

SAFEGUARDING QUALITY
Casting the Cylinder Block
Retail Sales Manager's Film Service
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One in a series of original filmstrips preserved for their historical value and presented to the members of the **Willys Overland Knight Registry**

Assembled February 2001 by Spence Fowler
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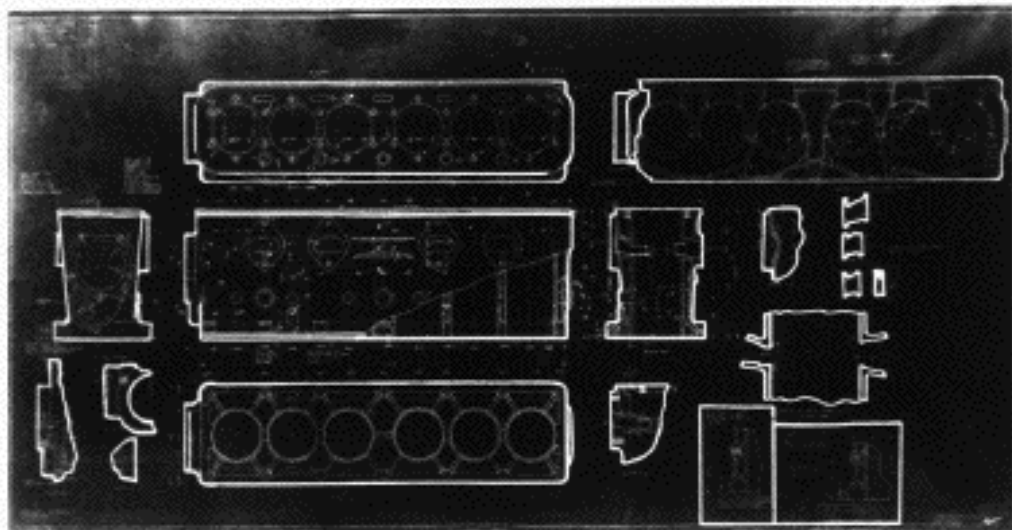
SAFEGUARDING QUALITY

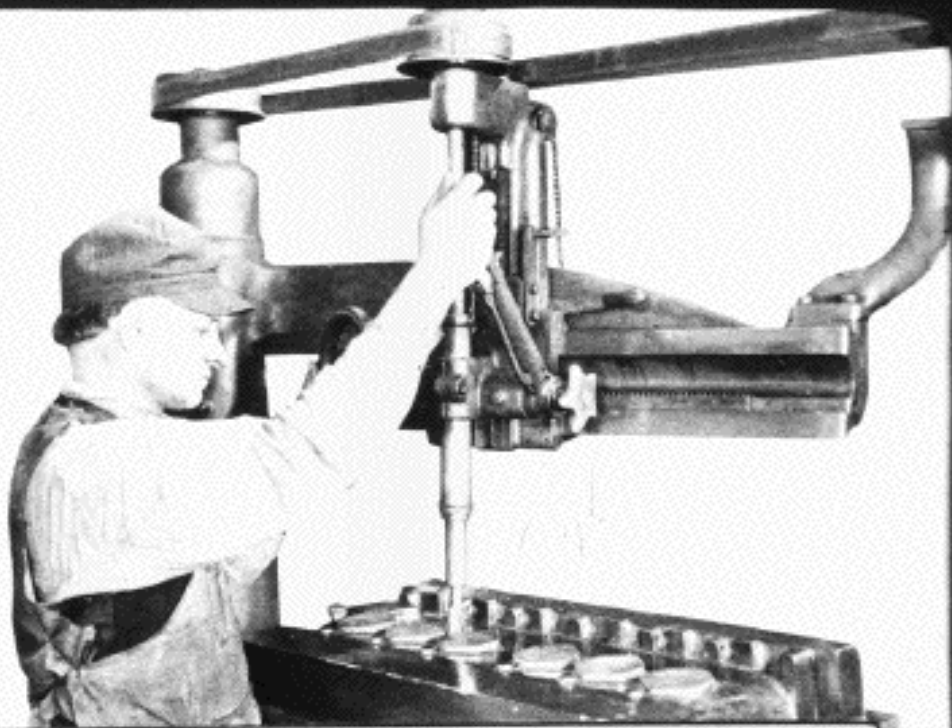
Casting
the
Cylinder Block.

