11x15	23 x14	10	58	77½	894	67000	30	26	12. 9½	19	2100	8x15x5

Officially Measured — Standard Code Rated

List Prices

	No. 18	No. 20	No. 22	No. 24	No. 27	No. 30
Furnace, complete	$135.60	$161.55	$193.80	$233.45	$326.60	$460.00
Furnace, less Casing	123.30	149.20	180.00	217.35	300.00	415.00

Above prices include poker, regulator chain and plate, shaker, pulleys, bolts, furnace cement, and all other accessories.

If upright lever shaker handle is wanted as illustrated on the opposite page specify the initials "R. G." after the furnace number. The No. 30 is made with duplex, triangular bar grate construction only.

No. 20 R. G. Series BENOIST BROS. Pipe Furnace

Dimensions of No. 20 R. G. Series BENOIST BROS. Pipe Furnaces

Number of Furnace	Casing Diameter	Inside Diam. of Fire Pots	Depth of Fire Pots	Diameter of Grate	Offi. Meas'd Grate Area	Heat. Surface Offi. Measure	Size of Fire Door	Size of Ash Door	Size of Smoke Collar	Height of Castings	Hgt. of Fur. Cased Up	Stand Code Rating Warm Air Pipe Area	Heating Cap. in Cubic Feet	Width Lower Casing Sheet	Width Upper Casing Sheet	Length of Upper and Lower Casing	Height of Reg. Canopy	Ship. Weight of Furnace	Size of Water Pan
	In.	In.	In.	In.	S. In	S. In	In.	In.	In.	In.	In.	S. In		In.	In.	Ft. In.	In.	Lbs.	In.
18	34	18	12	15	177	3781	11x13	17 x13	8	46	58½	318	11000	22	22	7.	12	735	8x15x5
20	36	20	12	17	227	4276	11x15	18 x13	8	46	58½	388	14000	22	22	7. 2	12	800	8x15x5
22	39	22	12½	19	280	5190	11x15	19½x13½	8	48	60½	475	19000	24	22	7.10¾	12	1000	8x15x5
24	44	24	13	21	330	6120	11x15	21 x14	8	50	63	560	29000	24	24	8.11	12	1210	8x15x5
27	52	27	13½	24	448	7396	11x15	23 x14	10	52	69½	738	45000	26	24	10. 8⅜	17	1690	8x15x5

Officially Measured — Standard Code Rated

List Prices

	No. 18	No. 20	No. 22	No. 24	No. 27
Furnace, complete	$135.60	$161.55	$193.80	$233.45	$326.60
Furnace, less Casing	123.30	149.20	180.00	217.35	300.00

Above prices include poker, regulator chain and plate, shaker, pulleys, bolts, furnace cement, and all other accessories.

When the upright lever shaker handle is wanted as illustrated above specify the initials "R. G." after the furnace number.

No. 400 Series BENOIST BROS. Pipe Furnace

(This series fills the demand for a furnace with a large size casing)

The No. 400 Series is of the same design and construction as the No. 20 Series. The casing diameter is extra large. Use this furnace where it is necessary to have a large casing.

Dimensions of No. 400 Series BENOIST BROS. Pipe Furnaces

Number of Furnace	Casing Diameter	Inside Diam. of Fire Pots	Depth of Fire Pots	Diameter of Grate	Offi. Meas'd Grate Area	Heat. Surface Offi. Measure	Size of Fire Door	Size of Ash Door	Size of Smoke Collar	Height of Castings	Hgt. of Fur. Cased Up	Stand Code Rating Warm Air Pipe Area	Heating Cap. in Cubic Feet	Width Lower Casing Sheet	Width Upper Casing Sheet	Length of Upper and Lower Casing	Height of Reg. Canopy	Ship. Weight of Furnace	Size of Water Pan
	In.	In.	In.	In.	S. In	S. In	In.	In.	In.	In.	In.	S. In		In.	In.	Ft. In.	In.	Lbs.	In.
418	40	18	12	15	177	3781	11x13	17 x13	8	46	58½	318	11000	22	22	8. 3½	12	790	8x15x5
420	42	20	12	17	227	4276	11x15	18 x13	8	46	62	388	14000	22	22	8. 4⅞	15½	905	8x15x5
422	46	22	12½	19	280	5190	11x15	19½x13½	8	48	64	475	19000	24	22	9. 4	15½	1045	8x15x5
424	50	24	13	21	330	6120	11x15	21 x14	8	50	66	560	29000	24	24	10. 3⅞	15½	1250	8x15x5
427	59	27	13½	24	448	7396	11x15	23 x14	10	52	71½	738	45000	26	24	12. 1¾	19	1705	8x15x5

Officially Measured — Standard Code Rated

List Prices

	No. 418	No. 420	No. 422	No. 424	No. 427
Furnace complete	$146.40	$172.80	$206.92	$247.51	$341.60
Furnace, less Casing	129.35	156.70	188.43	225.79	306.25

Above prices include poker, regulator chain and plate, shaker, pulleys, bolts, furnace cement, and all other accessories.

If the upright lever shaker handle as illustrated on pages 4 and 7 is wanted, specify the initials "R. G." after the furnace number.

No. 300 Series BENOIST BROS. Room Heater

This heater is designed for stores, halls, schools, churches, garages and all buildings having no basement. The castings are the same as used on the No. 20 Series. The casing has a corrugated sheet metal lining. The warm air is circulated from out of the top of the heater and the cold air is drawn up from off the floor.

Dimensions of No. 300 Series BENOIST BROS. Room Heaters

Number of Heater	Diameter of Casing	Inside Diameter Fire Pots	Diameter of Grate Surface	Depth of Fire Pots	Size of Fire Door	Size of Ash Door	Diameter of Smoke Collar	Size of Water Pan	Height of Castings	Height of Heater Complete	Heating Capacity Cubic Feet	Shipping Weight
	In.	In.	In.	In.	In.	In.	In.	In.	Ft.	Ft. In.		Lbs.
318	34	18	15	12	11x13	17 x13	8	8x15x5	46	5.6	11000	735
320	36	20	17	12	11x15	18 x13	8	8x15x5	46	5.6	14000	800
322	39½	22	19	12½	11x15	19½x13½	8	8x15x5	48	5.8	19000	1000
324	44	24	21	13	11x15	21 x14	8	8x15x5	50	5.9	29000	1210
327	52	27	24	13½	11x15	23 x14	10	8x15x5	52	5.11	45000	1690
330	60	30	27	15½	11x15	23 x14	10	8x15x5	58	6.5	67000	2100

List Prices

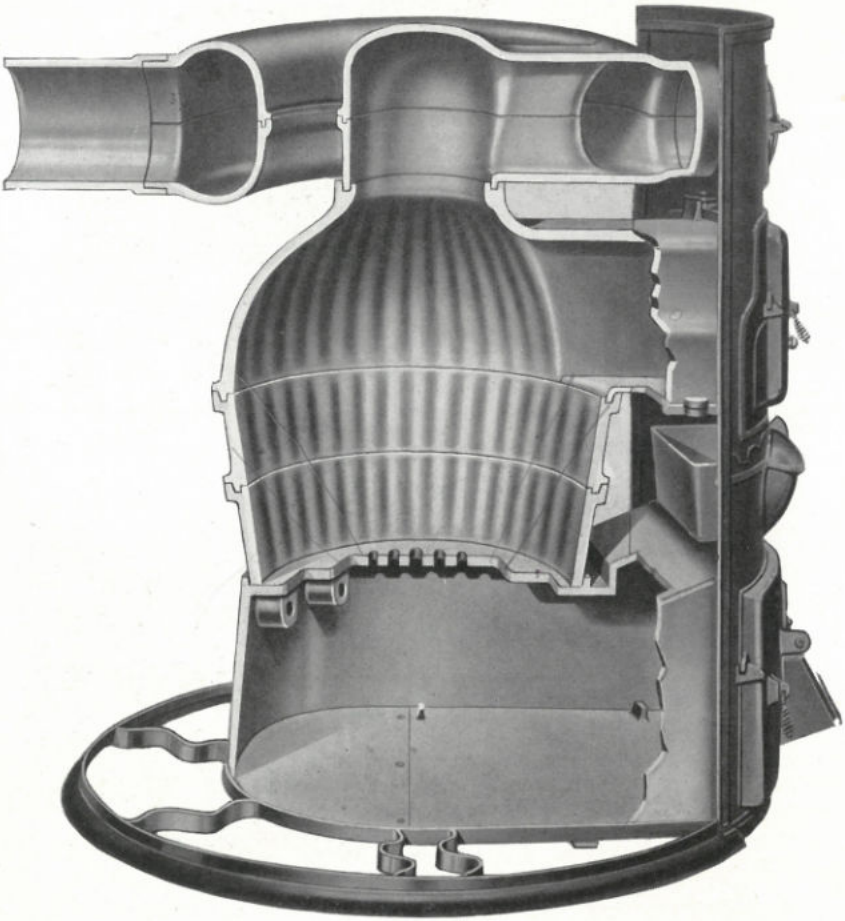
	No. 318	No. 320	No. 322	No. 324	No. 327	No. 330
Heater complete	$139.17	$165.30	$197.55	$237.20	$330.35	$467.54
Heater, less Casing	127.05	152.95	183.75	221.10	303.75	422.35

Above prices include poker, shaker, bolts, furnace cement and all other accessories.

