

CHAMBERSBURG DOUBLE FRAME FORGING HAMMERS

Illustration shows Standard
Design of Hammers -
10,000 lb. and 12,000 lb.
(with POWER/TROL Control System)



FIG. 1

**Standard Design,
Sizes to 4000 lbs.**

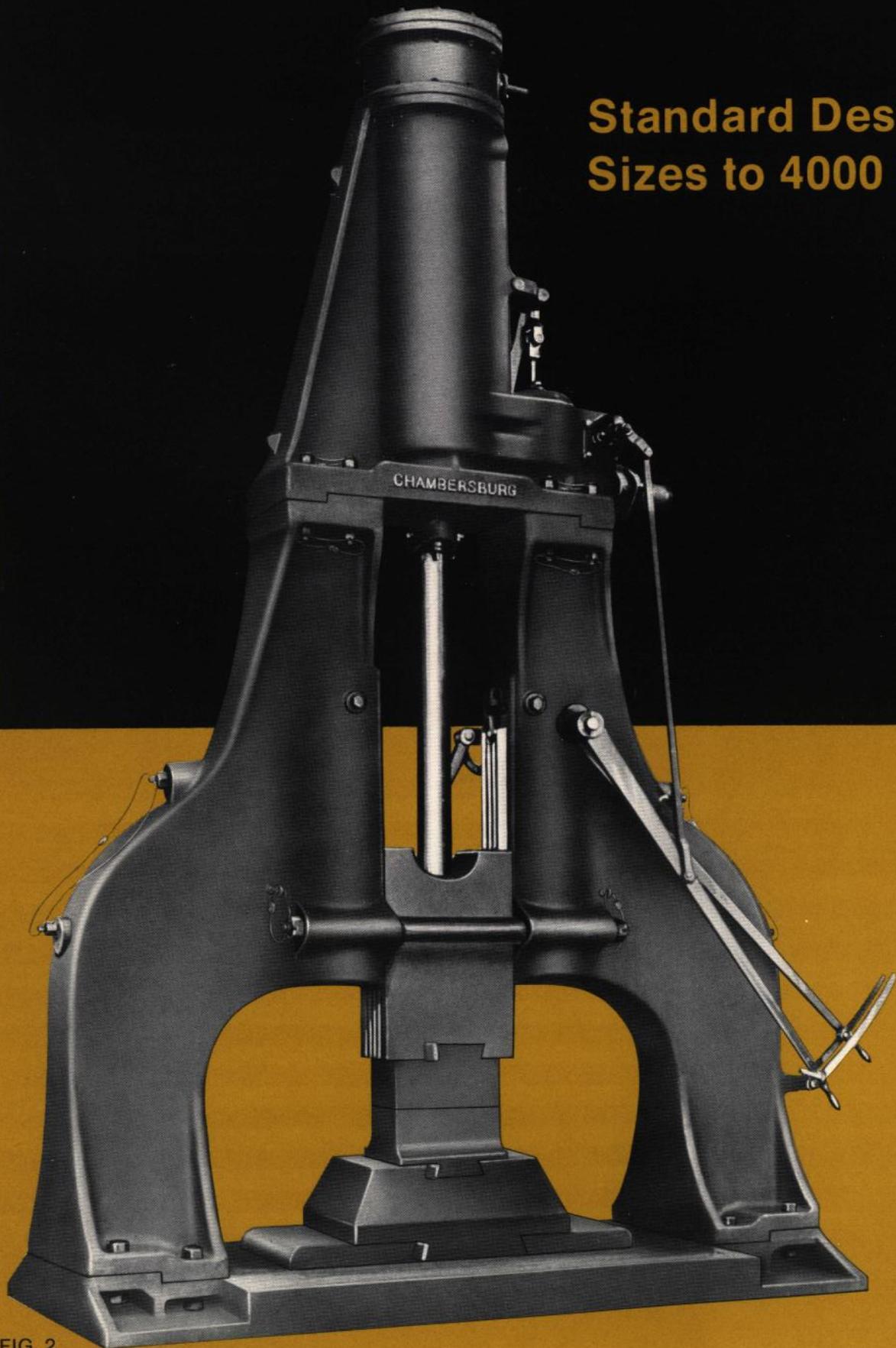


FIG. 2

Chambersburg Model "L" Double Frame Hammers have an enviable record throughout the open die forging industry for productivity, efficiency, versatility and reliability. The benefit of more than seventy-five years experience of hammer building is to be found in the design and construction features of this Chambersburg hammer.

