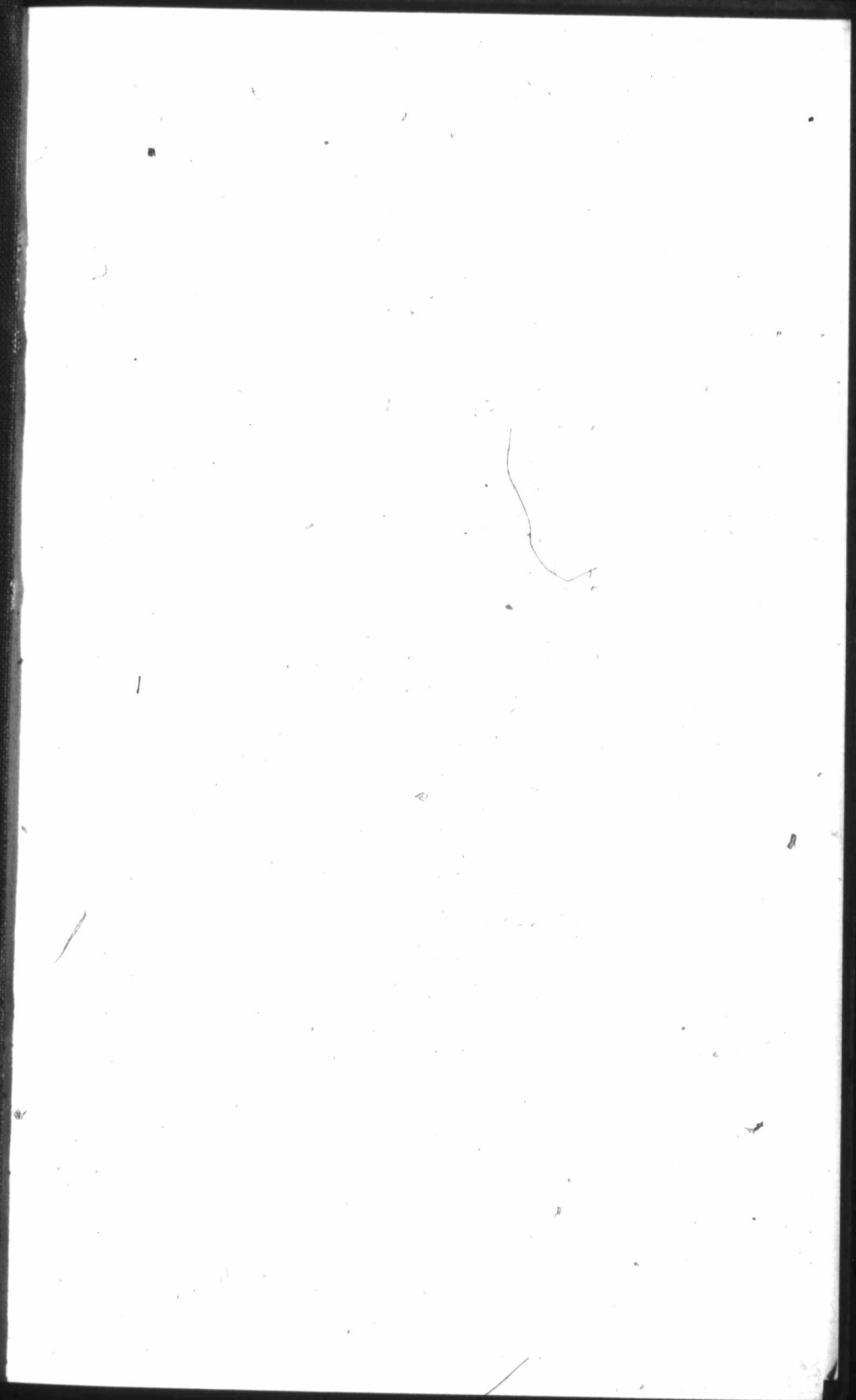
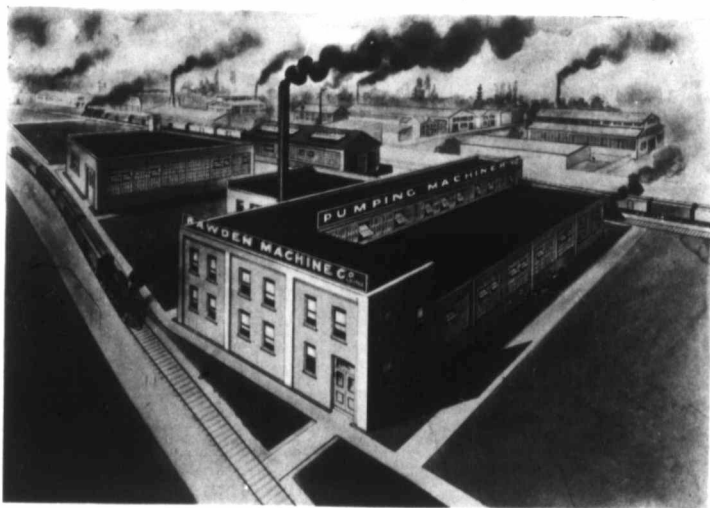
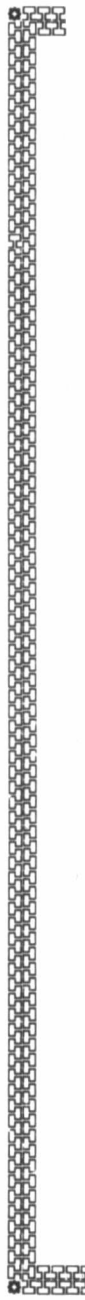


THE BAWDEN MACHINE CO.  
LIMITED.  
TORONTO, CANADA.





Bird's-eye View of Office and Works, Toronto, Canada



CATALOGUE No. 10

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**Bawden Steam & Power  
Pumping Machinery**

MADE IN CANADA



*The*  
**BAWDEN MACHINE CO.**  
LIMITED

STERLING ROAD, TORONTO  
CANADA

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# The Bawden Pump

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## INTRODUCTION



THE "BAWDEN" PUMP embodies all the latest and most up-to-date improvements that have been developed and stood the test within the last few years brought together into simple design leaving all valves in a position where they can be repaired or replaced with the least possible trouble, also dispensing with all motion work on the outside of the pump, the only moving part exposed being the pump rod from steam end to water end. This is protected so that it cannot be damaged by anything falling on it.

The "BAWDEN" is governed by balanced piston valves which are controlled by the action of live steam only. All tappets, levers, springs, rocker shafts, tubes or other extraneous gear which require lubrication and attention are dispensed with.

A special feature of the "BAWDEN" piston valves is the arrangement for catching leakage steam due to wear and tear, for preventing them from getting into equilibrium at their driving ends. This important feature forms part of the patent claim and results in placing the "BAWDEN" pump ahead of all others in consequence of the much longer time it will work without repairs.

The steam piston is automatically cushioned at each end of the cylinder by a special design of the two main steam ports, therefore dispensing with all adjusting

mechanism to compensate variations of speed, &c., and together with the allocation of the drain cocks, make the cushion effective under any emergency.

This pump has no dead centres, does not hang up and cannot be held up, it makes a full length stroke at any piston speed and on any duty.

These pumps are equally effective when exhausting into any kind of condenser and on account of their long strokes are specially adapted for producing high vacuums. The water ends are built on entirely new and improved designs and offer the greatest facilities for inspection and repairs. The valves and seats are secured by a new and simple method, superseding screwed seats which in practice are found to rust and shake loose.

They are particularly noted for the steady water pressures produced under varying loads and speeds which make them eminently suitable for Boiler feeding purposes, and owing to the absence of external valve motion they can run at very high piston speeds, filling all the requirements of a high speed Fire Pump for which purpose they are equally suitable.

Where a greater economy of steam is desired the "BAWDEN" Compound Pumps are the latest and most up-to-date design embodying the same valve gear as used on the simple pumps. The high and low pressure pistons work in one Cylinder, the steam ports are of the shortest length and so arranged that the high pressure steam in exhausting to the low pressure Cylinder never leaves the main Cylinder Casting. There are no external passages, therefore radiation and condensation are reduced to a minimum, only one Steam Chest is required and one valve to distribute the High and Low Pressure Steam, the whole forming a most compact, reliable and economical pump for Boiler Feeding and general purposes, and owing to the absence of all external valve gear, like the simple pumps, they can run at very high piston speeds if required, filling all the requirements of a High Speed Fire Pump for which purpose they are equally suitable.

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In the "BAWDEN" Duplex Pump the same simplicity of design is adopted throughout making it an ideal model for purposes where a duplex pump is desired, but unlike the ordinary duplex pattern, the "BAWDEN" has this special advantage, that when so required either side will work independently of the other, or if one side breaks down, the other side is available to continue a partial supply for Boiler Feeding or other purposes while repairs are being executed or new packing inserted.

The "BAWDEN" Pumps are heavily constructed and have an increased number of Bolts to meet modern steam pressures. The main idea is to give the Engineer the simplest and best arrangement for providing easy access to all working parts so as to shorten the time required for examination and repairs, and in case of accident by frost, &c., to cost less for renewals than the boxed-up-cast-all-in-one-piece kinds of most makers. In this respect our patterns stand out in marked contrast against those of earlier designs.

All face joints are machined, and every part is manufactured strictly to gauge and therefore interchangeable. Every pump undergoes a rigid test in our factory before shipping.

Measurements, weights and quantities are stated as accurately as possible and are based on the American standards. Illustrations, photographs or designs are not necessarily binding as to detail except when stated in estimate and must be regarded as approximate representations only.





# The Bawden Machine Co., Limited

## Explanation of Bawden Patent Operating Valve

Figs. 1, 2 and 3, show a Section of Steam Cylinder and Valve as used in all our Pumps.

Piston valve A carries slide valve C, which opens ports G and H on opposite ends of the piston to live steam and exhaust port E alternately.

Piston valve B carries slide valve D which opens ports I and J on opposite ends of the piston valve A to live steam and exhaust port F alternately.

Live steam is admitted to the centre compartments of both steam chests.

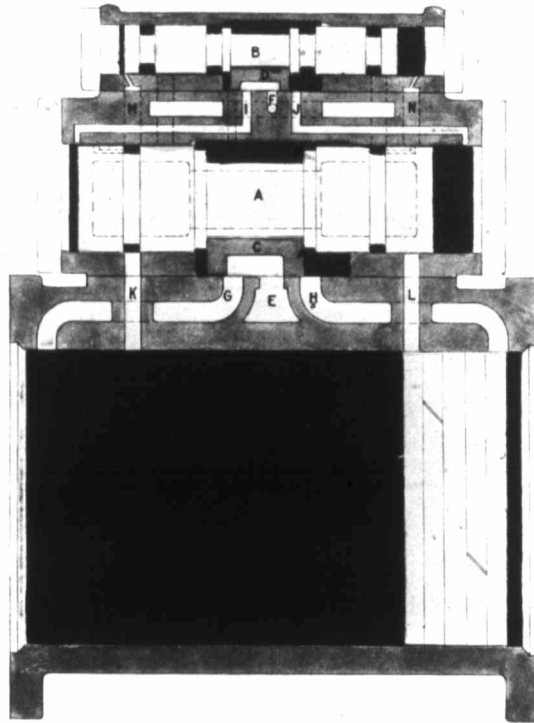


Fig. 1

When the valves are in position shown in Fig. 1, port H is open to the live steam. The steam enters the port H onto the end of the piston until it has completed its stroke as shown in Fig. 2, as shown on next page.

