Ed note: Billy Thompson, White Post Restorations, is a new member of the Airflow Club. He volunteered his article on the "Restoration of Worn Valves" as an aid to the Club and to explain the process by which bad valves may be restored. Thank you Billy, we continue to have great difficulty in locating replacement valves for the Airflow engine. Billy did not furnish an estimated cost for this operation, we know it is an expensive process, however, irreplaceable valves become very precious. The process has other applications as well and should be filed in the back of your mind for future reference. We believe you will find White Post Restorations most cooperative and capable when it comes to the unusual problems regardless of their size and regardless of their quantity or gross economic impact on your resources. Billy invites you to tour his shop any time you are in the area.

RESTORATION OF WORN VALVES

The following is a brief description of the process and technique used for restoring worn automotive valves at White Post Restorations. The process is known as the Eutalloy Process and is a hot, fusable spray process utilizing metallic powders. The powder used in this particular application is Eutallite Universal, no. 10092, which is a cobalt-stellite-based fusable powder. The procedure is as follows:

The valves are first prepared by rough grinding the face edge of each valve. This gives purchase area for the powder to be applied and also helps trim the valves to be concentric.

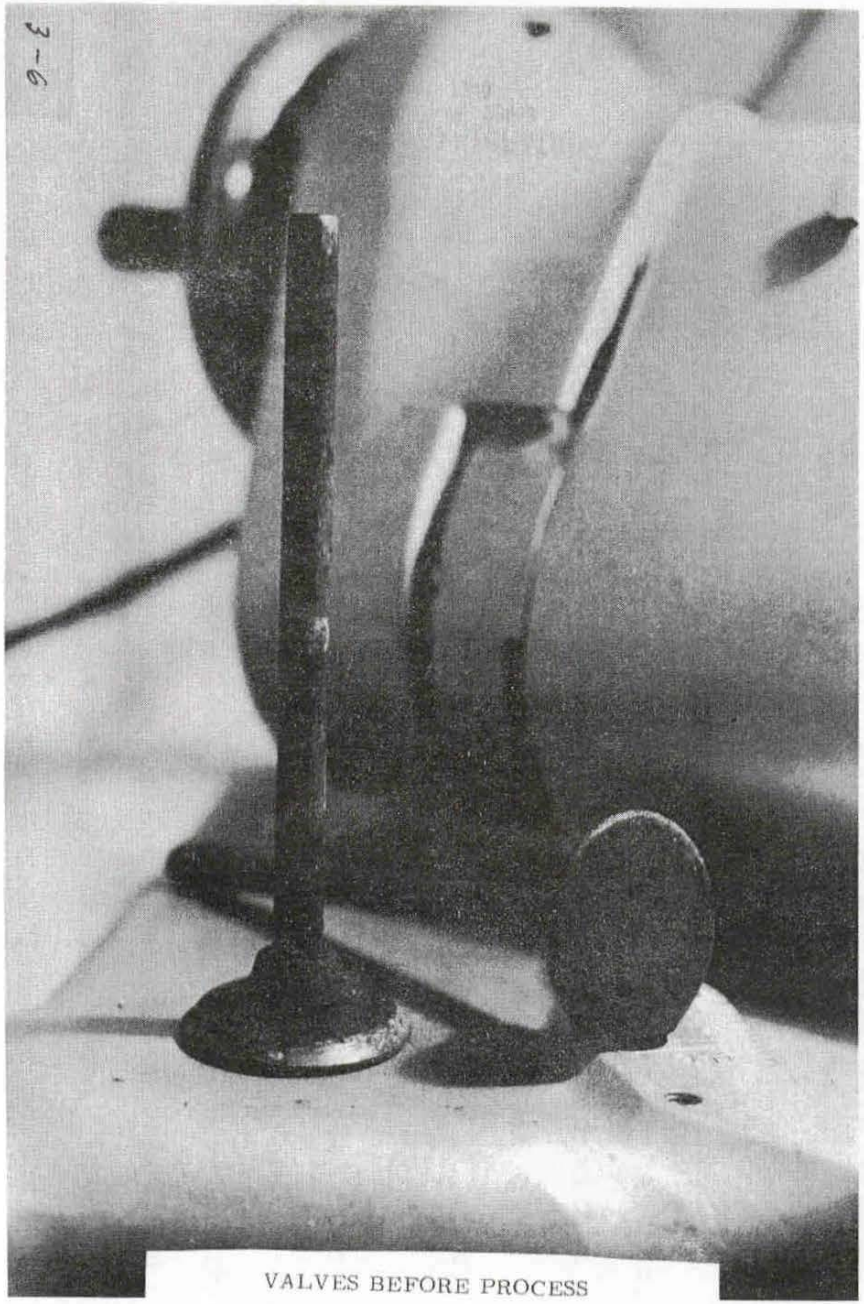
After the valves are cleaned and the face ground with a rough stone, each valve is placed in a lathe headstock and turned at a slow rpm. The rpm should be slow enough so that as the powder is applied in fusion temperature (about 1800° to 2000° F.) and as the powder wets to the liquid state, the molten alloy does not come off due to centrifugal force.

