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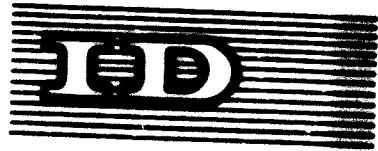
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MACHINE TOOL REBUILDING 1/

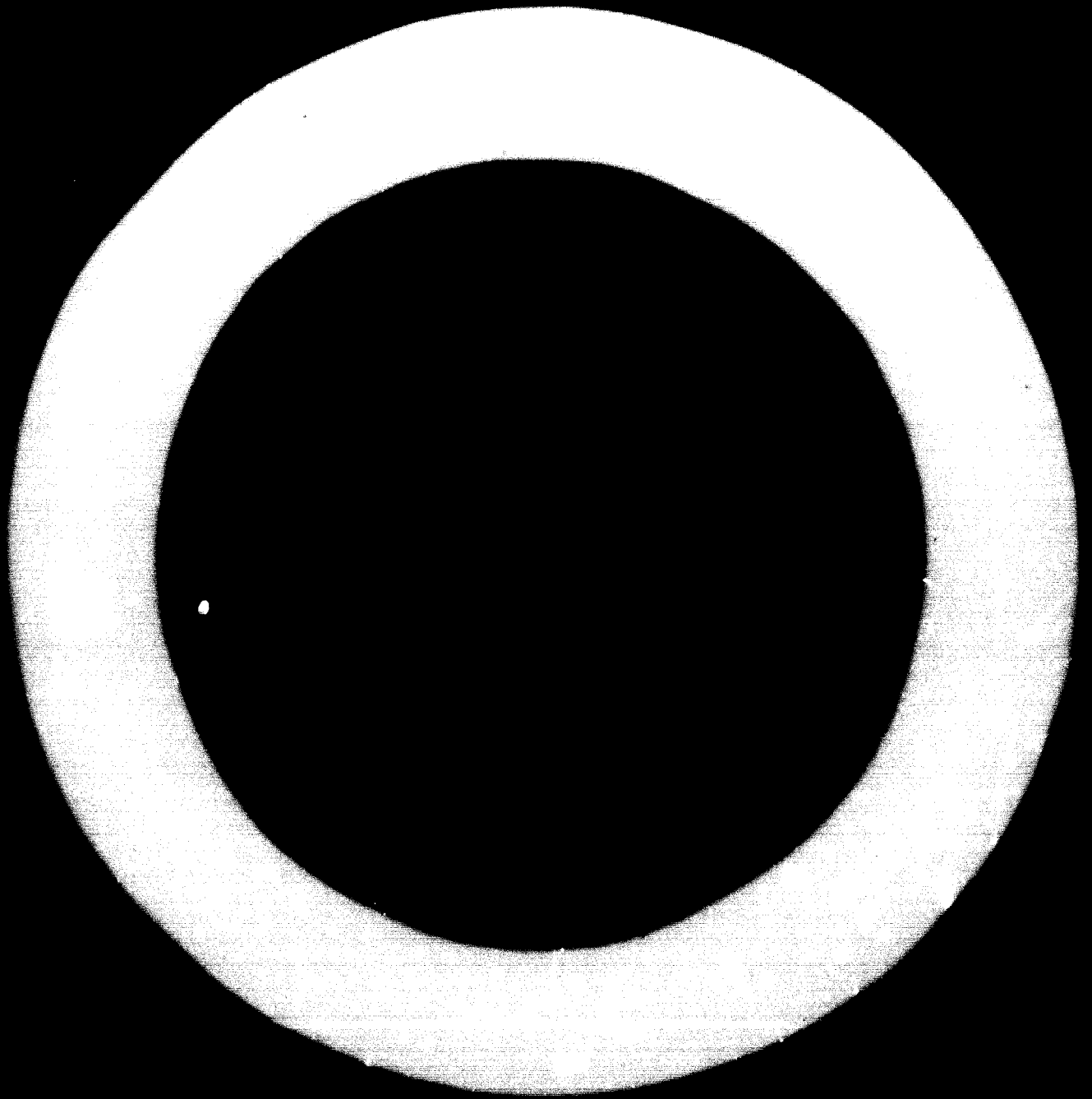
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INTRODUCTION

This paper is based on the rebuilding policies of one particular Company. As this Company is allied to a manufacturer of new machine tools, it is perhaps only natural that it should follow the general range of machines marketed by that Organisation. In this particular case there are two ranges of machine tools in question. One being sophisticated plant for the automotive and allied industries and the other being a range of high precision vertical jig boring machines. So in fact we cover a large cross section of machine tool users.