Port K i  
into port M  
shown in F

# The Bawden Machine Co., Limited

## Explanation of Bawden Patent Operating Valve

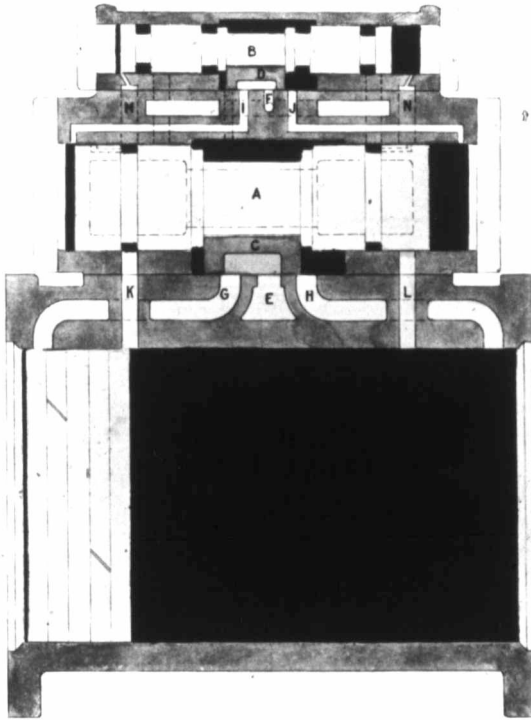


Fig. 2

Port K is opened, up which the steam passes around the groove in valve A into port M and on to the end of piston valve B carrying it over into position shown in Fig. 3. as shown on next page.

Valve

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1 opposite

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Explanation of Bawden Patent Operating Valve

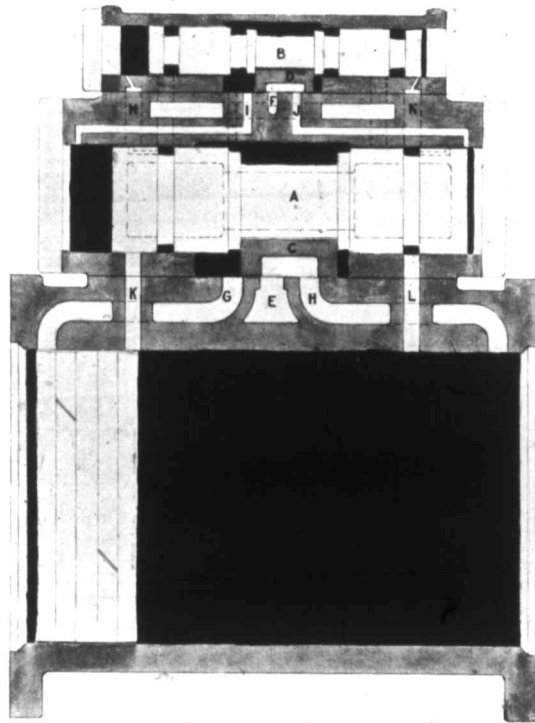


Fig. 3

Opening the port I to the live steam down which the steam passes onto the end of piston valve A, carrying it over into piston shown in Fig. 3, which opens port G to the live steam and the piston is ready for its return stroke.

Explan

Figs. 1  
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The pis  
live steam,  
ends of pis  
exhaust port  
ports P and  
R alternatel

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H is connecte  
end of high p  
cylinder F car

## Explanation of Bawden Patent Operating Valve on Compound Pumps

Figs. 1, 2 and 3 show a section of Steam Cylinder and Valve as used on all our compound pumps.

The piston valve A carries the slide valve C, which opens port G and H to the live steam, and to ports I and J to the low pressure cylinders F on the outer ends of piston alternately, and ports I and J from low pressure cylinders to exhaust port K alternately. Piston valve B carries the slide valve D, which opens ports P and Q on opposite ends of piston valve A to live steam and exhaust port R alternately.

Live steam is admitted to the centre compartments of both steam chests.

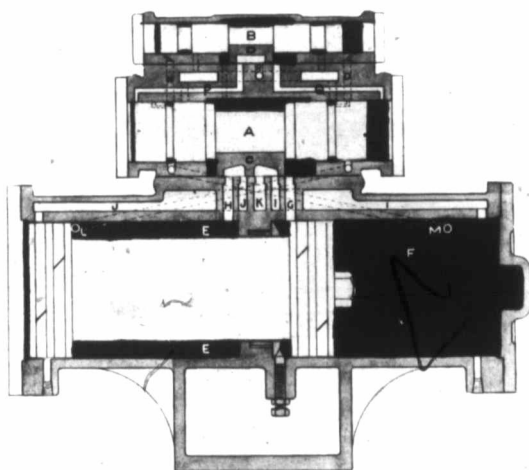


Fig. 1

When the valves are in position shown in Fig. 1, port G is open to live steam down which steam passes into right hand end of high pressure cylinder E. Port H is connected to port J, which allows the high pressure steam from the left hand end of high pressure cylinder E to pass into the left hand end of low pressure cylinder F carrying the piston into position as shown in Fig. 2 on the next page.

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Explanation of Bawden Patent Operating Valve  
on Compound Pumps

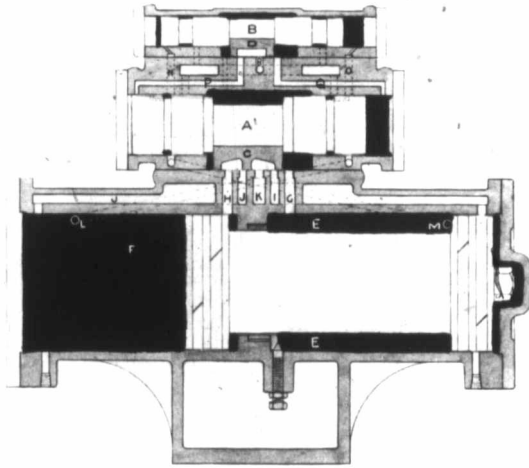


Fig. 2

When the piston has completed its stroke as shown in Fig. 2, port M is opened to steam in high pressure cylinder E, steam passes into port M along port shown by dotted lines at back, around groove in piston valve A into port N onto the end of piston valve B, carrying it over to position shown in Fig. 3 on the next page and end of high pressure cylinder F, an

Opening t  
end of piston  
port H for live  
port G is conn  
and end of hi  
cylinder F, an

**Explanation of Bawden Patent Operating Valve  
on Compound Pumps**

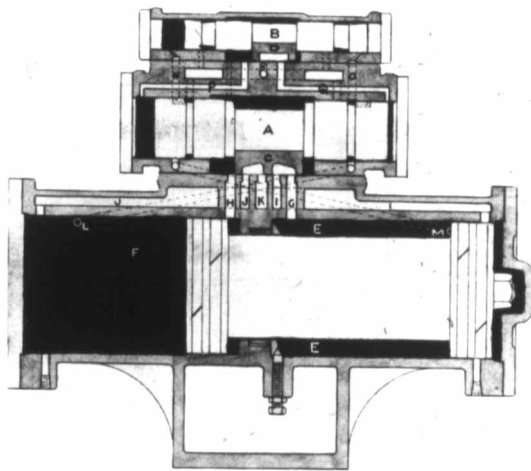


Fig. 3

Opening the port P to the live steam down which the steam passes onto the  
 t M is opened of piston valve A, carrying it over into position shown in Fig. 3, which opens  
 g port show port H for live steam to pass into left hand end of high pressure cylinder E, and  
 onto the cy port G is connected to port I, which allows the high pressure steam from the right  
 re next page and end of high pressure cylinder E to pass into the right hand end of low pressure  
 cylinder F, and the piston starts on its return stroke.

# The Bawden Machine Co., Limited

Genera

## The "Bawden" Patent General Service Pump for Medium Pressures

**NO  
TAPPETS**

**NO  
EXTERNAL  
VALVE  
GEAR  
LEVERS  
OR  
SPRINGS**

**NO  
INTERNAL  
TUBES  
OR  
STUFFING  
GLANDS**

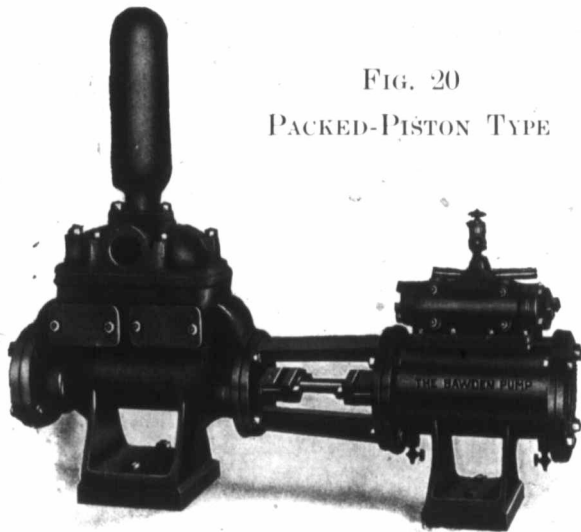


FIG. 20  
PACKED-PISTON TYPE

100 lb. SERIES

The Steam Cylinders are designed to withstand modern pressures. They are fitted with cast iron block pistons, self-adjusting cast iron rings and steel rods. The two steam ports are specially designed to ensure perfect cushioning of the piston at any speed. The piston valve is operated by two live steam ports on all complications are avoided. The water cylinders are of suitable strength for pressures not exceeding 100 lbs. per square inch. They have brass liners and are fitted with pistons packed with best quality hydraulic packing. The valves are of rubber or brass. The valve seats are brass, with flat faces, and are machined to a suitable taper, then pressed into pump seating and held in position with brass stoppers, accessible through hand holes as shown.

Bronze Rods and Brass Water Piston supplied at extra cost.

Above specification represents the regular style, but the pumps may be fitted to suit any kind of fluid.