PRODUCTIVITY

Excellent control of the forging blow from rapid, light planishing blows to maximum power breakdown forging operations is characteristic of Chambersburg Model "L" Forging Hammers.

This is due, in part, to differential valve porting, a novel valve and porting design which incorporates a reduced cylinder bore to achieve a high impact velocity of the ram, quick return and at the same time, effect considerable power savings. And the specially designed cylinder provides economy in the use of air or steam power.

The standard Chambersburg anvil assembly weighs 15 times the rated falling weight of the ram assembly. This heavy anvil provides an efficient ratio for general forging in that more of the impact force is utilized in deformation rather than being dissipated in anvil movement with the attending shock loads at the foundation. In special heavy duty applications, or where Korfund Heavy Duty Shock Isolation Pad System is employed to reduce shock transmission, a heavier 20:1 anvil ratio is recommended.

Further gains in productivity have been realized through POWER/TROL, an extra cost feature available on 3000 lb. and larger size hammers. With POWER/TROL, the effort required to operate the hammer is remarkably reduced; the hammer driver remains fresh throughout his shift; and, furthermore, his control stand can be situated remote from the hammer frame—away from the heat and scale—and in a position to improve communication with other crew members.

EFFICIENCY

Low operating costs are another Chambersburg feature. Differential porting has resulted in power savings as much as 30% over older hammers without sacrificing blow energy.

Automatic lubrication of cylinder, valving and ram guides is a standard Chambersburg feature which assures smooth running and prolonged parts life.

VERSATILITY

Chambersburg Model "L" Double Frame Hammers are well suited for billet breakdown and cogging operations, shaping tool steel, making rings and a variety of other forging jobs.

The generous working area can be greatly extended for special high jobs such as upsetting high stems, forming arch bars, etc., by removing the anvil cap and installing the anvil die directly in the anvil.

Standard flat faced dies are heat treated alloy forged steel, of die block quality, with the anvil die extended to make work manipulation easier. Special die steels or die configurations, such as, skewed dies, can be supplied at extra cost.

RELIABILITY

Chambersburg Model "L" Double Frame Hammers are ruggedly designed for long, reliable service. Standard frames up to 12,000 lb. size are high tensile iron, heavy reinforced box section type. Solid, ribbed type frames with split leg design, known as Type B, are available on 12,000 lb. and standard on 16,000 lb. and larger sizes. Cast Steel construction is available at extra cost on all sizes and standard on 20,000 lb. and larger sizes. The frames are stepped to the base plate and to the cylinder to preserve alignment.

Inserted guides are supported fully within a five bearing pocket in the frame. Full bearing guide adjusting wedges avoid the rocking tendency found in other types. Tie bars reinforce the frames to increase the rigidity of the hammer structure.

The ram is heat treated, carbon steel forging with long guideways machined to precision gauges to match the frame guides for improved

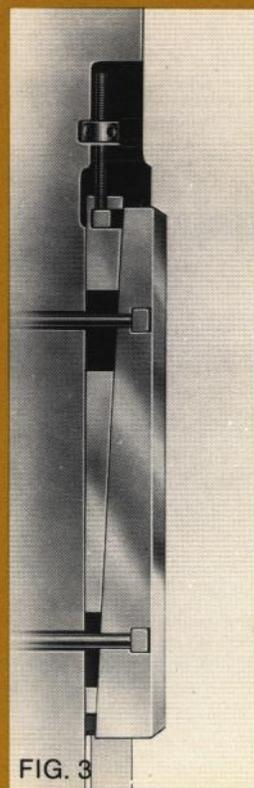


FIG. 3

Left - Detail of Guide. Full length and width steel wedge permits adjustment without removing the ram. Adjusting wedge bolt can be readily replaced.
Below - Ram. The incline is machined from the solid. Long guideways help maintain alignment.

