

# 2014 CATALOG

Rappahannock  
Boat Works

Tiny  
Power Steam  
Engines

Valves  
Gauges, etc.  
former Adamy business

- ◆ Custom Steam Boats
- ◆ Steam Engines
- ◆ Model Engines
- ◆ Code Boilers
- ◆ Pumps, Lubricators, etc.
- ◆ Valves, Gauges, etc.

Boatbuilding, Machining, Repairs, Sign Making  
Personal Service ◆ Attention to Detail

Rappahannock Boat Works, Inc.

4403 Dyes Ln., Bealeton, VA 22712

(540) 439-4045

[www.rappahannockboatworks.com](http://www.rappahannockboatworks.com) or [www.tinypower.com](http://www.tinypower.com)



## About Rappahannock Boat Works . . .

The Rappahannock River runs through Virginia, near our home, and is where we like to take our steamboat on an afternoon's outing. So it was natural to name our company after the Rappahannock when we started it in 2001. Since then, we've built many, many boats and have made many friends.

Tiny Power was a natural fit for us when we started looking around for an engine company that could supply good, reliable steam engines for the boats that we were building. We purchased the company in 2004, and have been very pleased with Tiny Power engines.

We also purchased Adamy in 2010, a company that supplies a broad range of industrial/commercial grade steam valves, pressure gauges, injectors, pipe fittings, etc., to operators of small steam power systems.

In short, we have everything you need to make your next steam project a complete success.

Ronnie and Deanna Baird, Bealeton, Virginia  
January 2014

## About Tiny Power . . .

Tiny Power was founded by Charles V. Arnold of Junction City, Oregon, who started the business some time during the 1940's. He was a meticulous and detailed model engineer who had extensive knowledge of both steam and model railroad engine design and construction. In its early days, Tiny Power offered a handful of highly-detailed steam model engines and a couple of marine steam engines in either kit form or as finished, ready-to-run engines, in addition to steam engine boilers and accessories. Mr. Arnold died in 1975 after having managed the Tiny Power business for some 30 years, and the business was purchased by Eugene Goebel in 1977 and was relocated to Branson, Missouri. Mr. Goebel continued managing and building the Tiny Power business for over 26 years and then sold the company to new owners in 2004.

Today, over 60 years after its founding, Tiny Power continues to offer many of the same engines originally designed and sold by Mr. Arnold, in addition to a few other models added to the line over the years.

Our models are sold primarily as do-it-yourself kits, and include castings and other assorted bar stock, nuts and bolts, etc.—everything needed to complete a project. The kits require machining, assembly, testing and fine-tuning, which assumes a certain level of ability to use machine tools and an understanding of steam engines.

Our marine engines are sold as castings and plans only, requiring you to obtain additional material—such as nuts and

bolts and bar stock—for completion. Machining of castings with a milling machine and lathe is also required.

Please feel free to call and ask questions while you are building if you don't understand something. We also machine engines to order (primarily the marine engines), if you'd prefer not doing it yourself. Call for pricing and to get on our build list.

We're committed to upholding the high standards that Mr. Arnold instituted when he started out, and to providing the best customer service possible in everything we do.

## Terms and Conditions . . .

We welcome internet, mail or phone orders, and accept cash, personal check, money order, Visa or MasterCard. All orders must be accompanied by payment in full—including shipping charges—prior to shipment. Unless otherwise stated, shipping will be added to stated prices. Payment for orders from countries outside the U.S. and Canada can be made by credit card or money order in U.S. dollars drawn on a U.S. bank. Wire transfers are also accepted for a \$13.00 fee. Please feel free to phone or e-mail us between 8 a.m. and 5 p.m. Monday through Friday. Or, if you're in the area, drop by and look us up (call first, though, to make sure we'll be here). We're about an hour southwest of Washington, D.C.

We ship either by U.S. Postal Service (flat rate box, where possible) or Fed. Ex., whichever is less costly, and make shipments by the next working day most of the time. If we have your e-mail address, we will notify you when your shipment has been made. Shipping estimates shown on our website are intended for U.S. customers. Customers from Canada and other countries, your postage will most likely be higher than what is stated on our website. We'll give you an estimate and get your approval before we ship.

Prices are subject to change without notice. Prices in this catalog supersede all previous prices. We reserve the right to change specifications of kits and engines. Virginia customers only, please add state sales tax, currently 5%.

Model kits include everything necessary to complete a project except pipe fittings. All prints are drawn full size, in inches. We do our best to provide the best castings we can get, but sometimes castings have hidden flaws that don't appear until you begin to machine them. Call us, and we'll replace defective castings at our expense. Or, if you mess up a part, you can buy a replacement for a reasonable price. We try to keep all parts for engines and models in stock.

If you wish to return your purchase, we'll refund your purchase price less a 15% restocking fee. Just let us know you'd like to return something so we'll know to expect it, then send it to us and we'll send you a refund check immediately.

## Table of Contents

<b>Boats</b> .....	4	<b>Fittings and Accessories</b>	
<b>Boat Accessories</b>		Hand Pumps .....	16
Mooring Bits .....	5	Piston Rings .....	17
Skeg Bars .....	5	Steam Cylinder Oil .....	17
Name Boards .....	5	Pipe Fittings .....	17
<b>Boilers</b> .....	6	Rod and Stem Packing .....	17
<b>Marine Engines</b>		Injectors/Ejectors .....	18
Half M .....	7	Globe Valves .....	19
M Cylinder Package .....	7	Whistle Valves .....	19
2 1/2" Cylinder Group .....	7	Boiler Blowdown Valves .....	19
W .....	8	Teflon Valve Discs .....	19
M Side Crank .....	9	Needle Valves .....	19
M Center Crank .....	10	Lift Check Valves .....	20
M Twin .....	11	Lift Check Valve Disc Holders .....	20
M Compound .....	12	Float Valves .....	20
<b>Model Engines</b>		Ball Valves .....	20
Ajax .....	13	Liquid Relief Valves .....	20
Little Kathy .....	13	“Y” Pattern Strainers .....	20
1V-10 .....	14	Drain Cocks .....	21
2V-10 .....	14	Tricocks .....	21
2V-10M .....	15	Safety Valves .....	22
Oil Cups for Models .....	15	Pressure Gauges .....	24
		Gauge Syphons .....	24
		Utility Gauges .....	25
		Hydrostatic Lubricators .....	25
		Sight Feed Oilers .....	25
		Reflex Water Gauge .....	26
		<b>Order Form</b> .....	27



# Boats

We build custom-designed wood steam launches up to 30 feet in length. The beauty of wood construction is that practically any design is achievable and we are not limited to what mould shapes we happen to have on hand. We build from the ground up, partial builds, or outfit existing fiberglass or wood hulls.

Our steam launch projects are always one-of-a-kind, featuring unique styles, colors and components. Here are a few examples of our past projects so you can see what is possible.



# Boat Accessories

## Skeg Bars

Solid silicon bronze skeg bar casting. Protects the propeller and supports the rudder. In two sizes.

**\$190.00**

22" Long

**\$450.00**

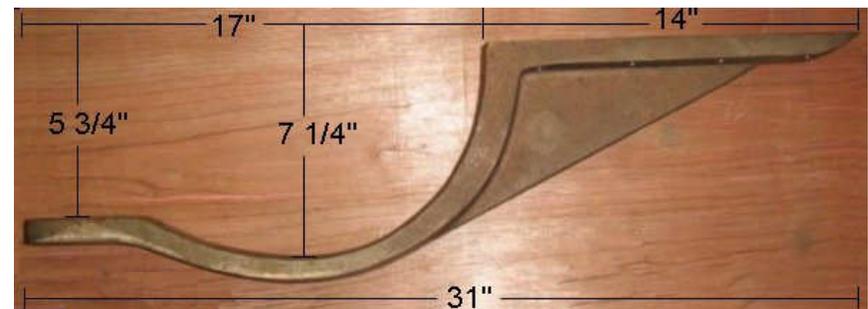
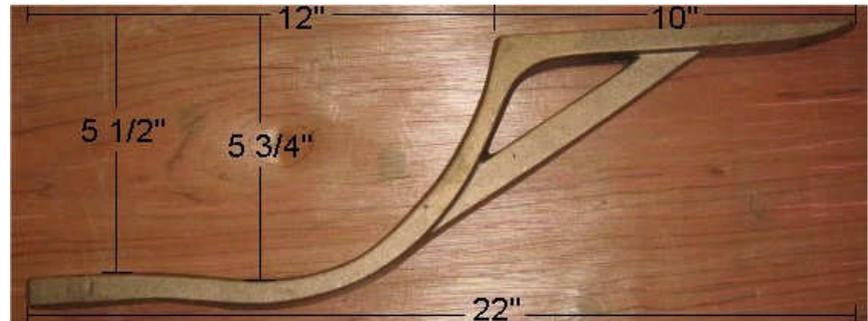
31" Long



## Mooring Bits

Solid bronze mooring bit. Attaches to deck with 1/2 - 13 bronze bolt. Approx. 3" tall.

**\$50.00**



## Name Boards

If you need a name board for your boat, we'll be glad to make you one. Or we'll paint one on your boat. Call for more information or for a quote. Here are some samples.



# Boilers

## Vertical Fire Tube Boilers

Water leg around the firebox. Large firebox. Easy to fire on wood or coal. (It's what we have in our own boat, and we love it.)

Includes door, grates, ashpan with draft door and smoke bonnet. Custom designed and built to ASME code 200 lb. working pressure. Call for availability; we usually build in batches.

Wood lagging and other options are available; call for details.

Two sizes available:

5 HP vertical fire tube code boiler, 18" diameter, 33" tall not including bonnet height

**\$8,500.00**

10 HP vertical fire tube code boiler, 22" diameter, 39" tall not including bonnet height.

**\$10,500.00**



## "M" Water Tube Boiler Blueprints

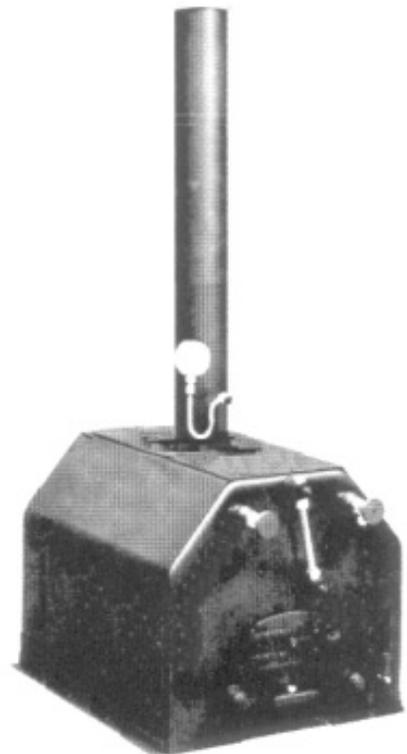
For the do-it-yourselfer, a horizontal water-tube boiler designed in the 1940s or 50s by Charles Arnold to accompany the "M" engine. A combination of the best features of the Roberts and Seabury boilers. With a working pressure up to 150 psi, it is 21" wide, 26" long and 24" high. Drawings include superheater and feed heater coils, and the boiler can be built either with or without these.