Steam Cylinder	Water Cylinder	Stroke
*4	2 1/2	8
4	3	8
4	4	8
4	5	8
*5	3	6
*5	2 1/2	10
*5	3	10
5	4	10
5	5	10
5	6	10
6	3	10
*6	4	10
6	5	10
6	6	10
6	7	10
*7	4	10
7	5	10
7	6	10
7	7	10
7	8	10
*8	4	10
*8	5	10
8	6	10
8	7	10
8	8	10
8	9	10
*9	5	10
*9	6	10
9	7	10
9	8	10
9	9	10
9	10	10
*10	5	10
*10	6	10
10	7	10
10	8	10
10	9	10
10	10	10
*12	6	10
*12	7	10
12	8	10
12	9	10
12	10	10

\*Combin

The gallo  
pumped at a p  
for 10' stroke  
pump capable  
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# The Bawden Machine Co., Limited

## The "Bawden" Patent

### General Service Pump for Medium Pressures

FIG. 20—PACKED-PISTON TYPE

Pressures	Steam Cylinder	Water Cylinder	Stroke	U.S. Gallons Per Hour (See foot note)	Lift in Feet Per lb. Steam At Pump	Pipe Sizes				Floor Space	Weight Pounds	Price	Code Word
						Steam	Exhaust	Suction	Delivery				
	*4	2 1/2	8	1100	3.8	1 1/2	3/4	2	1 1/2	9x40	300	\$110	Bagged
	4	3	8	1550	2.6	1 1/2	3/4	2	1 1/2	9x40	300	110	Baggy
	4	4	8	2800	1.5	1 1/2	3/4	2 1/2	2	10x42	350	150	Bagman
	4	5	8	4800	1.0	1 1/2	3/4	3	2 1/2	12x44	400	170	Bagnets
	*5	3	6	1500	4.0	3/4	1	2	1 1/2	10x40	400	125	Bag
	*5	2 1/2	10	1524	6.0	3/4	1	2	1 1/2	10x48	480	190	Bagpipe
	*5	3	10	2100	4.0	3/4	1	2 1/2	2	10x48	500	190	Bagreef
	5	4	10	3900	2.3	3/4	1	3	2 1/2	10x48	550	200	Bagwig
	5	5	10	6100	1.5	3/4	1	3 1/2	3	14x50	700	210	Backrope
	5	6	10	8800	1.0	3/4	1	4	3 1/2	16x52	800	225	Backs
	6	3	10	2100	6.0	3/4	1	2 1/2	2	11x48	530	200	Backset
	*6	4	10	3900	3.3	3/4	1	3	2 1/2	11x48	590	220	Bailiffs
	6	5	10	6100	2.1	3/4	1	3 1/2	3	14x50	780	250	Baitest
	6	6	10	8800	1.5	3/4	1	4	3 1/2	16x52	900	280	Baitmill
	6	7	10	11900	1.0	3/4	1	5	4	18x53	1140	300	Baits
	*7	4	10	3900	4.6	1	1 1/4	3	2 1/2	12x49	640	275	Backlog
	7	5	10	6100	3.0	1	1 1/4	3 1/2	3	14x51	860	290	Backlash
	7	6	10	8800	2.0	1	1 1/4	4	3 1/2	17x52	970	305	Backlook
	7	7	10	11900	1.5	1	1 1/4	5	4	18x53	1280	330	Bangles
	7	8	10	15600	1.1	1	1 1/4	6	5	21x54	1400	355	Bangs
	*8	4	10	3900	6.0	1 1/4	1 1/2	3	2 1/2	13x49	700	300	Baneful
	8	5	10	6100	3.7	1 1/4	1 1/2	3 1/2	3	14x51	900	325	Barbs
	8	6	10	8800	2.7	1 1/4	1 1/2	4	3 1/2	17x52	1000	370	Barbule
	8	7	10	11900	2.0	1 1/4	1 1/2	5	4	18x54	1320	390	Bardic
	8	8	10	15600	1.5	1 1/4	1 1/2	6	5	21x56	1450	425	Bardism
	8	9	10	19800	1.1	1 1/4	1 1/2	7	6	23x58	1590	450	Banian
	*9	5	10	6100	4.8	1 1/2	2	3 1/2	3	15x55	1000	385	Banshee
	*9	6	10	8800	3.3	1 1/2	2	4	3 1/2	17x56	1100	400	Bantam
	9	7	10	11900	2.5	1 1/2	2	5	4	19x57	1300	420	Baptism
	9	8	10	15600	1.8	1 1/2	2	6	5	21x59	1550	440	Barky
	9	9	10	19800	1.5	1 1/2	2	7	6	23x61	1800	470	Barley
	9	10	10	24400	1.0	1 1/2	2	8	7	26x63	2100	500	Bankbill
	*10	5	10	6100	6.0	1 1/2	2	3 1/2	3	16x55	1080	400	Bankrate
	*10	6	10	8800	4.0	1 1/2	2	4	3 1/2	18x56	1200	420	Bankstock
	10	7	10	11900	3.0	1 1/2	2	5	4	20x57	1390	440	Banknote
	10	8	10	15600	2.2	1 1/2	2	6	5	22x59	1620	470	Banktop
	The valve	10	9	19800	1.8	1 1/2	2	7	6	24x61	1930	500	Barmaid
are machine	10	10	10	24400	1.5	1 1/2	2	8	7	30x63	2250	550	Barndoor
position with	*12	6	10	8800	6.0	2	2 1/2	4	3 1/2	20x57	1480	480	Barnfull
	*12	7	10	11900	4.3	2	2 1/2	5	4	20x58	1600	510	Barnowl
	12	8	10	15600	3.3	2	2 1/2	6	5	22x60	1780	540	Barnyard
	12	9	10	19800	2.7	2	2 1/2	7	6	24x62	2000	570	Bankpost
may be fitted	12	10	10	24400	2.1	2	2 1/2	8	7	30x64	2450	600	Bankbook

\*Combinations marked thus will boiler feed.

The gallons of water per hour in above list are the theoretical quantities pumped at a piston speed of 75 feet per min. for 8" stroke and 100 feet per min. for 10" stroke pumps. For continuous service we recommend the selection of a pump capable of giving quantity required at a piston speed of 60 to 75 feet per min.

For further particulars of Boiler Feed Pumps, see Fig. 2.



The "Bawden" Patent

General Service Pump for Medium Pressures

Gene

- NO TAPPETS
- NO EXTERNAL VALVE GEAR LEVERS OR SPRINGS
- NO INTERNAL TUBES OR STUFFING GLANDS

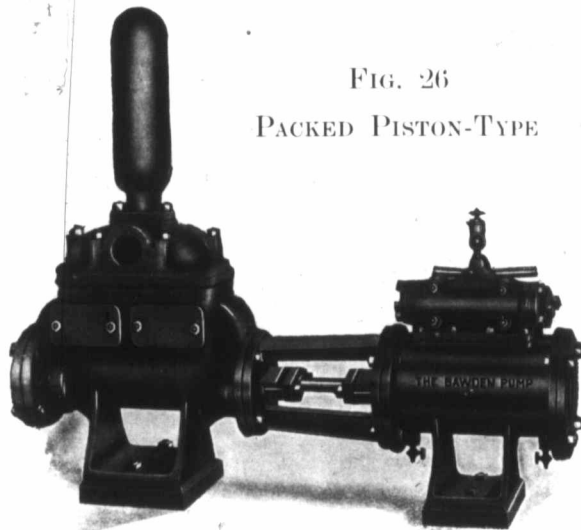


FIG. 26

PACKED PISTON-TYPE

100 lb. SERIES

Stream Cylinder	Water Cylinder	Stroke
*14	7	20
*14	8	20
*14	9	20
14	10	20
14	12	20
14	14	20
14	16	20
*16	8	20
*16	9	20
*16	10	20
16	12	20
16	14	20
16	16	20
*18	9	20
*18	10	20
*18	12	20
18	14	20
18	16	20
*20	10	20
*20	12	20
20	14	20
20	16	20

The Steam Cylinders are designed to withstand modern pressures. They are fitted with cast iron block pistons, self-adjusting cast iron rings and steel rods. The two steam ports are specially designed to ensure perfect cushioning of the piston at any speed. The piston valve is operated by two live steam ports only; all complications are avoided. The water cylinders are of suitable strength for pressures not exceeding 100 lbs. per square inch. They have brass liners and are fitted with pistons packed with best quality hydraulic packing. The valves are of rubber or brass. The valve seats are brass with flat faces, and are machined to a suitable taper, then pressed into pump seating and held in position with brass stoppers, accessible through hand holes as shown.

Bronze Rod and Brass Water Piston supplied at extra cost.

Above specification represents the regular style, but the pumps may be fitted to suit any kind of fluid.

\*Combir

The gallo continuous ser run faster, if i

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# ted The Bawden Machine Co., Limited

## The "Bawden" Patent

### General Service Pump for Medium Pressures

FIG. 26

#### PACKED-PISTON TYPE

Steam Cylinder	Water Cylinder	Stroke	U.S. Gallons Per Hour (See foot note)	Lift in Feet Per lb. Steam At Pump	Pipe Sizes				Floor Space	Weight Pounds	Price	Code Word
					Steam	Exhaust	Suction	Delivery				
*14	7	20	11900	6.0	2 1/2	3	5	4	On Application	On Application	On Application	Benkit
*14	8	20	15600	4.5	2 1/2	3	5	5				Bennets
*14	9	20	19800	3.6	2 1/2	3	7	6				Benteak
14	10	20	24400	2.9	2 1/2	3	8	7				Benty
14	12	20	35200	2.0	2 1/2	3	9	8				Benumbs
14	14	20	48000	1.5	2 1/2	3	10	9				Benzene
14	16	20	60000	1.0	2 1/2	3	12	10				Benzoate
*16	8	20	15600	6.0	2 1/2	3	6	5				Benzoline
*16	9	20	19800	4.7	2 1/2	3	7	6				Benzoyl
*16	10	20	24400	3.8	2 1/2	3	8	7				Benzule
16	12	20	35200	2.6	2 1/2	3	9	8				Bepaint
16	14	20	48000	2.0	2 1/2	3	10	9				Bepearls
16	16	20	60000	1.5	2 1/2	3	12	10				Bepinch
*18	9	20	19800	6.0	3	3 1/2	7	6				Bepuffed
*18	10	20	24400	4.8	3	3 1/2	8	7				Berries
*18	12	20	35200	3.3	3	3 1/2	9	8				Berth
18	14	20	48000	2.4	3	3 1/2	10	9				Beryl
18	16	20	60000	1.8	3	3 1/2	12	10				Besayle
*20	10	20	24400	6.0	3	3 1/2	8	7				Bereft
*20	12	20	35200	4.0	3	3 1/2	9	8				Bergylt
20	14	20	48000	3.0	3	3 1/2	10	9	Berdash			
20	16	20	60000	2.2	3	3 1/2	12	10	Berattle			

\*Combinations marked thus will boiler feed.

The gallons of water per hour in above list represent maximum quantity for continuous service at about 100 ft. piston speed per min., but in emergency will run faster, if required.