If the upright lever shaker handle as illustrated on pages 4 and 7 is wanted, specify the initials "R. G." after the heater number.

Cross-Cut View of the BENOIST BROS. No. 20 Series Furnace Without Casings

(Showing all joints and simple design)



Features of BENOIST BROS. Construction

In the above illustration simplicity is the noticeable feature. It is very important in furnace construction, as installation can be made quickly and efficiently. This saves cost to the dealer, which the buyer would otherwise have to pay.

The general lines of construction are arched, thereby securing great durability and guarding against giving way or breaking down under heat and severe usage.

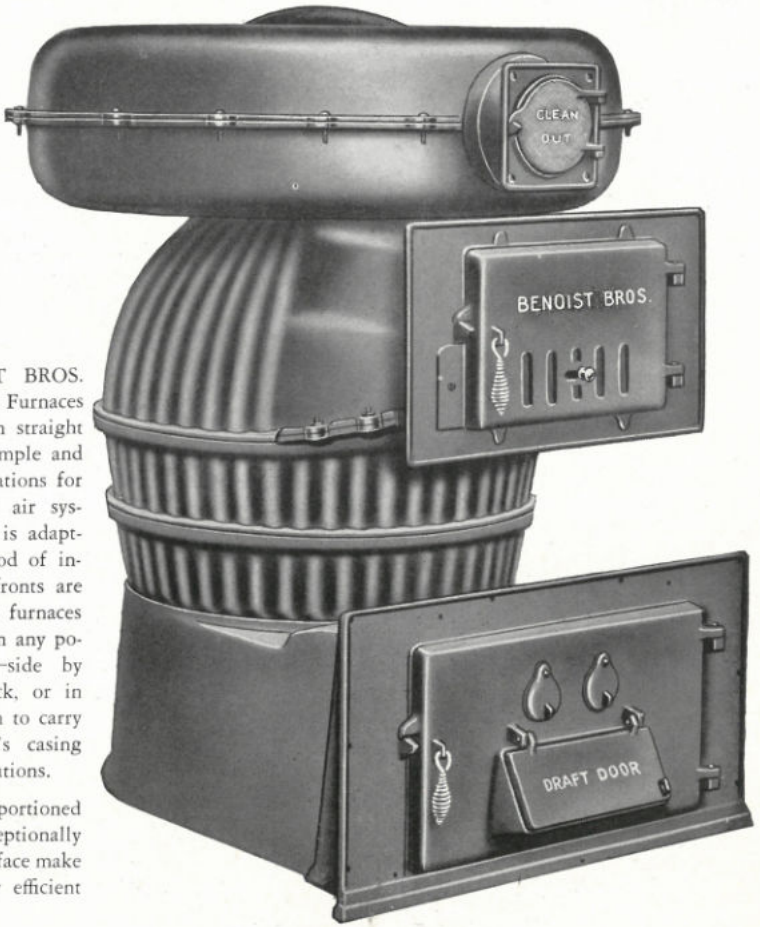
All sharp corners are avoided. Flames never enter corners, but always rise in a rolling, sweeping motion. This construction allows ample draft, increases combustion and consequently decreases the consumption of fuel.

Observe the lock-cup joints of the radiator, dome and fire pots.

The BENOIST BROS. has a specially designed *Reversible Notch Arrangement* in the grooves of the ash pit and fire pot joints, which insures correct alignment of the front and base ring when putting on the casing. This is another simplicity feature of the BENOIST BROS. which helps to make installation easy and fool-proof.

No. 500 Series BENOIST BROS. Straight Front Furnace

(For use with battery and forced air installations)



The BENOIST BROS. No. 500 Series Furnaces are equipped with straight fronts enabling simple and convenient installations for battery or forced air systems. This series is adaptable to any method of installation. The fronts are straight and the furnaces can be arranged in any position necessary—side by side, back to back, or in any other position to carry out the installer's casing plans and specifications.

The well proportioned design and exceptionally great radiation surface make this series a very efficient heating unit.

Dimensions of No. 500 Series BENOIST BROS. Straight Front Furnaces

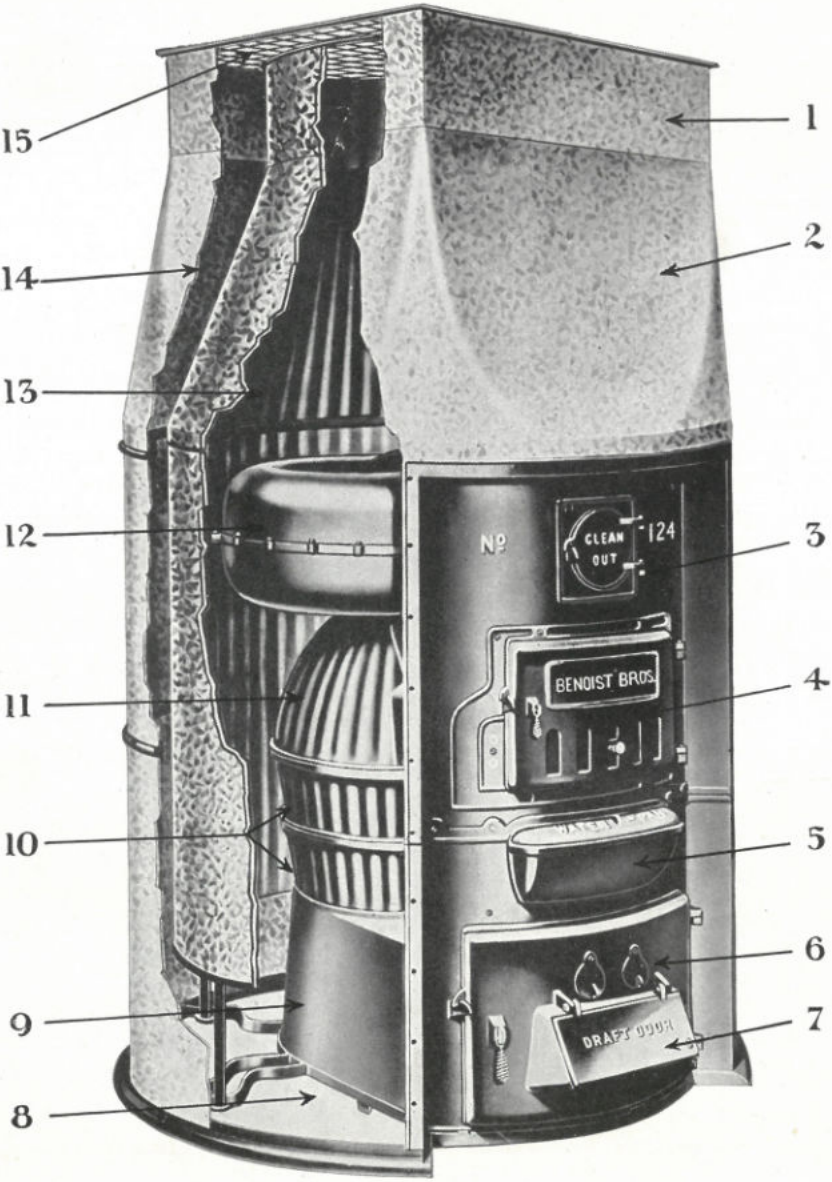
Number of Furnace	Inside Dia. of Fire Pots	Diameter of Grate Surface	Officially Measured Grate Area	Heating Surface Official Measure	Depth of Fire Pots	Size of Fire Door	Size of Ash Door	Diameter of Smoke Collar	Height of Castings	Shipping Weight Without Casing
	In.	In.	Sq. In.	Sq. In.	In.	In.	In.	In.	In.	Lbs.
527	27	24	448	7396	13½	10½x15	23x13	10	52	1440
530	30	27	573	8941	15½	10½x15	23x13	10	58	1850

Measured by Official Measurer of the National Warm Air Heating and Ventilating Association.

	No. 527	No. 530
List Price	$300.00	$415.00

The above prices include poker, regulator chain and plate, shaker, pulleys, bolts, furnace cement and all other accessories.