The particular torch we use is the Eutalloy B torch with a #45 tip. The oxygen pressure is set at 25 on the flow and the acetylene pressure is set at 5 psi on the flow. Once the torch is set up to these perameters, the flame is struck and

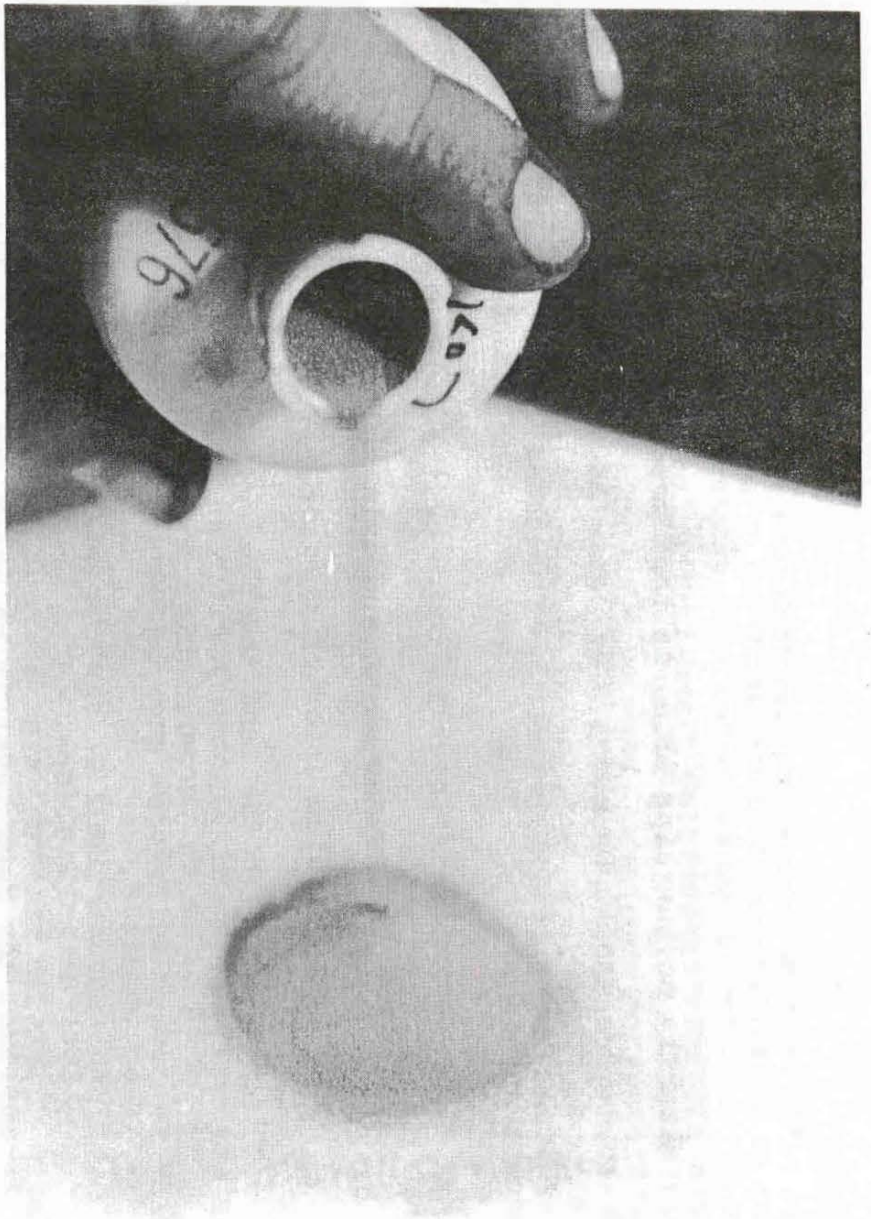
a slightly carburizing flame is then produced. The feather tip, which should be about 3/4" long, is used as a distance guide. The torch should not be brought any closer than this outer feather.

As the valve rotates in the headstock, the temperature of the valve is brought up to approximately 800°, which is indicated by the blue color of the steel. At this point, the feed lever is depressed and the powder is propelled onto the surface as close to perpendicular to the face surface of the valve as possible.