For further particulars of Boiler Feed Pumps see Fig. 2.

may be fitted

**The "Bawden" Patent**  
**General "Service Pump With Outside Valve Boxes**

General

**NO**  
TAPPETS

**NO**  
EXTERNAL  
VALVE  
GEAR  
LEVERS  
OR  
SPRINGS

**NO**  
INTERNAL  
TUBES  
OR  
STUFFING  
GLANDS

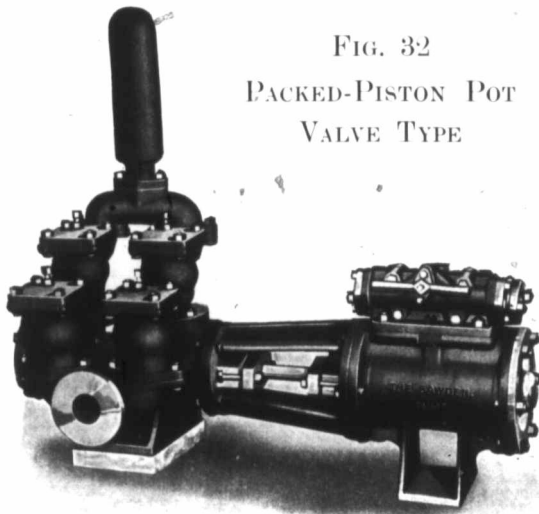


FIG. 32  
**PACKED-PISTON POT**  
**VALVE TYPE**

150 lbs. Series

The Steam Cylinders are designed to withstand modern pressures. They are fitted with cast iron block pistons, self-adjusting cast iron rings and steel rods. The two steam ports are specially designed to ensure perfect cushioning of the piston at any speed. The piston valve is operated by two live steam ports only all complications are avoided. The water cylinders are of suitable strength for pressures not exceeding 150 lbs. per square inch. They have brass liners and are fitted with pistons packed with best quality hydraulic packing. The valves are rubber or brass and each one is contained in a separate valve box, accessible by removing the top cover. The valve seats are brass with flat faces, and are machined to a suitable taper, then pressed into valve box seating and held in position with a brass stopper.

Bronze Rod and brass water piston supplied at extra cost.

Above specifications represents the regular style, but the pumps may be fitted to suit any kind of fluid.

This pattern provides a piston pump with the same accessibility to pump valve as on those of the outside packed Series.

Stream Cylinder	Water Cylinder	Stroke
*4	2 1/2	8
4	3	8
4	4	8
4	5	8
*5	2 1/2	10
*5	3	10
5	4	10
5	5	10
5	6	10
*6	3	10
6	4	10
6	5	10
6	6	10
6	7	10
*7	4	10
7	5	10
7	6	10
7	7	10
7	8	10
*8	4	10
8	5	10
8	6	10
8	7	10
8	8	10
*9	5	10
9	6	10
9	7	10
9	8	10
*10	5	10
10	6	10
10	7	10
10	8	10
*12	6	10
12	7	10
12	8	10

\*Combi

The gallon pumped at a for 10' stroke pump capable min.

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# The Bawden Machine Co., Limited

## The "Bawden" Patent

### General Service Pump With Outside Valve Boxes

FIG. 32

#### PACKED-PISTON POT VALVE TYPE

Steam Cylinder	Water Cylinder	Stroke	U.S. Gallons Per Hour (See foot note)	Lift in Feet Per lb. Steam At Pump	Pipe Sizes				Floor Space	Weight Pounds	Price	Code Word
					Steam	Exhaust	Suction	Delivery				
*4	2 1/2	8	1100	3.8	1 1/2	3/4	2	1 1/2	13x40	400	\$135	Bogbean
4	3	8	1550	2.6	1 1/2	3/4	2	1 1/2	15x40	400	145	Bogearth
4	4	8	2800	1.5	1 1/2	3/4	3	2 1/2	18x42	430	160	Bogeyism
4	5	8	4800	1.0	1 1/2	3/4	3	2 1/2	21x44	470	190	Bogglers
*5	2 1/2	10	1524	6.0	3/4	1	2	1 1/2	15x48	590	215	Bogland
*5	3	10	2100	4.0	3/4	1	2 1/2	2	15x48	590	215	Bombic
5	4	10	3900	2.3	3/4	1	3	2 1/2	18x48	630	240	Bognut
5	5	10	6100	1.5	3/4	1	3 1/2	3	21x51	690	270	Bogoak
5	6	10	8800	1.0	3/4	1	4	3 1/2	24x53	750	300	Bogore
*6	3	10	2100	6.0	3/4	1	2 1/2	2	18x48	630	230	Bogrush
*6	4	10	3900	3.3	3/4	1	3	2 1/2	18x48	720	255	Bogtract
6	5	10	6100	2.1	3/4	1	3 1/2	3	21x50	780	290	Bogus
6	6	10	8800	1.5	3/4	1	4	3 1/2	24x52	830	315	Boilest
6	7	10	11900	1.0	3/4	1	5	4	26x53	900	340	Bolary
*7	4	10	3900	4.6	1	1 1/4	3	2 1/2	17x49	800	310	Boldly
7	5	10	6100	3.0	1	1 1/4	3 1/2	3	21x51	860	325	Boletic
7	6	10	8800	2.0	1	1 1/4	4	3 1/2	24x52	910	390	Bolides
7	7	10	11900	1.5	1	1 1/4	5	4	26x53	980	430	Bollards
7	8	10	15600	1.1	1	1 1/4	6	5	34x54	1060	480	Bonedog
*8	4	10	3900	6.0	1 1/4	1 1/2	3	2 1/2	18x50	860	350	Bonedust
*8	5	10	6100	3.7	1 1/4	1 1/2	3 1/2	3	21x51	1000	375	Boneless
8	6	10	8800	2.7	1 1/4	1 1/2	4	3 1/2	24x52	1050	435	Boncmill
8	7	10	11900	2.0	1 1/4	1 1/2	5	4	26x54	1120	460	Boneset
8	8	10	15600	1.5	1 1/4	1 1/2	6	5	30x56	1250	485	Bonetta
*9	5	10	6100	4.8	1 1/2	2	3 1/2	3	21x55	1240	405	Boltboat
*9	6	10	8800	3.3	1 1/2	2	4	3 1/2	24x56	1430	420	Bolteth
9	7	10	11900	2.5	1 1/2	2	5	4	27x57	1500	450	Boltheads
9	8	10	15600	1.8	1 1/2	2	6	5	30x59	1650	480	Boltings
*10	5	10	6100	6.0	1 1/2	2	3 1/2	3	21x55	1300	435	Bonnily
*10	6	10	8800	4.0	1 1/2	2	4	3 1/2	24x56	1550	485	Bonten
10	7	10	11900	3.0	1 1/2	2	5	4	27x57	1780	505	Bonfire
10	8	10	15600	2.2	1 1/2	2	6	5	30x59	2000	530	Boobies
*12	6	10	8800	6.0	2	2 1/2	4	3 1/2	26x57	1770	520	Bonusses
*12	7	10	11900	4.3	2	2 1/2	5	4	29x59	2000	550	Bonduc
12	8	10	15600	3.3	2	2 1/2	6	5	33x60	2300	580	Bondage

\*Combinations marked thus will boiler feed.

The gallons of water per hour in above list are the theoretical quantities pumped at a piston speed of 75 feet per min. for 8" stroke, and 100 feet per min. for 10" stroke pumps. For continuous service we recommend the selection of a pump capable of giving quantity required at a piston speed of 60 to 75 feet per min.

For further particulars of Boiler Feed Pumps, see Fig. 8.

# The Bawden Machine Co., Limited

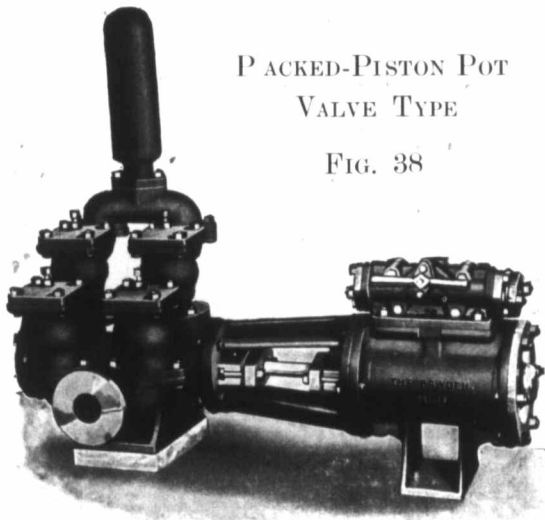
## The "Bawden" Patent

### General Service Pump With Outside Valve Boxes

- NO TAPPETS
- NO EXTERNAL VALVE GEAR LEVERS OR SPRINGS
- NO INTERNAL TUBES OR STUFFING GLANDS

PACKED-PISTON POT  
VALVE TYPE

FIG. 38



150 lb. SERIES

The Steam Cylinders are designed to withstand modern pressures. They are fitted with cast iron block pistons, self-adjusting cast iron rings and steel rods. The two steam ports are specially designed to ensure perfect cushioning of the piston at any speed. The piston valve is operated by two live steam ports only, all complications are avoided. The water cylinders are of suitable strength for pressures not exceeding 150 lbs. per square inch. They have brass liners and are fitted with pistons packed with best quality hydraulic packing. The valves are rubber or brass and each one is contained in a separate valve box, accessible by removing the top cover. The valve seats are brass with flat faces and are machined to a suitable taper, then pressed into valve box seating and held in position with a brass stopper.

Bronze Rod and Brass Water Piston supplied at extra cost.

Above specification represents the regular style, but the Pumps may be fitted to suit any kind of fluid.

This pattern provides a Piston Pump with the same accessibility to pump valves as on those of the outside packed series.

Steam Cylinder	Water Cylinder
*14	7
*14	8
*14	9
14	10
14	12
14	14
14	16
*16	8
*16	9
*16	10
16	12
16	14
16	16
*18	9
*18	10
*18	12
18	14
18	16
*20	10
*20	12
20	14
20	16

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# The Bawden Machine Co., Limited

## The "Bawden" Patent

### General Service Pump With Outside Valve Boxes

FIG. 38

#### PACKED-PISTON POT-VALVE TYPE

Steam Cylinder	Water Cylinder	Stroke	U.S. Gallons Per Hour (See foot note)	Lift in Feet Per lb. Steam At Pump	Pipe Sizes				Floor Space	Weight Pounds	Price	Code Word
					Steam	Exhaust	Suction	Delivery				
*14	7	20	11900	6.0	2 1/2	3	5	4				Bluffy
*14	8	20	15600	4.5	2 1/2	3	6	5				Blumite
*14	9	20	19800	3.6	2 1/2	3	7	6				Blunted
14	10	20	24400	2.9	2 1/2	3	8	7				Blunting
14	12	20	35200	2.0	2 1/2	3	9	8				Bluntish
14	14	20	48000	1.5	2 1/2	3	10	9				Bluntly
14	16	20	60000	1.0	2 1/2	3	12	10				Blunts
*16	8	20	15600	6.0	2 1/2	3	6	5				Blurt
*16	9	20	19800	4.7	2 1/2	3	7	6				Blurtest
*16	10	20	24400	3.8	2 1/2	3	8	7				Blushes
16	12	20	35200	2.6	2 1/2	3	9	8				Blushful
16	14	20	48000	2.0	2 1/2	3	10	9				Bluweed
16	16	20	60000	1.5	2 1/2	3	12	10				Bluewing
*18	9	20	19800	6.0	3	3 1/2	7	6				Bluffness
*18	10	20	24400	4.8	3	3 1/2	8	7				Bluishly
*18	12	20	35200	3.3	3	3 1/2	9	8				Blunders
18	14	20	48000	2.4	3	3 1/2	10	9				Blurreth
18	16	20	60000	1.8	3	3 1/2	12	10				Blushings
*20	10	20	24400	6.0	3	3 1/2	8	7				Bluewater
*20	12	20	35200	4.0	3	3 1/2	9	8				Blundered
20	14	20	48000	3.0	3	3 1/2	10	9				Bluntness
20	16	20	60000	2.2	3	3 1/2	12	10				Blushless

\*Combinations marked thus will boiler feed.