However, we feel that the above principles applied by our Company towards rebuilding apply to all machine tools in the medium/high bracket of prices and sophistication.

1. PREPARATION

Once the decision has been taken to rebuild, we can take various steps to avoid the machine in question being out of production for longer than is necessary. It is, therefore, necessary to determine, where possible, the delivery of all known bought out items, such as electrical control equipment, bearings, hydraulics etc. Our first move, therefore, is to process the order in complete detail in the engineering/drawing office. An assessment is then made of all items likely to be required, what modifications will be made to up date the machine and what known tooling, if any, will be supplied. Once these facts are determined it is possible to formulate a critical path analysis covering the complete rebuilding of the machine in question. We are then able to go back to the customer and give him an exact date as to when we require the machine to be sent to our Factory.

2. REBUILDING

For the purpose of this paper we are taking a case study on the rebuilding of a crankshaft grinding machine.

Stripping

On arrival at our Factory the machine is completely stripped and a detailed report is issued for our own and if required the customers benefit. In this report a skilled engineer will examine all component parts and determine whether such parts will be refitted as is, remachined and refitted or completely replaced.

Castings

All the castings to be re-used are then transported to a preparation area where they are completely stripped down to the bare metal. This is done by means of applying a paint stripping solution. After a short period of time this reacts with both existing paint and filler, and the whole casting is washed thoroughly down using a steam cleaning unit.

The castings are then transported to the paint shop where the same process of filling and primer painting is followed as with a new machine. The final movement of the castings is then back to the fitting shop.



MACHINE BASE BEING STEAM CLEANED.

Scraping

At this stage it has already been decided whether the bedways are to be replanned and rescraped, slide way ground or just rescraped. After machining, if any, the base is positioned and levelled on a sound concrete floor. Rough scraping, if any, is performed using a hand operated mechanical scraping device. The final scraping is then carried out using a standard hand scraper.



MACHINE BED BEING RE-SCRAPED.

Machining

At the same time as the preparation of the castings, all remachining of existing parts is taking place, e. g. worn holes are rebores and sleeved where necessary. All new parts to be fitted, in this case a wheelhead mounted wheel dressing unit, have been by this time completed and fitted ready for assembly. In this particular case, to conform to automotive standards, we are also fitting a free standing hydraulic control unit. This has been ordered for the delivery time to coincide with the completion of the stripping process.

Electrics

On the electrical side of the rebuilding we follow the standard procedure of stripping, cleaning, rewiring, revarnishing and re-assembling all electric motors. The machine is fitted with a completely new set of electrical control equipment conforming to manufacturers specification. To this end a new circuit, if required, is drawn up upon receipt of the official order. We have found, through past experiences, that there are several disadvantages with re-using existing electrical control gear, mainly through non availability of spares for old machines, time spent in stripping and cleaning existing components and on occasions considerable time spent in fault finding, and finally the fact that if we are unable to obtain such spares then a similar problem faces our customer. We have thus found it far more beneficial to replace all the control equipment from both a cost and customer convenience factor.



ASSEMBLY OF NEW ELECTRICAL CONTROL CABINETS.

Assembly

Within a short period of all the castings being prepared and rescraped, all the various units have been fitted ready for assembly, the new hydraulic power unit is ready to be piped to the machine and the electrical department is ready to rewire completely and connect the new control panel. The machine is then assembled completely, where possible, to building sheets as for a new machine of its type and from this point of view, we as an associate Company of a manufacturer are at a certain advantage.



MACHINE WAYS BEING CHECKED TO ORIGINAL TOLERANCES.



MACHINE DURING THE COURSE OF RE-CONSTRUCTION.

Where possible we insist that the machine is run and fully tested on our own shop floor with a large batch quantity of components to be used in production. Therefore, any faults or discrepancies that we may find at that time can be rectified on our own shop floor saving cost to ourselves and inconvenience to the customer at a later date.