No. 100 Series BENOIST BROS. Pipeless Furnace



List Prices

	No. 118	No. 120	No. 122	No. 124	No. 127
Furnace complete	$187.70	$215.95	$260.20	$301.20	$375.40
Furnace, less Register and Casing	129.35	160.38	192.96	232.10	311.25

Above prices include poker, regulator chain and plate, shaker, pulleys, bolts, furnace cement, and all other accessories.

The "furnace complete" price includes everything necessary for a complete heating system with the exception of the smoke pipe.

If the upright lever shaker handle as illustrated on pages 4 and 7 is wanted, specify the initials "R. G." after the furnace number.

Dimensions of No. 100 Series BENOIST BROS. Pipeless Furnaces

Number of Furnace	Diameter of Outer Casing	Diameter of Inner Casing	Height of Furnace Complete	Inside Dia. of Fire Pots	Diameter of Grate Surface	Officially Measured Grate Area	Heat. Surface Official Measure	Depth of Fire Pots	Size of Fire Door	Size of Ash Door	Diameter of Smoke Collar	Size of Water Pan	Height of Castings	Size of Register	Diameter WarmAirPipe	Heating Capacity Cubic Feet	Shipping Weight
	In.	In.	Ft. In.	In.	In.	S. In.	Sq. In.	In.	In.	In.	In.	In.	In.	In.	In.		Lbs.
118	40	34	7. 8	18	15	177	3781	12	11x13	17 x13	8	8x15x5	46	24x27	18	12000	895
120	42	36	7. 8	20	17	227	4276	12	11x15	18 x13	8	8x15x5	46	30x30	22	15000	1050
122	46	38½	7.10	22	19	280	5190	12½	11x15	19½x13½	8	8x15x5	48	34x34	26	20000	1235
124	50	43	8.	24	21	330	6120	13	11x15	21 x14	8	8x15x5	50	36x36	28	30000	1470
127	59	49	8.	27	24	448	7396	13½	11x15	23 x14	10	8x15x5	52	40x40	30	50000	1965

No. 100 Series BENOIST BROS. Features

1. **Register Box**—Made of heavy galvanized steel and adjustable to any height floor.
2. **Outside Casing**—Is easily put on when installing. Made of heavy galvanized steel.
3. **Front**—All cast. This front is so arranged that both inner and outer casings fasten to it and fit perfectly tight and rigid. This feature is greatly appreciated by the party installing the furnace, as it gives a well finished job with a minimum of labor.
4. **Fire Door**—It fits perfectly tight. Made extra large to enable firing large chunks of coal or wood.
5. **Water Pan**—Is of ample capacity so placed that the water evaporates rapidly. This produces a balmy warm air conducive to health and comfort. Handy to fill.
6. **Ash-Pit Door**—Is well fitted and full width of ash-pit for convenience in removing ashes.
7. **Draft Door**—Is large and adjusted by a convenient regulator plate placed in one of the rooms above.
8. **Base and Base Ring**—Has a wide casing flange. The larger sizes are made in two well fitted pieces to avoid breakage in transit and trouble in getting into small cellar openings when installing.
9. **Ash-Pit**—Large, roomy, cast in one piece. Joints are deep and fit tight, allowing no dust or dirt to escape into the air chamber. The grate bars are hung into cored pockets of the ash-pit affording a substantial bed for the fire. Either of the bars can be removed in an instant through the ash door. These pipeless furnaces can also be furnished with the ball bearing, round grate and upright lever shaker handle as illustrated on pages 4 and 7 of the catalog.
10. **Two-Piece Fire Pot**—Allows for expansion and contraction. Made extra heavy and corrugated to give increased radiation surface. The lock-cup joints are deep and are permanently sealed with asbestos cement when erected.
11. **Combustion Dome**—Built extra heavy to withstand the constant strain of hard usage. The opening at the top is large enough to admit the passing of the burning gases into the radiator and yet not so large as to allow the gases to rush out unconsumed. A pocket is cast into the side of feed section so that the water coil when installed will not interfere with firing.
12. **Radiator**—Is exceptionally large. It is reversible, allowing the smoke exit to be placed in any position convenient to connect with flue. Notice oval shape. There are no corners for the soot to lodge in and impede radiation. The leak-proof lock-cup joint is made permanently tight by the use of heavy bolts placed at close intervals.
13. **Inner Casing**—Is made of two sheets of galvanized steel riveted together with a layer of asbestos between, the inner sheet is corrugated which provides a dead air space. This construction thoroughly insulates the cold air chamber and insures unimpaired air circulation.
14. **Cold Air Space**—Is large and properly proportioned between the inner and outer casings.
15. Combination cold and warm air REGISTER is properly proportioned and attractively finished.

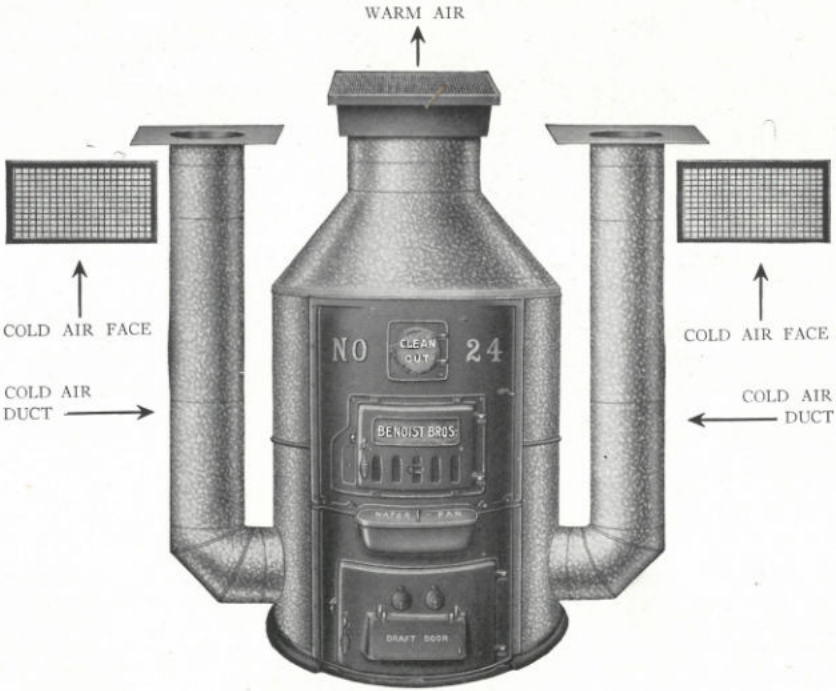
How the No. 100 Series BENOIST BROS. Pipeless Furnace Operates

The BENOIST BROS. Pipeless heating system takes advantage of nature's never-failing law of gravity. Cold air being heavier than warm air, the warm air rises and travels to the farthest and coldest corners of the house and the cold air falls to the lowest levels, is drawn down the cold air register, is heated, then rises again and is distributed through the house. Warm air always rises and will circulate and penetrate wherever there is an opening and as it becomes cool, it will quickly descend and find its way back to the cold air register from any part of the house, upstairs or down. This combined system of circulation and ventilation continues to operate as long as any fire remains in the furnace, giving a mild but continuous motion of air through the entire house and insuring an even temperature and freshness of air at all times.

Wherever the arrangement of the building permits, the No. 100 series BENOIST BROS. Pipeless furnace is the preferred heating system to install. There is no heat lost before the air is circulated into the rooms.

On account of the cold air chamber surrounding that of the warm air, there is practically no heat waste in the basement. The winter's supply of fruits and vegetables can be kept adjoining the furnace and not become too warm.

No. 600 Series BENOIST BROS. Three Way Heating System



The BENOIST BROS. Three-Way Heating System is fast coming into favor from the heating as well as the selling standpoint. The castings are the same as those in the No. 20 Series shown on pages 6, 7 and 10. The registers, cold and warm air ducts are large and properly proportioned.

This system is furnished complete, as illustrated, ready for installation. The regular equipment, in addition to the casing and canopy, includes the following for the warm air: 1 Black Japan Register, 1 register box and 1 drawband 18" wide; and the following for the cold air returns: 2 Oak finish steel cold air faces (wood faces furnished if desired), 2 galvanized iron ceiling plates, 2 90-degree adjustable galvanized iron elbows, 2 galvanized iron casing collars and 12 feet of galvanized iron cold air pipe. On the Numbers 627 and 630, cold air shoes are supplied instead of the 90-degree elbows.