The gallons of water per hour in above list represent maximum quantity for continuous service at about 100 feet piston speed per min., but in emergency this Series will run faster if required.

For further particulars of Boiler Feed Pumps, see Fig. 8.

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# The Bawden Machine Co., Limited

## The "Bawden" Patent

### General Service Pump for High Pressures

- NO**
- TAPPETS**
- NO**
- EXTERNAL**
- VALVE**
- GEAR**
- LEVERS**
- OR**
- SPRINGS**
- NO**
- INTERNAL**
- TUBES**
- OR**
- STUFFING**
- GLANDS**

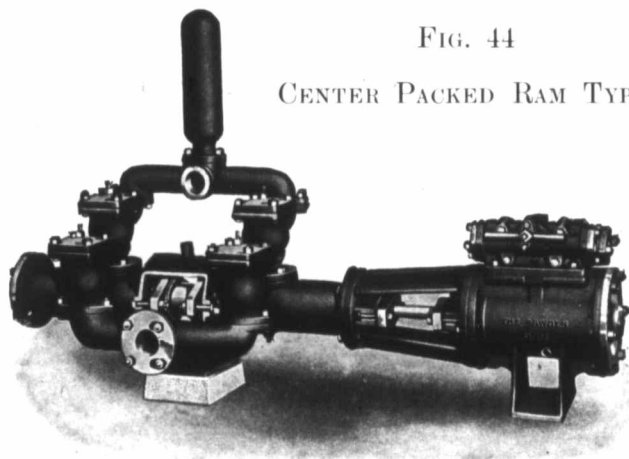


FIG. 44

CENTER PACKED RAM TYPE

200 lb. SERIES

The Steam Cylinders are designed to withstand modern pressures. They are fitted with cast iron block pistons, self-adjusting cast iron rings and steel piston rods. The two steam ports are specially designed to ensure perfect cushioning of the piston at any speed. The piston valve is operated by two live steam ports only, all complications are avoided. The pumps are of suitable strength for pressures not exceeding 200 lbs. per square inch. The rams are made of close grained cast iron, securely cottered to steel piston rods. The valves are a special design and each one is contained in a separate valve box accessible by removing the top cover. The valve seats are brass with flat faces, and are machined to a suitable taper, then pressed into valve box seating.

Bronze Rod and Brass Cased Ram are supplied at extra cost.

Above specification represents the regular style, but the pumps may be fitted to suit any kind of fluid.

Unlike Packed Piston Pumps this pattern shows when packings need attention or renewal, which makes it especially suitable for Mines, Quarries, Clay Pits, or any purpose where the fluid is gritty.



Ge

Steam  
Cylinder  
Water Ram

*4	2 1/2
4	3
*5	2 1/2
*5	3
5	4
*6	3
*6	5
*7	3
*7	4
7	5
7	6
*8	4
*8	5
8	6
8	7
*9	4
*9	5
*9	6
9	7
9	8
*10	4
*10	5
*10	6
10	7
10	8
10	9
*12	5
*12	6
*12	7
12	8
12	9
12	10

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# The Bawden Machine Co., Limited

## The "Bawden" Patent

### General Service Pump for High Pressures

FIG. 44—CENTER PACKED RAM TYPE

Steam Cylinder	Water Ram	Stroke	U.S. Gallons Per Hour (See foot note)	Lift in Feet Per lb. Steam At Pump	Pipe Sizes				Floor Space	Weight Pounds	Price	Code Word
					Steam	Exhaust	Suction	Delivery				
*4 2 1/2	8	8	1100	3.8	1 1/2	3/4	2	1 1/2	16x69	450	\$160	Charger
4 3	8	8	1550	2.6	1 1/2	3/4	2	1 1/2	16x69	450	180	Chargeth
*5 2 1/2	10	10	1524	6.0	3/4	1	2	1 1/2	17x75	700	240	Charily
*5 3	10	10	2100	4.0	3/4	1	2 1/2	2	17x75	700	240	Chariness
5 4	10	10	3900	2.3	3/4	1	3	2 1/2	18x75	860	280	Chariot
*6 3	10	10	2100	6.0	3/4	1	2 1/2	2	17x75	784	260	Charities
*6 4	10	10	3900	3.3	3/4	1	3	2 1/2	18x75	900	290	Charlatan
6 5	10	10	6100	2.1	3/4	1	3 1/2	3	19x77	1100	305	Charlock
*7 3	10	10	2100	8.1	1	1 1/4	2 1/2	2	17x75	850	320	Charmels
*7 4	10	10	3900	4.6	1	1 1/4	3	2 1/2	18x75	1000	340	Charmest
7 5	10	10	6100	3.0	1	1 1/4	3 1/2	3	20x77	1170	360	Charming
7 6	10	10	8800	2.0	1	1 1/4	4	3 1/2	24x80	1400	475	Charms
*8 4	10	10	3900	6.0	1 1/4	1 1/2	3	3 1/2	20x75	1060	380	Charneco
*8 5	10	10	6100	3.7	1 1/4	1 1/2	3 1/2	3	20x77	1230	400	Charnel
8 6	10	10	8800	2.7	1 1/4	1 1/2	4	3 1/2	24x80	1450	500	Charoven
8 7	10	10	11900	2.0	1 1/4	1 1/2	5	4	26x81	1840	525	Charpooy
*9 4	10	10	3900	7.9	1 1/2	2	3	2 1/2	20x79	1200	385	Charred
*9 5	10	10	6100	4.8	1 1/2	2	3 1/2	3	21x81	1340	420	Chartism
*9 6	10	10	8800	3.3	1 1/2	2	4	3 1/2	24x83	1680	440	Chatelet
9 7	10	10	11900	2.7	1 1/2	2	5	4	26x86	2000	480	Chattels
9 8	10	10	15600	1.8	1 1/2	2	6	5	30x88	2270	520	Chatting
*10 4	10	10	3900	9.6	1 1/2	2	3	2 1/2	21x79	1400	400	Chatty
*10 5	10	10	6100	6.0	1 1/2	2	3 1/2	3	22x82	1500	470	Chatwood
*10 6	10	10	8800	4.0	1 1/2	2	4	3 1/2	25x84	1800	550	Chayroot
10 7	10	10	11900	3.0	1 1/2	2	5	4	27x87	2090	570	Cheapen
10 8	10	10	15600	2.2	1 1/2	2	6	5	31x89	2380	590	Cheapjack
10 9	10	10	19800	1.8	1 1/2	2	7	6	35x91	2700	620	Cheapness
*12 5	10	10	6100	8.6	2	2 1/2	3 1/2	3	24x84	1730	525	Checkbar
*12 6	10	10	8800	6.0	2	2 1/2	4	3 1/2	27x85	2050	560	Checkers
*12 7	10	10	11900	4.3	2	2 1/2	5	4	29x87	2420	590	Checkless
12 8	10	10	15600	3.3	2	2 1/2	6	5	32x89	2600	620	Checkline
12 9	10	10	19800	2.7	2	2 1/2	7	6	36x92	2810	670	Checknut
12 10	10	10	24400	2.1	2	2 1/2	8	7	40x95	3090	750	Checkmate

\*Combinations marked thus will boiler feed.

The gallons of water per hour in above list are the theoretical quantities pumped at a piston speed of 75 feet per min. for 8" stroke and 100 feet per min. for 10" stroke pumps. For continuous service we recommend the selection of a pump capable of giving quantity required at a piston speed of 60 to 75 feet per min.

For further particulars of Boiler Feed Pumps, see Fig. 14.

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TYPE



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# The Bawden Machine Co., Limited

## The "Bawden" Patent General Service Pump for High Pressures

NO  
TAPPETS  
NO  
EXTERNAL  
VALVE  
GEAR  
LEVERS  
OR  
SPRINGS  
NO  
INTERNAL  
TUBES  
OR  
STUFFING  
GLANDS

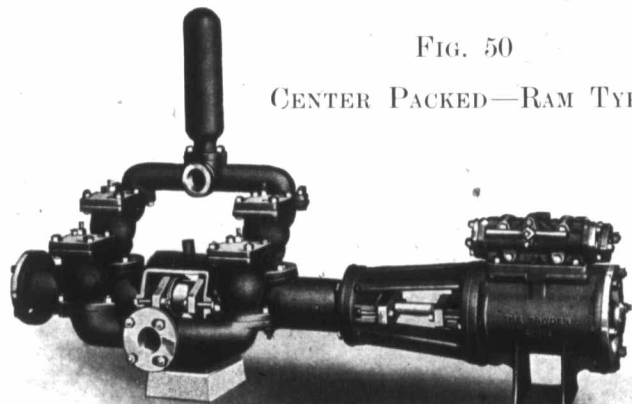


FIG. 50

CENTER PACKED—RAM TYPE

250 lb. SERIES

The Steam Cylinders are designed to withstand modern pressures. They are fitted with cast iron block pistons, self-adjusting cast iron rings and steel piston rods. The two steam ports are specially designed to ensure perfect cushioning of the piston at any speed. The piston valve is operated by two live steam ports only, all complications are avoided. The pumps are of suitable strength for pressures not exceeding 250 lbs. per square inch. The rams are made of close grained cast iron, securely cottered to steel piston rods. The pump valves are a special design fitted with renewable beats of suitable material for their duty. Each valve is contained in a separate valve box and accessible by removing the top cover. The valve seats are brass with flat faces, and are machined to a suitable taper then pressed into valve box seating.

Bronze Rod and Brass Cased Ram are supplied at extra cost.

Above specification represents the regular style, but the Pumps may be fitted to suit any kind of fluid.

Unlike packed Piston Pumps this pattern shows when packings need attention or renewal, which makes it especially suitable for Mines, Quarries, Clay Pits, or for purpose where the fluid is gritty.