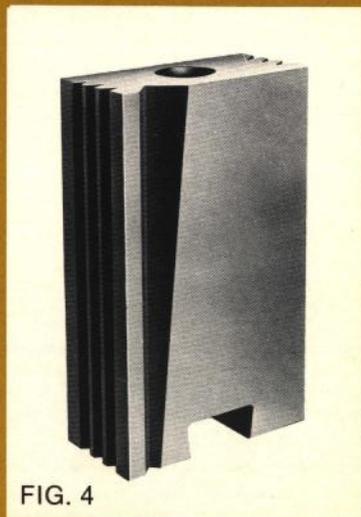


FIG. 4

accuracy. Alloy forged steel ram is available at extra cost. The two piece, alloy forged steel piston rod and forged steel head are fitted with alloy steel, heat treated piston rings for long, low leak service. Non-metallic piston rings are available for air operated hammers. The rod is secured to the ram by tapered drive fit.

The high tensile iron cylinder is designed with the self draining valve porting cast integral to minimize parts and overhanging assemblies which require more maintenance. At extra cost, the cylinder can be supplied as a steel casting and/or fitted with a long wearing stainless steel liner for the main bore. Throttle valve is rotary, self seating type. Main valve is piston type, fitted within a renewable cage. Inlet and exhaust connections incorporate deep stuffing boxes which can be tightened or packed without disturbing other parts. Piston rod gland is split for greater accessibility and packing is an improved vee square type for easier adjustment and longer service.

Safety cylinder cover arrangement can be removed as a unit for quick access to the piston. Piston rings can be examined or renewed without removing the rod from the ram.

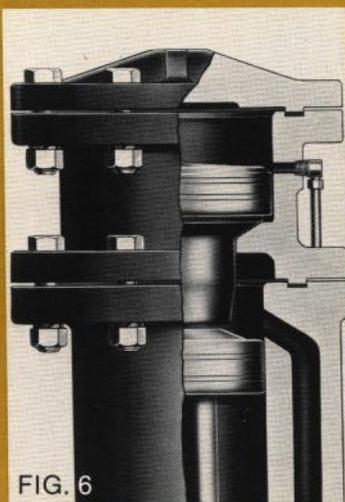
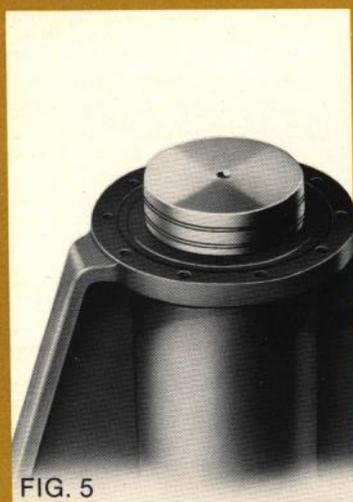
SAFETY

Chambersburg Model "L" Double Frame Forging Hammers are equipped with a number of safety features.

1. Safety cables attach vulnerable, overhead assemblies to the hammer structure.
2. The Safety Cylinder Cover provides positive protection against piston overtravel.
3. The Chambersburg Safety Valve, a stop arranged under the main operating valve, shuts off

Electronically heat treated, alloy steel piston rings give long, seal tight service. The lightweight piston reduces piston rod stresses.

Safety Cylinder Cover. Cushion of live steam or air at top of plunger is not wasteful and subject to the pumping of the hammer. Provides positive protection against piston overtravel.



air or steam in the event of damage to the valve gear.

4. A ram safety mark on the left hand frame indicates the lowest point of ram stroke position.

5. A manual safety latch is provided to lock the throttle valve handle in the off position. In addition, hammers equipped with extra cost POWER/TROL are provided with padlock provision for the hydraulic power unit controls.