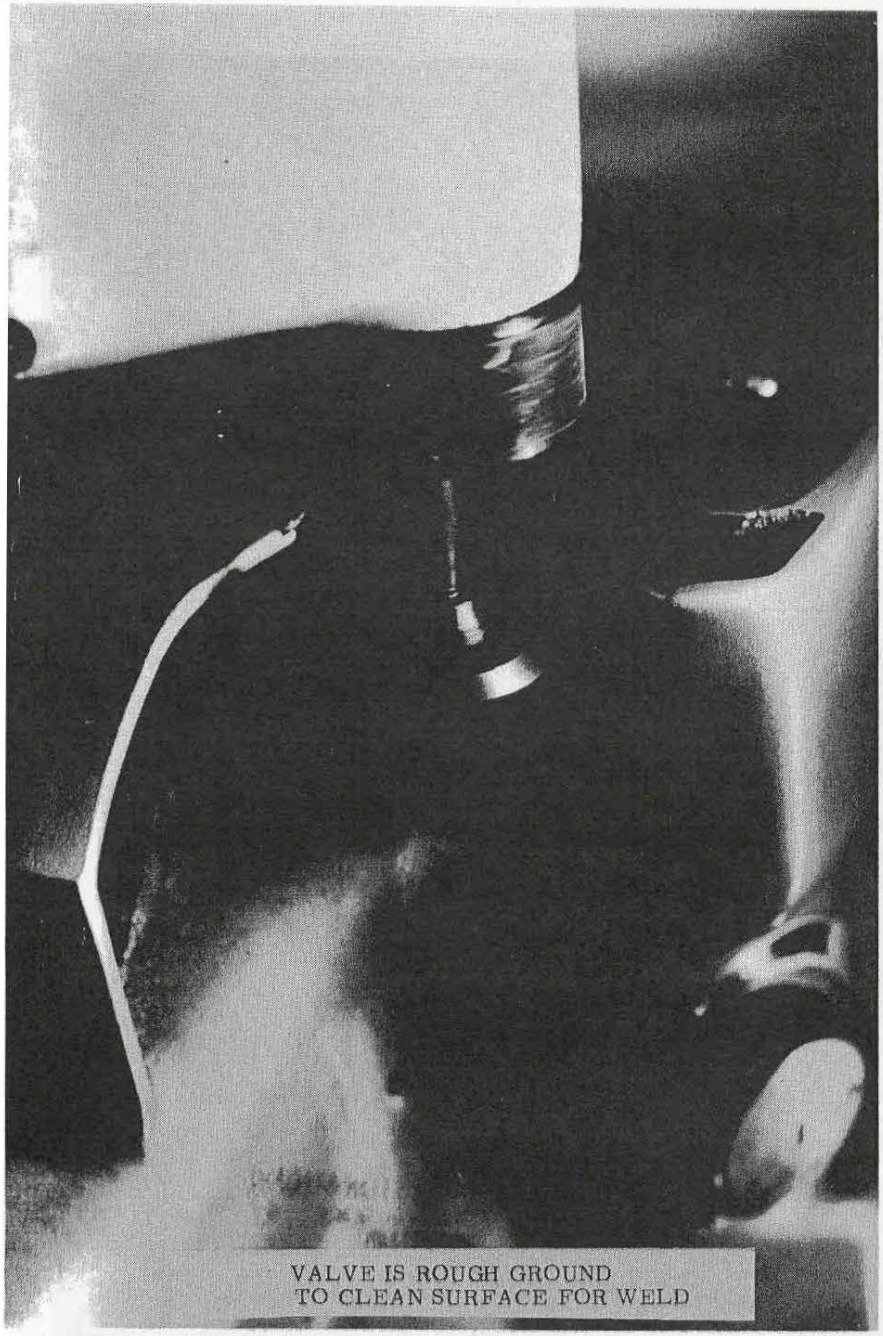
After an initial coat of several thousandths of an inch is applied, the feed lever is released and this initial coat is wet out and brought to fusion temperature. The valve is checked for size with the caliper, and if necessary, it is recoated once or twice more, spraying and then fusing. As each valve is finished, it is removed from the headstock, cooled and the flashing trimmed. The process is completed by using a finishing grade of grinding wheel, according to standard procedures.



