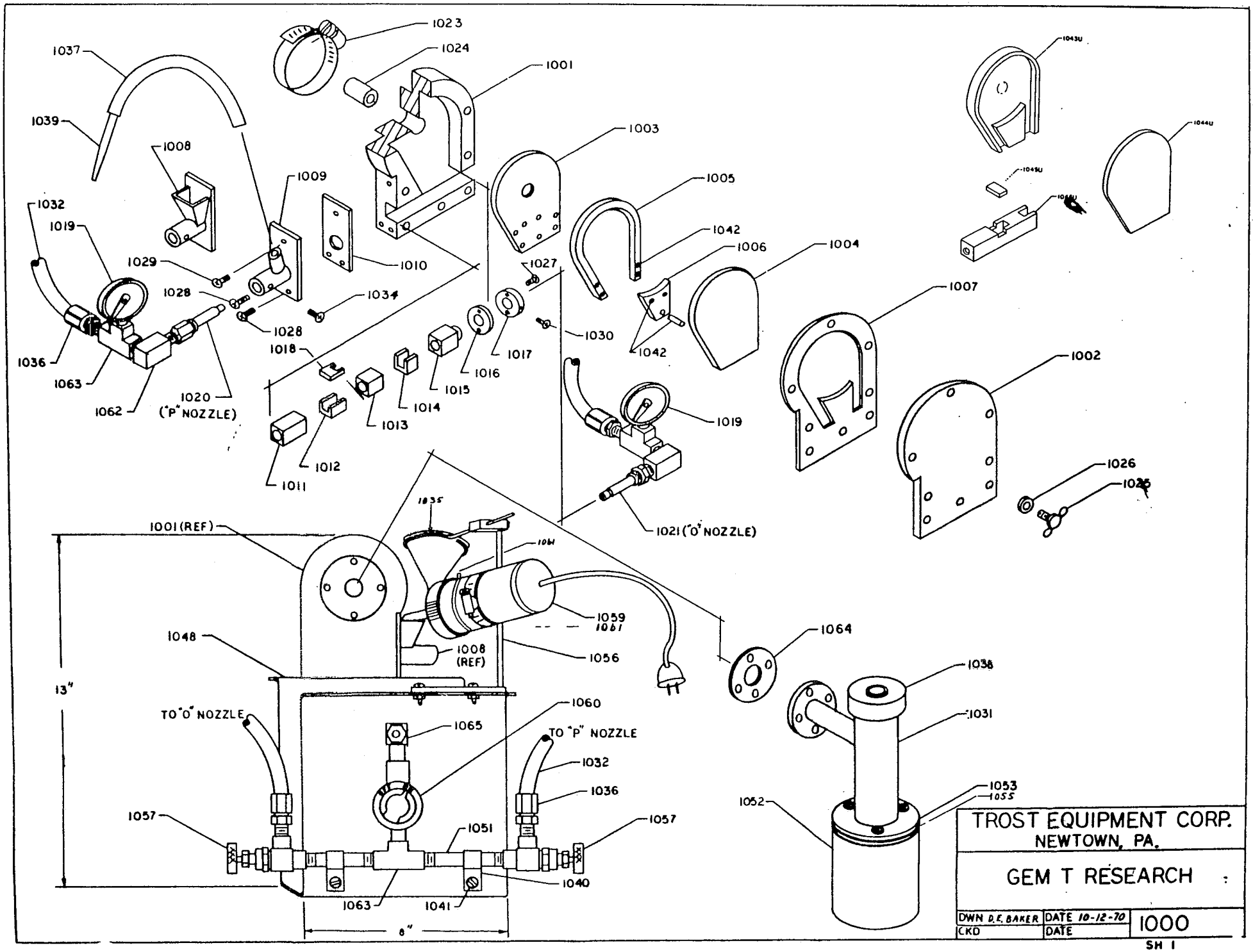
ASSEMBLY DRAWING AND BILL OF MATERIAL
FOR
TROST IMPACT PULVERIZER

GEM T RESEARCH MODEL



TROST EQUIPMENT CORP.
NEWTOWN, PA.

