VOITH

INSTALLATION, OPERATING AND MAINTENANCE INSTRUCTIONS FOR VALLEY 1½ lb. and 5 lb. LABORATORY BEATERS

VALLEY

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INSTALLATION

1½ LB. NIAGARA BEATER may be installed on the same table as the sheet making apparatus provided it will be entirely free of vibration. Otherwise, it should have its own separate table stand, preferably fixed and of substantial wood construction.

The controlled bedplate mechanism should project through the table top and be accessible from underneath.

A sketch showing the necessary cutout of the table is shown here.

The hollow midfeather is tapped for a drain connection.

5 LB. NIAGARA BEATER should be set on its own foundations and a sketch will be furnished upon request, showing suitable piers.

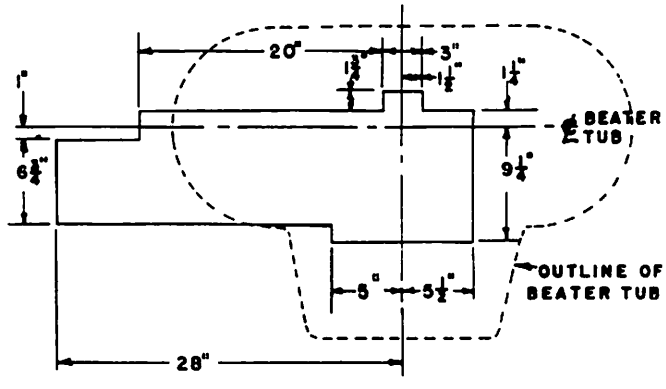

TABLE TOP CUTOUT 1½ LB. BEATER

SIZE	Roll Speed	Pulley	Motor*	Motor Pulley	Capacity	Approx. Shp. Wt.
1½ lb	7 5/8 Dia. by 6" face 500 RPM	7" PD 2A Grvs.	¾ HP 1200 RPM	3" PD 2A Grvs.	1 lb. @ 1½% consistency	600 lbs.
5 lb	14 Dia. by 12" face 425 RPM	12" PD 3A Grvs.	2 HP 1200 RPM	4.4" PD 3A Grvs.	Up to 8 lb @ 3% consistency	1800 lbs.

* Not included

OPERATION

In accordance with procedure T-200-m and T-205-m of the Technical Association of the Pulp & Paper Industry.

Preparation of Sample

The pulp sample should be torn up to flakes not more than an inch diameter, diluted to 10 liters and disintegrated for 10 minutes with the *Standard Disintegrator. Do not put undefibred pulp into the beater. (See Care and Maintenance Instructions.)

Furnish of the Beater

Amount of Sample: 360 grams (oven dry).

Amount of Water: 23 liters. Consistency 1.58% b.d.

Beating Temperature: 25° C.

Weight on Bedplate: In addition to bedplate counter poise, 5500 grams for all pulps.

Weight of Test Sheets: — 60 grams per square meter
= 42.7 lbs. Basis 25" x 40" — 500

Sample Withdrawal from Beater

The correct amount of sample for each sheet can be calculated. The number of sheets made is determined by testing requirements. We quote from T.A.P.P.I. Standard T-200-m . . . "Prepare a set of 5 test sheets with an aggregate area of 210 square inches for each time interval, providing each trimmed sheet is of approximately 42 square inches area and that three strength characteristics (such as bursting, tearing and folding endurance) are to be measured each time. Should but two strength characteristics be sought, only an aggregate of 168 square inches of test sheet area need be made each time; and should but one characteristic be of interest, only an aggregate of 126 square inches of test sheet area need be made. In the making of test sheets by the beater method of processing it is permissible to form sheets of areas larger or smaller than the above 42 square inches. In such cases the number of sheets for each set shall be determined by the above aggregate area requirements."

It is recommended that a set of sheets be made before weights are applied to the bedplate so that a record of the pulp's unbeaten characteristics is available. After this sample is taken the required bedplate weights are applied and samples are taken at the following intervals:

a. First set 5 minute after setting the bedplate.

b. Second set 20 minutes after setting the bedplate, except in the case of kraft pulps, when the second set should be taken 25 minutes after setting the bedplate.

c. Additional sets at 15 minutes for sulphite pulps and at 20 minutes for kraft pulps until a decided drop in bursting strength is obtained, i.e., until the maximum bursting strength has been developed.