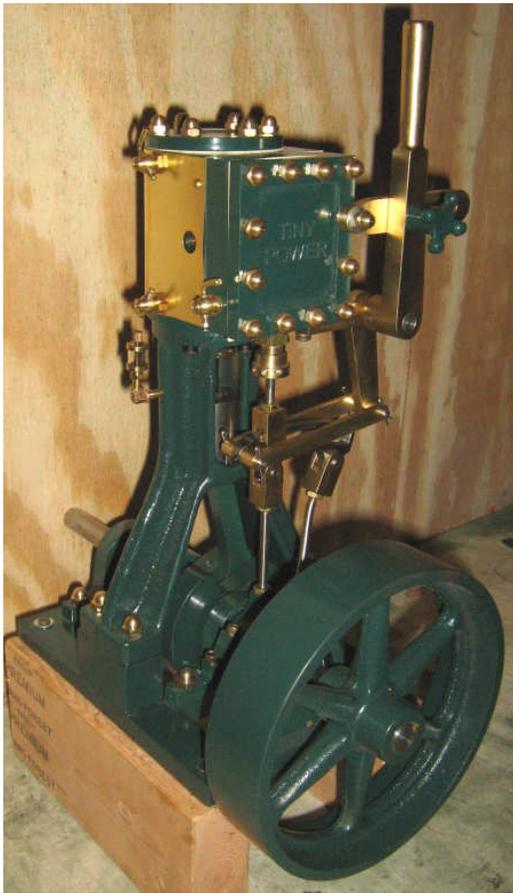
The boiler provides 30 sq. ft. of heating surface, not including the superheater or feed heater. All-welded steel construction. Excellent welding skills required. An approximation of the style is shown at right.

Plans Only

**\$50.00**

Postage Included





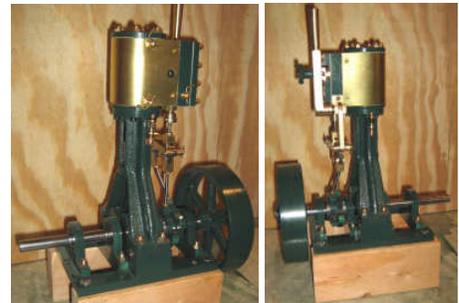
## Half M

### 1-CYLINDER VERTICAL STEAM ENGINE

New in 2012. The Half M is half the size of our M Center Crank engine (shown on page 10). Iron cylinder and frame, all ball bearing construction. Although it's small, it is not a model, but intended to be an actual working engine suitable for a rowboat or canoe or any other application needing about 1/3 horsepower. We offer the engine finished and ready to run. A kit will be available in the future.

Bore . . . . 1 1/2"  
 Stroke . . . . 2"  
 Shaft Size . . . . 5/8"  
 Flywheel Diameter . . . . 6"  
 Height . . . . 12 1/4"  
 Length Base . . . . 8"  
 Width Base . . . . 6"  
 Inlet Pipe . . . . 1/4" IP  
 Exhaust Pipe . . . . 1/4" IP  
 Shipping Weight . . . . 28 lbs.

Ready to Run  
**\$2,200.00**



## M Cylinder Package

This is for those who want to design and build their own 3" bore by 4" stroke engine or modify an existing engine and just need the cylinder and associated parts. These are the same parts as in our M engine series shown on the following pages. Includes a cylinder, steam chest, steam chest cover, top and bottom cylinder heads, piston (specify either aluminum or iron), valve, valve stem guide, piston gland, piston gland nut and two 3" piston rings.

**\$340.00**



## 2 1/2" Cylinder Package

For the do-it-yourselfer, we offer a set of cast iron castings available for building your own 2 1/2" bore, 3" stroke engine.

Five castings only, as shown. Cast in ports. Slide valve. Also includes top and bottom covers, steam chest and cover to match. We don't have blueprints for these yet. Two 2 1/2" piston rings are included.

**\$125.00**



# Marine Engines

**W**

## 2-CYLINDER VERTICAL STEAM ENGINE

The "W" makes a fine launch engine for boats up to 18', with a recommended propeller size of 14" or 15". With its combination of cast and beautifully turned columns, and all moving parts in full view, the "W" is very striking. Castings are bronze except for the cylinders, which are cast iron. The plans include a detailed oiling system or you can use individual oilers.

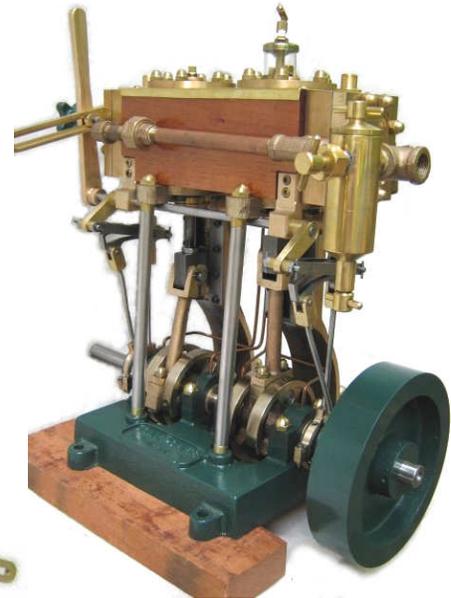
This is a project for the advanced builder. The cylinders are bolted back-to-back, allowing the engine to be built with smaller lathes. *Live Steam* magazine displayed this engine on their November 1981 cover and ran a feature article describing the building process. The "W" produces about 3 h.p. at 100 p.s.i., and uses Stephenson Link reverse gear. Blueprints are available for purchase separately so you can study them.

Bore . . . . 2"  
Stroke . . . . 2.25"  
Shaft Size . . . . .75"  
Flywheel Diameter . . . . 7"  
Height . . . . 14.5"  
Length Base . . . . 11.25"  
Width Base . . . . 10"  
Inlet Pipe . . . . 3/8" IP  
Exhaust Pipe . . . . 1/2" IP  
Shipping Weight . . . . 100 lbs.

Unmachined Castings  
**\$1,100.00**

Plans Only  
**\$60.00**  
Postage Included

Ready to Run  
**\$5,200.00**



# Marine Engines

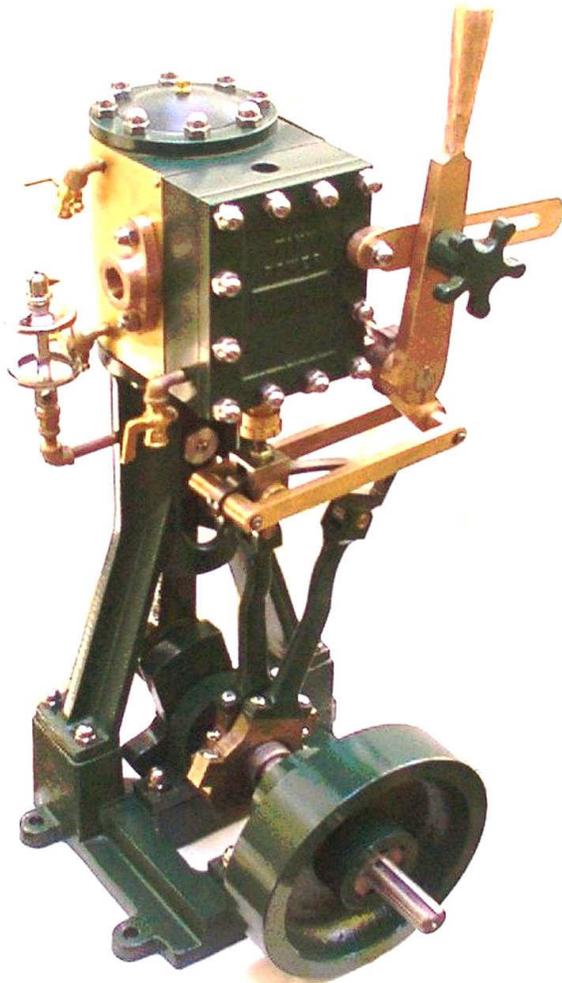
## M Side Crank

### 1-CYLINDER VERTICAL STEAM ENGINE

The one cylinder "M", as designed by Charles Arnold, is the easiest of the "M" series to build.

The engine uses sealed ball bearings on the crankshaft and both ends of the connecting rod. The eccentrics are lubricated with Zerk fittings for grease, or can be fitted with oil cups. A common "D" valve is used, which never needs adjustment for wear and is self-sealing.

Reverse gear is of the Stephenson Link type, well known for its durability and cut-off control of the valving. The crankshaft is a straight piece of steel pressed into a steel crank disk. The cast iron cylinder has extra large steamways cast in, which gives the steam unrestricted flow in and out of the cylinder and accounts for this engine's exceptional power for its size.



Our 5 hp boiler will run this engine quite well.

The M makes an excellent engine for a steamboat of 18' - 23' using an 18" propeller. We provide an adjusting knob on the reversing lever to set the cutoff at any point desired, instead of limiting the valve setting to a few notches on the quadrant.

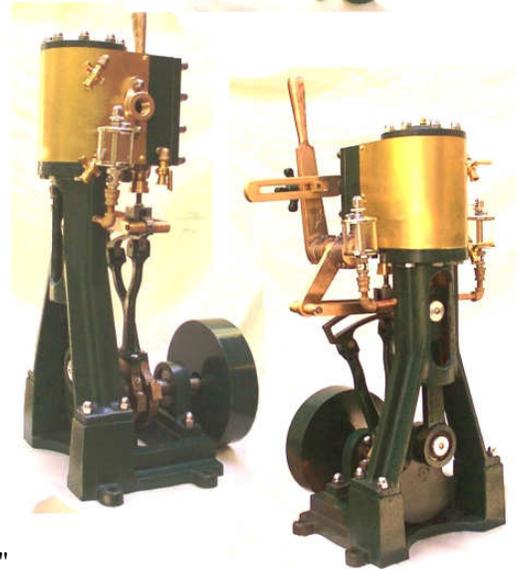
The blueprints, which are sold separately, are drawn full size and all dimensions are in inches and all threads are

American.

As a final note, *Live Steam Magazine* ran a construction article on this engine featuring it on the cover of the January, 1990 issue.