GEM T RESEARCH

DWN D.E. BAKER	DATE 10-12-70	1000
CKD	DATE	SH 1

TROST EQUIPMENT COMPANY
Newtown, Pa.

BILL OF MATERIAL NO. Sheet 1
ASSEMBLY DRAWING NO. D-1000 **DRAWING TITLE:** GEM – T
DATE: Nov. 5, 1970 This B/M is to be used with drwg. No. D-1000 supersedes all drwgs. as of 1-1-7-70

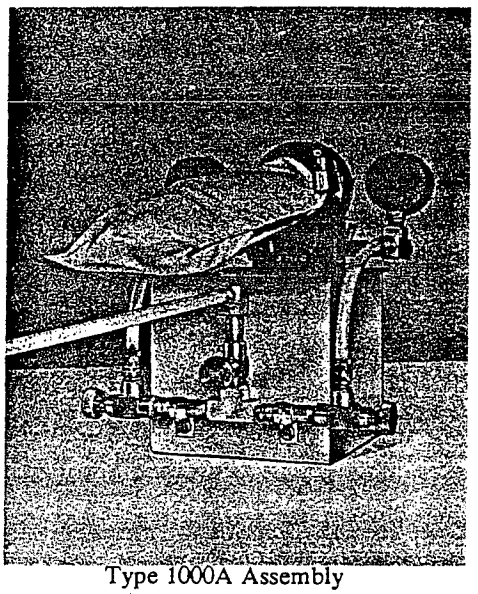
PART NO.	DESCRIPTION AND/OR VENDOR NAME & ADDRESS	QTY.	PART NO.	DESCRIPTION AND/OR VENDOR NAME AND ADDRESS	QTY.
1001	Housing	1	1035	Funnel	
1002	Front Cover	1	1036	Male Hose Connectors	
1003	Rear Liner Plate	1	1037	Asperator Feed Hose	1
1004	Front Liner Plate	1	1038	Gas Out Enclosure	
1005	Peripheral Liner	1	1039	Intake Pipette	
1006	Classifier Block	1	1040	Clamp – BX½	2
1007	Cover Gasket	1	1041	Clamp Screws	2
1008	Feed Hopper	1	1042	Roll Pin	2
1009	Asperator – Suction Feeder	1	1043	Rear Plate, Peripheral Liner, & Classifier Block (Upper Liner Asy.	1 unit
1010	Hopper Gasket	1	1044	Front Liner Plate – Same as 1004	1
1011	P–Block	1	1045	Impact Chamber Cover	1
1012	Impact Chamber	1	1046	Impact Liner Complete with Cover	1
1013	O-Block	1	1047	Gem–T Mill Complete	
1014	Return Chamber	1	1048	Mill Support	1
1015	O–Nozzle Guide	1	1051	Nipples Close	2
1016	O–Collar Gasket	1	1052	Product Collector 1 pt.	1
1017	O–Nozzle Collar	1	1053	Product Collector Cover	1
1018	Impact Chamber Cover	1	1055	Product Gasket	
1019	Pressure Gauge	2	1056	Feed Support Assembly	2
1020	P–Nozzles (jets)	1	1057	Angle Valve	2
1021	O–Nozzles (Jets)	1	1058	Carrying Case	1
1022	Air Relief Bag	1	1059	Vibra Feeder Spatula	1
1023	Bag Clamp	1	1060	Straight On/Off Valve	1
1024	Discharge Liner	1	1061	Feeder Switch	1
1025	Wing nut	8	1062	Brass Street Elbows	2
1026	Washer	8	1063	Brass Tee	3
1027	O–Collar Nozzle Screw	2	1064	Cyclone Inlet Gasket	1
1028	Hopper Screw	2	1065	Elbow	1
1029	Hopper Screw	1			
1030	O–Collar Nozzle Lock Screw	1			
1031	Cyclone with stiffener	1			
1032	Feeder Air Hose	2			
1034	Hopper Lock Screw				