Withdraw from the beater at each time interval as much pulp as is required for the freeness test and for the number of sheets required. A sheet of 7¾" diameter at 60 grams per square meter weighs 1.82 grams. WITHDRAW THE SAME QUANTITY OF PULP AT EACH TIME INTERVAL SO that progressive reduction of the beater charge is uniform.

SHEETING MAKING: — The beater sample for pulp sheets should be diluted to 0.20 consistency (b.d.) and 910 c.c. of this well-stirred mixture used for each sheet. In the case of a short fibered pulp more than 910 c.c. will be required to compensate for loss through the wire. Fill the sheet mould half full of water and pour in the accurately measured quantity of sample, simultaneously opening the water supply-valve and filling the sheet mould to the annular groove 35 cms. above the wire. The perforated stirrer is then inserted and in 6 seconds steadily moved down and up 6 times keeping the disc beneath the level of the liquid and this double movement very slowly repeated once in 6 seconds, followed by a careful withdrawal of the stirrer. The drain valve is then opened and the sheet allowed to drain under suction for one-half minute after the water has disappeared. The deckle box is then unlatched and tilted back taking care not to wet the sheet. After 10 seconds the sheet is couched off the wire.

COUCHING: — Two pieces of 8" x 8" blotting paper* are laid centrally over the sheet on the sheet mould; the couch plate is laid over the blotters and the couch roll placed gently in the middle of the plate. The roll is moved back to the edge of the plate (the opposite edge of which is held horizontal with the fingers) then forward to the front edge, then back and forth 4 times and finally to the middle, where it is lifted off. The time taken to perform the 5 rolls should be about 20 seconds.

The pulp sheet, blotters and couch plate are then removed from the wire in a manner similar to that of opening a book, and the sheet will be found adhering to the blotter next to it (the couch blotter). The couch blotter and the sheet are detached from the other blotter (the couch filler) and laid centrally, test sheet uppermost, on one dry blotter (the press filler) which has been previously placed in the press. A polished stainless steel plate is then placed on the test sheet, followed by another press filler to receive the next couch blotter and sheet. The wire in the sheet machine is washed by turning on the water supply and the required number of sheets made (c.f. "SAMPLE WITHDRAWAL FROM BEATER"). The stack in in the press will, when complete, consist of couch filler, couch blotter and drying disc, for each sheet. Finally a single blotter is laid on the top disc to avoid direct contact with the press cover.

FIRST PRESSING: — The hinge adjustment and latch of the hydraulic press should be turned so that when the cover is swung down on the stack of sheets, etc., and latched, it lies parallel to the press platen (i.e. horizontal). The pressure is then gradually raised to 50 pounds gauge in 30 seconds and maintained there for 5 minutes. Then the pressure is released and the press cover thrown back. Return the release valve to its closed position at once.

SECOND PRESSING: — The drying discs with attached test sheets are removed from the pile of moist blotters. The plate that was on top of the stack during the first pressing is now laid centrally on a dry blotter, test sheet uppermost and covered with one new blotter. This blotter serves as base for the next plate and test sheet; the stack is built up in this manner. The order of the sheets is thus reversed in the second pressing. Before dropping press cover, add to the top of the stack one extra blotter for each sheet made, so that the cover will

again rest horizontally. The press cover is again latched and the pressure raised at once to 50 pounds and held there for 2 minutes. During couching and pressing the felt sides and not the wire sides of the blotters are to be in contact with the test sheets.

DRYING: — The stack is removed from the press. The drying discs and attached test sheets are fitted into a set of drying rings each test sheet uppermost and in contact with the rubber of the next ring and a heavy weight placed on top of the pile. The sheets are dried in position with the aid of a fan blowing air over them through the holes in the rings.

CONDITIONING: — The sheets are kept in an atmosphere of 50% relative humidity and 73° F. until they reach equilibrium as to moisture.

BASIS WEIGHT: — After conditioning, the sheets are numbered and the average basis weight is obtained for each group of sheets, by weighing them. The area of each sheet 7¾" diameter is 303 square centimeters, so that if "n" is the number of sheets in a group weighing "w" grams the basis weight is 33 w/n grams per square meter air dry basis. The oven or bone dry basis is obtained by applying a correction factor for the moisture content as subsequently obtained.