6. Extra cost POWER/TROL permits locating the hammer driver away from the forging area.

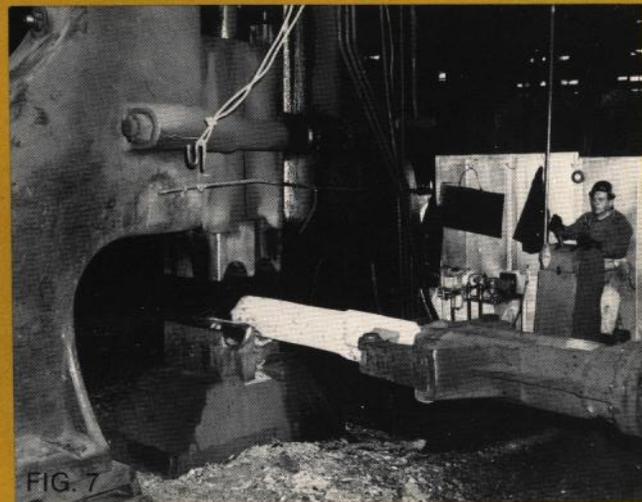
All Chambersburg equipment includes certain items necessary for compliance with the Occupational Safety and Health Act of 1970, but compliance may require additional items for which we cannot be held responsible. The items supplied are based on our interpretations of the standard as of this date, but the responsibility for adherence to the provisions of the Act rests with the employer/user.

POWER/TROL

Chambersburg Model "L" Double Frame Hammers, 3,000 lbs. and larger, can be equipped with POWER/TROL. It's a power assist control system that makes hammer operation practically effortless and increases operator efficiency.

POWER/TROL eliminates the large heavy levers normally associated with flat die hammers and transfers control to two short stroke levers mounted on a console. Operator fatigue is reduced. The console allows the operator to be stationed anywhere within twenty feet of the hammer away from the heat and flying scale. Communication with other crew members is easier and surer.

12,000 lb. hammer equipped with POWER/TROL. Operator effort is greatly reduced and he can more readily communicate with the manipulator operator from his remote location.



KORFUND FOUNDATION PAD SYSTEM

The patented Korfund Heavy Duty Shock Isolation Pad System installed beneath the anvil reduces transmitted shock, increases employee efficiency and provides long life and low cost maintenance. This extra cost feature can only be used in conjunction with a 20:1 ratio anvil assembly for maximum effectiveness.

RATINGS AND WORKING CAPACITIES

Chambersburg Double Frame Hammers are size rated by the nominal weight of the reciprocating ram assembly, i.e., the combined weight of the ram, rings, ram die and key.

The energy available per stroke and the recom-

mended maximum sizes of square forging stock for each hammer size grouped by relative forgeability is given in the following tables.

The column headed, "Occasional Production", lists sizes which should be considered when a hammer is to be used for maintenance purposes only and will not be considered a production tool. The columns headed, "Manufacturing Production", serve as a guide to the proper hammer sizes for the most economical continuous production of forgings.

Heavy duty hammers of special cast steel construction are recommended when regularly forging alloys with a forgeability index of 1.30 and above.

CAPACITY OF CHAMBERSBURG DOUBLE FRAME FORGING HAMMERS*

TABLE 1

Inches and pounds shown in white bands, metric measures shown in color bands.

Rated Size Hammer	Max. Energy Per Stroke	Square Stock Sizes											
		Occasional Production	Manufacturing Production										
			Groups										
			A	A	B	C	D	E	F	G	H	I	J
Lbs.	Ft. Lbs.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	
Kgs.	Mkg.	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
2000	18880	12½	9	8½	8	7¾	7¾	6¾	6¾	5¾	5¾	4¾	4¾
907	2600	317	229	216	203	197	184	171	159	143	131	121	
3000	29700	15	11	10½	10	9½	9	8½	7¾	7	6¾	6	
1361	4100	381	279	266	254	242	228	216	197	178	159	151	
4000	40000	17	12½	12	11½	11	10¾	9½	8¾	8	7¾	6¾	
1814	5500	432	317	304	292	279	260	242	222	203	182	171	
6000	68000	20	15	14¾	13¾	13¾	12¾	11¾	10½	9½	8¾	8	
2722	9380	508	380	362	350	337	310	284	266	242	222	203	
8000	93000	23	17	16¾	15½	15	14	12¾	12	10¾	9¾	9	
3629	12800	585	432	412	394	380	354	324	305	273	249	228	
10000	117000	25	19	18	17¾	16½	15½	14¾	13½	12	11	10¾	
4536	16150	635	483	456	440	419	394	360	344	305	278	260	
12000	145000	27	20½	19½	18¾	18	16¾	15½	14½	13	11¾	11	
5443	20000	686	521	495	475	457	425	394	368	329	302	279	
16000	194000	30	23	22	21	20¾	18¾	17½	16¾	14½	13¾	12¾	
7258	26700	762	585	559	533	516	477	445	413	369	337	310	
20000	260000	34	26	24¾	23¾	22¾	21¾	19¾	18½	16½	15	14	
9072	35800	864	660	626	604	578	540	504	470	418	382	354	
24000	310000	36	28	26½	25¾	24½	23	21¾	19¾	17¾	16¾	15	
10886	42700	914	721	675	652	624	580	540	504	453	413	382	