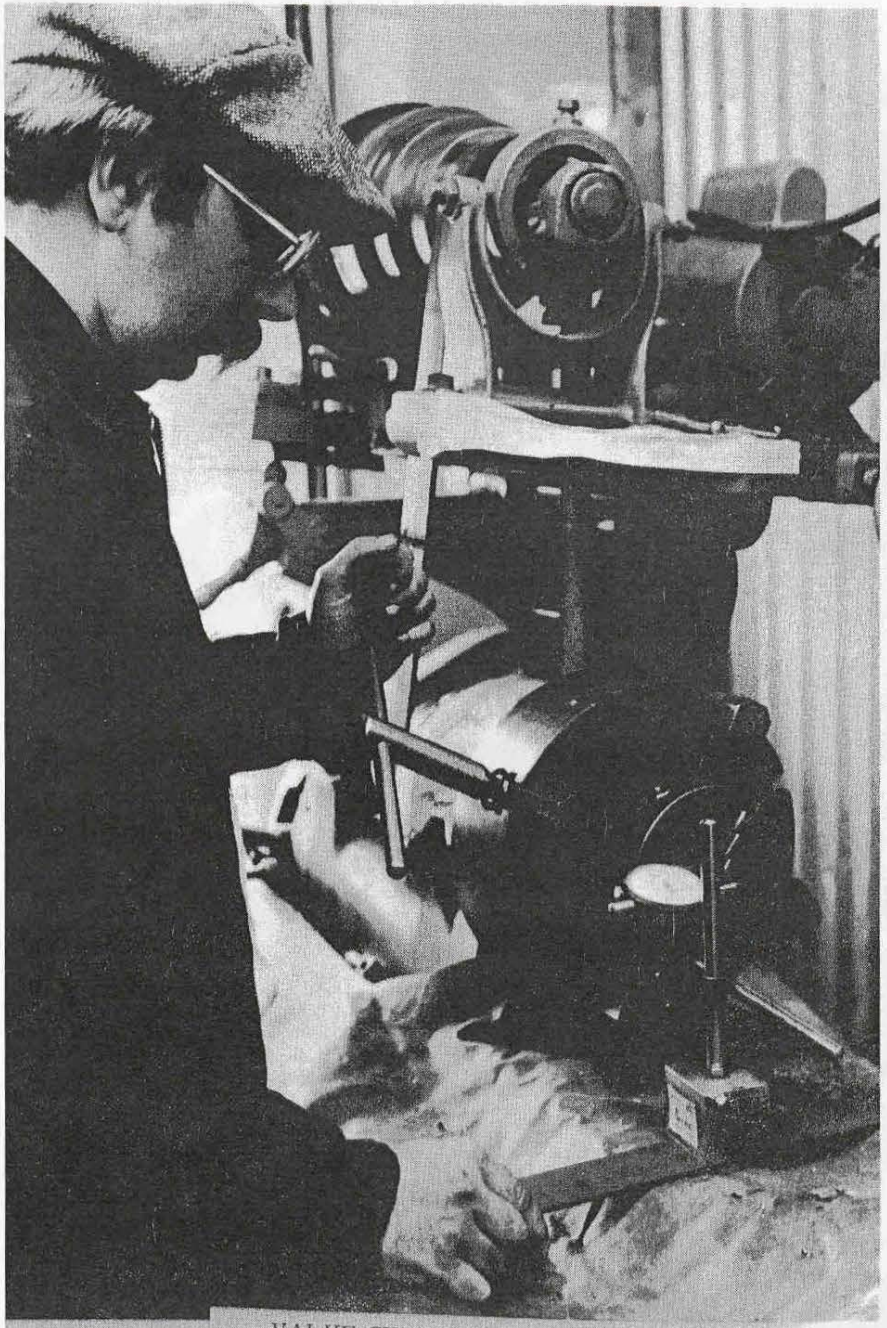
VALVES BEFORE PROCESS



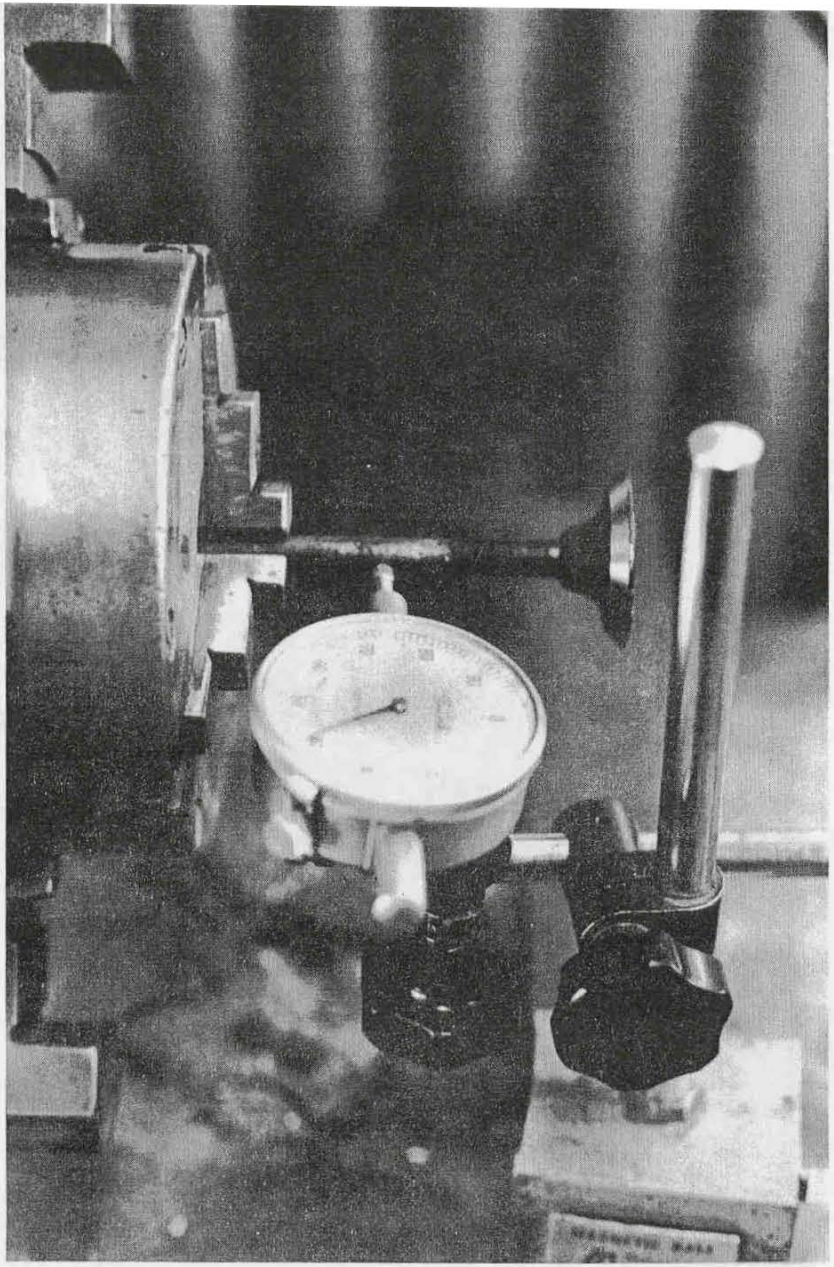