PART NUMBER SUFFIXES:
C – Ceramic
N – Nylon
P – Plexiglass
S – Stainless Steel (304)
U – Urethane
W – Tungsten Carbide

OPERATING INSTRUCTIONS
Mounted Gem-T
Research Model Jet Mill

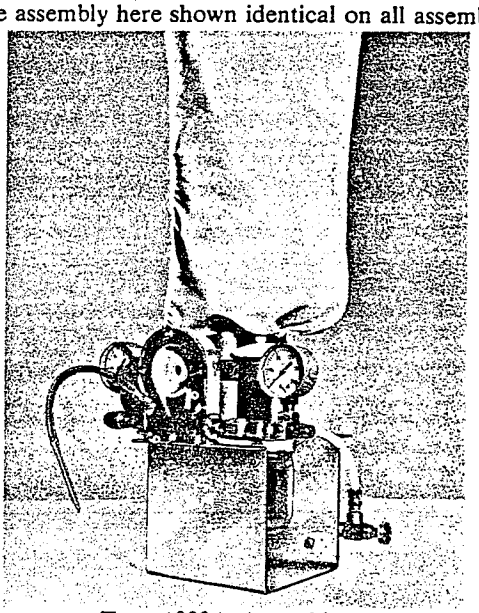
(with separate jet pressure and complete shut off control)

The present standard assemblies of the Trost Gem-T Research Model Jet Mill are illustrated at the right. All assemblies include mounting of the mill on a U-shaped support, with fittings, hose connections, valves and gauges. Two angle needle valves control the pressure to each of two jets; the straight needle valve shuts off both jets at once. A length of hose, usually shipped unconnected, is attached to the elbow at the back of the support. This ends in a 1/4" pipe thread fitting to connect to the compressed air or gas supply line.

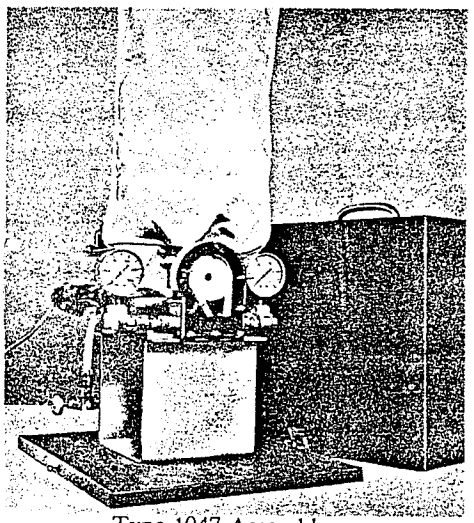


Type 1000A Assembly

(Valve assembly here shown identical on all assemblies)



Type 1033A Assembly



Type 1047 Assembly

STARTING THE OPERATION

Check all screw and hose connections. Over tightening should be avoided on the wing screws and hose connections. Tightening with pliers and wrenches should never be essential.

Position the jets for proper operation. (These are not preset at the time of shipment.) The jet on the feed side is the "P" or pusher jet. The jet opposing this is the "O" jet. The tip of the "O" jet should be flush with the outside wall of the downstack which is done correctly by pushing the "O" jet into the mill 7/8" from the tip. This position is normal and should be maintained. Any necessary shift of this position (to maintain suction on the feed side, etc.) may indicate wear in the passage from the feeder to impact chamber. The "P" jet should be pushed in 1" from the tip. With set screws tightened (again, do not overtighten) turn on the main valve to the jet lines and then adjust the pressure on each jet with the angle valves until you have 70 psig on the feeder ("P") jet and 100 psig on the opposing ("O") jet. If it is necessary to operate at lower pressures, keep the differential pressure at approximately 30% . . . always greater on the "O" jet. The angle valve setting should be left alone after the differential pressure is established and start up and shut down controlled by the straight valve. Total pressure reduction is also controlled by this valve.