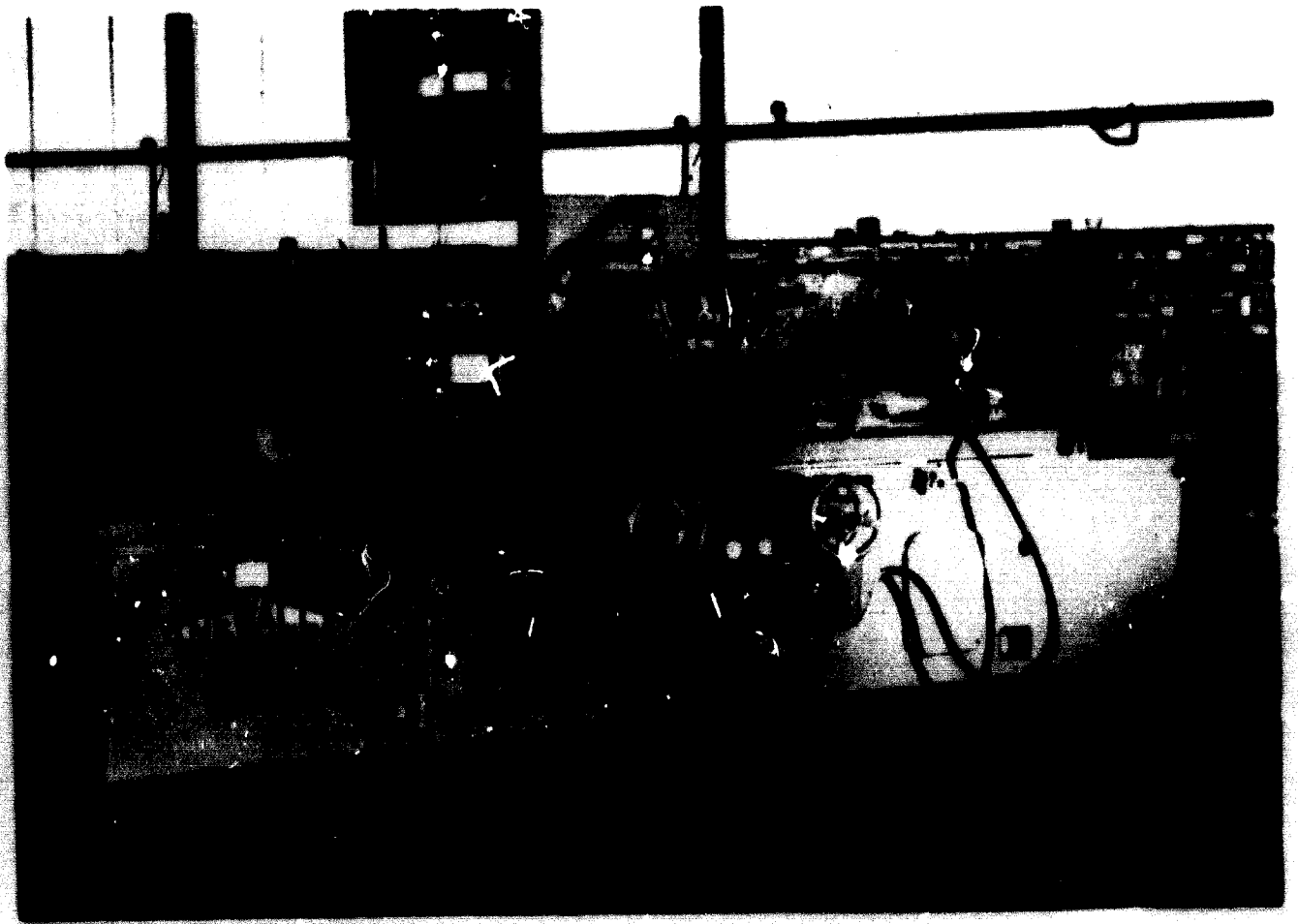
4. SUMMARY

As you will have read from this paper we are only concerned here with the actual process of rebuilding and although we have discussed one particular type of machine the general principles apply to all machines of a high precision nature.