EUTECTIC #10092 POWDER IS USED



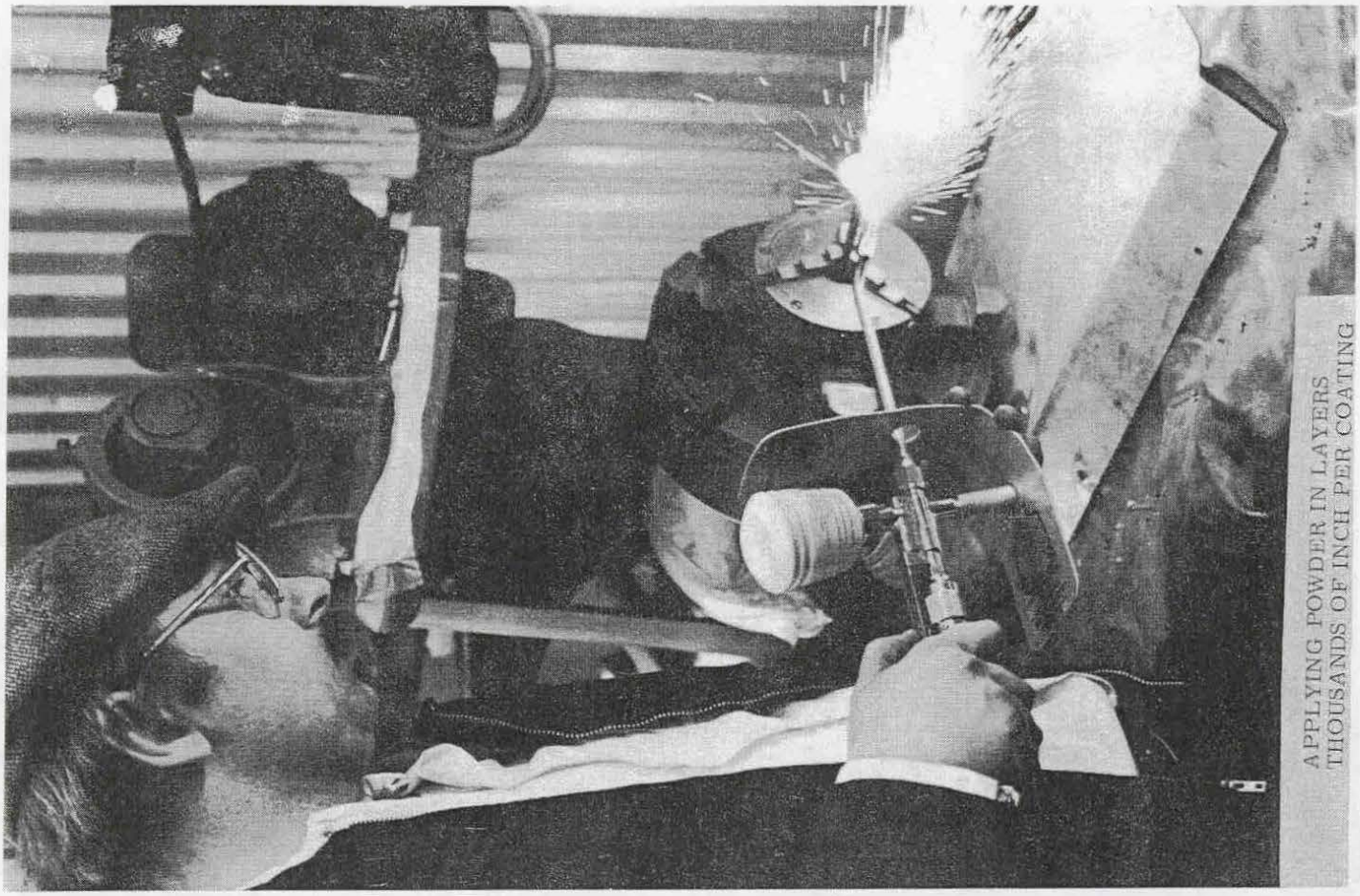
VALVE IS ROUGH GROUND
TO CLEAN SURFACE FOR WELD