Bore . . . . 3"  
Stroke . . . . 4"  
Shaft Size . . . . 1"  
Flywheel Diameter . . . . 8"  
Height . . . . 26"  
Length Base . . . . 9.5"  
Width Base . . . . 12.5"  
Inlet Pipe . . . . 1/2" IP  
Exhaust Pipe . . . . 3/4" IP  
Shipping Weight . . . . 200 lbs.

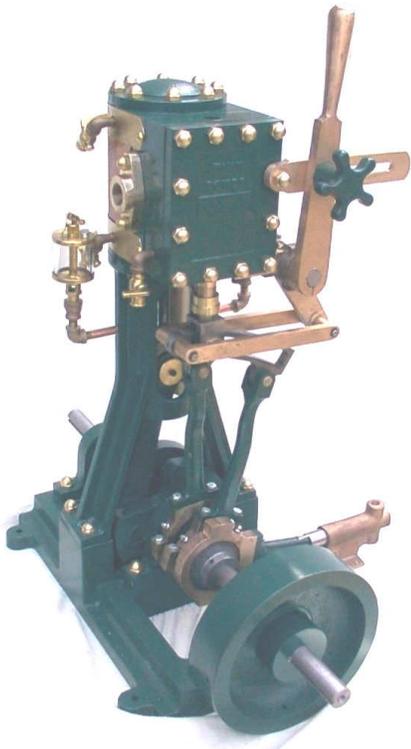
Unmachined Castings  
**\$1,200.00**



Ready to Run  
**\$3,900.00**

Plans Only  
**\$75.00**  
Postage Included

# Marine Engines



## M Center Crank

### 1-CYLINDER VERTICAL STEAM ENGINE

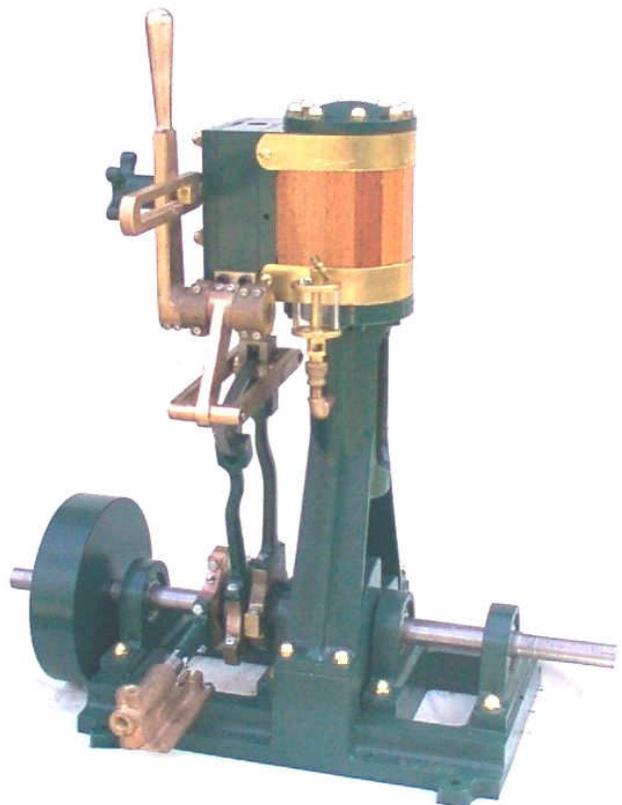
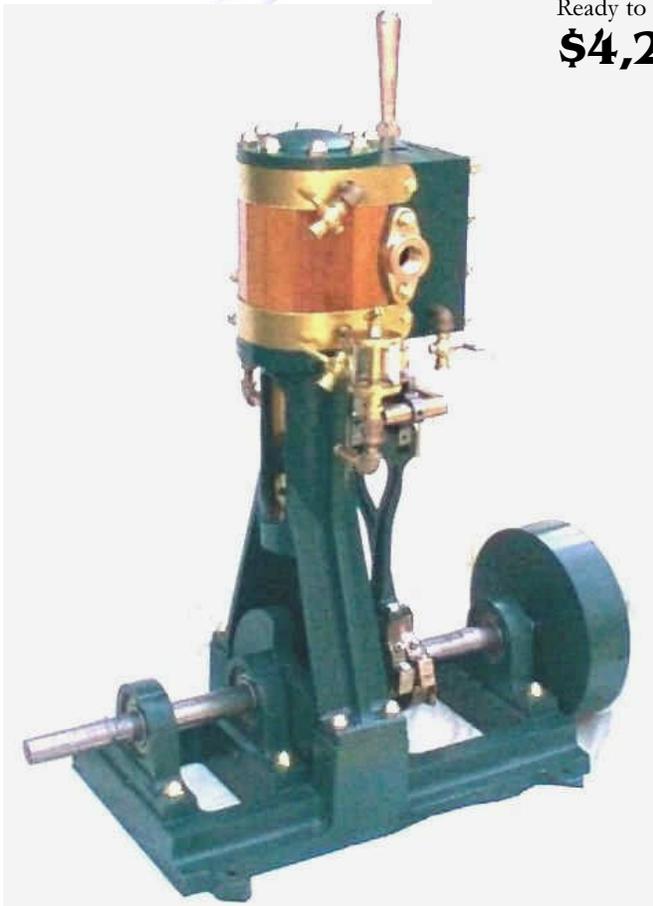
The M center crank uses all of the design features of the M side crank. The addition of another crank web enables the use of two more ball bearings for better load distribution. Also, power can be taken from both ends, allowing for close-in use of power take-off for auxiliaries.

Bore . . . . 3"  
Stroke . . . . 4"  
Shaft Size . . . . 1"  
Flywheel Diameter . . . . 8"  
Height . . . . 26"  
Length Base . . . . 15.5"  
Width Base . . . . 12.5"  
Inlet Pipe . . . . 1/2" IP  
Exhaust Pipe . . . . 3/4" IP  
Shipping Weight . . . . 220 lbs.

Unmachined Castings  
**\$1,300.00**

Plans Only  
**\$75.00**  
Postage Included

Ready to Run  
**\$4,200.00**



# Marine Engines

## M Twin

### 2-CYLINDER VERTICAL STEAM ENGINE

This 3" x 4" steam engine produces about 10 h.p. Very robust, self-starting. Main bearings consist of 6 sealed ball bearings; no lubrication needed. Rod bearings are sealed ball bearings on both big and little ends. "D" valves. Cylinder drains top and bottom of each cylinder, and one on each valve chest. Valve gear uses replaceable bronze bushings.

This engine will do a good job in boats from 23' - 30'. The engine would need about a 24" propeller. Use with our 10 hp boiler or similar size.

The casting set weighs about 375 lbs., consisting of a mix of cast iron, aluminum, and bronze.

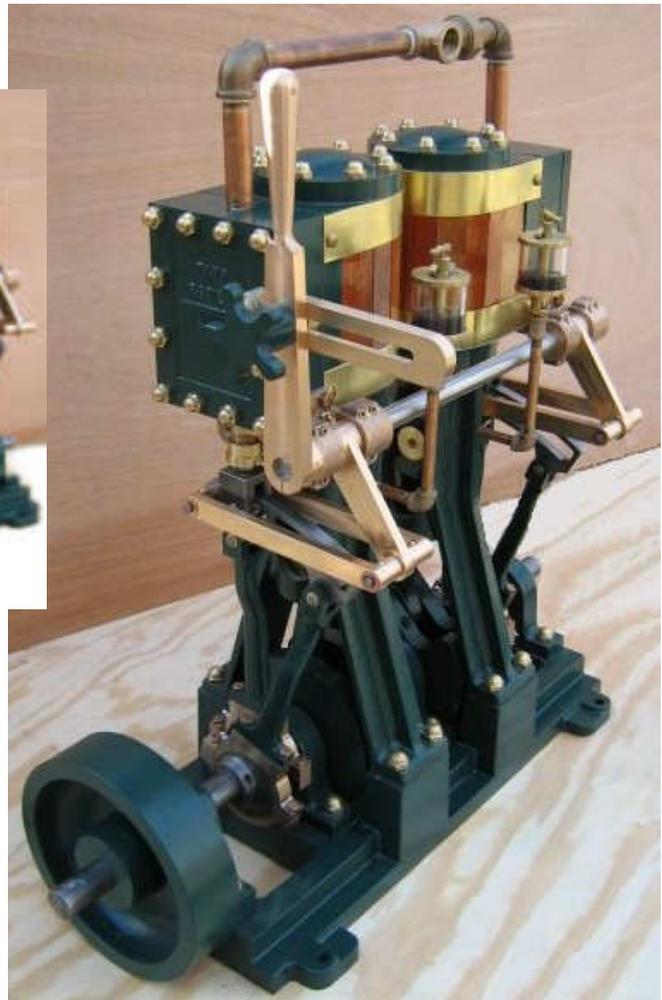
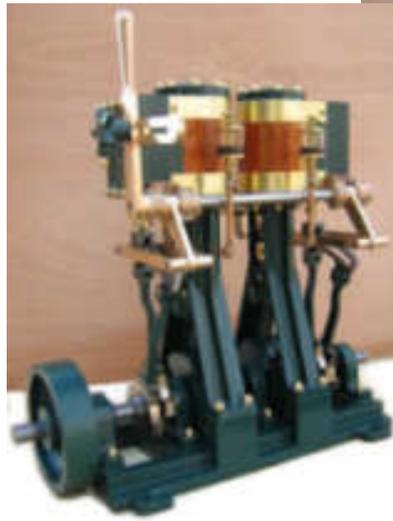
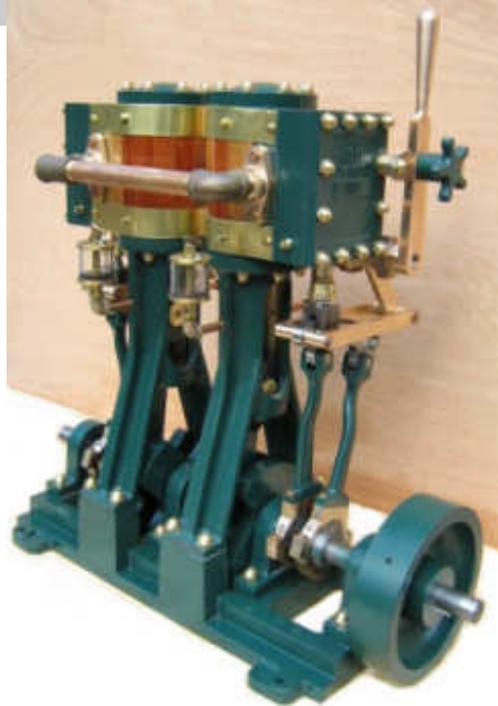
Bore . . . . 3"  
Stroke . . . . 4"  
Shaft Size . . . . 1"  
Flywheel Diameter . . . . 8"  
Height . . . . 26"  
Length Base . . . . 30"  
Width Base . . . . 12.5"  
Inlet Pipe . . . . 1/2" IP  
Exhaust Pipe . . . . 3/4" IP  
Shipping Weight . . . . 375 lbs.