TABLE 2

GUIDE TO RELATIVE FORGEABILITY **

Forgeability Index ▶	1.00	1.10	1.20	1.30	1.50	1.75	2.00	2.50	3.00	3.50
MATERIAL ▶	1010-1030 BRASS	1035-1050 BRONZE 1112-1137	9310-9315 1055-1075 2300-2330 3100-3135 4100-4140 4600-4620 5100-5140 6100-6135 8600-8630	2335-2350 3140-3150 3300-3335 4300-4340 4625-4640 4815-4820 6140-6150 8635-8650	HY-TUFF AMS 6407 AMS 6427 400 SERIES SS 14S (ALU-MINUM)	300 SERIES SS TRICENT VASCO JET 1000 THERMOLD J 75S (ALU-MINUM)	17-4 PH 17-7 PH AM-350 AM-355	A-286 DISC-ALLOY STAIN-LESS W INCONEL X 16-25-6 19-9-DL	TITANIUM ALLOYS N-155 HASTELLOY C	UDIMET 500 INCO 700 RENE 41 M-252 WASPALLOY

*Tabulation based on Group "A" established by Chambersburg Engineering Company in Standard Sheet 4.44C, dated 6-1-48, using Forgeability Index 1.00.

**This table published by the Forging Industry Association August 1962.

General Specifications

CYLINDERS

Self-draining, high tensile iron casting, solid stuffing boxes. Held to frame with body bound bolts. Fitted with safety cover and safety valve. Protected gaskets. At extra cost, a cast steel cylinder and/or a stainless steel liner can be supplied.

VALVES

Throttle: rotary, self-seating, fitted to a renewable seat. Operating: balanced piston fitted in a renewable iron seat; through stem with fixed nut preserves alignment; actuated by control lever through a cam and ram incline. Sizes above 8,000 lb. Double Frame feature direct manual operation of both valves.

FRAMES

High tensile iron, heavy reinforced box section with large fillets. Single tie bars on sizes up to 8,000 lbs. falling weight and double tie bars on larger sizes. Interlocked to cylinder and stepped to base plate. On 16,000 size, frames are ribbed