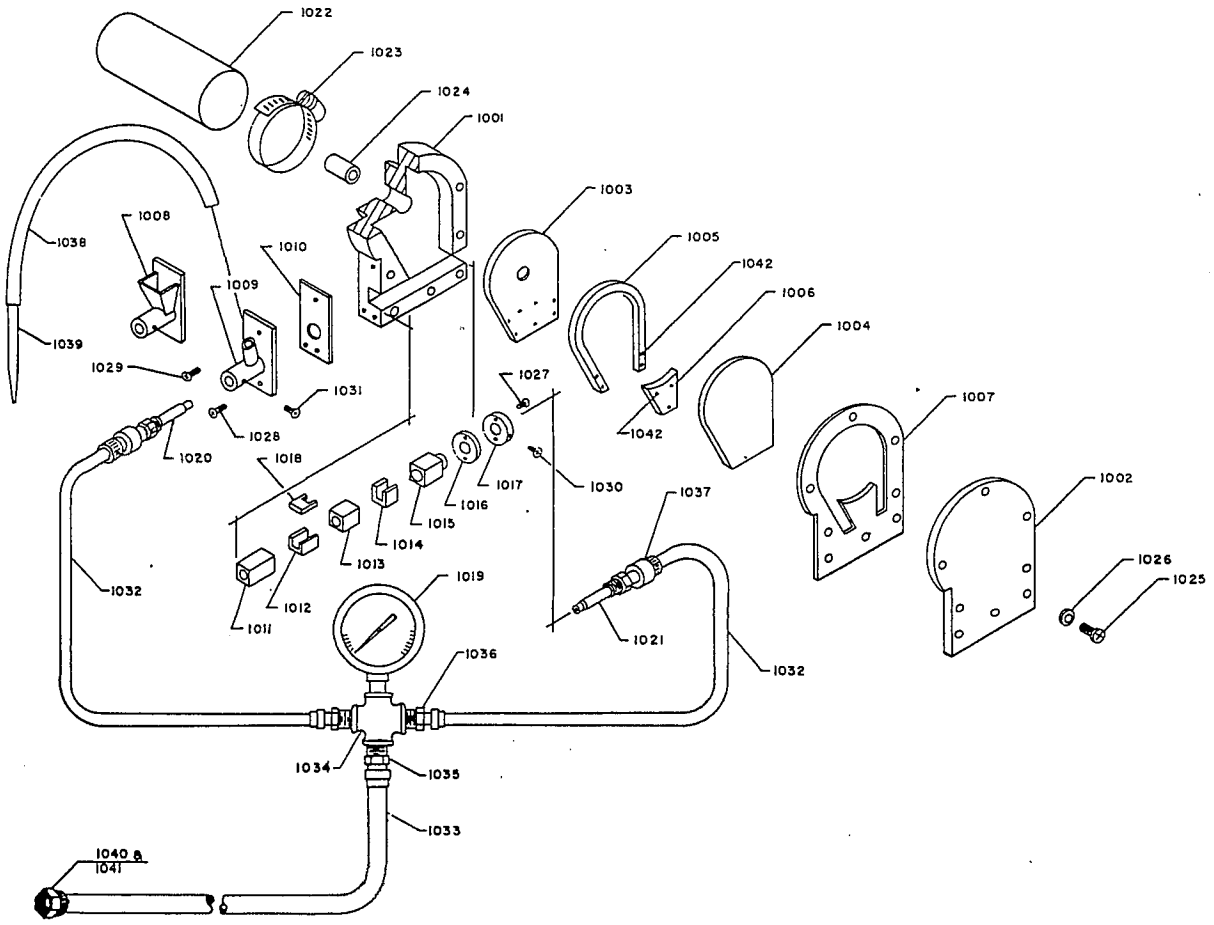
NOTE: The differential pressure suggested above provides a finer grind and better classification with nearly all materials and is especially valuable with "tough" ones. The main valve to shut off both jets at once prevents blowing material retained in the mill into one or another of the jet lines, which can be an unlooked for source of cross contamination when changing to another material.