Dimensions of No. 600 Series BENOIST BROS. Three Way Heating Systems

Number of Furnace	Casing Diameter	Ap. Height Furnace Co.	Inside Diam. of Fire Pot	Diameter of Grate Surface	Depth of Fire Pot	Size of Feed Door	Size of Ash Door	Diameter of Smoke Collar	Size of Water Pan	Height of Castings	Size of Warm Air Register	Diameter of Warm Air Pipe	Size of Cold Air Faces	Diameter of Cold Air Ducts	Heating Capacity Cubic Feet	Shipping Weight
	In.	Ft.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.		Lbs.
618	34	8	18	15	12	11x13	17 x13	8	8x15x5	46	18x20	18	10x24	14	12000	895
620	36	8	20	17	12	11x15	18 x13	8	8x15x5	46	20x24	20	12x24	16	15000	1050
622	39	8	22	19	12½	11x15	19½x13½	8	8x15x5	48	24x24	22	12x30	18	20000	1235
624	44	8	24	21	13	11x15	21 x14	8	8x15x5	50	24x30	24	14x30	18	30000	1470
627	52	8	27	24	13½	11x15	23 x14	10	8x15x5	52	26x30	26	18x30	20	50000	1965
630	60	8	30	27	15½	11x15	23 x14	10	8x15x5	58	30x36	30	20x30	22	70000	2400

List Prices

	No. 618	No. 620	No. 622	No. 624	No. 627	No. 630
Furnace Complete (includes casing, registers, pipe and all items specified above)	$195.60	$237.50	$286.20	$331.30	$431.70	$608.30
Furnace, less casing, pipes and registers	123.30	149.20	180.00	217.35	300.00	415.00

Above prices include poker, regulator chain and plate, shaker, pulleys, bolts, furnace cement, and all other accessories.

The "furnace complete" price includes everything necessary for a complete heating system with the exception of the smoke pipe.

If the upright lever shaker handle as illustrated on pages 4 and 7 is wanted, specify the initials "R. G." after the furnace number. The No. 630 is made with the duplex triangular bar grate construction only.

BENOIST BROS. Bolted Radiator

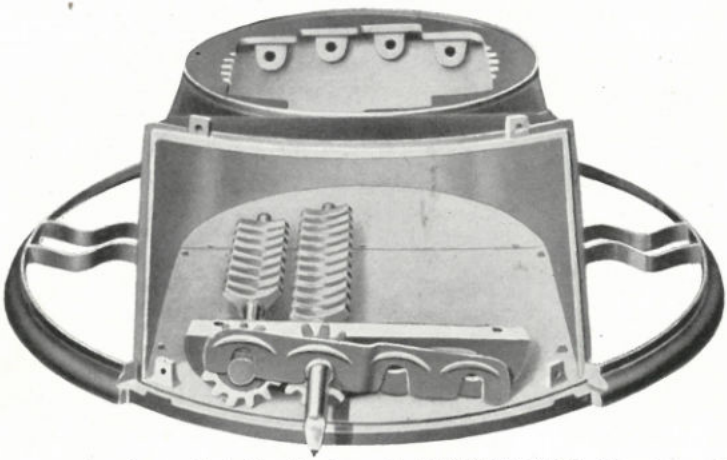
This is the tightly bolted radiator used on all BENOIST BROS. Furnaces with the exception of the No. 2000 Series, which has the one-piece radiator. The burning fumes are forced to pass completely around the radiator before leaving the furnace. Thus practically all of the heating value in the fuel burned is used in warming the circulating air as it passes over the castings and large radiator surface. The large oval shape prevents soot from accumulating, which would impede radiation and choke off the draft. The construction is such that the smoke exit can be placed in any position convenient for connecting with the flue. Because of the large radiation surface and full measurements throughout, the BENOIST BROS. has a much larger heating capacity than the average furnace of its type.

Dome or Combustion Chamber

The dome or combustion chamber is built extra heavy to withstand hard usage. The opening at the top is large enough to admit the passing of the burning gases into the radiator and yet not so large as to allow the gases to rush out into the flue unconsumed. The feed section is of ample dimensions and well proportioned, permitting the use of a large scoop and the firing of big chunks of coal or wood. A pocket is cast into the side of the feed section so that the water coil when installed will not interfere with firing. The smoke curtain in the feed section prevents smoke from escaping when firing.

BENOIST BROS. Ash Pit and Base Ring

(Showing Duplex Triangle Bar Grate Construction)



This grate construction is regularly furnished on all BENOIST BROS. Furnaces unless the Ball Bearing Round Grate Construction is specified.

The ash pit is cast in one piece and is deep and roomy. The grate bars are hung into cored pockets of the ash pit. This grate construction affords a substantial bed for the fire, the fire not touching the grate supports at any place. There are no grate rings, cotter pins or bolts to burn out. Clinkers are either dislodged or ground up by the action of the bars in revolving when the shaker is operated. Either of the bars can be removed in an instant from the ash door.

BENOIST BROS. Combination Fire Pot for Coal and Gas

Combination Fire Pot for Coal and Gas

This fire pot takes the place of the regular fire pot section. It is made in 18, 20, 22 and 24-inch fire pot diameters.

When furnished with furnace the following additions to the list price appply:

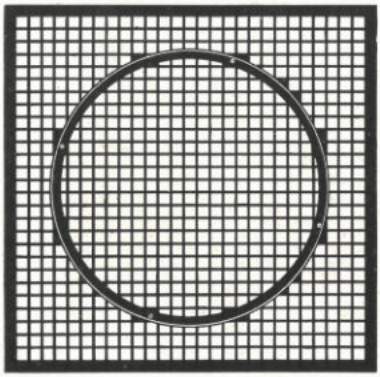
18" Diameter	$10.25
20" Diameter	11.54
22" Diameter	13.47
24" Diameter	16.67

Water Coil

This cast iron water coil or heater can easily be installed in all sizes of BENOIST BROS. Furnaces. It has ample capacity for the domestic hot water supply. All coils are tested to a 200-pound water pressure. Tapped for ¾" pipe. List Price $3.85.

Water Coil

Duplex Grating for Pipeless Furnaces



This grating or register is plain and neat in design. It is made of cast iron and built with a maximum free air area. The warm air outlet is properly proportioned with the cold air intake.

This register is furnished regularly on BENOIST BROS. Pipeless Furnaces in a glossy black japan finish that won't chip off. Should the oxidized copper finish be wanted we will quote prices on furnaces thus equipped on request.

List Prices of Duplex Gratings Only

Size Grating	Size Collar	Black Japan	Oxidized Copper
24x27	18 in.	$30.00	$36.00
30x30	22 in.	39.00	45.00
34x34	26 in.	44.00	52.50
36x36	28 in.	52.00	61.00
40x40	30 in.	68.50	80.00

Discounts applying on the above list prices quoted on application.

School Room Heaters

The BENOIST BROS. No. 300 Series Room Heaters as shown on page 9 are adaptable for school room installations. Care should be taken when making installations in school houses to comply with the provisions of the state school boards relative to fresh air intakes and foul air vents.

Pipe Furnace Fittings

We job a complete line of Floor and Baseboard registers, cold air faces, and all standard size sheet metal fittings used in furnace installations including double wall stack and fittings thereto. Our prices and discounts are the same as quoted by the register and fittings manufacturers. All orders are carefully handled and filled promptly.

BENOIST BROS. Enameled Circulator

for Beauty *and* Home Comfort
There is nothing like a BENOIST BROS. Circulator

(Complete description on pages 18 and 19)

The BENOIST BROS. Provides Con

Beauty

The wood grained enamel finishes in either Walnut or Mahogany color give the BENOIST Bros. Circulator the beauty of an ornamental piece of furniture—yet the mica openings in the fire door show the warm glow of a radiant fire.

Comfort

This heater provides positive circulation of air—therefore the name "circulator." There is nothing more comfortable than circulating air when it is properly humidified. The BENOIST BROS. humidity pan is placed so as to give the proper amount of evaporation. It is out of sight in the rear of the heater but is convenient to fill. Humid air is always more healthful.

Convenience

The big item of convenience in the BENOIST BROS. Circulator is the ease with which it is kept clean. In cleaning merely use a dust cloth as on other living room furniture. The large fire door makes it convenient for firing large pieces of fuel. The grate shaker handle is conveniently placed at the side. There is a large ash pit which makes it easy to remove ashes.

Coal or Wood

The BENOIST BROS. heats equally as effective with wood as with coal. There is a reversible V-shaped bar grate construction. By one turn of the crank the grates are instantly changed from coal burning to wood burning or vice versa.

stant Circulation of Healthful Air

Construction Features

The BENOIST BROS. Circulator is of rigid construction throughout.

The entire front is cast in one piece.

The base and legs are all cast and are well fitted.

The edges of the steel sides are angled providing perfect joints, distinct lines, and rigid construction.

The top is cast in one piece with a cast removable grille. This gives access to the interior of the heater for cleaning.

There is a 12″ cast grille in the rear at the bottom to provide additional circulation.