Steam Cylinder	Water Ram	
*14	7	2
*14	8	2
*14	9	2
14	10	2
14	12	2
14	14	2
14	16	2
*16	7	2
*16	8	2
*16	9	2
*16	10	2
16	12	2
16	14	2
16	16	2
*18	7	2
*18	8	2
*18	9	2
*18	10	2
18	12	2
18	14	2
18	16	2
*20	7	2
*20	8	2
*20	9	2
*20	10	2
*20	12	2
20	14	2
20	16	2

\*Comb

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Series will r  
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# The Bawden Machine Co., Limited

## The "Bawden" Patent General Service Pump for High Pressures

FIG. 50

### CENTER PACKED—RAM TYPE

TYPE	Steam Cylinder	Water Ram	Stroke	U.S. Gallons Per Hour (See foot note)	Lift in Feet Per lb. Steam At Pump	Pipe Sizes				Floor Space	Weight Pounds	Price	Code Word
						Steam	Exhaust	Suction	Delivery				
*14 7	20	11900	6.0	2 1/2	3	5	4						Corrosive
*14 8	20	15600	4.5	2 1/2	3	6	5						Corsair
*14 9	20	19800	3.6	2 1/2	3	7	6						Corselet
14 10	20	24400	2.9	2 1/2	3	8	7						Corseting
14 12	20	35200	2.0	2 1/2	3	9	8						Cortege
14 14	20	48000	1.5	2 1/2	3	10	9						Cortes
14 16	20	60000	1.0	2 1/2	3	12	10						Cortical
*16 7	20	11900	7.8	2 1/2	3	5	4						Corticated
*16 8	20	15600	6.0	2 1/2	3	6	5						Corticose
*16 9	20	19800	4.7	2 1/2	3	7	6						Corundum
*16 10	20	24400	3.8	2 1/2	3	8	7						Coruscated
16 12	20	35000	2.6	2 1/2	3	9	8						Corvette
16 14	20	48000	2.0	2 1/2	3	10	9						Corvine
16 16	20	60000	1.5	2 1/2	3	12	10						Corylus
*18 7	20	11900	9.9	3	3 1/2	5	4						Corynite
*18 8	20	15600	7.5	3	3 1/2	6	5						Corystes
*18 9	20	19800	6.0	3	3 1/2	7	6						Coteries
*18 10	20	24400	4.8	3	3 1/2	8	7						Cotgare
18 12	20	35200	3.3	3	3 1/2	9	8						Cotidal
18 14	20	48000	2.4	3	3 1/2	10	9						Cotman
18 16	20	60000	1.8	3	3 1/2	12	10						Cotswold
*20 7	20	11900	12.2	3	3 1/2	5	4						Cottages
*20 8	20	15600	9.3	3	3 1/2	6	5						Cotterell
*20 9	20	19800	7.3	3	3 1/2	7	6						Cotterite
*20 10	20	24400	6.0	3	3 1/2	8	7						Cottised
*20 12	20	35200	4.0	3	3 1/2	9	8						Cottoid
20 14	20	48000	3.0	3	3 1/2	10	9						Cottoning
20 16	20	60000	2.2	3	3 1/2	12	10						Cottoncin

\*Combinations marked thus will boiler feed.

The gallons of water per hour in above list represent maximum quantity for continuous service at about 100 feet piston speed per min., but in emergency this Series will run faster, if required.

For further particulars of Boiler Feed Pumps, see Fig. 14.

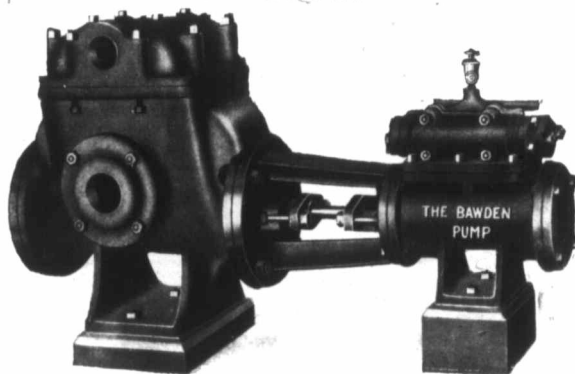
## The "Bawden" Patent Vacuum Pump

**NO  
TAPPETS**

**NO  
EXTERNAL  
VALVE  
GEAR  
LEVERS  
OR  
SPRINGS**

**NO  
INTERNAL  
TUBES  
OR  
STUFFING  
GLANDS**

Fig. 56



The Steam Cylinders are designed to withstand modern pressures. They are fitted with cast iron block pistons, self-adjusting cast iron rings and Tobin bronze rods. The two steam ports are specially designed to ensure perfect cushioning of the piston at any speed. The piston valve is operated by two live steam ports only, all complications are avoided. The pumps have brass liners, and pistons packed with best quality hydraulic packing. The pump valves are rubber and their seats are brass with flat faces and are machined to a suitable taper then pressed into pump seating and held in position with brass stoppers accessible through hand holes as shown.

These long stroke pumps embody the latest improvements for producing high vacuums. The pump valves have large areas and are all water sealed.

Above specification represents the regular style, but the pumps may be fitted to suit special duties.

Steam Cylinder	Water Cylinder
4	3
4	4
4	5
4	6
5	4
5	5
5	6
5	7
6	5
6	6
6	7
6	8
7	6
7	7
7	8
7	9
8	7
8	8
8	9
8	10
9	8
9	9
9	10
10	12
10	14
12	16

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per min.

# The Bawden Machine Co., Limited

## The "Bawden" Vacuum Pumps

FIG. 56

Steam Cylinder	Water Cylinder	Stroke	U.S. Gallons Per Hour (See foot note)	Pipe Sizes				Floor Space	Weight Pounds	Price	Code Word
				Steam	Exhaust	Suction	Delivery				
4	3	8	1550	1 1/2	3/4	2	1 1/2	9x40	300	\$110	Cladonic
4	4	8	2800	1 1/2	3/4	2 1/2	2	10x42	350	150	Claglocks
4	5	8	4800	1 1/2	3/4	3	2 1/2	12x44	400	170	Claimer
4	6	8	6600	1 1/2	3/4	4	3	14x47	490	190	Claimeth
5	4	10	3900	3/4	1	3	2 1/2	10x48	550	200	Clambake
5	5	10	6100	3/4	1	3 1/2	3	14x50	700	210	Clammed
5	6	10	8800	3/4	1	4	3 1/2	16x52	800	225	Clammy
5	7	10	11900	3/4	1	5	4	18x53	950	245	Clamour
6	5	10	6100	3/4	1	3 1/2	3	14x50	780	250	Clamp
6	6	10	8800	3/4	1	4	3 1/2	16x52	900	280	Clampers
6	7	10	11900	3/4	1	5	4	18x53	1140	310	Clamshell
6	8	10	15600	3/4	1	6	5	20x54	1300	340	Clancular
7	6	10	8800	1	1 1/4	4	3 1/2	17x52	970	305	Clangour
7	7	10	11900	1	1 1/4	5	4	18x53	1280	330	Clapman
7	8	10	15600	1	1 1/4	6	5	21x54	1400	355	Clapnet
7	9	10	19800	1	1 1/4	7	6	22x57	1500	385	Claptrap
8	7	10	11900	1 1/4	1 1/2	5	4	18x54	1320	390	Clarets
8	8	10	15600	1 1/4	1 1/2	6	5	21x56	1450	420	Clarify
8	9	10	19800	1 1/4	1 1/2	7	6	23x58	1590	435	Clarionet
8	10	10	24400	1 1/4	1 1/2	8	7	25x60	1800	445	Clarius
9	8	10	15600	1 1/2	2	6	5	21x59	1550	440	Claritude
9	9	10	19800	1 1/2	2	7	6	23x61	1800	470	Claspered
9	10	10	24400	1 1/2	2	8	7	26x63	2100	500	Claspest
10	12	20	35200	1 1/2	2	9	8	.....	3590	.....	Clasping
10	14	20	48000	1 1/2	2	10	9	.....	4650	.....	Claspnail
12	16	20	60000	2	2 1/2	12	10	.....	5000	.....	Classics

60 feet per min. = 90 single strokes for 8" stroke pumps.  
 60 feet per min. = 72 single strokes for 10" stroke pumps.  
 75 feet per min. = 90 single strokes for 10" stroke pumps.  
 75 feet per min. = 45 single strokes for 20" stroke pumps.

The gallons of water per hour in above list are the theoretical quantities pumped at a piston speed of 75 feet per min. for 8" strokes and 100 feet per min. for 10" and 20" stroke pumps. For continuous service we recommend the selection of a pump capable of giving quantity required at a piston speed of 60 to 75 feet per min.

They are in bronze ioning of am ports ers, and alves are suitable stoppers

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be fitted

The "Bawden" Patent

Standard Boiler Feed Pumps for High Pressure  
REGULAR LINE

Standards

- NO TAPPETS
- NO EXTERNAL VALVE GEAR LEVERS OR SPRINGS
- NO INTERNAL TUBES OR STUFFING GLANDS

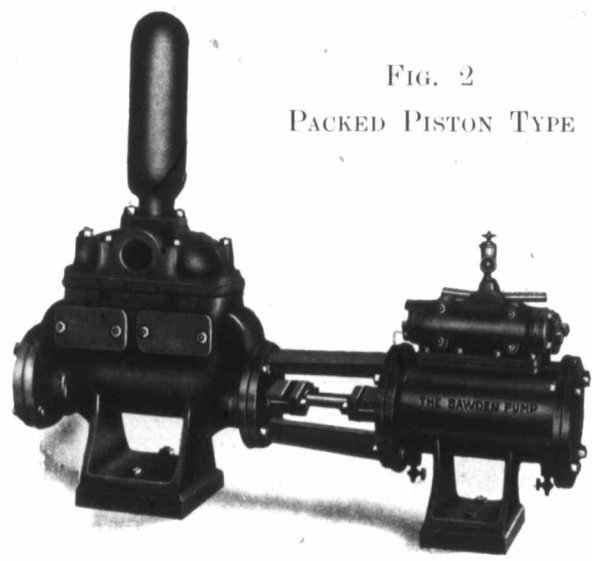


FIG. 2  
PACKED PISTON TYPE

100 lb. SERIES

Steam Cylinder	Water Cylinder	Stroke
4	2 1/2	8
5	3	10
5	2 1/2	10
5	3	10
6	3	10
6	4	10
7	4	10
8	4	10
8	5	10
9	5	10
9	6	10
10	5	10
10	6	10
12	6	10
12	7	10
14	8	20
16	9	20
18	10	20
20	12	20

The Steam Cylinders are designed to withstand modern pressures. They are fitted with cast iron block pistons, self-adjusting cast iron rings and steel rods. The two steam ports are specially designed to ensure perfect cushioning of the piston at any speed. The piston valve is operated by two live steam ports only, all complications are avoided. The water cylinders are of suitable strength for pressures not exceeding 100 lbs. per square inch. They have brass liners and are fitted with pistons packed with best quality hydraulic packing. The valves are of rubber or brass. The valve seats are brass, with flat faces and are machined to a suitable taper, then pressed into pump seating and held in position with brass stoppers, accessible through hand holes as shown.

Tobin Bronze Rod and Brass Water Piston supplied at extra cost.

40 feet per min. = 60 single stroke for 8" stroke pumps.  
50 feet per min. = 60 single stroke for 10" stroke pumps.