EXAMINATION OF THE TEST SHEETS: — The sheets should be tested according to the official testing methods of the Technical Association of the Pulp and Paper Industry for such characteristics as may be desired.

MAINTENANCE

1½# BEATER: — Watch the behavior of your beater. It is a precision instrument, sturdily built so that accurate alignment between roll and bedplate will be maintained when the locating taper dowel pins are tight in the bedplate holder and box, in the roll bearing stands and in the lever arm bearing brackets and with all cap screws tight.

Provide water connections for the two 3/8" openings under the beater for flushing out the BEDPLATE COMPARTMENT and equip the line with a valve so that the water may be easily turned on and off. At the end of each test after the beater is dumped, turn this flushing water on and clear the bedplate chamber of all adhering fibre. Moving the bedplate up and down at the same time will help. If stock is allowed to accumulate in the bedplate chamber it will impair the sensitivity of the bedplate action and make reproducible results impossible.

The roll has been carefully and accurately "ground-in" against the bedplate with 80-mesh emery so as to be concentric and in full contact with the bedplate before shipment from the factory.

Having a concentric roll is of prime importance. Careful handling will prolong roll concentricity. Be careful that all stock is complete defibered prior to roll and bedplate contact. It is recommended that pulp be defibered before putting it in the beater. During the beating cycle care should be taken not to push or knock the lever arm. This action can gouge the roll and cause it to become eccentric. Bedplate pressure against the roll is by a free hanging weight and either outside vibration or lumps of undefibered stock causing the roll to jump will hasten roll eccentricity.

GRINDING-IN: — The roll and bedplate should be ground-in whenever:

1. A new bedplate is installed. (See Paragraph 9, Additional Comments.)
2. The bedplate chatters excessively during the last portion of a regular beater test, indicating an improper fit of the roll on the bedplate or an eccentric roll. See Par. 8, Add'l. Comments.
3. The beater does not give reasonable check results in the calibration tests.

BEDPLATE "GRINDING-IN" CLAMP: — This equipment complete with cap screws for attaching is shipped disassembled with the beater. It is to be installed for the "grinding-in" procedure only and must be removed for normal use of the beater in order that the counter-poise weight can be used. In order to grind the beater tackle properly it is necessary that the bedplate be held in a fixed position relative to the roll in order to obtain a truly cylindrical and concentric roll. The bedplate clamp is furnished for this purpose.

The clamp is fastened beneath the tub so the lever is in the slot with a set screw above and below. The relative position of the bedplate to the roll is adjusted while "grinding-in" with the two set screws.

Procedure for Grinding-in:

1. Remove counterpoise weight.

2. Install bedplate clamp.
3. Determine the high point on the roll while the beater is empty. This can be done by turning the roll while making the bedplate approach the roll by using the clamp set screws. The first contact is your starting point.
4. Mark the starting point by making a mark on the head of the top set screw to coincide with the chisel mark on the smooth surface on the clamp around the set screw. (This latter mark together with the mark on the top of the top set screw was used to indicate the roll position during the initial grinding-in at the factory.)
5. Now relieve the top set screw at least ¼ turn, lock tight with the jam nut, then bring up and lock the bottom screw. Charge the beater with 23 liters of water, 360 grams of defibered stock. Allow this mixture to run a minute then add 250 grams of 80-mesh emery dust gradually, at a point away from the approach to the roll. Allow charge to circulate another minute.
6. The first adjustment should only bring the grit in contact with the high point of the roll as indicated by the sound when the ear is pressed against the side of the lever arm. Following adjustments are made only after the sound of grit contact disappears.
7. When further adjustment fails to produce irregularities in sound or vibration it indicates that the roll is round. This is ordinarily the end of reconditioning the beater roll so Instruction Paragraph #9 should be followed.
8. When "grinding-in" a new bedplate, carefully make adjustments as for reconditioning the beater roll. Adjustment of the top bedplate clamp screw ¼ turn past the starting point should remove sufficient material from the bedplate so all the bedplate knives are in contact with the roll. (Note Paragraph # 2 under ADDITIONAL COMMENTS.)
9. With only water in the beater run the roll with bedplate pressure applied with the 5500 gram weight in place. (The clamp can be left in place at this stage.) If the roll runs smoothly, despite accompanying normal noise, the roll is considered truly round. If the roll vibrates or chatters return the pump and grit for further grinding. (Note Paragraph #8 under ADDITIONAL COMMENTS.)
10. After "grinding-in" is finished:
    a. Remove diaphragm clamp from under the bedplate box and thoroughly clean out the pulp and grit from the bedplate compartment. You will find a substantial amount of grit here which would eventually hinder bedplate operation.
    b. Back off the shaft seals and remove the hood; then carefully clean out the grit from within the seals otherwise the shaft will wear at these points. Reassembly after cleaning.
    c. Remove bedplate clamp.
    d. Apply counterpoise weight to the lever arm so that substantially no force is required to make the bedplate come in contact with the roll. Do this with the beater full of water.