Unmachined Castings  
**\$2,400.00**

Ready to Run  
**\$7,800.00**

Plans Only  
**\$85.00**

Postage Included



## Reverse Link for M Engines

Fully machined reverse link and block. Link is hardened steel. Block is aluminum bronze.

**\$125.00**



# Marine Engines

## M Compound ("3454")

### 2-CYLINDER VERTICAL STEAM ENGINE

The 3" + 5" x 4" compound steam engine is conservatively rated at about 8 to 10 h.p. A very robust, hard-working engine.

Main bearings consist of 6 sealed ball bearings; no lubrication needed. Rod bearings are sealed ball bearings on both big and little ends. "D" valves.

Cylinder drains top and bottom of each cylinder, and one on each valve chest. All parts of valve gear use replaceable bronze bushings.

This engine will do a good job in boats from 23' - 30' with a 22" propeller.

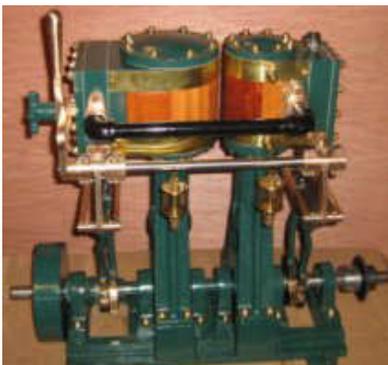
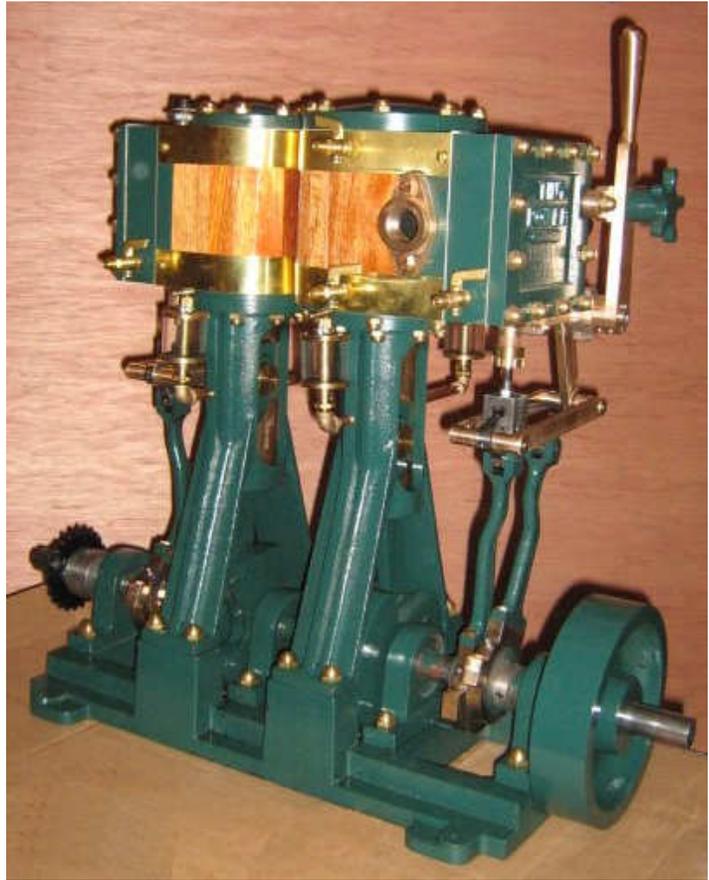
Casting set a mix of cast iron, aluminum and bronze castings.

Bore . . . . 3", 5"  
Stroke . . . . 4"  
Shaft Size . . . . 1"  
Flywheel Diameter . . . . 8"  
Height . . . . 26"  
Length Base . . . . 30"  
Width Base . . . . 12.5"  
Inlet Pipe . . . . 1/2" IP  
Exhaust Pipe . . . . 3/4" IP  
Shipping Weight . . . . 380 lbs.

Plans Only  
**\$85.00**  
Postage Included

Unmachined Castings  
**\$2,500.00**

Ready to Run  
**\$7,800.00**



# Model Engines

## Ajax

### 1-CYLINDER HORIZONTAL STEAM ENGINE

Charles Arnold modeled this engine after a famous turn-of-the-century engine bearing the same name (see picture below). In fact, he designed it to be used as the engine for his model free-lance steam tractor. It is quite a powerful little engine. Mr. Arnold described it as having "ample ports and large steamways for plenty of power and snap".

With the exception of pipe fittings, the kit contains everything needed to build the engine including cast-iron piston rings. Castings are a combination of aluminum, bronze and cast iron, and all fasteners are of scale size. Flywheels are available in either bronze or cast iron.

Tap sizes required: 4-40, 5-40, 6-32, 8-32, 10-32.  
Dies: 10-32, 1/4-28.

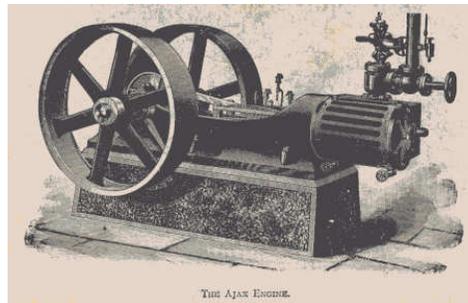
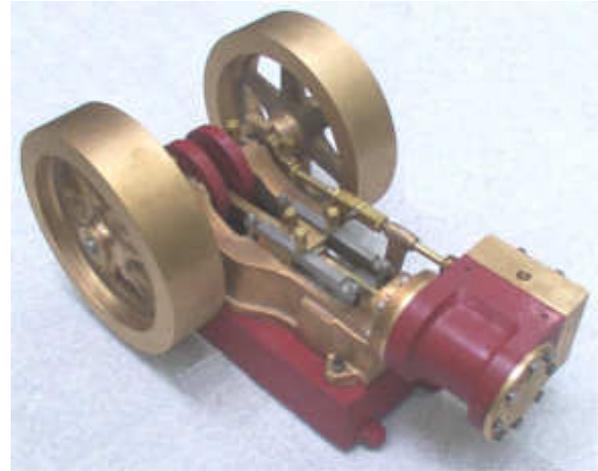
Bore . . . . 1.25"  
Stroke . . . . 1.5"  
Shaft Size . . . . .375"  
Flywheel Diameter . . . . 5.375"  
Height . . . . 5.5"  
Length Base . . . . 11.25"  
Width Base . . . . 7.5"  
Inlet Pipe . . . . 5/16" OD  
Exhaust Pipe . . . . 1/8" IP  
Shipping Weight . . . . 30 lbs.

**\$395.00**

(w/2 Bronze Flywheels)

**\$355.00**

(w/2 Cast Iron Flywheels)



## Little Kathy

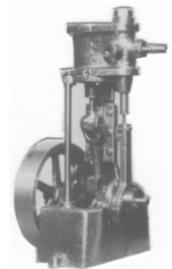
### 1-CYLINDER VERTICAL STEAM ENGINE

This model steam engine was designed and introduced by H.J. Coventry and was featured on the front cover of the October, 1926, issue of *The Modelmaker Magazine*. It is the only steam engine we offer with a piston valve. All castings are in bronze. Included is a copy of the original 1926 blueprint, along with a new updated blueprint by Ed Warren of *Modeltec Magazine*. Mr. Coventry wrote an article on how to build this model with very basic tools (files, drill, and small lathe), step by step (think: 1926). A reprint of this is also included. A moderate project for the beginner as parts are quite small requiring tight tolerances. Tap sizes required: 2-56, 5-40, 10-32, 1/4-28. Dies: 5-40, 1/4-28.

Bore . . . . 5/8"  
Stroke . . . . 3/4"  
Flywheel Diameter . . . . 2 1/2"  
Height . . . . 5 1/4"  
Shipping Weight . . . . 4 lbs.

**\$89.00**

*Little Kathy, built in March 2000 by Ed Warren, consulting editor for ModelTec Magazine.*



# Model Engines

## 1V-10

### 1-CYLINDER VERTICAL STEAM ENGINE

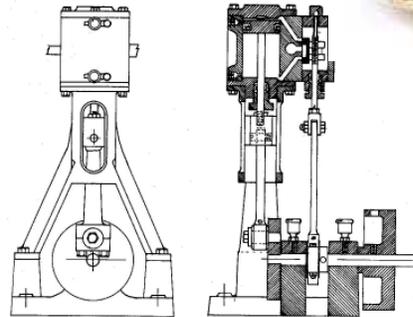
The 1V-10 adopts a rather smart appearance suitable for static display, yet capable for use in working models such as radio-controlled boats, dynamos, etc. In the photo at right, the flywheel shows spokes, but it can also be left solid. Note the extensive use of castings rather than machined barstock, enabling a more accurate appearance of a stationary vertical steam engine.



All castings are in bronze and hex scale nuts and bolts are included along with all necessary parts and well-detailed, full-size blueprints to complete the model in short order. (Note: model steel hex nuts are included with kits instead of the allen bolts shown in the photo at right.) Tap sizes required: 2-56, 3-48, 5-40, 8-32, 10-32. Dies: 5-40, 10-32.

Bore . . . . .75"  
Stroke . . . . .875"  
Shaft Size . . . . .25"  
Flywheel Diameter . . . . 2"  
Height . . . . 6.5"  
Length Base . . . . 3"  
Width Base . . . . 3.25"  
Inlet Pipe . . . . 3/16" OD  
Exhaust Pipe . . . . 1/4" OD  
Shipping Weight . . . . 7 lbs.

**\$185.00**



## 2V-10

### 2-CYLINDER VERTICAL STEAM ENGINE

By setting the cranks at 90 degrees, dead-centers are avoided, giving the 2V-10 self-starting capability. This feature has made the 2V-10 popular with radio-controlled boat builders. As with the other 10 series engines, castings are in bronze, and scale nuts and bolts and all necessary parts are included. Beautifully detailed blueprints are drawn full size and all dimensions are in inches, and all threads are American.

Pipe fittings are not included. Tap sizes required: 2-56, 3-48, 5-40, 8-32, 10-32. Dies: 5-40, 10-32.