The gas pumped at a min. for 10' is considered should be sel

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# The Bawden Machine Co., Limited

## The "Bawden" Patent Standard Boiler Feed Pumps for High Pressure

REGULAR LINE

FIG. 2  
PACKED PISTON TYPE

Steam Cylinder	Water Cylinder	Stroke	U.S. Gallons Per Hour (See foot note)	Pipe Sizes				Floor Space	Horse Power	Weight Pounds	Price	Code Word
				Steam	Exhaust	Suction	Delivery					
4	2 1/2	8	1100	1 1/2	3/4	2	1 1/2	9x40	110	300	\$110	Aback
5	3	6	1500	3/4	1	2	1 1/2	10x40	150	400	125	Abad
5	2 1/2	10	1524	3/4	1	2	1 1/2	10x48	150	480	190	Abaft
5	3	10	2100	3/4	1	2 1/2	2	10x48	200	500	190	Abanga
6	3	10	2100	3/4	1	2 1/2	2	11x48	200	550	200	Abashed
6	4	10	3900	3/4	1	3	2 1/2	11x48	350	590	220	Abassis
7	4	10	3900	1	1 1/4	3	2 1/2	12x49	350	640	275	Abater
8	4	10	3900	1 1/4	1 1/2	3	2 1/2	13x49	350	700	325	Abating
8	5	10	6100	1 1/4	1 1/2	3 1/2	3	14x51	600	900	350	Abattis
9	5	10	6100	1 1/2	2	3 1/2	3	15x55	600	1000	385	Abatude
9	6	10	8800	1 1/2	2	4	3 1/2	17x56	900	1100	400	Abacy
10	5	10	6100	1 1/2	2	3 1/2	3	16x55	600	1080	400	Abroach
10	6	10	8800	1 1/2	2	4	3 1/2	18x56	900	1200	420	Abrook
12	6	10	8800	2	2 1/2	4	3 1/2	20x57	900	1480	480	Abrupt
12	7	10	11900	2	2 1/2	5	4	20x58	1200	1600	510	Abruptly
14	8	20	15600	2 1/2	3	6	5	22x70	1500	2600	1000	Abscind
16	9	20	19800	2 1/2	3	7	6	24x77	1900	3100	1100	Absorb
18	10	20	24400	3	3 1/2	8	7	30x85	2400	3900	1300	Abstain
20	12	20	35200	3	3 1/2	9	8	32x94	3500	4900	1550	Absume

The gallons of water per hour in above list are the theoretical quantities pumped at a piston speed of 75 ft. per min. for 8" stroke pumps, and 100 ft. per min. for 10" and 20" stroke pumps. A piston speed from 40 to 50 feet per min. is considered fast enough to feed high pressure boilers, consequently a pump should be selected capable of giving quantity required at about that piston speed.

40 feet per min. = 60 single strokes for 8" stroke pumps.

50 feet per min. = 60 single strokes for 10" stroke pumps.

The "Bawden" Patent

Standard Boiler Feed Pumps for High Pressures

Standard

- NO TAPPETS
- NO EXTERNAL VALVE GEAR LEVERS OR SPRINGS
- NO INTERNAL TUBES OR STUFFING GLANDS

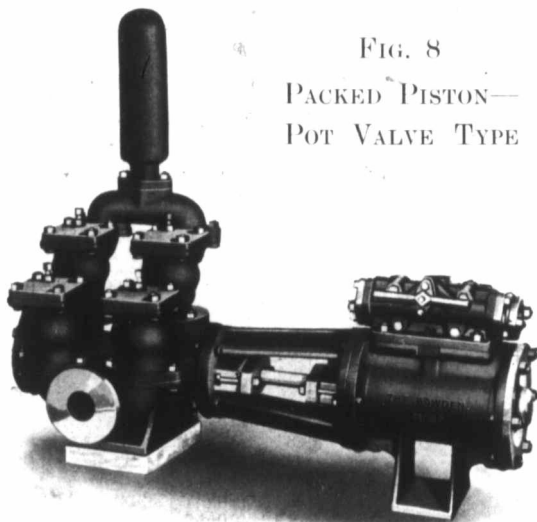


FIG. 8  
PACKED PISTON—  
POT VALVE TYPE

150 lb. SERIES

The Steam Cylinders are designed to withstand modern pressures. They are fitted with cast iron block pistons, self-adjusting cast iron rings and steel rods. The two steam ports are specially designed to ensure perfect cushioning of the piston at any speed. The piston valve is operated by two live steam ports only, all complications are avoided. The water cylinders are of suitable strength for pressures not exceeding 150 lbs. per square inch. They have brass liners and are fitted with pistons packed with best quality hydraulic packing. The valves are of rubber or brass and each one is contained in a separate valve box, accessible by removing the top cover. The valve seats are brass with flat faces and are machined to a suitable taper then pressed into valve box seating and held in position with a brass stopper.

Bronze Rod and Brass Water Piston supplied at extra cost.

Steam Cylinder	Water Cylinder	Stroke
4	2 1/2	8
5	2 1/2	10
5	3	10
6	3	10
6	4	10
7	4	10
8	4	10
8	5	10
9	5	10
9	6	10
10	5	10
10	6	10
12	6	10
12	7	10
14	8	20
16	9	20
18	10	20
20	12	20

The gallons pumped at a pressure of 100 lbs. per square inch per minute for 10" diameter.

A piston pressure boiler required at above pressures.

50  
50

# The Bawden Machine Co., Limited

## The "Bawden" Patent

### Standard Boiler Feed Pumps for High Pressures

FIG. 8

#### PACKED PISTON—POT VALVE TYPE

Steam Cylinder	Water Cylinder	Stroke	U.S. Gallons Per Hour (See foot note)	Pipe Sizes				Floor Space	Horse Power	Weight Pounds	Price	Code Word
				Steam	Exhaust	Suction	Delivery					
4	2 1/2	8	1100	1 1/2	3/4	2	1 1/2	13x40	110	400	\$135	Absurd
5	2 1/2	10	1524	3/4	1	2	1 1/2	15x48	150	590	215	Abuna
5	3	10	2100	3/4	1	2 1/2	2	15x48	200	590	215	Abundant
6	3	10	2100	3/4	1	2 1/2	2	18x48	200	630	230	Abbey
6	4	10	3900	3/4	1	3	2 1/2	18x48	350	720	255	Abbot
7	4	10	3900	1	1 1/4	3	2 1/2	18x49	350	800	310	Abdest
8	4	10	3900	1 1/4	1 1/2	3	2 1/2	18x50	350	860	350	Abditory
8	5	10	6100	1 1/4	1 1/2	3 1/2	3	21x51	600	1000	375	Abclite
9	5	10	6100	1 1/2	2	3 1/2	3	21x55	600	1240	405	Abetted
9	6	10	8800	1 1/2	2	4	3 1/2	24x56	900	1430	420	Abhal
10	5	10	6100	1 1/2	2	3 1/2	3	21x55	600	1300	435	Abhor
10	6	10	8800	1 1/2	2	4	3 1/2	24x56	900	1550	485	Abiders
12	6	10	8800	2	2 1/2	4	3 1/2	26x57	900	1770	520	Abigail
12	7	10	11900	2	2 1/2	5	4	29x59	1200	2000	545	Abusable
14	8	20	15600	2 1/2	3	6	5	34x70	1500	3200	.....	Abuseful
16	9	20	19800	2 1/2	3	7	6	38x77	1900	4500	.....	Abusing
18	10	20	24400	3	3 1/2	8	7	42x85	2400	5200	.....	Abutilon
20	12	20	35200	3	3 1/2	9	8	50x94	3500	6400	.....	Abuttal

The gallons of water per hour in above list are the theoretical quantities pumped at a piston speed of 75 feet per min. for 8" stroke pumps and 100 feet per min. for 10" and 20" stroke pumps.

A piston speed of 50 feet per min. is considered fast enough to feed high pressure boilers, consequently a pump should be selected capable of giving quantity required at about that piston speed.

50 feet per min.=60 single strokes for 10" stroke pumps.

50 feet per min.=30 single strokes for 20" stroke pumps.

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The "Bawden" Patent Compound  
Standard Boiler Feed Pumps for High Pressures

The  
Standard

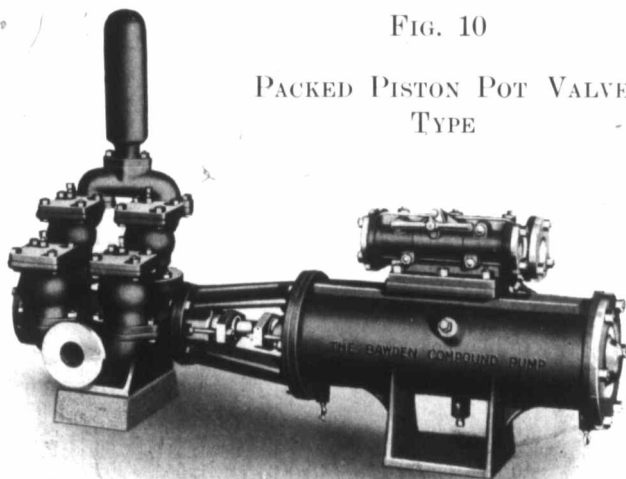
FIG. 10

PACKED PISTON POT VALVE  
TYPE

**NO  
TAPPETS**

**NO  
EXTERNAL  
VALVE  
GEAR  
LEVERS  
OR  
SPRINGS**

**NO  
INTERNAL  
TUBES  
OR  
STUFFING  
GLANDS**



High Pressure Cylinder	Low Pressure Cylinder	Water Cylinder
4	8	3
5	9	4
6	10	5
7	12	6
8	14	7
9	16	8
10	18	9
11	20	10

In the Bawden Compound Steam Pump the same balanced valve motion is used as on the simple steam pumps enabling the high and low pressure pistons to work in one cylinder with one specially designed two ported slide valve to distribute the high and low pressure steam, thus dispensing with extraneous valve motion, exhaust pipes, extra cylinder, steam chest and glands. By an ingenious arrangement of the steam ports the pistons are automatically cushioned for any pressure or piston speed without external adjustment.

The Bawden Compounds effect a saving in steam of from 25 to 40 per cent.

The pumps of this series are designed to withstand the highest boiler pressures available and are equipped accordingly. The water ends are brass lined, have packed piston and brass piston rod. The water valves are contained in pot valve boxes, which are bolted to the water cylinder and each valve is accessible by removing each top cover.

This pattern provides the greatest accessibility to all working parts and is a high grade pump at moderate price.

The galle  
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boilers, conse  
at about that

50 ft  
50 ft

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# The Bawden Machine Co., Limited

## The "Bawden" Patent Compound

### Standard Boiler Feed Pumps for High Pressures

FIG. 10

#### PACKED PISTON POT VALVE TYPE

High Pressure Cylinder	Low Pressure Cylinder	Water Cylinder	Stroke	U.S. Gallons Per Hour (See foot note)	Pipe Sizes				Floor Space	Horse Power	Weight Pounds	Price	Code Word
					Steam	Exhaust	Suction	Delivery					
4	8	3	10	2100	$3\frac{3}{4}$	$1\frac{1}{2}$	$2\frac{1}{2}$	2	12x 60	200	750	\$360	Chicory
5	9	4	10	3900	$3\frac{3}{4}$	2	3	$2\frac{1}{2}$	18x 66	350	1100	460	Chidden
6	10	5	10	6100	1	2	$3\frac{1}{2}$	3	21x 68	600	1750	540	Chideth
7	12	6	10	8800	$1\frac{1}{4}$	$2\frac{1}{2}$	4	$3\frac{1}{2}$	26x 70	900	2400	710	Chidingly
8	14	7	20	11900	$1\frac{1}{2}$	3	5	4	30x 93	1200	3360	.....	Chidings
9	16	8	20	15600	$1\frac{1}{2}$	3	6	5	33x 96	1500	4450	.....	Chiefage
10	18	9	20	19800	2	$3\frac{1}{2}$	7	6	38x100	1900	5000	.....	Chiefs
11	20	10	20	24400	2	$3\frac{1}{2}$	8	7	42x102	2400	6000	.....	Chieftain

The gallons of water per hour in above list are the theoretical quantities pumped at a piston speed of 100 feet per min.