Now test the suction on the feed side by placing the aspirator against the cheek or lip or a small piece of paper over the feed hopper. The "P" jet can be moved back and forth to determine the range of positioning at which the suction is good. You will notice that suction increases as the jet is pushed in. However, if this jet is pushed in too far, feeding will be impeded by the lack of space for feed between the jet tip and the entrance to the mill.

The mill can be set up initially with the clear Plexiglas front panel (Part 1004P), underneath the Plexiglas front cover (Part 1002), instead of the front panel supplied in the specified liner construction. This permits seeing the flow pattern of material in the classifier or upper part of the mill. *If the downstack from the classifier area fills up with recycled material the feed rate is too high.* Plexiglas is a soft material and will abrade with an abrasive feed. In such cases it should be replaced with the regular liner panel after a satisfactory feed rate is established.

The feed rate can be established, when using the aspirator feed, by evenly spreading a known weight in grams of feed over, say, 100 squares of graph paper and pulling the eye-dropper aspirator at a steady rate along the edge of the material. The number of squares uncovered in a minute will approximate the gram-per-minute rate, which may be from 1/2 gram to 3 grams per minute, and sometimes, with easily pulverized materials, at as high a feed rate as will be accepted by the mill. With the Type 1047 assembly the feed is controlled by the knurled knob behind the feeder trough. Fill a funnel with feed, turn on the feeder and allow feed to run until it is level in the trough from the throat of the feeding funnel to the end of the trough. Collect the feed in a small plastic bag or something similar until the feed is level. Then start again, collect as before and weigh the amount after 30 seconds. From the time and weight, calculate the feed rate. A good starting rate is 100 grams per hour, but the range can extend from 25 grams to 250 grams per hour.

When you cannot see the pattern inside the mill, listen to the sound. If there is a sound of periodical spitting of feed material through the discharge of the mill, this may be due to overfeeding or to a pressure too high for the particular material being pulverized. The product in the latter case is often characterized by a scattering of oversize with a low particle size average.



(Exploded view of parts and assembly)

Fig. 1

Disassembly, changing liners, replacing parts and cleaning.

The Gem-T can be supplied with practically any type liner to resist abrasion and contamination. Any single part can be ordered for replacement. Some liners are constructed differently from others, as described in Bulletin 1000. The exploded view (Fig. 1) indicates the common part construction. It also shows the assembly and dis-assembly of mill parts. Parts constructed other than shown in Fig. 1 are shown in Fig. 2.

The mill casting is normally cleaned out with light pressure from an air hose. The liner parts can be cleaned with soap, detergents or bleach powders. Solvents and proprietory cleaners are often useful. Do not *soak* urethane in solvents as it will swell and take a long time to shrink to original dimensions.

Use of gas cylinders.

If compressed gas in cylinders are used for operating the Gem-T, it is necessary to install pressure regulator valves and it is best to use cylinders in banks of two to four to maintain a reasonably long and steady supply of compressed gas.

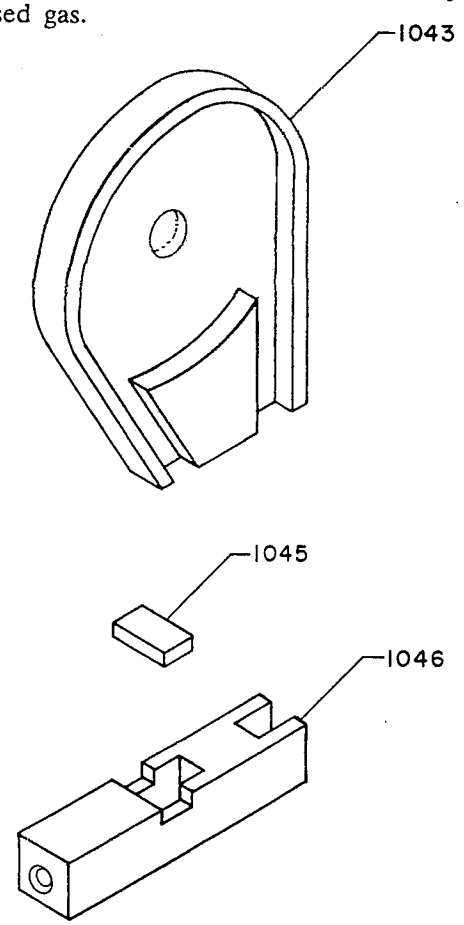


Fig. 2

Part 1043 (a combination of Parts 1003, 1005 and 1006 in Fig. 1.) applies to urethane, tungsten carbide and ceramic construction.