The humidity pan is of cast iron and is set in a cast iron frame at the rear.

A hot blast feature is provided in the feed door.

Dimensions and Specifications

	No. 18	No. 20
Height Over All	43″	45″
Width	25½″	27½″
Depth	17¾″	18¾″
Firepot Inside	18″x11″x8″	20″x12″x9″
Feed Door Opening	7¼″x14″	8¼″x16″
Ash Door Opening	7″x14″	7″x16″
Smoke Collar	7″	7″
Approximate Shipping Weight	325 lbs.	425 lbs.

Finishes: Walnut, Mahogany and Black.

List Prices

	No. 18	No. 20
Circulator, Fully Enameled	$71.77	$95.69
Circulator, Enameled but with Black Back	67.58	91.51
Circulator, with Black Satin Finish	52.63	71.77

Series "A" BENOIST BROS. Laundry Tank Heaters

No. A26 and A28
Two-Hole

BENOIST BROS. Tank Heaters and Laundry Stoves are neat in appearance. All castings are smooth and clean. They are durable and give thorough satisfaction.

The grate will not drop when shaking ashes. It is substantial and has a draw center. Its surface is the largest that can possibly be provided. The ash pit is deep and roomy. The feed door is exceptionally large. The tops fit perfectly. Lock washers are used on the bolts eliminating all possibility of loosening in transit.

The BENOIST BROS. is built to satisfy the user. It is correct in design. The highest quality materials are used and skilled workmen are employed in its construction.

The BENOIST BROS. is neat in appearance. Unity in design is maintained throughout.

The fire pot is so constructed that the water within its cored wall makes a complete circulation of the fire bed. This circulation utilizes a maximum of the heat produced. Every fire pot is tested with a water pressure of 200 pounds.

No. A46 and A48
Four-Hole

Dimensions and Specifications

	TWO-HOLE		FOUR-HOLE	
	No. A26	No. A28	No. A46	No. A48
Diameter of Covers	7½"	8¼"	7½"	8¼"
Size of Top	19¼"x20½"	20¼"x22½"	18"x23"	22½"x25½"
Inside Diameter of Fire Pot at Top	10"	11½"	10"	11½"
Height Over All	21½"	24"	20½"	24"
Size of Smoke Collar	6"	6"	6"	6"
Diameter of Grate Surface	9"	10¾"	9"	10¾"
Size of Ash Door	9½"x3"	10½"x4"	9½"x3"	10½"x4"
Size of Feed Door	9"x4"	9"x4"		
Weight	104 lbs.	130 lbs.	112 lbs.	150 lbs.
Heating Capacity per Hour	75 gal.	100 gal.	75 gal.	100 gal.
List Price	**$15.70**	**$19.70**	**$17.95**	**$22.80**

Series No. A100 BENOIST BROS. Laundry Tank Heaters

No. A126 and A128—Two-Hole

These A100 Series Tank Heaters have the same heating capacities as the "A" Series illustrated on page 20. They have the same straight walled fire pots, the same large diameter grates, the same covers, centers, feed doors and legs.

On this series the hood and top is cast in one piece whereas on the "A" Series this section is cast in two pieces.

Nickle plated draft screw disks are used. High quality is maintained throughout in the construction of these heaters. The tops and doors fit perfectly. As on the "A" Series, they are mounted with lock washers on all bolts.

Every fire pot is tested with a water pressure of 200 pounds.

No. A148—Four Hole

Dimensions and Specifications

	TWO-HOLE		FOUR-HOLE
	No. A126	No. A128	No. A148
Diameter of Covers	7⅛"	8¼"	8¼"
Size of Top	18"x18½"	19½"x20½"	22½"x25½"
Inside Diameter of Fire Pot at Top	10"	11½"	11½"
Height Over All	21½"	24"	24"
Size of Smoke Collar	6"	6"	6"
Diameter of Grate Surface	9"	10¾"	10¾"
Size of Ash Door	9½"x3"	9½"x3"	9½"x3"
Size of Feed Door	9"x4"	9"x4"	
Shipping Weight	95 lbs.	115 lbs.	140 lbs.
Heating Capacity per Hour	75 gal.	100 gal.	100 gal.
List Price	**$14.92**	**$17.73**	**$21.66**

BENOIST BROS. Tank Heaters

No. A18 HB

The A18 HB is a very efficient tank heater for use where the laundry top is not required. The same fire pot and grate is used as on the No. A28 illustrated on page 20. The high base provides a much deeper ash pit.

Dimensions and Specifications

Diameter of Top	16½"
Inside Diameter of Fire Pot at Top	11½"
Height Over All	21"
Height of Base	10"
Size of Smoke Collar	6"
Diameter of Grate Surface	10¾"
Size of Ash Door	10½"x4"
Weight	110 lbs.
Heating Capacity per Hour	100 gal.
List Price	**$19.20**

Prices on Other Combinations

The top and base used on the No. A18 HB Tank Heater can be supplied on the other Tank Heaters as follows:

For the High Base on the No. A28 add $1.00 to list price of No. A28.
For the High Base on the No. A128 add $2.02 to list price of No. A128.
For the One Hole Top on the No. A28 deduct $1.50 from list price of No. A28.
For the One Hole Top on the No. A128 deduct $ .55 from list price of No. A128.
For the One Hole Top on the No. A26 deduct $1.33 from list price of No. A26.
For the One Hole Top on the No. A126 deduct $ .55 from list price of No. A126.
The One Hole Top on the A26 and A126 is 14¾" in diameter.

No. 200 BENOIST BROS. Tank Heater

The No. 200 BENOIST BROS. Tank Heater is of sturdy construction throughout. The water circulates around the entire wall of the fire pot including the top — this is conducive to efficiency. The heat loss is reduced to the minimum.

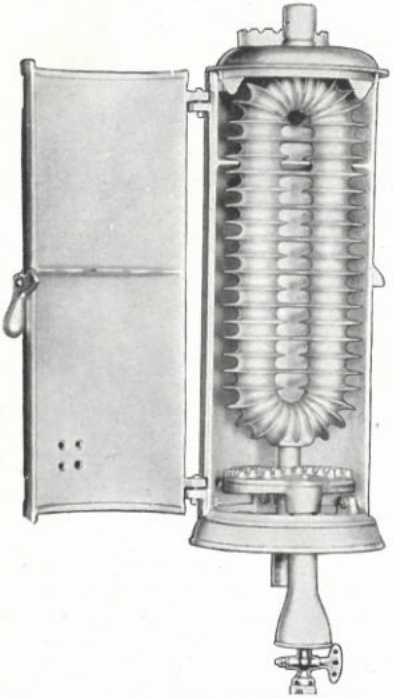
There is a large size fire door with a hot blast arrangement. The large round grate has a draw center. The ash pit is large with a full size ash door. The drop draft door permits using automatic draft control.

Dimensions and Specifications

Diameter of Top	14½"
Inside Diameter of Fire Pot	12"
Diameter of Grate	12"
Height of Ash Pit	9"
Height Fire Pot and Water Barrel	18"
Height Over All	27"
Smoke Collar	6"
Gallons Hot Water per Hour	200
Tappings	1¼" pipe
Approx. Shipping Weight	275 lbs.
List Price	**$55.00**

200 Gallon per Hour Capacity

Duplex Jiffy Gas Water Heaters



All Parts Are Accessible When Door is Open

Lasting Service

The Duplex Jiffy Gas Heaters are built to last a lifetime. They will operate under severe conditions and for that reason are often used in factories, barber shops, and restaurants.

Hard Water

The Duplex Jiffy is especially adaptable for hard water. The opening in the coil is large and it does not lime up as is the case on many other gas heaters.

Coils

The Coils are castings of highly conductive iron alloy—less expensive than copper tubing, but many times more lasting and, with our patented construction, just as efficient.

No Condensation

Solid heat absorbing horizontal fins add heating efficiency and dispose of all condensation. No drip inside or outside.

Quicker Hot Water

No scale or powder forms on the outside of the coils to lower the heat transfer and drop down onto the burner. The coils are of large inside diameter and as the circulation is vertical there are no horizontal surfaces or curves to collect sediment or lime deposits.

Burner

The easy adjustment of air and gas flow insures proper fuel mixture while secondary air admission from below the burner causes perfect combustion. No burner gauzes are necessary.

Dimensions and Specifications

	No. 30	No. 50
Boiler Size	20–30	30–50
Height	22	26
Diameter	7	8
Water Connection	¾″ pipe	¾″ pipe
Gas Connection	½″ pipe	½″ pipe
Vent Pipe	3″ Oval	3″ Oval
Approx. Artificial Gas Consumption per hr.	55 Cu. Ft.	55 Cu. Ft.
Approx. Natural Gas Consumption per hr.	35 Cu. Ft.	35 Cu. Ft.
Crated Weight	45 pounds	60 pounds
List Price	**$12.22**	**$13.00**

All Duplex Jiffy Heaters are finished in aluminum both inside and out. This finish will not burn off.