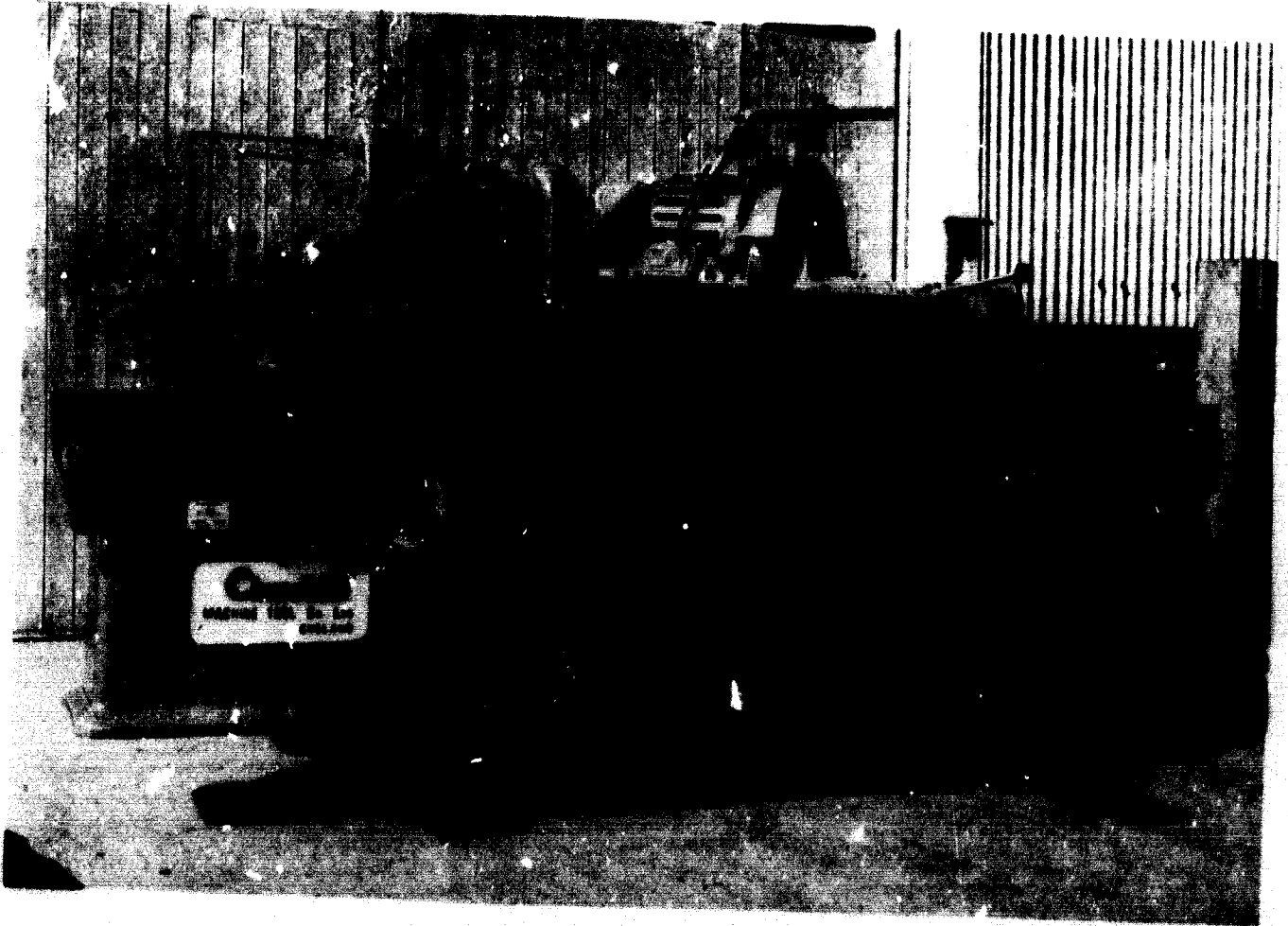
We specialise in rebuilding to the maximum possible extent, that is not only do we rebuild machine tools to original limits but the machine is completely modernised to include present day manufacturing specifications and modifications where feasible, that have been made since the machine was originally built.