Retail Sales Manager's Film Service

Quality in the finished product is the result of perfection in the many details of manufacture. Just a single part, such as the cylinder block, requires much care and skill in many operations.

The engineers produce a detailed blue print and specifications from which --



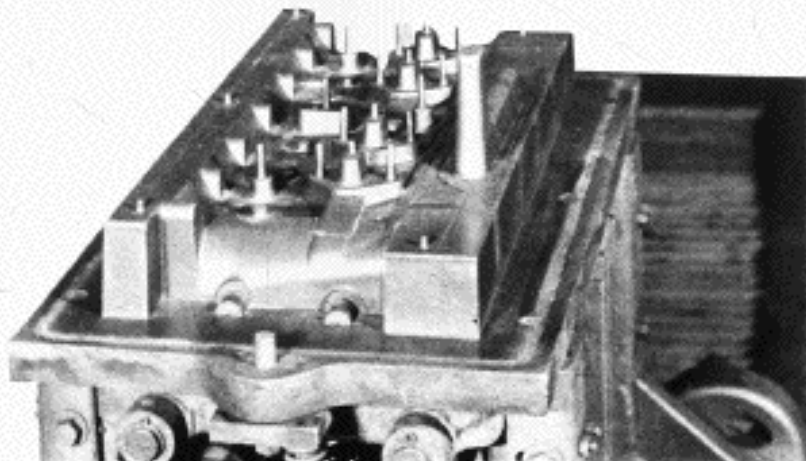


The pattern maker turns out a wooden model, exact in every detail.

The finished pattern received at the foundry is checked closely against specifications and is reproduced in metal.



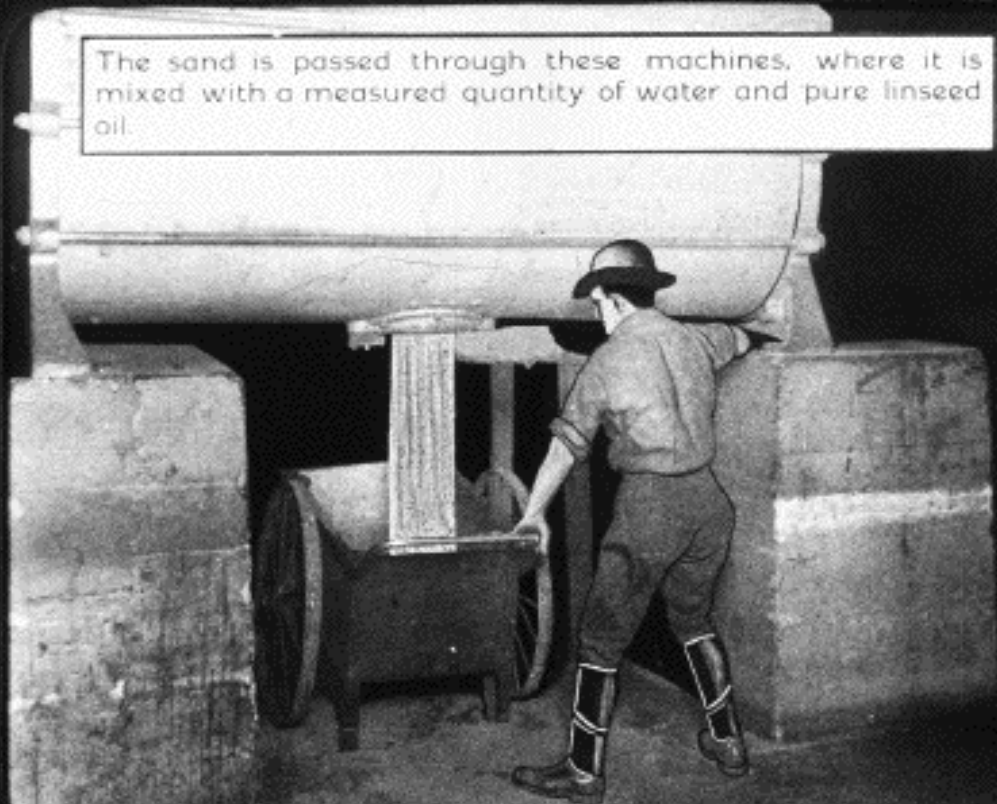
This metal pattern is then used as a standard for forming sand molds into which molten metal is poured.