BENOIST BROS. Kitchen Heater

The BENOIST BROS. Kitchen Heater is of rigid construction throughout. The front is all cast. The sides are of heavy gauge steel. The height is adjustable.

This heater operates equally as well with wood as with coal. There is a reversible V-shaped bar grate construction. By one turn of the crank the grates are instantly changed from coal burning to wood burning or vice versa.

Size of Top 14x22½ inches. Height of Body 21½ inches. Width of Body 11 inches. Fire Box 17x8x8 inches. Shipping weight 115 lbs.

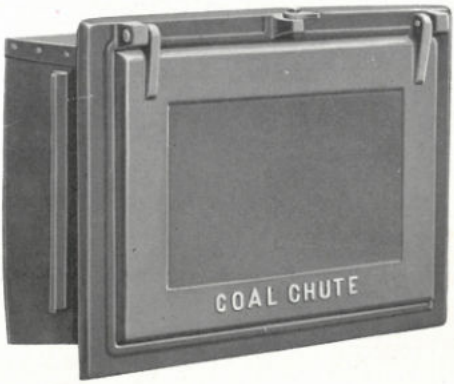
List Price with Two Shelves as illustrated..$22.50
List Price with One Shelf 21.88
List Price without Shelves..... 21.25

BENOIST BROS. Coal Chute Door

The BENOIST BROS. Coal Chute Door is substantial, the door and frame being made of a special grade, heavy cast iron. It comes regularly equipped with a heavy sheet metal Wall Extension 10 inches deep. The BENOIST BROS. Coal Chute Door is self-locking and burglar proof. There is also a lock which holds the door up firmly against the house when open. This feature prevents coal from striking and scarring the outside of the building above the coal chute.

Width, 24 in. Height, 17 in. Depth, 10 in.

List Price $10.00.



BENOIST BROS. Flue Cleanout Doors

A BENOIST BROS. Cleanout Door built in a flue makes the cleaning of a chimney and the removal of soot a simple matter. Both the door and frame are made of cast iron. The door has a positive catch which can be operated easily, but it cannot blow open. Made in five sizes.

Size	Shipping Weight	List Price
8 x 8	8 lbs.	$1.40
8 x 10	10 lbs.	1.70
10 x 12	14 lbs.	2.10
12 x 15	20 lbs.	4.65
16 x 20	40 lbs.	7.00

BENOIST BROS. Laundry Stoves

The No. 80 BENOIST BROS. Two-Hole Laundry Stove is substantial and neat appearing. It is a popular number and big seller.

Height 21 inches. Size of Top 19¼x20½ inches. Shipping weight 65 lbs. **List Price $9.38.**

No. 180—This No. 180 Two-Hole Laundry Stove has the same castings throughout as the No. 80 with the exception of the top and hood. In the No. 180 the top and hood are cast in one piece.

Height 21 inches. Size of Top 18x18½ inches. Shipping weight 57 lbs. **List Price $8.91.**

No. 80 Two-Hole

No. 480 Four-Hole

The No. 480 stove is the same as the No. 80 but has a four-hole top.

Height 20 inches. Size of Top 23x18 inches—has four 7½-inch covers. Shipping weight 75 lbs. **List Price $11.85.**

The No. 8 Two-Hole Laundry Stove—a good stove for the money.

Height 19 inches. Size of Top 14½x19½ inches. Shipping weight 45 lbs. **List Price $6.88.**

No. 8 Two-Hole

All of the BENOIST BROS. Laundry Stoves are made of high quality heat resisting iron. The castings are uniform, smooth and clean. All stoves fit perfectly.

Series B Benoist Bros. Laundry Stoves

No. B26 and B28—Two-Hole

Series B Laundry Stoves are high grade in every particular. They are of full and ample proportions throughout.

The fire pots are made with straight walls, affording larger grate surface. The hoods are so constructed as to give ample room for the large capacity feed pouch and door. The feed doors are exceptionally large. The tops and doors fit perfectly.

The grate will not drop when shaking ashes. It is substantial and has a draw center. Its surface is the largest that can possibly be provided. The ash pits are deep and roomy. The feet are well seated in grooves, to avoid shifting and are held firmly in place by quarter-inch bolts.

These stoves are all carefully mounted and fitted throughout. Lock washers are used on the bolts.

No. B46 and B48—Four-Hole

QUALITY is plainly evident throughout the construction of these stoves. Measurements are full and true. The fire pot and grate surface are exceptionally large.

Dimensions and Specifications

	TWO-HOLE		FOUR-HOLE	
	No. B26	No. B28	No. B46	No. B48
Diameter of Covers	7½"	8¼"	7½"	8¼"
Size of Top	19¼"x20½"	20¼"x22½"	18"x23"	22½"x25½"
Inside Diameter of Fire Pot at Top	11½"	12¼"	11½"	12¼"
Height Over All	21½"	24"	20½"	24"
Size of Smoke Collar	6"	6"	6"	6"
Diameter of Grate Surface	9"	11¼"	9"	11¼"
Size of Ash Door	9½"x3"	10½"x4"	9½"x3"	10½"x4"
Size of Feed Door	9"x4"	9"x4"		
Weight	82 lbs.	100 lbs.	90 lbs.	120 lbs.
List Price	**$11.80**	**$13.76**	**$13.50**	**$16.44**

Series No. B100 BENOIST BROS. Laundry Stoves

No. B126 and B128—Two-Hole

These B100 Series Laundry Stoves have the same large straight walled fire pots as the Series B illustrated on page 26. They have the same large diameter draw center grates, the same covers, centers, feed doors and legs.

On this series the hood and top is cast in one piece, whereas on the B Series this section is cast in two pieces.

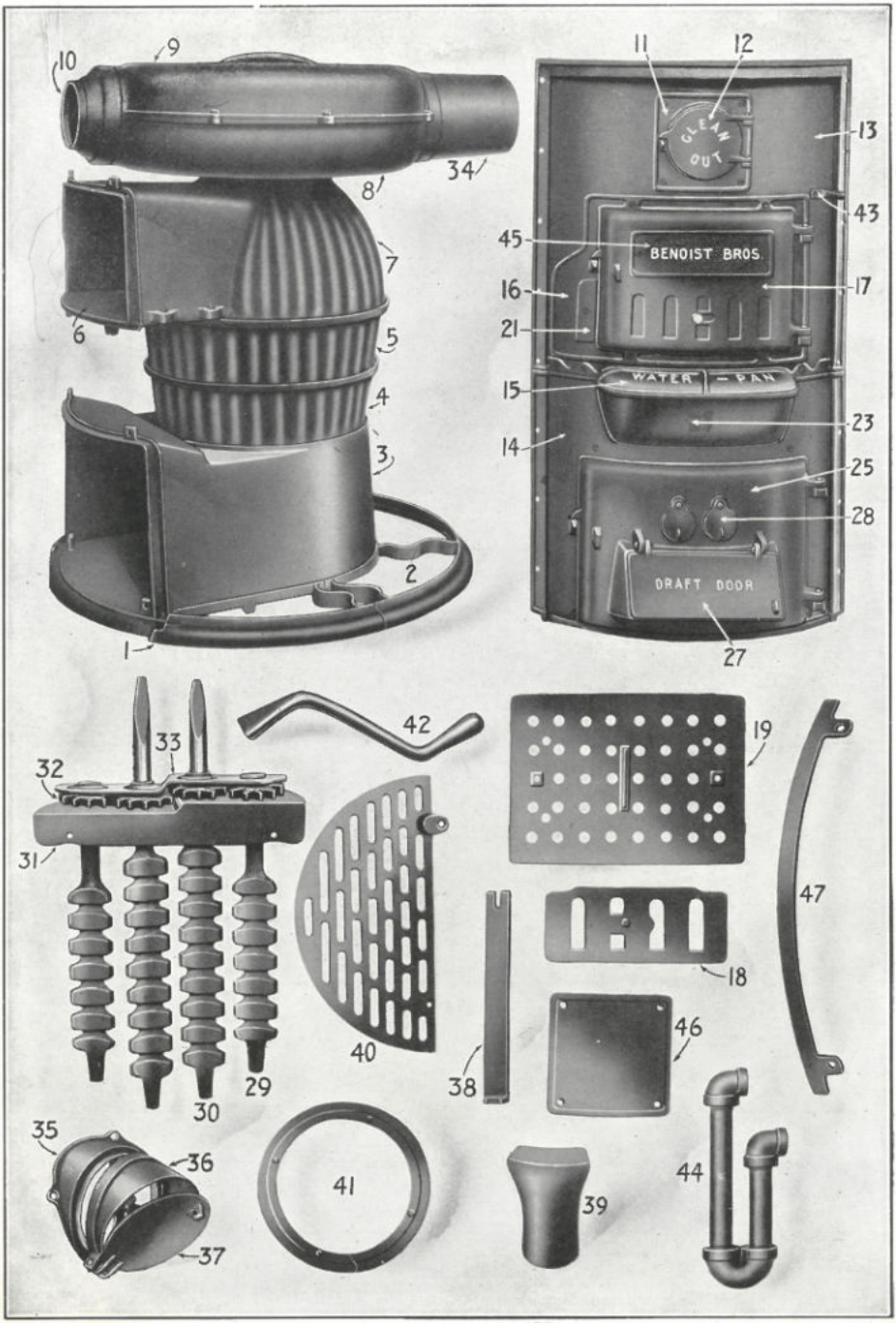
Nickel plated draft screw discs are used. High quality is maintained in the construction of these heaters. The tops and doors fit perfectly. As on the "B" Series, they are mounted with lock washers on the bolts.