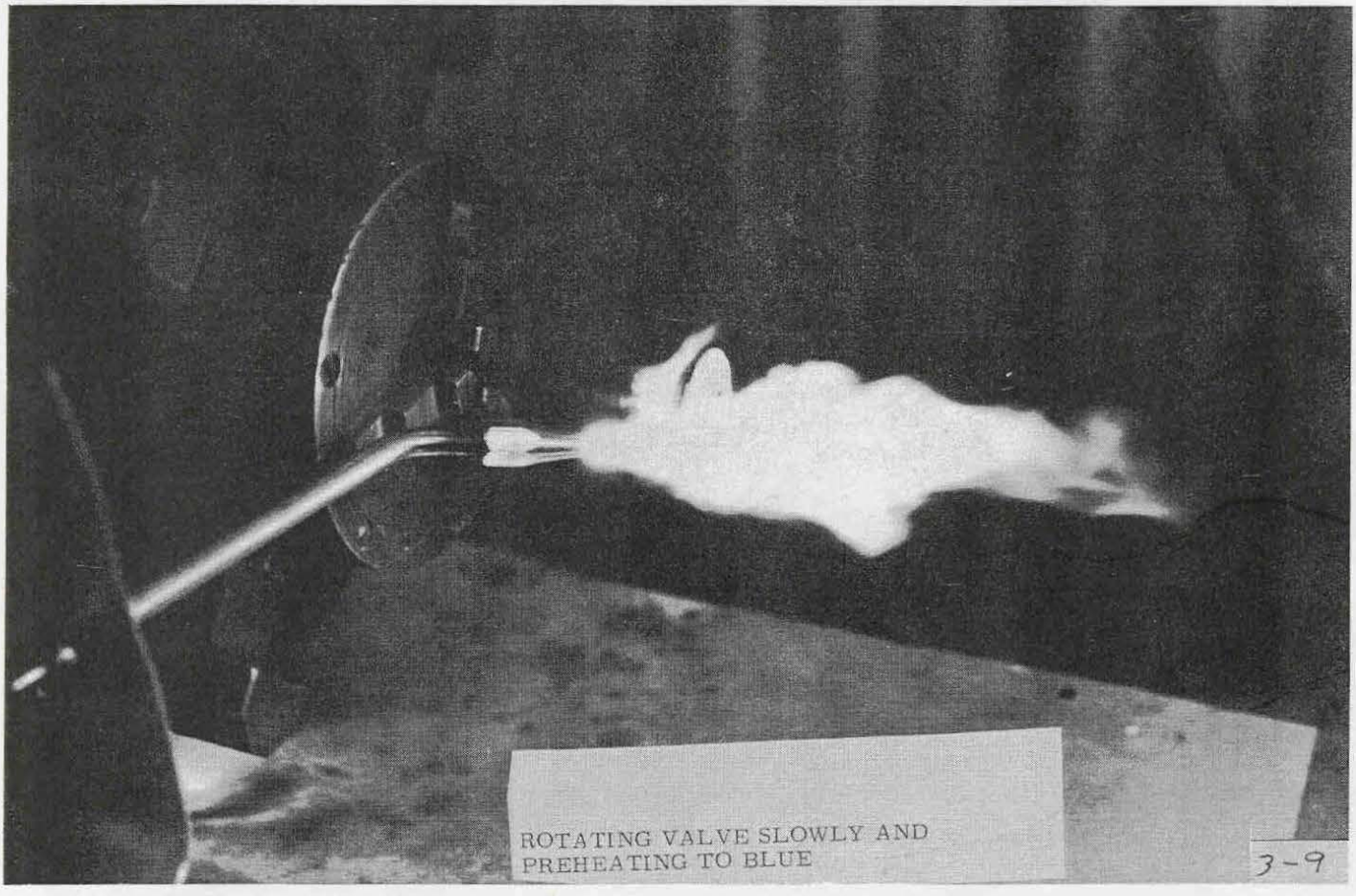
VALVE CHUCKED IN LATHE AND
INDICATED FOR CONCENTRICITY