Additional Comments:

1. A large amount of grit settles in the bedplate box. The grit is also reduced in size considerably during the grinding-in. To compensate for this it is necessary to add grit during the grinding.
2. When grinding-in a new bedplate usually ¼ turn of the set screw past the starting point will take sufficient material off the bedplate so all the bedknives are in contact with the roll. However, if the roll is out of round, grinding beyond ¼ turn past the starting point may be necessary in order to remove all the beater roll high points.
3. Normally 5 to 15 minutes should be sufficient to either "grind-in" a new bedplate or to take the high points off the beater roll. A roll considerably out of round, however, will require a longer period as determined by the number of times Step 6 in the procedure is performed.
4. It is advisable to calibrate the beater against a standard pulp periodically. Samples of standard pulp can be obtained through T.A.P.P.I. at 122 East 42nd Street, New York 17, New York.
5. The beater roll bars should be replaced when the bar depth becomes only 3/8".
6. When 3/32" is worn from the bedplate it should be replaced. This wear can be determined with a pair of machinists spring calipers. The roll will leave a ridge at each end of the bedplate because the bedplate is wider than the roll. Clamp the bedplate away from the roll and caliper from a roll bar to the end ridge and to the worn area of the bedplate to determine the amount of wear.
7. A dial indicator is used at the factory in a final check to determine that the beater roll is round. The roll is indicated one inch (1") from each end on every bar. We suggest that this procedure be used as a positive check on the roll. Factory tolerance is plus or minus .001" from zero (0) reading at any point.
8. The presence of chatter could be because of a loose bedplate so check the cap screws holding

the bedplate in its holder to be sure that they and the dowel pins are tight.

9. Extra bedplates not furnished with the original beater order will not have been drilled and reamed for dowel pins. To do this, securely apply the new bedplate to the lever arm with the cap screws, then using the existing holes in the lever arm as guides, carefully drill and ream for the two (2) #2 dowel pins. This can be done with the lever arm in place. Be sure to clean out the reamed holes before driving in the dowel pins.

REPLACING A NEW BEDPLATE: — The diaphragm must first be removed and should be carefully examined before reuse. The bedplate will be found leaded into its holder. It may be burned out and a new plate leaded in, but this operation can most satisfactorily be done at our shops. We recommend the purchase of a spare bedplate and holder which can be sent in for repairs. The new bedplate should be ground in following the preceeding instructions. Be sure to wash all the emery out as outlined above. Bedplates should be smooth at all times — never chisel out the wood.

Replacing Set of New Fly Bars:

1. Take off front and rear stainless steel decking but leave the stainless steel decking on top of the hood.
2. Loosen the ¼" R.H. machine screws on the hood sides and on the stuffing boxes and remove the hood. This joint is packed with a gasket compound and should be so replaced on reassembling.
3. Drive out the Taper Pins (#2) in the bearing stand feed with a 3/16" punch.
4. Remove the cap screws in the bearing stand feet and lift out the roll with its stands.
5. Disassemble and remove bearings, tagging the bearing stands and bearings as they are removed and be sure to reassemble in the same order; note that the inboard bearing has 1/16" axial play.
6. Remove the end rings on the roll and pound out the fly bars.
7. Drive the new fly bars in place radially using a copper pounding sheet. Bars should be driven in tight and will require substantial pounding. They must be tight or the roll will rattle. Do not file the bars unless necessary. Roll should now be painted.
8. After the bars are in and assembled with the end rings replaced, turn the roll to 7.625" diameter.
9. Reassembly the roll in the beater then follow the PROCEDURE FOR GRINDING-IN.