We have found it uneconomical to apply this form of rebuilding process to the smaller standard machine which is produced in large batches. A good example of this being small mass produced centre lathes.

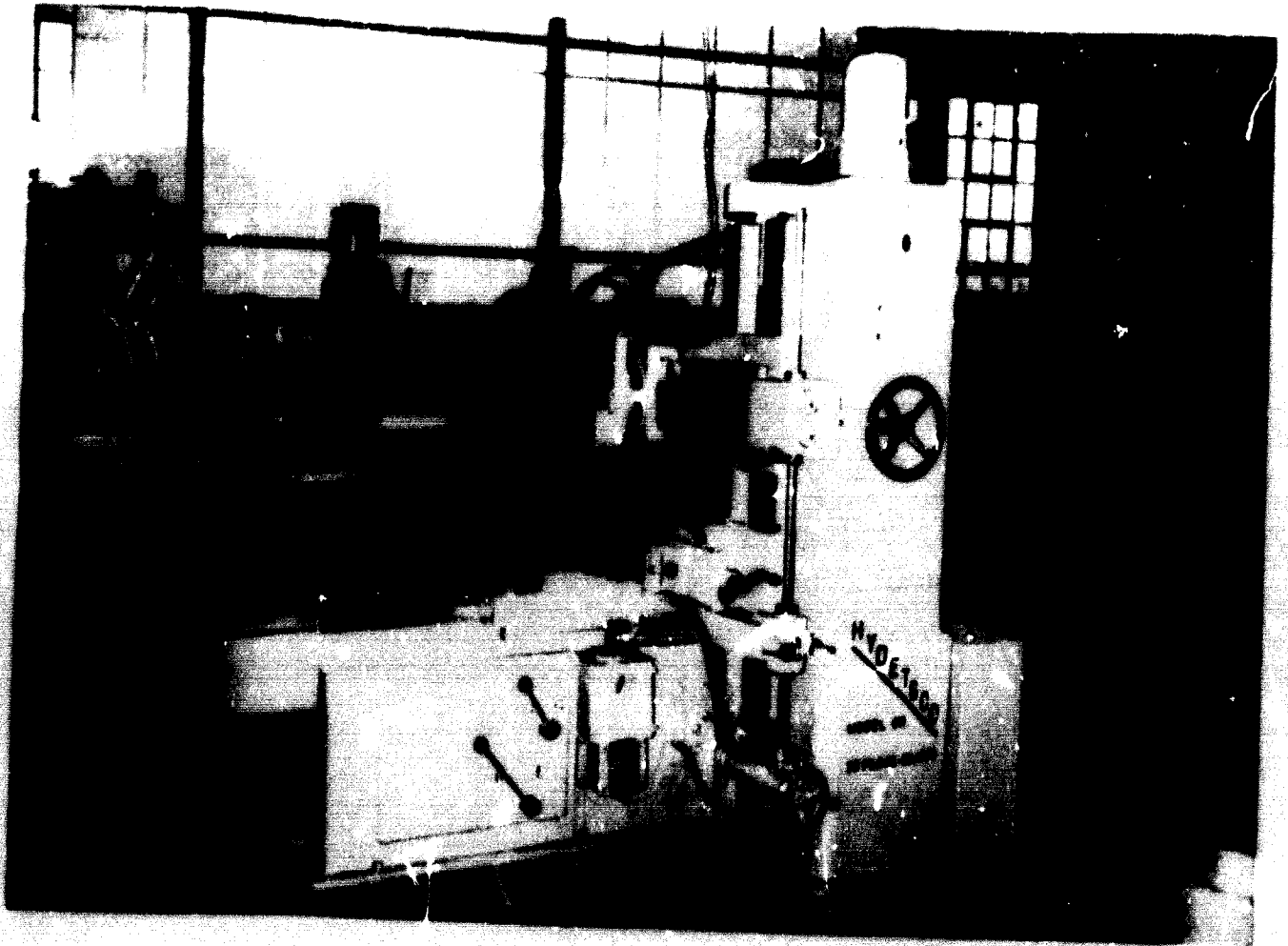
We do feel, however, that there is a strong economical justification for rebuilding machines as described to this high degree of quality, and, therefore, before considering having a machine rebuilt a customer should satisfy himself as to the capability and resources of the rebuilder in question. We find that many users go solely on the total cost and do not relate the cost to the actual work being done and the benefits thereof.