**Standard Design of
6000 lb. and 8000 lb.**

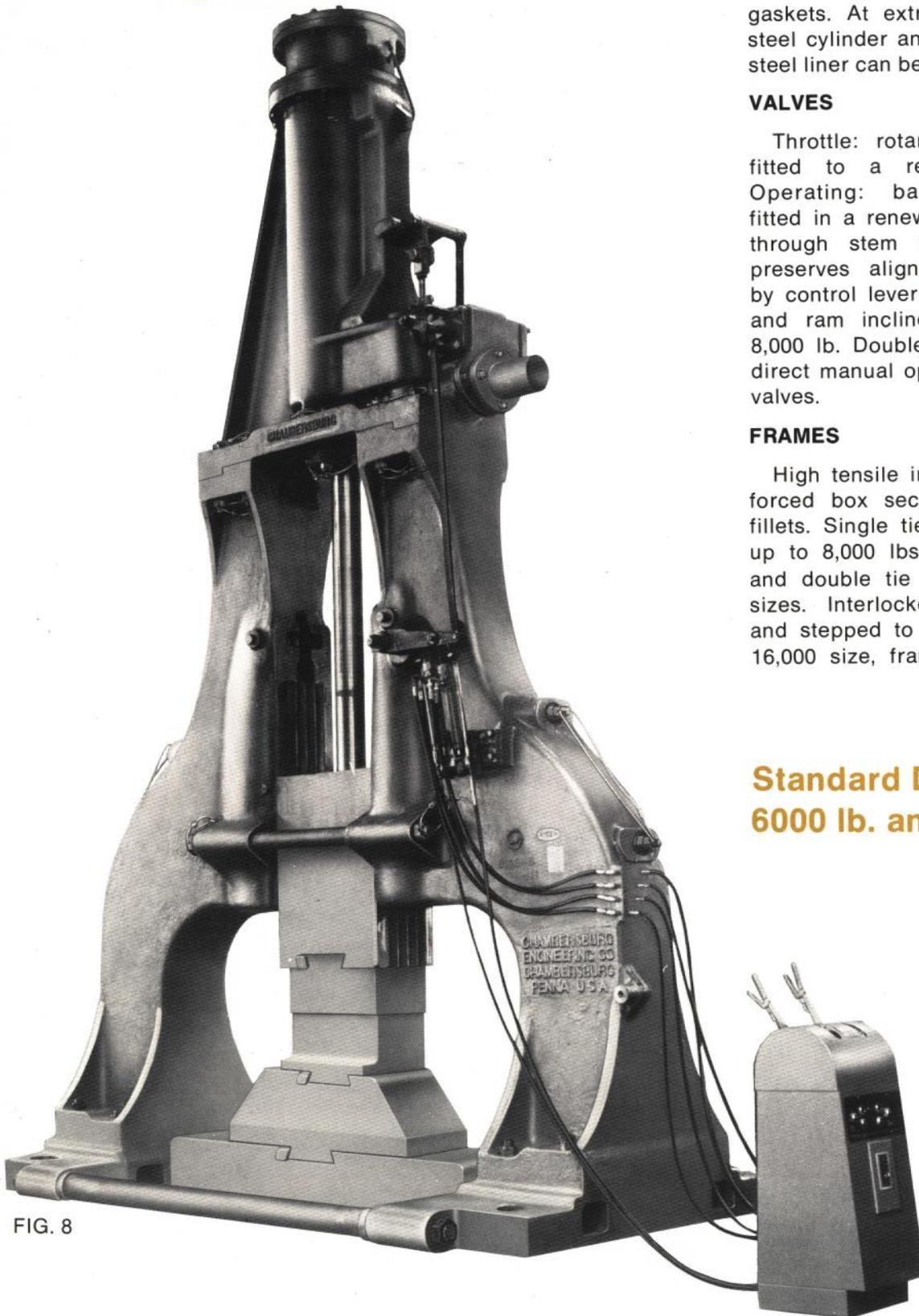


FIG. 8

type, high tensile iron. On 20,000 lb. size and larger, above frames are ribbed type, cast steel. Cast steel frames are an extra cost option.

BASE PLATE

On hammers up to 4,000 lbs. falling weight - one piece box section, high tensile iron casting stepped to frame. On hammers of 6,000 lbs. or more falling weight - two piece pedestal base plate, lipped to frames, securely tied with bolts and separators.

GUIDES

High tensile iron, supported on five sides by frame; steel adjusting wedge with bearing full length and width of guides. Adjustment by bolt and spool supported by frame.

RAM

Heat treated carbon steel forging. Incline machined from

solid. An alloy forged steel ram can be supplied.

ROD

Two piece piston rod assembly consisting of alloy forged steel piston rod and carbon steel piston head is standard.

ANVIL

Cecolloy casting standard. Fifteen times falling weight; consists of anvil, cap, die and keys. Cast steel anvil, or greater anvil ratios, are available.

RINGS

Narrow type, heat treated alloy steel designed especially for impact service. Non-metallic rings available for air operated hammers.

POWER/TROL

A power assist control system complete with 3 H.P. hydraulic

power unit and all cables and hoses. Arranged for operation on 230 or 460 volts, 3 phase, A.C.