Bore . . . . .75"  
Stroke . . . . .875"  
Shaft Size . . . . .25"  
Flywheel Diameter . . . . 2"  
Height . . . . 6.125"  
Length Base . . . . 5.5"  
Width Base . . . . 3.25"  
Inlet Pipe . . . . 1/4" OD  
Exhaust Pipe . . . . 1/4" OD  
Shipping Weight . . . . 12 lbs.

**\$325.00**



# Model Engines

## 2V-10M

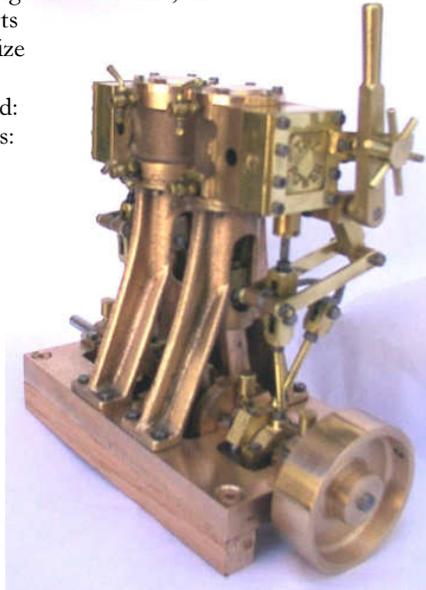
### 2-CYLINDER VERTICAL STEAM ENGINE WITH REVERSE

The 2V-10M was introduced in 2006. It is a redesigned version of the 2V-10, with the cylinders back to back and an added Stephenson link reverse. This engine is ideal for a five- or six-foot-long model boat with a 4" or 5" propeller.

As with the other 10 series engines, castings are in bronze, and scale nuts and bolts and all necessary parts are included. Blueprints are drawn full size and all dimensions are in inches, and all threads are American. Tap sizes required: 2-56, 3-48, 5-40, 6-32, 8-32, 10-32. Dies: 5-40, 10-32.

Bore . . . . .75"  
Stroke . . . . .875"  
Shaft Size . . . . .25"  
Flywheel Diameter . . . . 2"  
Height . . . . 5.5"  
Length Base . . . . 5.75"  
Width Base . . . . 3.25"  
Inlet Pipe . . . . 1/4" OD  
Exhaust Pipe . . . . 1/4" OD  
Shipping Weight . . . . 12 lbs.

**\$375.00**



## Oil Cups for Model Engines

These oil cups really dress up a model! Offered in either 1/4" or 5/16" diameter. The oil cups hold a small amount of oil, which is released into the bearings through a small drilled hole in the bottom.

Each has a hex nut instead of a round flange, or collar, so installation and removal are easy. The cap is threaded and knurled, which makes it easy to take them off and put them back on.

The 1/4" oil cups are used on the 1V-10, 2V-10 and 2V-10M. The Ajax use both the 1/4" and 5/16" sizes.

1/4" Oil Cup and Cap  
5-40 thread, 1/2" tall above threads

**\$2.50**

5/16" Oil Cup and Cap  
8-32 thread, 5/8" tall above threads

**\$2.50**



## Reverse Link for 2V-10M Engine

Fully machined reverse link and block. Link is steel, block is yellow brass.

**\$50.00**

# Fittings & Accessories

## Hand Pumps

These manual pumps are very reliable for filling boilers when used with steam, and for hydro-testing them, or as an auxiliary pump. The HP-2 would work well for model boilers, HP-3 for small steam boats, and HP-4 for larger steam boats.

Rams are stainless steel and sealed with an 'O' ring. HP-2 and HP-3 pumps use stainless steel balls for checks (or you could use commercially available external check valves, not included); HP-4 requires check valves, which are included. All parts are bronze, brass or stainless steel for rust resistance. Complete kit.

We machine HP-4 pumps to order. Call for availability.

### HP-2

Bore . . . . 1/2"  
Suction . . . . 1/8 NPT  
Discharge . . . . 1/8 NPT  
Length . . . . 7"  
Handle . . . . 1/2" x 7"  
Shipping Wt. . . . 4 lbs.

**\$65.00**

Kit Price

### HP-3

Bore . . . . 3/4"  
Suction . . . . 1/4 NPT  
Discharge . . . . 1/4 NPT  
Length . . . . 8"  
Handle . . . . 5/8" x 10"  
Shipping Wt. . . . 7 lbs.

**\$90.00**

Kit Price

### HP-4

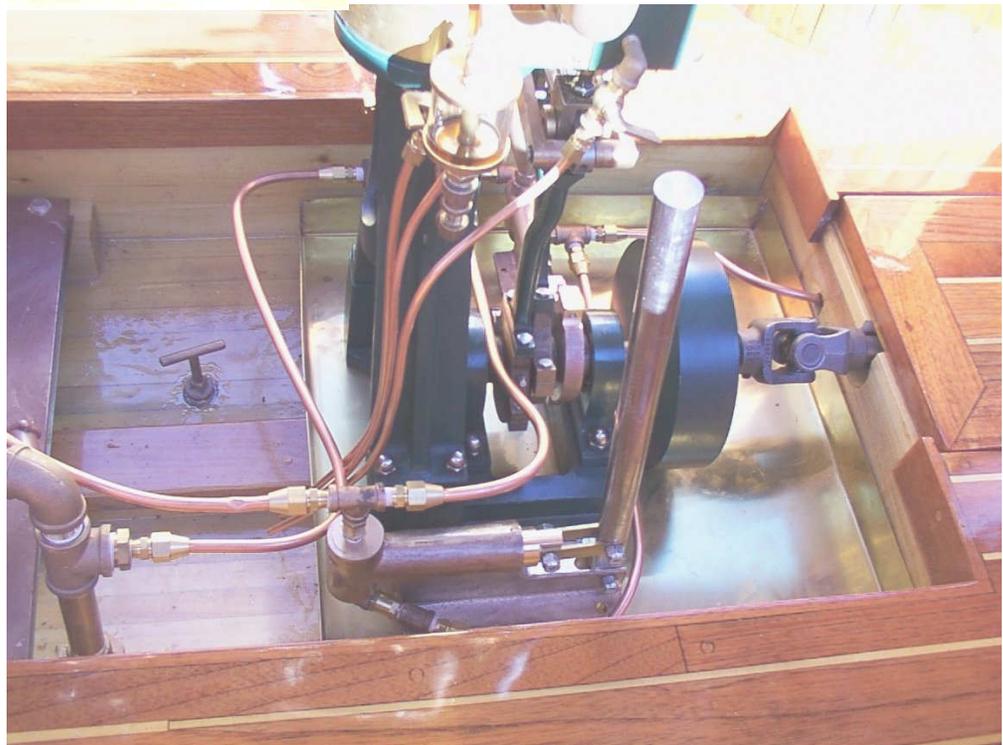
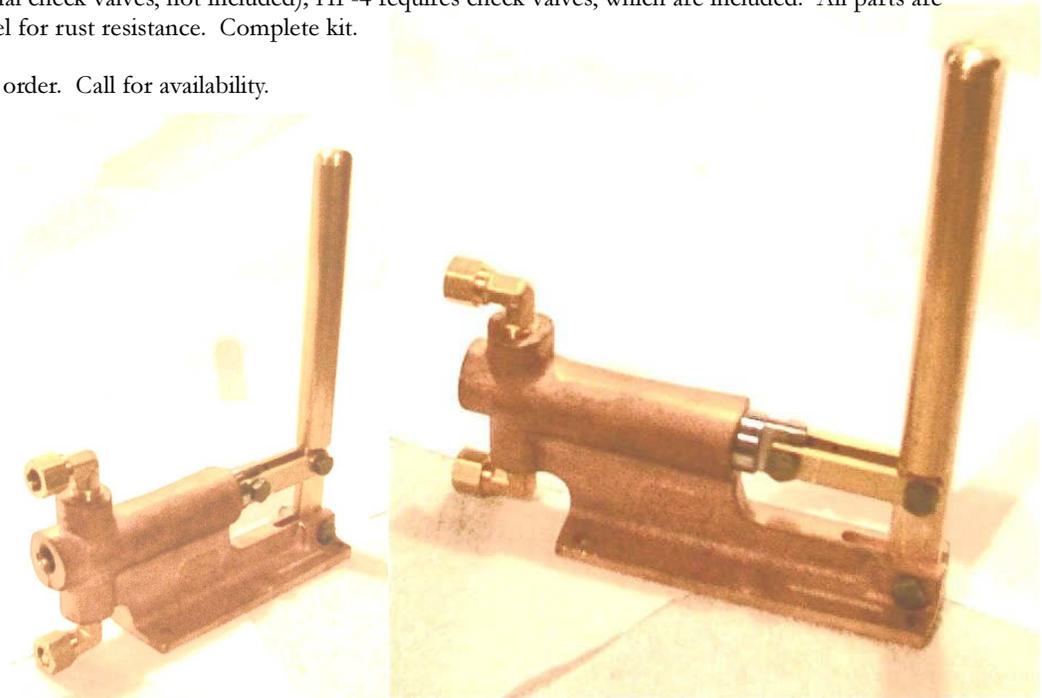
Bore . . . . 1 1/4"  
Suction . . . . 1/4 NPT  
Discharge . . . . 1/4 NPT  
Length . . . . 10"  
Handle . . . . 1" x 18"  
Shipping Wt. . . . 18 lbs.

**\$195.00**

Kit Price

**\$350.00**

Machined Price



*At right, a HP-4 hand pump installed in a boat.*

# Fittings & Accessories

## Piston Rings

We offer high-quality replacement cast iron rings for our larger engines. (Note: we no longer sell the 103, 104, 109 and 110 engines but if you have one, here are the replacement rings.) Here are the sizes we offer and the Tiny Power engines they fit:

- 1" x 3/32" ..... 103 and 104 engines
- 1 1/8" x 3/32" ..... None, we just have some
- 1 1/4" x 3/32" ..... Ajax engine
- 1 1/2" x 3/32" ..... 109 and 110 engines
- 2" x 3/32" ..... W engine
- 2 1/2" x 1/8" ..... 2 1/2" Cylinder Group
- 3" x 1/4" ..... M engine and M compound engine
- 5" x 3/8" ..... M compound engine

**\$5.00**

apiece, all sizes except 5"

**\$7.00**

apiece, 5"



## Steam Cylinder Oil

Made specifically for internal lubrication of the cylinder's piston and valve. Not necessary if you run only on air. Use 460 weight steam cylinder oil with saturated steam or 680 weight oil for either saturated steam or super-heated steam. Sold in plastic container with screw-on cap, 8 Oz., Qt. or Gal. Cannot be shipped overseas.