REPLACING RUBBER DIAPHRAGMS: — Replacement diaphragms for beaters, when we receive identification, are cut and punched. Otherwise, the rubber must be cut and punched by scribing in the field from diaphragm clamping plate and bedknife box.

Serial # 109-F-1553 M916794

700006 $2,180 Bedplate assembly

Knife compound $7/lb

For additional information, please contact
Mr. Tim Bartelt at:

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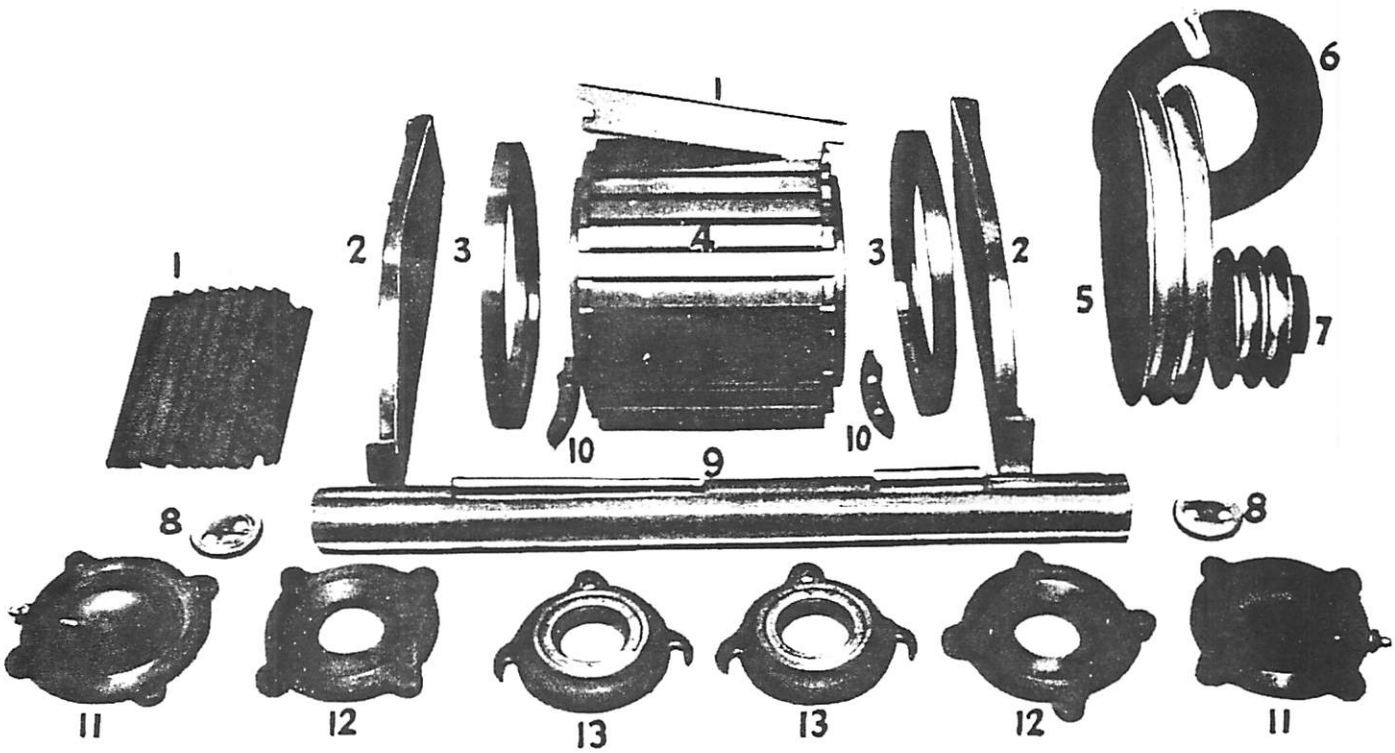
REPAIR PARTS LIST

— FOR —

VALLEY 1½ LB. LABORATORY BEATER

● To order beater repair parts specify part name and number from the following list along with serial and production numbers from name plate.