No. B148—Four-Hole

Dimensions and Specifications

	TWO-HOLE		FOUR-HOLE
	No. B126	No. B128	No. B148
Diameter of Covers	7½"	8¼"	8¼"
Size of Top	18"x18½"	19½"x20½"	22½"x25½"
Inside Diameter of Fire Pot at Top	11½"	12¾"	12¾"
Height Over All	21½"	24"	24"
Size of Smoke Collar	6"	6"	6"
Diameter of Grate Surface	9"	11¼"	11¼"
Size of Ash Door	9½"x3"	9½"x3"	9½"x3"
Size of Feed Door	9"x4"	9"x4"	
Shipping Weight	70 lbs.	90 lbs.	110 lbs.
List Price	**$11.21**	**$12.38**	**$15.62**

BENOIST BROS. Furnace Parts

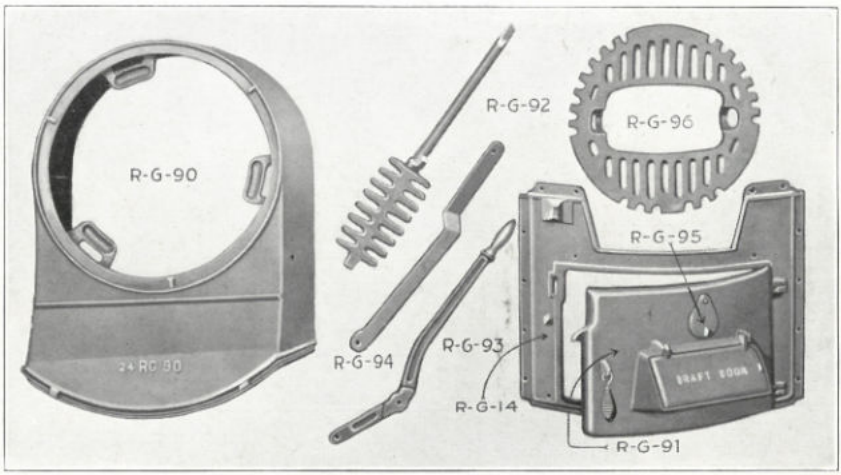


List of BENOIST BROS. Furnace Parts

No.	Name of Part
1	Base Ring Front Section
2	Base Ring Back Section
3	Ash Pit
4	Lower Fire Pot
5	Upper Fire Pot
6	Dome Cover
7	Dome
8	Lower Section Radiator
9	Upper Section Radiator
10	Clean Out Collar
11	Clean Out Frame
12	Clean Out Door
13	Upper Front
14	Lower Front
15	Water Pan Cover
16	Fire Door Frame
17	Fire Door
18	Fire Door Slide
19	Fire Door Lining
21	Water Stop
23	Water Pan
25	Ash Door

No.	Name of Part
27	Draft Door
28	Grate Stop
29	Short Grate Bar
30	Long Grate Bar
31	Grate Hanger
32	Cog
33	Cog Shield
34	Smoke Collar
35	Lower Section of Check
36	Middle Section of Check
37	Check Draft Door
38	Inside Casing Support
39	Room Heater Leg
40	Wood Grate
41	Expansion Ring
42	Shaker Handle
43	Chain Guide
44	Water Coil
45	Fire Door Panel
46	Blank Panel
47	Front Extension

BENOIST BROS. Round Grate Furnace Parts



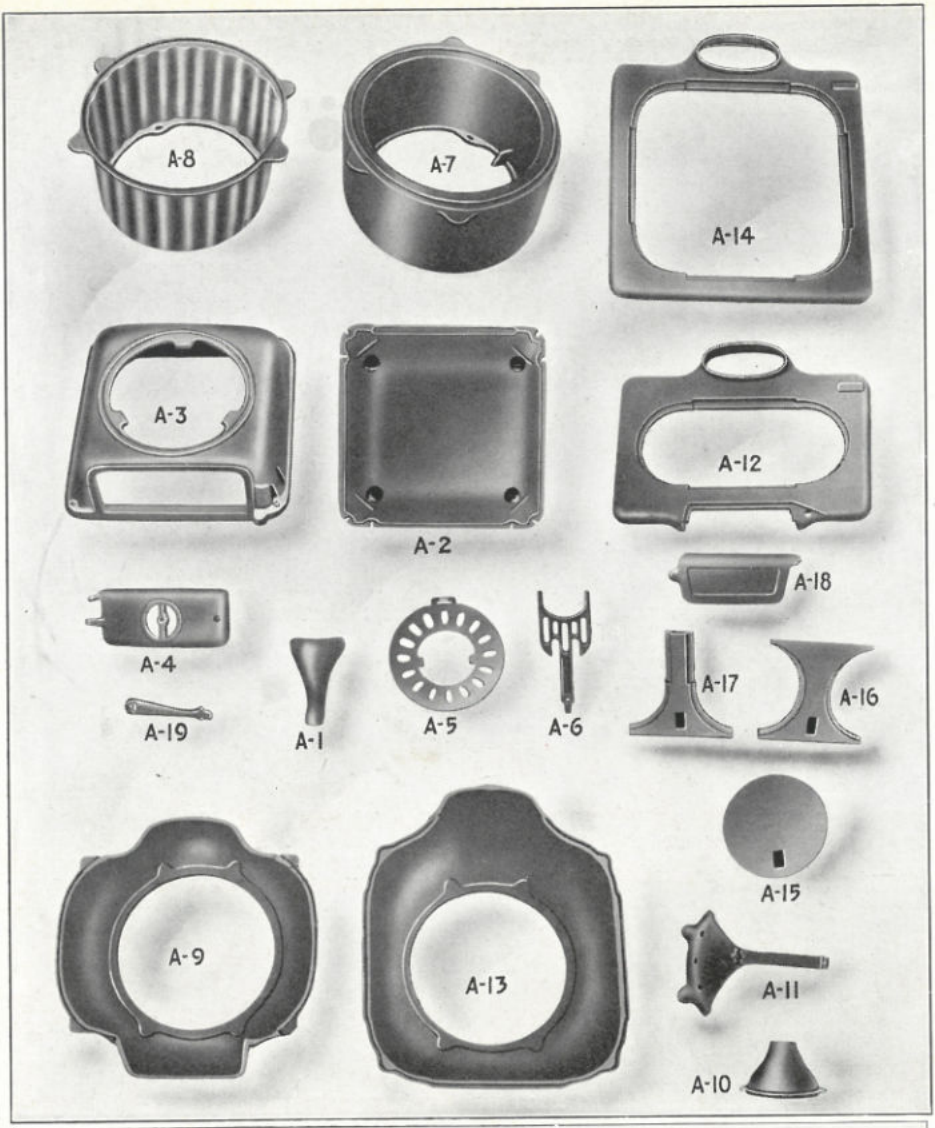
List of BENOIST BROS. Round Grate Furnace Parts

(All other parts are the same as those illustrated on page 28)

No.	Name of Part
RG14	Lower Front
RG90	Ash Pit
RG91	Ash Door
RG92	Center Grate

No.	Name of Part
RG93	Shaker Handle
RG94	Horizontal Lever
RG95	Grate Stop
RG96	Round Grate