**\$3.50**

8 Oz.  
460 Wt. or 680 Wt.

**\$10.00**

Quart  
680 Wt. Only

**\$35.00**

Gallon  
680 Wt. Only



### *A Note of Caution:*

The construction and operation of steam powered systems is covered by certain standards and government regulations. An example of one of these is the ASME (American Society of Mechanical Engineers) Boiler and Pressure Vessel Code. The buyer is cautioned that it is possible to use items offered in this catalog in ways which are in violation of these codes and regulations, which could result in unsafe operating conditions. Upon request, we will provide the buyer with whatever help we can give regarding the choice of items for specific uses. Ultimately, however, the responsibility for correctly choosing and correctly using any of our merchandise, for any purpose, rests with the buyer.

## Pipe Fittings

We have a limited selection of heavy wall malleable black fittings available. We have pipe nipples, elbows, tees, crosses, unions, reducing elbows and caps.

Just let us know what you need and we'll get it for you if we don't have it in stock.



## Rod and Stem Packing

General purpose graphite infused aramid fiber packing, square shape. Recommended temperature range is -400° F to +600° F. Material can be cut and formed into individual rings and then stuffed into place to act as seals.

**PA-1**

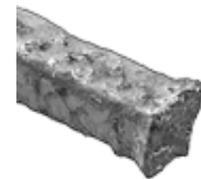
1/8" Sq.

**\$3.00 / Ft.**

**PA-2**

3/16" Sq.

**\$4.50 / Ft.**



**PA-3**

1/4" Sq.

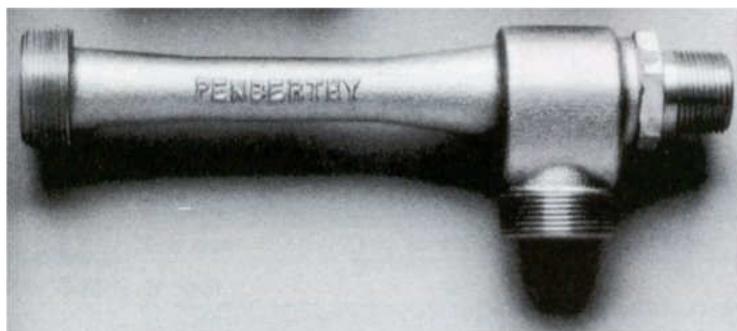
**\$6.00 / Ft.**

# Fittings & Accessories

## Injectors

Steam operated jet pumps for boiler feed.\*\*\* Available in two different models, the "Stock Model" (shown at top right) and the "Suction Front, Delivery Back" model (shown at bottom right). The Stock Model will be furnished unless you specify otherwise. Special order; call for pricing.

STOCK NO.	PIPE SIZE	OPERATING PRESSURES
OO-526	3/8"	15-100 PSI
AA-528	1/2"	15-100 PSI
BB-530	3/4"	15-100 PSI
OO-21	3/8"	25-140 PSI
AA-21	1/2"	25-140 PSI
BB-21	3/4"	25-140 PSI
OO-326	3/8"	50-200 PSI
AA-328	1/2"	50-200 PSI
BB-330	3/4"	50-200 PSI



## Ejectors

Pumps for general pumping of water such as bilge water, etc.\*\*\* Designed for use with 60 to 150 PSIG steam. No moving parts. Special order; call for pricing.

STOCK NO.	STEAM CONNECTION	WATER CONNECTION	PUMPING CAPACITY*	STEAM CONSUMPTION (LBS./HR.)	PARTICLE SIZE**
1/2A	1/4" NPT	1/2" NPT	1.62	8.31	0.097
1/2B	1/4" NPT	1/2" NPT	2.54	13.02	0.122
1/2	3/8" NPT	1/2" NPT	6.53	33.52	0.195
3/4	1/2" NPT	3/4" NPT	11.23	57.62	0.256

\*In gal./min. at 80 PSI with 5 feet suction lift and 5 feet discharge head, pumping 80° F water.

\*\*These pumps are capable of pumping water which contains solid particles. This is the maximum particle size which can pass.

\*\*\*Larger sizes are available. These items are not in stock and delivery time is approximately four weeks.

# Fittings & Accessories

## Globe Valves

United Brass Works, rated 200 WSP (Working Steam Pressure) and 400 WOG (Water, Oil or Gas Service), with Teflon disc and union bonnet. Straight pattern.

STOCK NO.	SIZE	PRICE
GV1	1/8" NPT	\$44.22
GV2	1/4" NPT	\$45.56
GV3	3/8" NPT	\$56.48
GV4	1/2" NPT	\$63.55
GV5	3/4" NPT	\$75.86
GV6	1" NPT	\$104.93



## Teflon Valve Discs

For United Brass Works globe, whistle and blowdown valves.

STOCK NO.	SIZE	PRICE
TD2	1/8" NPT 1/4" NPT	\$3.14
TD3	3/8" NPT	\$3.51
TD4	1/2" NPT	\$3.98
TD5	3/4" NPT	\$5.65
TD6	1" NPT	\$6.11

### A Note on Teflon Valve Discs

One might think that Teflon, being a so-called "plastic," could not be used in a steam valve. This is not the case. A look through most any of the valve makers' catalogs will show Teflon discs used for high pressure steam. Our major manufacturer, NICBO, rates them as high as 300 SWG. Conbraco, who claims to be the country's leading manufacturer of pop safety and relief valves, uses a Teflon seat in ASME code safety valves up to 250 PSI steam. The advantage of the Teflon disc is that, being somewhat flexible, it can make a tight seal (somewhat like a rubber disc in a water faucet). The tradeoff is that, being non-metallic, it will wear slightly faster. This would be most pronounced under prolonged severe throttling conditions (where the valve is open only slightly). We have been using valves with Teflon discs for many years, and have no complaints about excessive disc wear.

## Whistle Valves

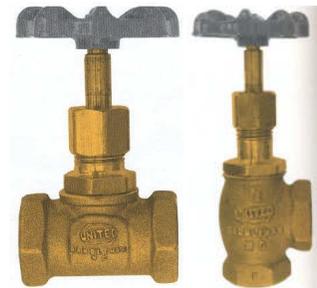
United Brass Works, rated 200 WSP, 400 WOG, with Teflon disc.

STOCK NO.	SIZE	PRICE
WV1	1/4" NPT	\$68.22
WV2	3/8" NPT	\$73.77
WV3	1/2" NPT	\$85.18
WV4	3/4" NPT	\$133.57
WV5	1" NPT	\$199.38



## Needle Valves

United Brass Works. Primarily intended for fine regulation of flow, rated 200 WSP, 400 WOG.



## "Y" Pattern Boiler Blowdown Valves

United Brass Works, rated 200 WSP, 400 WOG, with union bonnet. Replaceable Teflon disc and bronze seat ring. Built to withstand the frequent use of boiler blowdown service.

STOCK NO.	SIZE	REPLACEABLE SEAT RING STOCK NO.	PRICE
BD2	1" NPT	SR2	\$201.81
BD3	1 1/4" NPT	SR3	\$250.98



STOCK NO.	PATTERN	SIZE	PRICE
NV1	STRAIGHT	1/8" NPT	\$36.74
NV2	STRAIGHT	1/4" NPT	\$36.74
NV3	STRAIGHT	3/8" NPT	\$38.14
NV4	STRAIGHT	1/2" NPT	\$45.06
NV5	STRAIGHT	3/4" NPT	\$66.33
NV10	90° ANGLE	1/8" NPT	\$29.94
NV11	90° ANGLE	1/4" NPT	\$29.94
NV12	90° ANGLE	3/8" NPT	\$33.40
NV13	90° ANGLE	1/2" NPT	\$40.90
NV14	90° ANGLE	3/4" NPT	\$54.78

# Fittings & Accessories

## Lift Check Valves



United Brass Works, rated 200 WSP, 400 WOG, with Teflon disc and union bonnet.

STOCK NO.	PATTERN	SIZE	PRICE
LC1	STRAIGHT	1/4" NPT	\$34.57
LC2	STRAIGHT	3/8" NPT	\$47.41
LC3	STRAIGHT	1/2" NPT	\$48.66
LC4	STRAIGHT	3/4" NPT	\$59.85
LC5	STRAIGHT	1" NPT	\$91.11

## Lift Check Valve Disc Holders

United Brass Works. If it becomes necessary to change a disc in a lift check valve, we recommend changing the entire moveable part of the valve, called the "disc holder", which includes the Teflon disc.

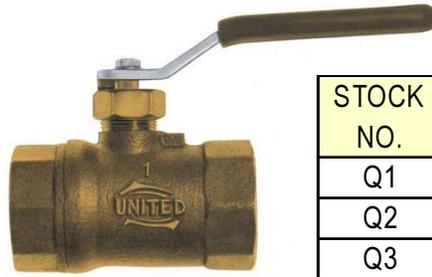
STOCK NO.	WILL FIT	PRICE
DH1	LC1	\$11.35
DH2	LC2, LC11	\$12.65
DH3	LC3, LC12	\$13.24
DH4	LC4, LC13	\$18.43
DH5	LC5	\$21.14

## Float Valves

United Brass Works. Max inlet water pressure 50 PSI. Bronze body, brass piston. Connections are 1/2" NPT in a 90° angle pattern. Actuating lever has an angle adjustment, and is tapped 1/4-20 so that a rod and float can be attached. Has a rubber 'O' ring.



STOCK NO.	PRICE
FV1	\$39.06



## Ball Valves

United Brass Works, rated 200 WSP, 400 WOG.

Ideally suited where quick shut off is necessary (1/4 turn). "On/Off" status can be determined by handle position. Bronze body and chromed bronze ball.

STOCK NO.	SIZE	PRICE
Q1	1/4" NPT	\$33.61
Q2	3/8" NPT	\$33.61
Q3	1/2" NPT	\$33.61
Q4	3/4" NPT	\$47.61
Q5	1" NPT	\$65.38

## Liquid Relief Valves

Conbraco. For pressure relief or bypass control of liquids (NOT FOR STEAM). Teflon seat and stainless steel spring. Viton "O" ring and fiber gasket seals against external leakage. Adjustable from 0 - 250 PSI, 1/2" NPT male inlet and 1/2" NPT female outlet.



STOCK NO.	PRICE
RV1	\$32.23

## "Y" Pattern Strainers

United Brass Works, rated 200 WSP. Used to trap particles of rust, scale, etc., which might otherwise clog devices with small orifices such as injectors and whistles. They will also protect equipment with internal moving parts such as pumps. Type 304 stainless steel screen, 50 mesh. Screen can be easily cleaned by removing brass plug and blowing out.