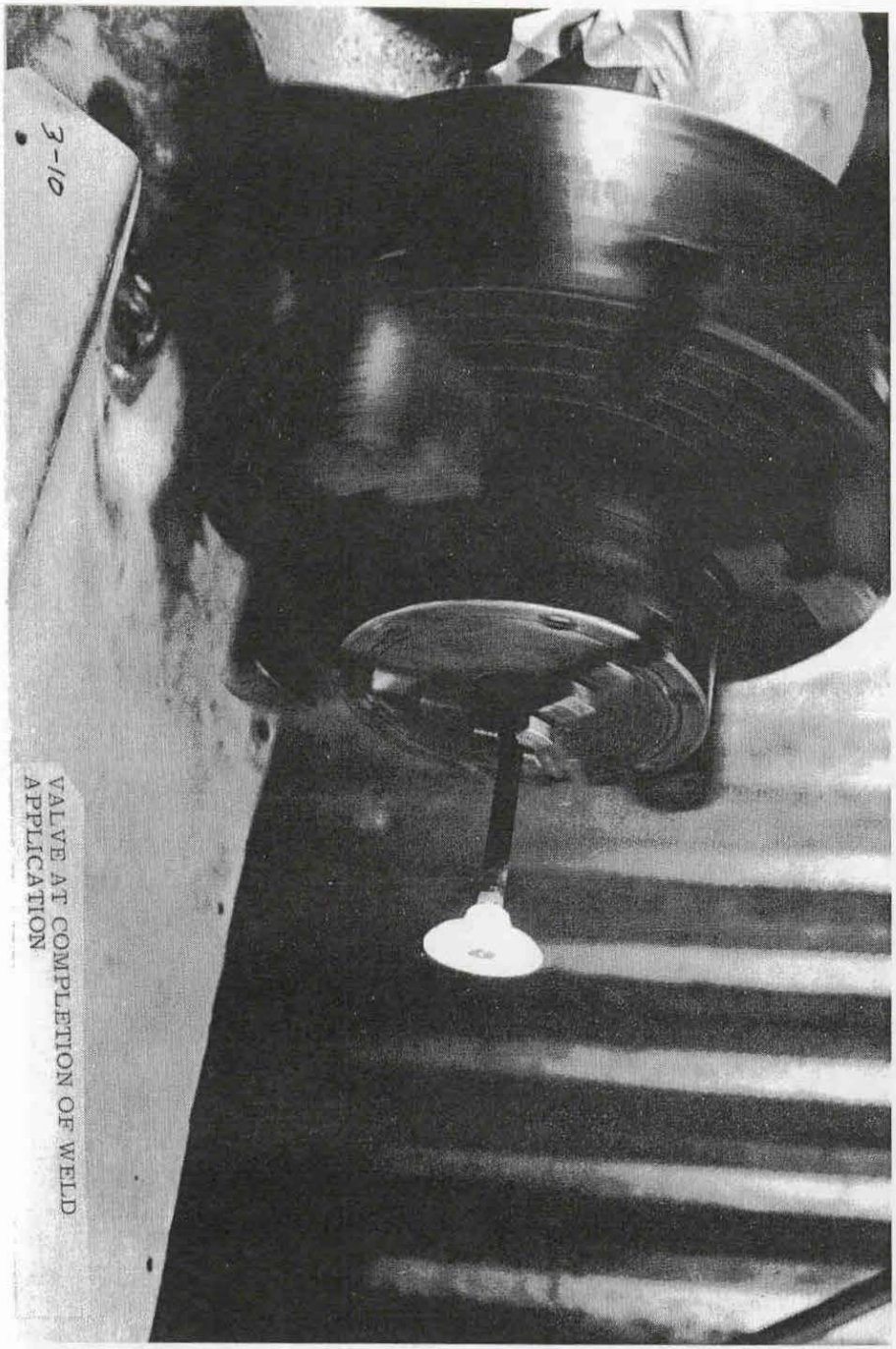
MASKING COMPOUND APPLIED
WHERE WELD ADHESION IS UNDESIRED