From 40 to 50 feet per min. is considered fast enough to feed high pressure boilers, consequently a pump should be selected capable of giving quantity required at about that piston speed.

50 feet per min. = 60 single strokes for 10" stroke pumps.

50 feet per min. = 30 single strokes for 20" stroke pumps.

For outside packed Ram Pumps, see Fig. 16 Series.

# The Bawden Machine Co., Limited



## The "Bawden" Patent Standard Boiler Feed Pumps for High Pressure

NO  
TAPPETS

NO  
EXTERNAL  
VALVE  
GEAR  
LEVERS  
OR  
SPRINGS

NO  
INTERNAL  
TUBES  
OR  
STUFFING  
GLANDS

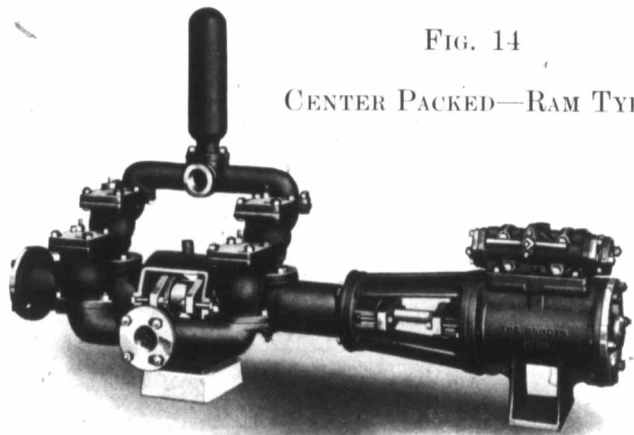


FIG. 14

CENTER PACKED—RAM TYPE

200 lb. SERIES

The **Steam Cylinders** are designed to withstand modern pressures. They are fitted with cast iron block pistons, self adjusting cast iron rings and steel rods. The two steam ports are specially arranged to ensure perfect cushioning of the piston at any speed. The piston valve is operated by two live steam ports only, all complications are avoided.

The **Pumps** are of suitable strength for pressures not exceeding 200 lbs. per square inch. The Rams are made of close grained cast iron, securely cotttered to steel piston rods. The Valves are a special design, fitted with renewable beats of suitable material to stand hot water. Each valve is contained in a separate valve box and accessible by removing the top cover. The valve seats are brass with flat faces, and are machined to a suitable taper, then pressed into valve box seating. Unlike packed piston pumps. This pattern shows when packings need attention or renewal, and embodies the very best features for its special purpose, which, combined with the flexibility of the steam end makes it preferable to all other types for boiler feeding.

Bronze Rod and Brass Casd Ram are supplied at extra cost.

Stand

Steam Cylinder	Water Ram	Stroke
4	2 1/2	8
5	2 1/2	10
5	3	10
6	3	10
6	4	10
7	4	10
8	4	10
8	5	10
9	5	10
9	6	10
10	5	10
10	6	10
12	6	10
12	7	10
14	8	20
16	9	20
18	10	20
20	12	20

The gall  
pumped at a  
per min. for

A piston  
pressure boiler  
required at al

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# The Bawden Machine Co., Limited

## The "Bawden" Patent Standard Boiler Feed Pumps for High Pressure

FIG. 14  
CENTER PACKED—RAM TYPE

Steam Cylinder	Water Ram	Stroke	U.S. Gallons Per Hour (See foot note)	Pipe Sizes				Floor Space	Horse Power	Weight Pounds	Price	Code Word
				Steam	Exhaust	Suction	Delivery					
4	2 1/2	8	1100	1 1/2	3/4	2	1 1/2	12x 60	110	450	\$160	Acarus
5	2 1/2	10	1524	3/4	1	2	1 1/2	15x 64	150	650	240	Acacias
5	3	10	2100	3/4	1	2 1/2	2	15x 64	200	680	240	Acacine
6	3	10	2100	3/4	1	2 1/2	2	16x 64	200	710	260	Acajou
6	4	10	3900	3/4	1	3	2 1/2	18x 64	350	1000	290	Accent
7	4	10	3900	1	1 1/4	3	2 1/2	18x 64	350	1100	350	Acantha
8	4	10	3900	1 1/4	1 1/2	3	2 1/2	18x 65	350	1200	380	Accident
8	5	10	6100	1 1/4	1 1/2	3 1/2	3	21x 70	600	1570	400	Acclams
9	5	10	6100	1 1/2	2	3 1/2	3	21x 70	600	1660	420	Accloved
9	6	10	8800	1 1/2	2	4	3 1/2	24x 72	900	1780	440	Accoils
10	5	10	6100	1 1/2	2	3 1/2	3	21x 70	600	1700	470	Accord
10	6	10	8800	1 1/2	2	4	3 1/2	24x 72	900	1950	550	Accrued
12	6	10	8800	2	2 1/2	4	3 1/2	26x 74	900	2300	560	Accumb
12	7	10	11900	2	2 1/2	5	4	29x 80	1200	2700	580	Acerb
14	8	20	15600	2 1/2	3	6	5	34x114	1500	4800	1200	Aceric
16	9	20	19800	2 1/2	3	7	6	38x116	1900	6700	.....	Acerval
18	10	20	24400	3	3 1/2	8	7	42x120	2400	7200	.....	Acetal
20	12	20	35200	3	3 1/2	9	8	50x124	3500	8600	.....	Acetify

The gallons of water per hour in above list are the theoretical quantities pumped at a piston speed of 75 feet per min. for 8" stroke pumps, and 100 feet per min. for 10" and 20" stroke pumps.

A piston speed of 50 feet per min. is considered fast enough to feed high pressure boilers, consequently a pump should be selected capable of giving quantity required at about that piston speed.

40 feet per min.=60 single strokes for 8" stroke pumps.

50 feet per min.=60 single strokes for 10" stroke pumps.

# The Bawden Machine Co., Limited

## The "Bawden" Patent Compound

**NO  
TAPPETS**

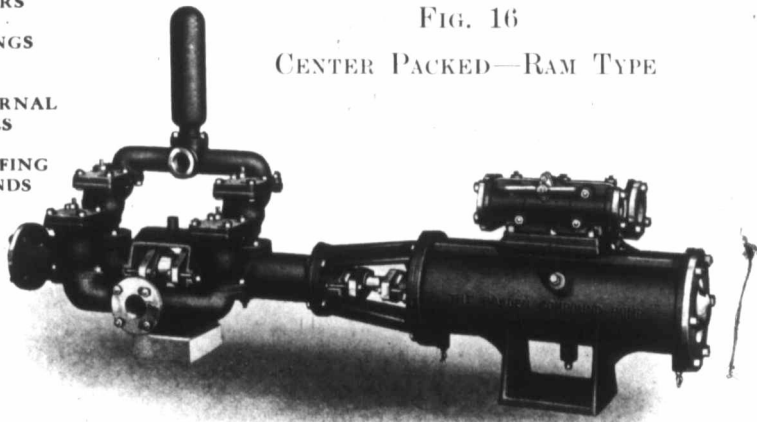
**NO  
EXTERNAL  
VALVE  
GEAR  
LEVERS  
OR  
SPRINGS**

**NO  
INTERNAL  
TUBES  
OR  
STUFFING  
GLANDS**

Standard Boiler Feed Pumps for  
High Pressures

FIG. 16

CENTER PACKED—RAM TYPE



In the Bawden Compound Steam Pump the same balanced valve motion is used as on the simple steam pumps, enabling the high and low pressure pistons to work in one cylinder with one specially designed two ported slide valve to distribute the high and low pressure steam, thus dispensing with extraneous valve motion, exhaust pipes, extra cylinder, steam chest and glands.

By an ingenious arrangement of the steam ports the pistons are automatically cushioned for any pressure or piston speed, without external adjustment.

The Bawden Compounds effect a saving in steam of from 25 to 40 per cent.

The pumps of this Series are designed to withstand the highest boiler pressures available. The ram is cased with hard brass and cotted to Tobin bronze piston rod. The working barrels have the pot valve boxes bolted on and the valves are accessible by removing each top cover. The ram being outside packed, renders all leakage visible, this together with the great facilities for examination and easy renewals makes this pattern the most modern, economical and desirable Pump for Boiler Feeding purposes.



**T  
Standa**

High Pressure Cylinder	Low Pressure Cylinder	Water Ram
4	8	3
5	9	4
6	10	5
7	12	6
8	14	7
9	16	8
10	18	9
11	20	10

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pumped at a  
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at about tha

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For Insi

# The Bawden Machine Co., Limited

## The "Bawden" Patent Compound Standard Boiler Feed Pumps for High Pressures

FIG. 16

### CENTER PACKED—RAM TYPE

High Pressure Cylinder	Low Pressure Cylinder	Water Ram	Stroke	U. S. Gallons Per Hour (See foot note)	Pipe Sizes				Floor Space	Horse Power	Weight Pounds	Price	Code Word
					Steam	Exhaust	Suction	Delivery					
4	8	3	10	2100	$\frac{3}{4}$	$1\frac{1}{2}$	$2\frac{1}{2}$	2	12x 90	200	980	\$392	Cockloft
5	9	4	10	3900	$\frac{3}{4}$	2	3	$2\frac{1}{2}$	18x 96	350	1250	500	Cockney
6	10	5	10	6100	1	2	$3\frac{1}{2}$	3	21x106	600	1560	642	Cockpit
7	12	6	10	8800	$1\frac{1}{4}$	$2\frac{1}{2}$	4	$3\frac{1}{2}$	26x107	900	2100	810	Cocksfoot
8	14	7	20	11900	$1\frac{1}{2}$	3	5	4	30x154	1200	4300	.....	Cockhorse
9	16	8	20	15600	$1\frac{1}{2}$	3	6	5	33x160	1500	5400	.....	Cockbur
10	18	9	20	19800	2	$3\frac{1}{2}$	7	6	38x164	1900	7000	.....	Codliver
11	20	10	20	24400	2	$3\frac{1}{2}$	8	7	42x167	2400	10900	.....	Codlivers

The gallons of water per hour in above list are the theoretical quantities pumped at a piston speed of 100 feet per min.

From 40 to 50 feet per min. is considered fast enough to feed high pressure boilers, consequently a Pump should be selected capable of giving quantity required at about that piston speed.

50 feet per min. = 60 single strokes for 10" stroke pumps.

50 feet per min. = 30 single strokes for 20" stroke pumps.

For Inside Packed Pot Valve Box Type, see Fig. 10, Series.

# The Bawden Machine Co., Limited

## Extra for Pan

ON "BAWDEN" FIG. 56 VACUUM AND FIG. 2 STANDARD  
BOILER FEED PUMPS.

Steam Cylinder	Stroke	Water Cylinder	Price
4	8	Size Specified	\$30
5	10		40
6	10		40
7	10		44
8	10		48
9	10		52
10	10		52
12	10		56