STOCK NO.	SIZE	PRICE
YS1	1/4" NPT	\$25.75
YS2	3/8" NPT	\$26.07
YS3	1/2" NPT	\$26.62
YS4	3/4" NPT	\$39.99

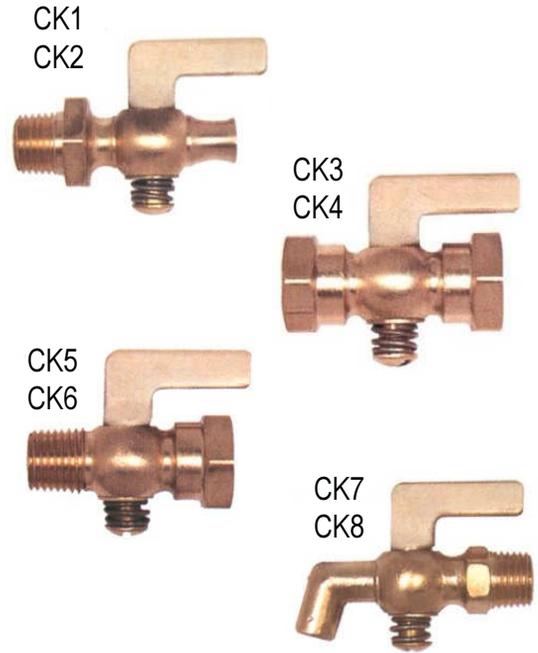
# Fittings & Accessories

## Drain Cocks

Conbraco. It is hard to find a full selection of cocks rated for steam. These are rated for air but have a solid nut on the bottom instead of a spring, and a 1/8" port. Generally, spring bottom cocks are rated for 80 to 100 PSI, but these are rated for up to 200 PSI. All have a lever handle, and wrench flats on one or both ends.

STOCK NO.	TYPE	PRICE
CK1	1/8" NPT MALE X UNTHREADED NOSE	\$18.00
CK2	1/4" NPT MALE X UNTHREADED NOSE	\$12.44
CK3	1/8" NPT FEMALE X FEMALE	\$15.68
CK4	1/4" NPT FEMALE X FEMALE	\$12.97
CK5	1/8" NPT MALE X FEMALE	\$12.82
CK6	1/4" NPT MALE X FEMALE	\$12.82
CK7	1/8" NPT MALE X ANGLE NOSE*	\$16.35
CK8	1/4" NPT MALE X ANGLE NOSE*	\$16.35
CK9	1/8" NPT MALE X FLARED 1/4 OD TUBE	\$8.63

\*UNTHREADED BIBB NOSE



## Tricocks

Conbraco. Polished brass with aluminum handwheel, stainless steel ball seat and packing gland on stem. Rated 250 PSI.

United Brass Works. Brass with aluminum handwheel and packing gland on stem. Rated 250 WSP, 400 WOG.

STOCK NO.	SUPPLIER	SIZE	PRICE
TC1	CONBRACO	3/8" NPT	\$21.56
TC2	CONBRACO	1/2" NPT	\$21.90
TC3	CONBRACO	3/4" NPT	\$26.61
TC10	UN. BRASS	1/2" NPT	\$15.54
TC11	UN. BRASS	1/2" NPT*	\$16.51

\*WITH 1/2" LONGER SHANK TO EXTEND OUT FROM THE BOILER FARTHER (FOR LAGGED BOILERS).



## Temperatures of Saturated Steam

Gauge Pressure (PSIG)	Temperature (F°)
50	295
75	320
100	338
125	353
150	366
175	377
200	388
225	397
250	406

# Fittings & Accessories

## Safety Valves

Conbraco. Pressures available through 250 lbs. PSI, 1/2" - 2 1/2". By special order.

**\$195.00**

# Bronze High Pressure Safety Valves For Steam, Air & Nonhazardous Gas

Conbraco 19 Series safety valves are capacity certified by the National Board in accordance with the ASME Boiler and Pressure Vessel Code Section I and Section VIII, Division 1. They feature a patented "soft" seat that dramatically reduces seat leakage problems that often exist with metal-to-metal seated valves.

*Features include:*

- Teflon PFA fluorocarbon seat which resists corrosive boiler chemicals
- Pressures available through 250 PSI (275 PSI Air Service)
- Inlet sizes: 1/2" to 2 1/2"
- Registered in Canadian Provinces
- Reduced repair costs: soft seat easily factory replaced
- High-capacity construction: double ring, full bore
- Tapped body drain provides piping of condensate from equipment
- Optional packed lever or pressure tight cap
- Rust-proofed steel spring, top and bottom spring washers, lever and stem
- Top cap constructed of aluminum alloy
- Optional vibration dampening hardware
- Models 19-202, -302 and -402 available with 316 SS wetted trim

**SERIES**

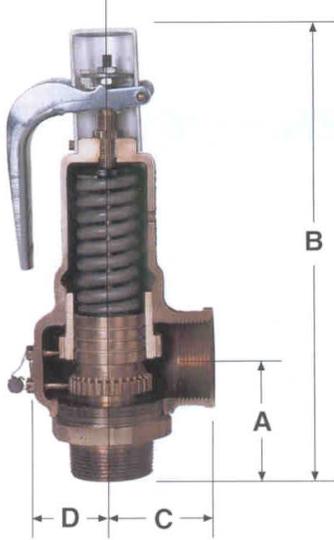


**Information required when ordering 19 Series safety valves:**

1. Inlet Size - male pipe thread
2. Outlet Size - female pipe thread (if important)
3. Service Media
4. Pressure setting
5. Required Discharge Capacity
6. Type of Service: Power Boiler or Pressure Vessel

# Fittings & Accessories

## 19 SERIES BRONZE SAFETY VALVES



VALVE NO.	ORIFICE DESIGNATION	SIZE INLET OUTLET	A	B	C	D	WEIGHT EACH
19-202	D	1/2 x 3/4	1 25/32	6 1/8	1 23/64	27/32	1.50
19-301	D	3/4 x 3/4	1 27/32	6 3/16	1 23/64	27/32	1.50
19-302	E	3/4 x 1	1 61/64	6 5/8	1 3/4	1 1/16	1.90
19-401	E	1 x 1	2 5/64	6 3/4	1 3/4	1 1/16	2.08
19-402	F	1 x 1 1/4	2 3/8	8 25/32	2	1 7/16	3.90
19-501	F	1 1/4 x 1 1/4	2 7/16	8 27/32	2	1 7/16	4.05
19-502	G	1 1/4 x 1 1/2	2 11/16	10 3/16	2 3/8	1 11/16	7.03
19-601	G	1 1/2 x 1 1/2	2 3/4	10 1/4	2 3/8	1 11/16	6.98
19-602	H	1 1/2 x 2	3 3/64	11 9/32	2 3/4	2 1/16	11.20
19-701	H	2 x 2	11 11/32	2 3/4	2 1/16	2 1/16	11.33
19-702	J	2 x 2 1/2	3 7/16	13 5/8	3 1/2	2 7/16	19.20
19-801	J	2 1/2 x 2 1/2	3 13/16	14	3 1/2	2 7/16	19.80

“V” Steam

ASME Section I – Power Boilers

STEAM RATING CHART - 90% OF ACTUAL CAPACITY AT 3% ACCUMULATION CAPACITY IN POUNDS OF SATURATED STEAM PER HOUR

Set Pressure P.S.I.	VALVE SIZE DESIGNATION "D" 1/2 x 3/4 405 DIA	VALVE SIZE DESIGNATION "E" 3/4 x 1 541 DIA	VALVE SIZE DESIGNATION "F" 1 x 1 1/4 676 DIA	VALVE SIZE DESIGNATION "G" 1 1/4 x 1 1/4 866 DIA	VALVE SIZE DESIGNATION "H" 1 1/2 x 2 1,082 DIA	VALVE SIZE DESIGNATION "J" 2 x 2 1/2 1,386 DIA
15	165	295	460	755	1178	1934
20	194	345	539	884	1380	2264
25	222	395	617	1013	1581	2594
30	250	446	696	1142	1782	2925
35	279	496	774	1271	1984	3255
40	307	546	853	1400	2185	3585
45	335	597	931	1529	2386	3915
50	363	647	1010	1658	2587	4246
55	392	697	1089	1786	2789	4576
60	420	748	1167	1915	2990	4906
65	448	798	1246	2044	3191	5237
70	476	848	1324	2173	3393	5567
75	505	898	1403	2302	3594	5897
80	533	949	1481	2431	3795	6227
85	561	999	1560	2560	3996	6558
90	590	1049	1639	2689	4198	6888
95	618	1100	1717	2818	4399	7218
100	646	1150	1796	2947	4600	7549
105	674	1200	1874	3076	4802	7879
110	703	1251	1953	3205	5003	8209
115	731	1301	2031	3334	5204	8539
120	759	1351	2110	3463	5406	8870
125	787	1402	2189	3592	5607	9200
130	816	1452	2267	3721	5808	9530
135	844	1502	2346	3850	6009	9861
140	872	1553	2424	3979	6211	10191
145	900	1603	2503	4107	6412	10521
150	929	1653	2581	4236	6613	10851
160	985	1754	2739	4494	7016	11512
170	1042	1855	2896	4752	7418	12173
180	1098	1955	3053	5010	7821	12833
190	1155	2056	3210	5268	8224	13494
200	1211	2157	3367	5526	8626	14154
210	1268	2257	3524	5784	9029	14815
220	1324	2358	3681	6042	9431	15476
230	1381	2458	3839	6300	9834	16136
240	1438	2559	3996	6557	10236	16797
250	1494	2660	4153	6815	10639	17457
APPROX. 1 LB. INCRMENTS FOR INTERP.	5.7	10	15.6	25.8	40.2	66

KEY	
PRESSURE P.S.I.	SUFFIX NUMBER
15	-04
20	-05
25	-06
30	-07
35	-08
40	-09
45	-10
50	-11
55	-12
60	-13
65	-14
70	-15
75	-16
80	-17
85	-18
90	-19
95	-20
100	-21
105	-22
110	-23
115	-24
120	-25
125	-30
130	-31
135	-32
140	-33
145	-34
150	-35
155	-36
160	-37
165	-38
170	-39
175	-40
180	-41
185	-42
190	-43
195	-44
200	-45
205	-46
210	-47
215	-48
220	-49
225	-50
230	-51
235	-52
240	-53
245	-54
250	-55
Special settings available upon request	

# Fittings & Accessories

## Pressure Gauges

McDaniel Controls, Inc. Brass case. Heavy die cast solid brass watertight case (painted brass color). Polished brass screw-on front ring. Laminated safety glass window. Safety blow-out disc with case vent. 1% accuracy. Made in France.