Parts 1045 and 1046 (a combination of Parts 1011, 1012, 1013, 1014 and 1018 in Fig. 1) apply to urethane and ceramic construction.

CONVERTING MILLS PURCHASED BEFORE 1969

The individual control of pressure on each jet and a main valve shut off requires a mounted assembly. Such an assembly is not only more convenient for the user but assures him of getting the ultimate in fine particle grinding for research. It also, in many cases, does away with multiple passes to produce the finest particle size. We supply all parts for mounting mills already in use and the following are instructions for converting to any type of assembly you desire.

Mounting the Mill.

To mount the Gem-T on the U-shaped support, take off the front cover and take out at least the bottom liner sections. With the front of the mill housing placed flush with the edge of the flange and with the side of the mill housing one and 1/16 inch from the right end of the flange, clamp in position (illustrated in Fig. 3) with two clamps. *The plexiglas front cover will overhang the flanges.* Then spot the holes to be drilled in the bottom of the housing from the predrilled holes in the flange of the support. It is best to tap the holes in the housing straight through to the bottom liner area for 8-32 machine screws of 5/8" length (as provided with the support) but an alternate is to drill 11/64" clearance holes through the bottom of the mill into the casting relief holes only and then fasten the mill with 8-32 machine screws with nuts. These machine screws must be 1/2" long and this size with nuts are also provided with the U-shaped support. This is the only major work.

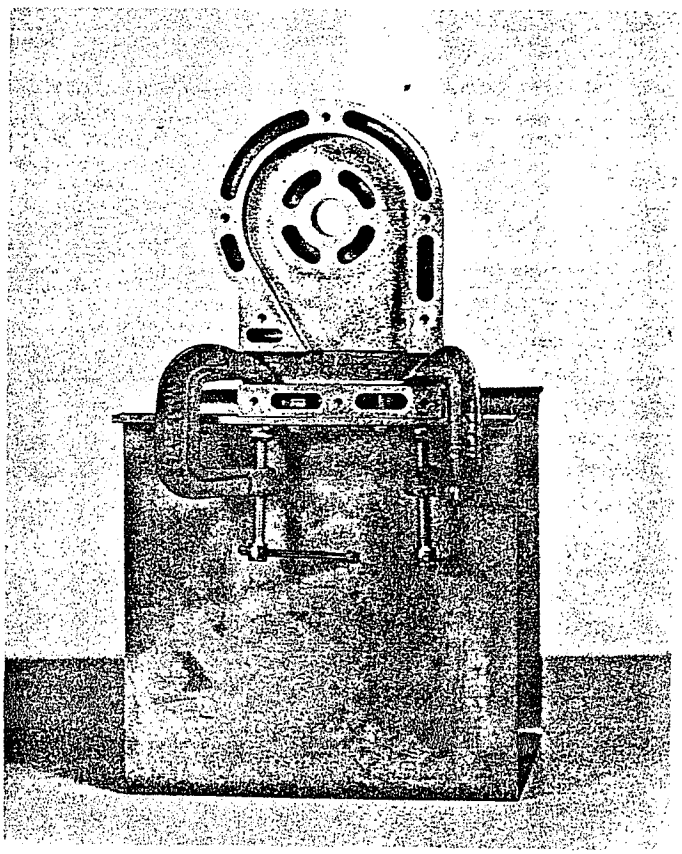


Fig. 3

Mounting mill accessories.

You can now add a cyclone/jar collector, if you don't have one. If your mill was purchased before the first part of 1968 without a cyclone, it will be necessary to drill and tap the mill discharge boss for the 10-32 screws furnished with the cyclone assembly. The pint jar collector is normally supplied in clear polystyrene. The same jar can be supplied in glass, if specified.