When ordering parts be sure to give furnace number as well as part number and name.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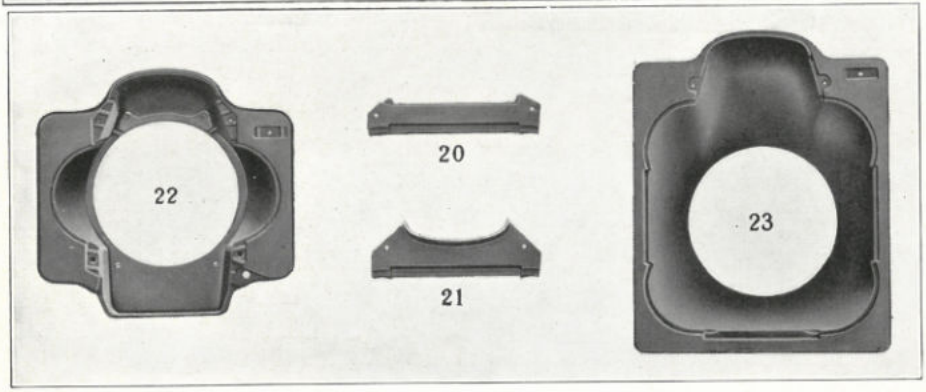
A-19
A-1
A-5
A-6
A-17
A-16
A-9
A-13
A-15
A-11
A-10


22
20
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23

List of BENOIST BROS. Tank Heater and Laundry Stove Parts

(For illustrations see page 30)

A-1 Foot
A-2 Botton
A-3 Base
A-4 Ash Door
A-5 Round Grate
A-6 Draw Grate
A-7 Water Pot
A-8 Laundry Pot
A-9 Two-Hole Hood
A-10 Two-Hole Deflector
A-11 Four-Hole Deflector and Post
A-12 Two-Hole Top
A-13 Four-Hole Hood
A-14 Four-Hole Top
A-15 Cover
A-16 Short Center
A-17 Cut Center
A-18 Fire Door
A-19 Shaker and Lifter
A-20 Front Section
A-21 Collar Section
A-22 Two-Hole Top and Hood
A-23 Four-Hole Top and Hood

When ordering parts be sure to give stove or heater number as well as part number and name.

STANDARD CODE

ARTICLE No. 3

Method for Determining Sizes of Warm Air Pipes, Wall Stacks and Furnaces for Use in Residences

Method for Determining Sizes of Basement Warm Air Pipes

Section 1.—Each First Floor Room

Divide square feet of glass by 12,
Divide square feet of net outside wall by 60, (See Table A)
Divide cubic contents by 800,
Add together the above and multiply by 9.
The result is the area of the basement pipe.

The sum of:			
Glass (sq. ft.) (*Note 4*)	÷	12	
Net Wall (sq. ft.) (*Note 5*)	÷	60	×9=Area of
Cubic Contents	÷	800	Basem't Pipe

Section 2.—Each Second Floor Room

Divide square feet of glass by 12,
Divide square feet of net outside wall by 60, (See Table A)
Divide cubic contents by 800,
Add together the above and multiply by 6.
The result is the area of the basement pipe.

The sum of:			
Glass (sq. ft.) (*Note 4*)	÷	12	
Net Wall (sq. ft.) (*Note 5*)	÷	60	×6=Area of
Cubic Contents	÷	800	Basem't Pipe

Section 3.—Each Third Floor Room

Divide square feet of glass by 12,
Divide square feet of net outside wall by 60 (See Table A)
Divide cubic contents by 800,
Add together the above and multiply by 5.
The result is the area of the basement pipe.

The sum of:			
Glass (sq. ft.) (*Note 4*)	÷	12	
Net Wall (sq. ft.) (*Note 5*)	÷	60	×5=Area of
Cubic Contents	÷	800	Basem't Pipe

Basis of Working Rules for Pipes

(a) These formulae are for 70 degrees temperature difference (outside temperature zero, inside temperature 70 degrees Fahrenheit). When temperature difference is more than 70 degrees, add 1½% per degree to final figures. When temperature difference is less than 70 degrees, deduct 1½% per degree from final figures.

(b) The values as given in Table A for use in the working rules, article 3, section 1 - 2 and 3 are derived as follows:

EXAMPLE:

The factor 60 in Table A, Item No. 1, is based upon a co-efficient of heat transmission of 0.23 B. t. u. per square foot per degree difference per hour, thus: W x 0.23 x 70 ÷ 111 = sq. in. first floor leader to compensate for the heat loss through walls only. In this, W = net area of exposed wall in sq. ft.; 0.23 = coefficient of transmission in B. t. u. per sq. ft. per degree of difference per hr.; 70 = difference in temperature of air on inside and outside of wall; 111 =

heat delivering capacity of one square inch of first floor leader pipe for a register temperature of 175°F. Reduced to its simplest approximate form this is

$$\frac{W \times 9}{60}$$

Likewise substitute 167 for second floor and 200 for third floor in place of 111.

The values in Table A for the different types of walls were obtained by substitution of proper coefficient of heat transmission instead of 0.23 in the above formula.

TABLE A

(The factor 60 used in the above example, is for buildings constructed as in item No. 1. When other types of walls are used substitute the appropriate factor as given below).

No. 1.	Frame wall constructed of siding, paper, sheathing, studding, lath and plaster	60
No. 2.	Frame wall constructed of siding or stucco direct to sheathing (no paper), lath and plaster	52
No. 3.	9″ Brick Wall (no plaster)	40
No. 4.	9″ Brick Wall plastered one side	48
No. 5.	9″ Brick Wall, air space, furred and plastered	65
No. 6.	13″ Brick Wall, no plaster	53
No. 7.	13″ Brick Wall, plastered one side	57
No. 8.	13″ Brick Wall, air space, furred and plastered	75
No. 9.	4″ Brick, 4″ hollow tile, plastered	55
No. 10.	4″ Brick, paper, sheathing, studding, lath and plaster (brick veneer)	68
No. 11.	8″ Hollow tile stucco and plaster	67
No. 12.	8″ Hollow tile, stucco furred and plastered	90
	Roofs	
No. 13.	1″ T & G. Sheeting, Tar & Gravel	48
No. 14.	1″ T & G. Sheeting & Composition roof	40
No. 15.	1″ T & G. Sheeting & Tin	24
No. 16.	Corrugated Iron on strips	9.3
	Ceilings	
No. 17.	Lath and plaster without floor above	50
No. 18.	Lath and plaster with tight floor above	90
No. 19.	Metal without floor above	40
No. 20.	Metal with tight floor above	70

Method for Determining Size of Wall Stacks

Section 4. First Floor Rooms.
Same as Section 1.

Section 5. Second Floor Rooms.
Not less than 70% of basement pipe area as determined in Section 2.

Section 6. Third Floor Rooms.
Not less than 70% of basement pipe area as determined in Section 3.

Where two or more rooms are heated from the same basement pipe and stack, the area of such basement pipe and stack shall equal the combined areas as determined in Article 3, Section 1, 2 and 3.

Explanatory Notes

Note 3. In obtaining glass surface use full casement opening. An outside door is figured as glass.

Note 4. To obtain net outside wall multiply height by width and deduct the glass in all windows and outside doors. For all rooms with attic spaces immediately above full ceiling areas shall be taken into account, using Table A. Floors over unexcavated spaces shall be figured as 50% exposed wall and fully exposed floors shall be figured as 100% exposed wall.

Note 5. For rooms having unusual exposure, ordinarily north, northeast and northwest, add 15% to pipe area. For east and west exposure, add 10%.

Note 6. Use no basement warm air pipe less than 8 inches in diameter. If a basement warm air pipe figures greater area than any standard commercial size then the nearest commercial size shall be used, provided, however, that the total pipe area shall in no case be less than the total requirements according to Sec. 1, 2 and 3.

Note 7. It is understood in using the above values for determining basement warm air pipe areas, that these pipes should be run comparatively straight and that they should not be over 12 feet in length. Sharp turns and long pipes should have extra capacity. When warm air pipes exceed 12 ft. in length or have more than two 70 degree turns, the next larger commercial size pipe must be used.

Note 8. The value of 800 (used in cubic contents) is for an estimated air change of one room volume per hour. If it is desired to provide for 1½ room volume use the figure 600. If for 2 room volumes use the figure 400.

Transition Fittings to Stacks

Section 7. (a) Transition from warm air pipes to stacks or register heads shall be made with a well designed elbow or boot and no stack shall be less than 70% of the area of the warm air pipe leading to it.

(b) **All first floor fittings and connections shall** maintain a free area equal to the round basement pipes leading to them.

To Determine Size of Registers

Section 8. All registers shall have a free area at least equal to the area of the basement pipes leading to them.

Method for Determining Size of Furnace

Section 9. Add together the actual warm air pipe areas in sq. in. as obtained in Sec. 1, 2 and 3, and select a furnace having a rating in sq. in. not less than the sum of all of the warm air pipe areas. This rating to be the one established by the National Warm Air Heating & Ventilating Association in accordance with certified measurements made by the Official Measurer of the National Warm Air Heating and Ventilating Association.

DICKINSON BROS
GRAND RAPIDS