EQUIPMENT

One pair of heat treated forged alloy steel dies, motor driven, automatic lubricator; steam and exhaust nipples.

HEAVY DUTY

Heavy duty hammers can be supplied with cast steel anvil, forged steel anvil cap, cast steel base plate, cast steel frames, cast steel cylinder, stainless steel cylinder liner, alloy forged steel ram, alloy forged steel rod.

CHANGE IN SPECIFICATIONS

The builder reserves the right to make substitutions in the design and material specifications consistent with good engineering practices and the stated performance standards.

STANDARD SIZES

CHAMBERSBURG MODEL "L" DOUBLE FRAME HAMMERS

Inches and pounds shown in white bands, metric measures shown in color bands

TABLE 3

Rated Size	Cyl Bore	Stroke	Ram		Ram Die Face	Anvil Die Face	Betw. Frames at Die Line	Anvil Die to underside of Frame	Inlet	Exhaust	Floorspace	O.A. above Floor
			F to B	Betw. Guides								
Lbs.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.
Kg.	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
2000	10¼	35¾	10	16	15½ x 7½	19½ x 7½	66	20	2½	3½	99½ x 50	177¼
907	260	908	254	406	394 x 191	495 x 191	1676	508	64	89	2527 x 1270	4502
3000	12	41½	10¾	17½	17 x 8	21½ x 8	76	20	3	4	114 x 58	191¾
1361	305	1054	273	445	432 x 203	546 x 203	1930	508	76	102	2896 x 1473	4870
4000	14	47¾	12	20½	20 x 9	24½ x 9	84	23	3	4	126 x 62	208½
1814	356	1200	305	521	508 x 229	622 x 229	2134	584	76	102	3200 x 1575	5296
6000	16	55¼	15	25½	25 x 12	30 x 12	102	23	3½	5	152 x 70	231¼
2722	406	1403	381	648	635 x 305	762 x 305	2591	584	89	127	3861 x 1778	5874
8000	17	59	16	27	26 x 14	32 x 14	108	24	3½	5	160 x 72	245¼
3629	432	1498	406	686	660 x 356	813 x 356	2743	610	89	127	4064 x 1829	6229
10000	19	64	17	29	27 x 15	33 x 15	120	27	4	6	216 x 101	280½
4536	483	1626	432	737	686 x 381	838 x 381	3048	686	102	152	5486 x 2565	7125
12000	21	64	18	29	28 x 16	34½ x 16	120	27	4	6	216 x 101	280½
5443	533	1626	457	737	711 x 406	876 x 406	3048	686	102	152	5486 x 2565	7125
16000	25	68	22½	31	30 x 18	36½ x 18	126	30	5	8	234 x 108	300
7258	635	1727	572	787	762 x 457	927 x 457	3200	762	127	203	5944 x 2743	7620
20000	28	72	24	34	32 x 19	39 x 19	129	33	5	8	243 x 126	325
9072	711	1829	610	864	813 x 483	991 x 483	3277	838	127	203	6172 x 3200	8255
24000	30	72	28	36	34 x 20	40 x 20	131	33	6	8	243 x 126	330
10886	762	1829	711	914	864 x 508	1016 x 508	3327	838	152	203	6172 x 3200	8382

Sizes are designated by the weights of the ram, its die & piston rod.

Automatic Lubricator Motor is ¼HP, 115V, 1ph, 60Hz, A.C.

POWER/TROL Console is 18" x 18" x 48" high. (457 mm x 457 mm x 1219 mm) POWER/TROL Power Unit is 36" x 24" x 36" high (914 mm x 610 mm x 914 mm)

Electrical requirements—¾ HP, 230 or 460V, 3ph, 60Hz AC. User to specify connecting voltage

Hammers are designed to operate on compressed air or steam at 90-110 PSIG (6.32-7.73 Kg/cm²) at the hammer.



At a large South American steel mill, a 16,000 lb. Chambersburg Model "L" Double Frame Hammer prepares billets for later ring forging operation in a smaller 10,000 lb. Chambersburg hammer.

Heavy ribbed Type B frame construction available on 12,000 lb. size and standard on 16,000 lb. and larger hammers.

FIG. 9

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