The feeder with on-and-off switch, funnel holder, funnels and three sizes of feeding troughs are supplied with their support that can be bolted to the flange opposite the mill, using the predrilled holes for proper positioning. A feed hopper is also supplied to replace the feed aspirator fitting.

PART NUMBERS FOR ACCESSORIES NOT IN FIGURES 1 and 2.

Cyclone	1031
U-shaped mill support	1048
Feeder and ring support assembly	1056
1/4" brass angle needle valves	1057
Case	1058
Feeder, with on/off switch	1059
1/4" brass straight valve	1060

PART NUMBER SUFFIXES

C — Ceramic
N — Nylon
P — Plexiglas
S — Stainless Steel (304)
T — Teflon
U — Urethane
W — Tungsten Carbide

THE T-X LABORATORY JET MILL

The next larger size of Trost Jet Mills is the T-X Laboratory Model, shown on the right.

This packaged unit, with feeder, cyclone and collector system, is shipped assembled and crated.

Its general capacity range is 2 to 40 pounds per hour and requires only 18.4 scfm at 100 psig. (The actual extent of the capacity range, in factory test work, has been from 1/2 pound per hour to 70 pounds per hour, depending on material fed and the product specification.)

This mill is a fine research tool for the comminution of a large variety of materials equipped with a variety of sizes of two interchangeable parts. One part increases or decreases the impact force for pulverization, thus providing control of particle size reduction of materials of different fracture characteristics. The other increases or decreases the recycling of the coarser fraction from impact to re-impact, thus exerting control of the fractured particles. The use of these varied and interchangeable parts provide the utmost in particle size reduction with tough materials and the utmost in production of easily fractured materials.

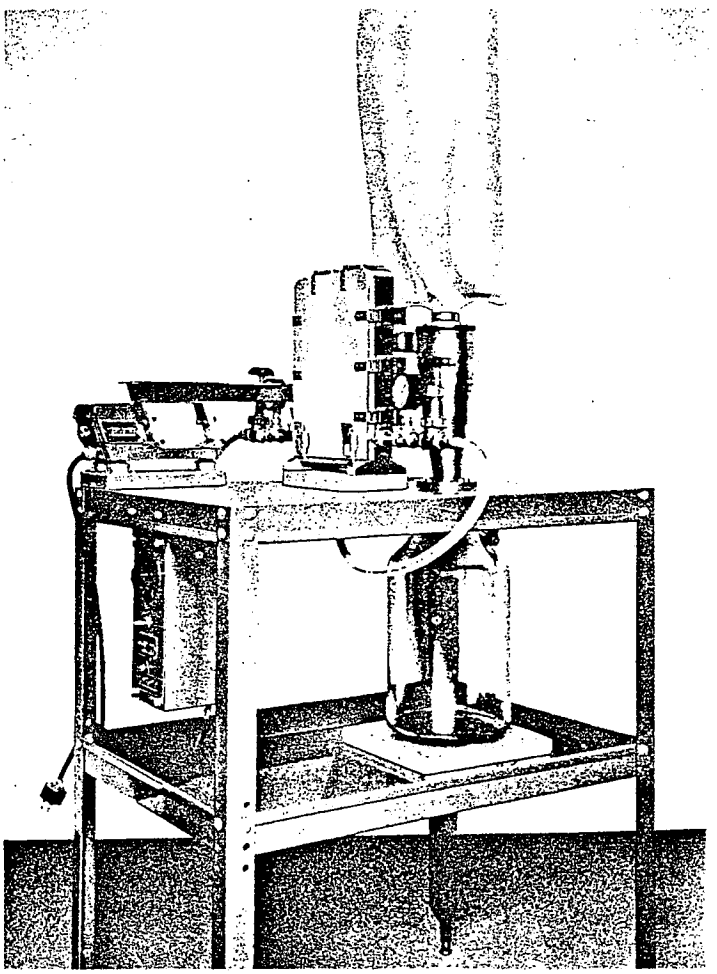


Fig. 4