1—Flybar
2—Hoodside R & L
3—Outside Ring
4—Roll
5—Driven Pulley
6—V-Belt
7—Driver Pulley
8—Washer
9—Shaft
10—Banger Bar
11—Brg. Cover—Outer
12—Brg. Cover—Inner
13—Seal Retainer

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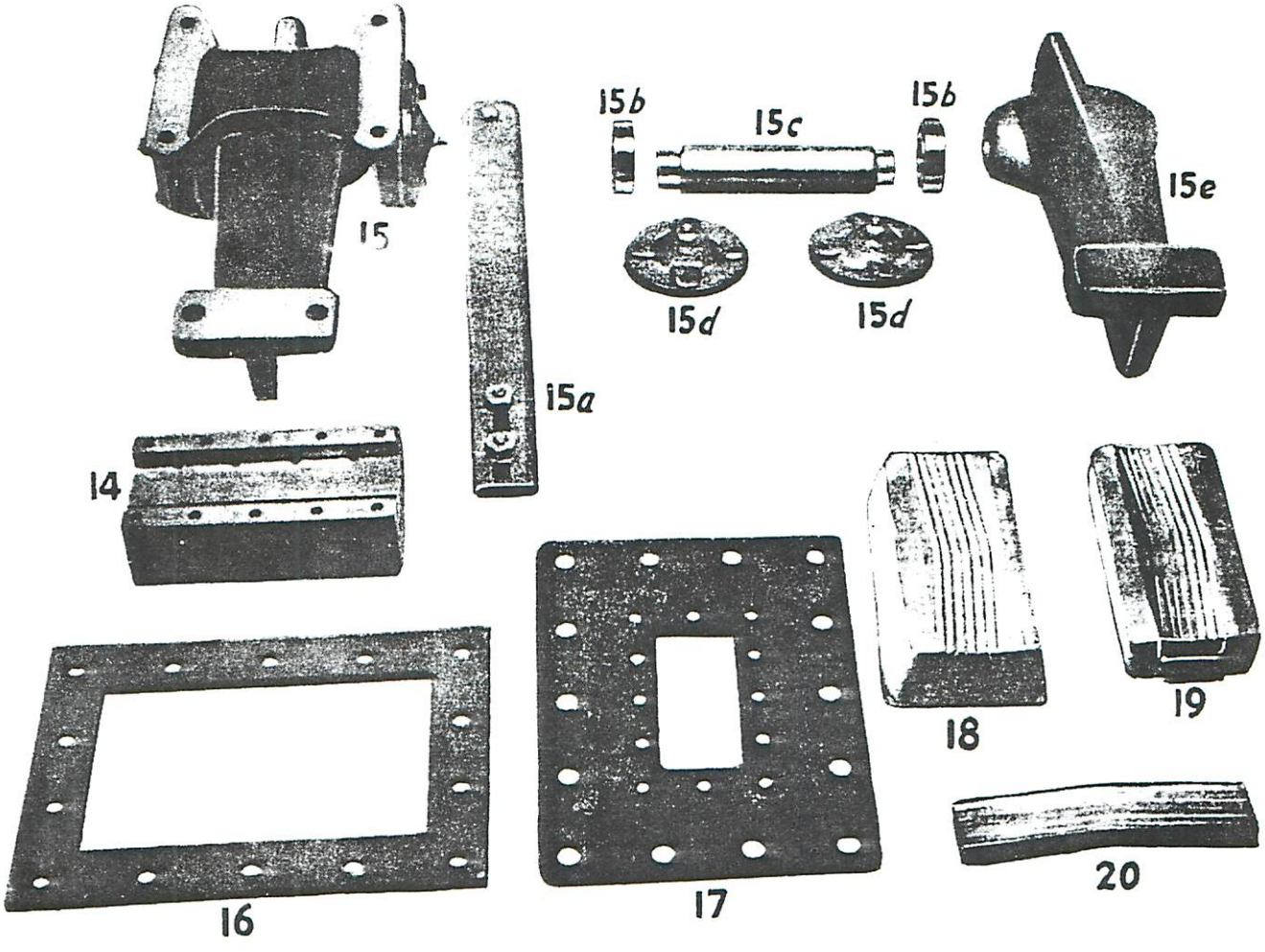

14—Bedknife Box Style "B," "C," "D," & "E"
15—Lever Arm Assembly
15a-Weight Lever Extension
15b-Antifriction Brg.
15c-Lever Arm Shaft
15e-Lever Arm
15d-Brg. Housing Cover
16—Diaphragm Clamp
17—Diaphragm
18—Style "B," "C," "D" & "E" Bedknife & Holder
19—Style "A" Bedknife & Holder
20—Bedknife