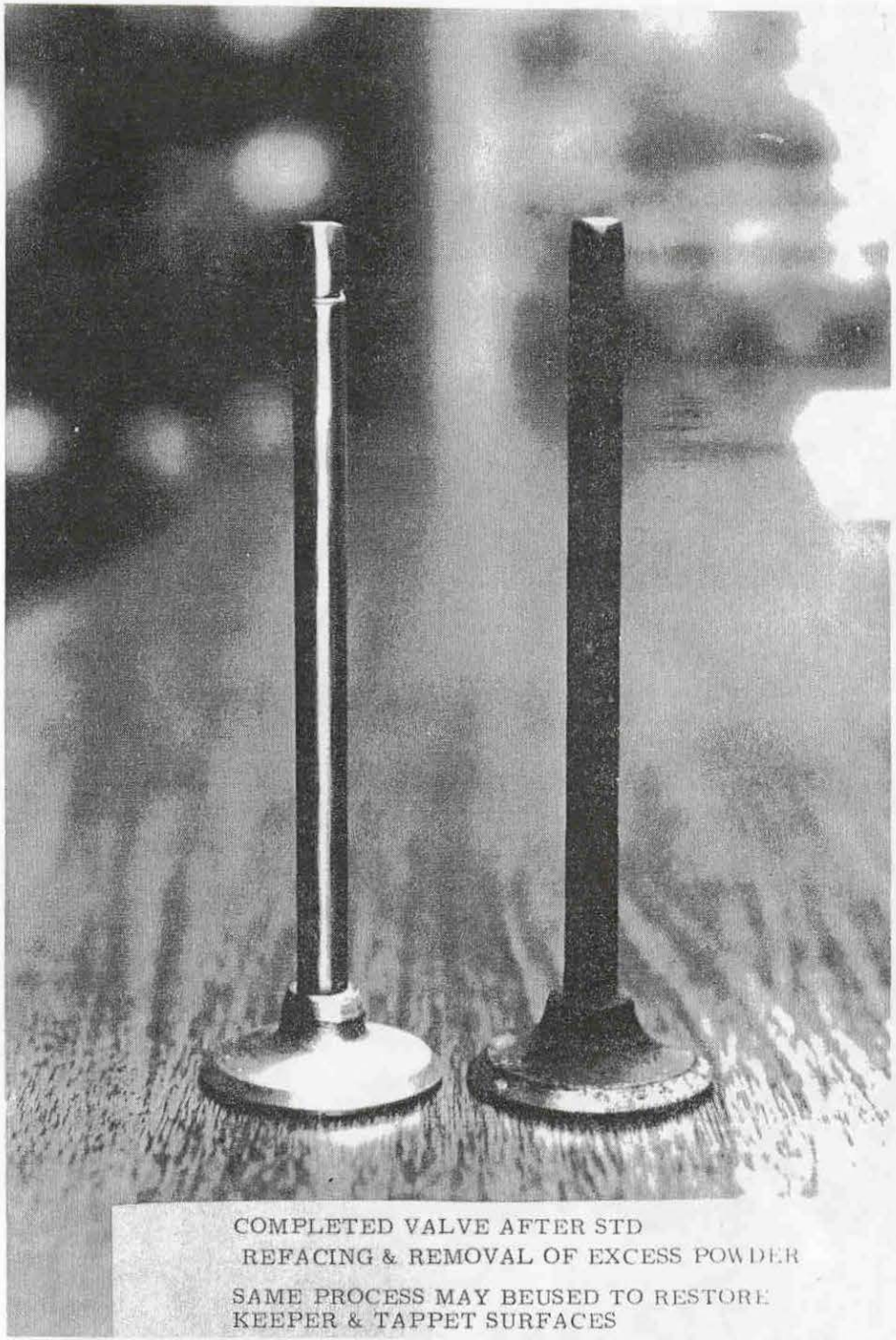
APPLYING POWDER IN LAYERS
THOUSANDS OF INCH PER COATING



ROTATING VALVE SLOWLY AND
PREHEATING TO BLUE



VALVE AT COMPLETION OF WELD APPLICATION



COMPLETED VALVE AFTER STD REFACING & REMOVAL OF EXCESS POWDER

SAME PROCESS MAY BEUSED TO RESTORE KEEPER & TAPPET SURFACES