STOCK NO.	GAUGE SIZE	BOTTOM CONNECTION	RATING	PRICE
PG54	2"	1/8" NPT	VACUUM-0-15 PSI	\$64.02
PG55	2"	1/8" NPT	0-30" Hg VACUUM	\$64.02
PG56	2"	1/8" NPT	0-160 PSI	\$64.02
PG57	2"	1/8" NPT	0-200 PSI	\$64.02
PG58	2"	1/8" NPT	0-300 PSI	\$64.02
PG4	2 1/2"	1/4" NPT	VACUUM-0-15 PSI	\$64.02
PG5	2 1/2"	1/4" NPT	0-30" Hg VACUUM	\$64.02
PG6	2 1/2"	1/4" NPT	0-160 PSI	\$64.02
PG7	2 1/2"	1/4" NPT	0-200 PSI	\$64.02
PG8	2 1/2"	1/4" NPT	0-300 PSI	\$64.02



Ashcroft Type 2071A Gauges. Black painted aluminum case, 4 1/2" dial size, 5 3/4" back mounting flange, 1/4" NPT bottom connection. Glass window with chrome plated steel front ring. Adjustable pointer. Accuracy: 1% in mid-range of scale, 2% elsewhere.

STOCK NO.	RATING	PRICE
PG45	VACUUM-0-15 PSI	\$46.92
PG46	0-30" Hg VACUUM	\$46.92
PG47	0-160 PSI	\$46.92
PG48	0-200 PSI	\$46.92
PG49	0-300 PSI	\$46.92

Please note: a gauge should always be installed with a cock which can isolate it in the event of failure. when a gauge is connected to something hot (like a boiler or live steam line), a gauge syphon must be used.

## Antique Style Brass Ring for Ashcroft Type 2071A Gauge

Machined and polished casings made exclusively for us. They slip onto the 2071A gauges and are secured with a set screw. Very elegant indeed!

STOCK NO.	PRICE
BR2	\$81.00



## Gauge Syphons

Conbraco. Made of 1/4" heavy gauge seamless brass tubing and rated 250 PSI saturated steam. Two types: one at 360° so connections are in line with each other (shown here), and 270° so

STOCK NO.	TYPE	PRICE
GS1	360°	\$16.56
GS2	270°	\$16.56

connections are at right angles to each other.

# Fittings & Accessories

## Utility Gauges

Ashcroft. "Utility Gauge" is the name the industry gives to the lower-priced gauges which, while serviceable, are not as durable and vibration-resistant as the higher-priced gauges. they are widely used for many purposes. Black painted steel case with glass window. Bronze bourdon tube with brass socket. Accuracy: 2% in mid-range of scale, 3% elsewhere. 1/4" NPT bottom connection.



STOCK NO.	DIAL SIZE	RATING	PRICE
PG14	2 1/2"	VACUUM-0-15 PSI	\$22.45
PG17	2 1/2"	0-30" Hg VACUUM	\$22.45
PG18	2 1/2"	0-160 PSI	\$22.45
PG15	2 1/2"	0-200 PSI	\$22.45
PG16	2 1/2"	0-300 PSI	\$22.45
PG24	3 1/2"	VACUUM-0-15 PSI	\$28.60
PG25	3 1/2"	0-30" Hg VACUUM	\$28.60
PG28	3 1/2"	0-160 PSI	\$28.60
PG26	3 1/2"	0-200 PSI	\$28.60
PG27	3 1/2"	0-300 PSI	\$28.60

## Hydrostatic Lubricator

Full-size sight feed lubricator, steam chest type, for steam boats, steam engines, cylinders, steam pumps, portable engines, traction engines. For saturated steam. For the advanced machinist.

Strongly made, simply constructed lubricator screws directly into the steam chest. Rate of oil drip can be regulated and monitored with a down drop sight feed. Half pint capacity, 1/2" pipe thread on shank, 8" tall above threads. Complete kit, or machined and ready to use. (We may substitute handles other than what is shown depending on availability.)



Kit  
**\$115.00**

Machined  
**\$375.00**



## Sight Feed Oilers

Brass, with snap filler opening. Strong and substantially built oiler, simple in operation with few moving parts lowing the risk of malfunction. Outside glass diameter 1 1/2", height of glass 1 3/8", shank pipe thread 1/8". One ounce capacity.

**\$55.00**



# Fittings & Accessories

## Reflex Style Water Gauge

For use on full size steam boilers up to 150 psi to visually inspect water level. Very handsome.

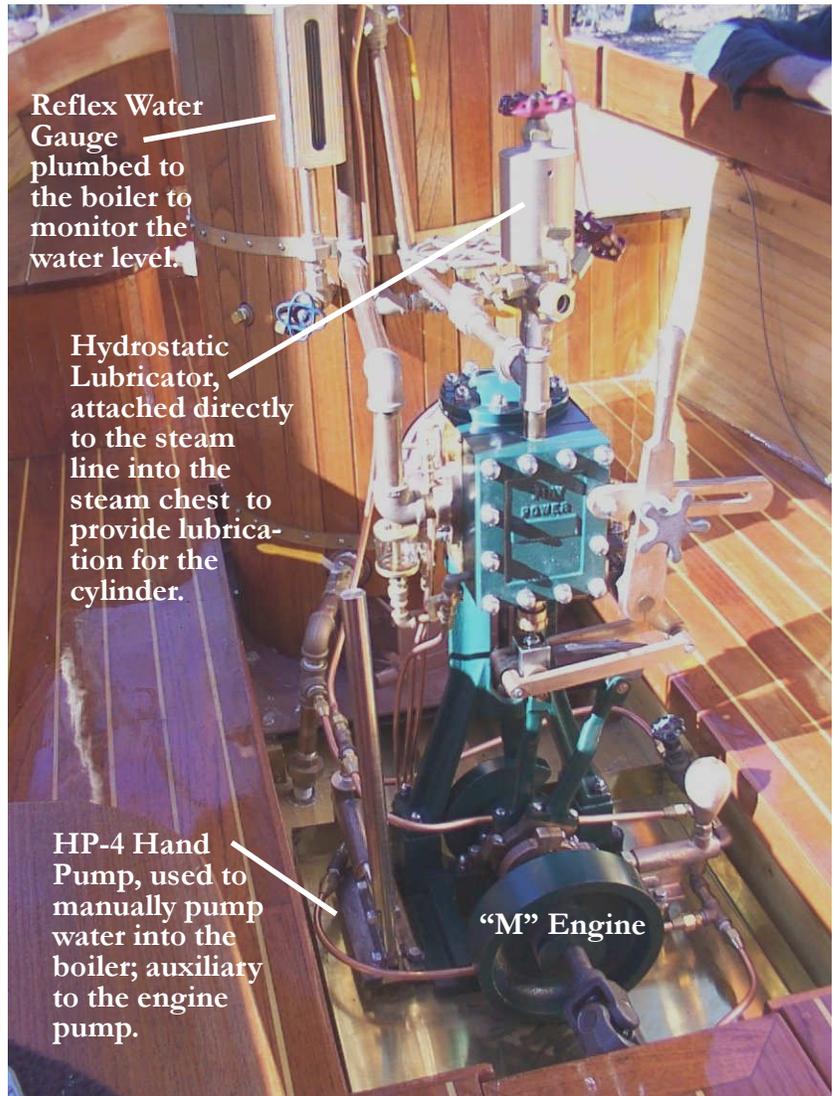
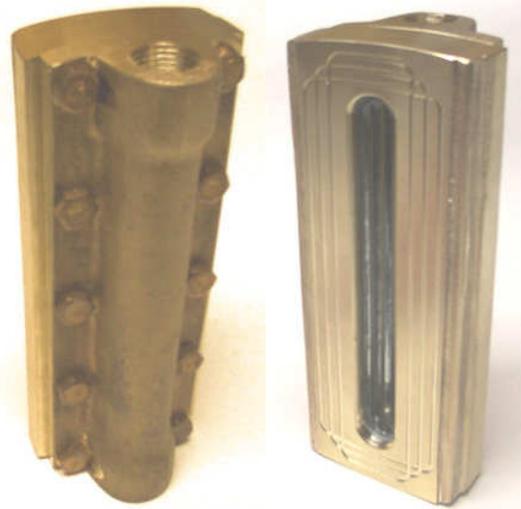
Silicon bronze, 7 1/2" tall, 3" wide, about 3" deep, with 5 1/2" tall visible glass. Threaded 1/2" NPT each end. Weighs about 6 lbs.

Kit

**\$200.00**

Machined

**\$315.00**



Reflex Water Gauge  
plumbed to the boiler to monitor the water level.

Hydrostatic Lubricator,  
attached directly to the steam line into the steam chest to provide lubrication for the cylinder.

HP-4 Hand Pump, used to manually pump water into the boiler; auxiliary to the engine pump.

"M" Engine

*Tiny Power's marine engines were designed in the 1940s and 1950s, and we have found them to be both sturdy and reliable. In fact, we have an "M" twin in our own boat and are very pleased with it.*

*To give you an idea of where it all fits together, here is a picture of the engine compartment of a steam boat under construction with an installed Tiny Power single-cylinder "M" engine, and reflex water gauge, hydrostatic lubricator and HP-4 hand pump.*

# Order Form

Tiny Power, 4403 Dyes Ln., Bealeton VA 22712 (540) 439-4045

Date: \_\_\_\_ / \_\_\_\_ / \_\_\_\_

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Zip: \_\_\_\_\_

Phone: (\_\_\_\_) \_\_\_\_\_

E-Mail Address: \_\_\_\_\_

(We'll send you an e-mail when we've sent your order.)

Check Enclosed

Visa     MasterCard    \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_

Expiration Date: \_\_\_\_ / \_\_\_\_    Credit Card Security #: \_\_\_\_\_

(The last 3 digits on the back of the card in the signature area.)

QUANTITY	DESCRIPTION (INCLUDING ITEM # IF THERE IS ONE)	PRICE

Add up the shipping weights of all the products you've selected from the catalog.

**Shipping Rates:**

Catalog, Blueprints: Free

Up to 4 Lbs.: 6.10

4 - 11 Lbs.: 12.10

11 - 19 Lbs.: 12.25

19 - 28 Lbs.: 14.95

28 - 45 Lbs.: 23.95

45 - 60 Lbs.: 46.25

60 - 85 Lbs.: 71.50

Over 85 Lbs.: Call Us

We use U.S. Postal Service "Flat Rate" Priority Mail whenever possible and will try to fit all items into the smallest flat rate box offered. If you can't figure what shipping would be, call us and we'll let you know. Thanks.

SUBTOTAL [ ]

6% TAX (If VA Resident) [ ]

SHIPPING (See chart at left) [ ]

TOTAL [ ]

Additional Instructions: \_\_\_\_\_