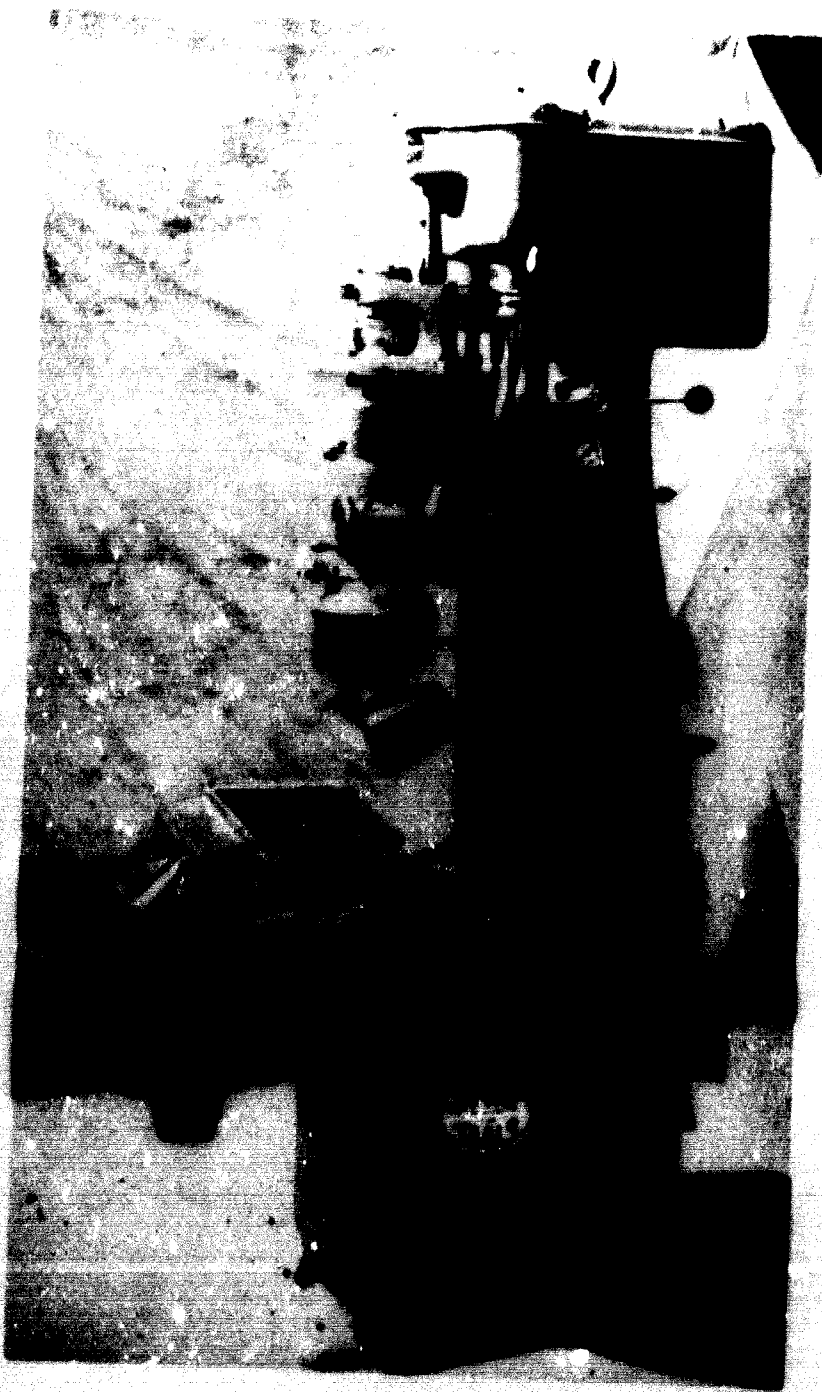
PLAIN CYLINDRICAL GRINDER.



CHURCHILL ANGLE HEAD GRINDER.



PLANO-SHAPING MACHINE.



JIG GRINDING MACHINE.





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