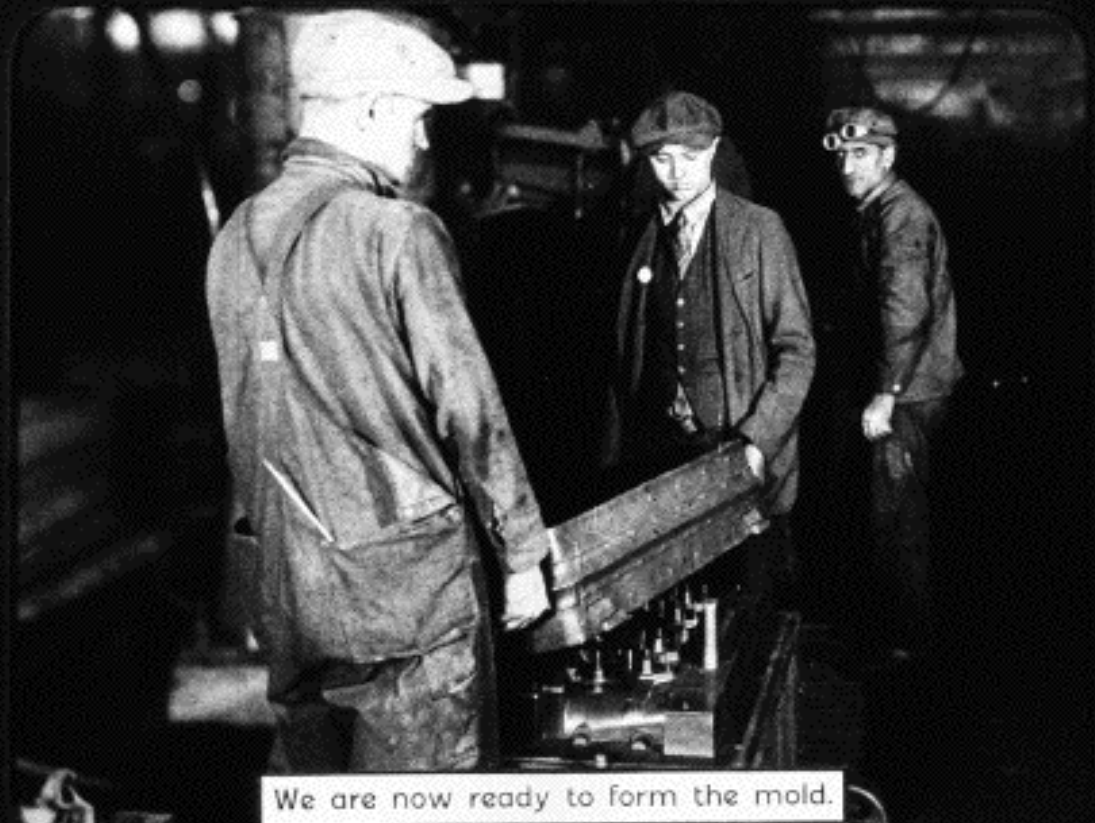


The molding sand must be of a certain quality and requires careful treatment before it is used.

The sand is passed through these machines, where it is mixed with a measured quantity of water and pure linseed oil.

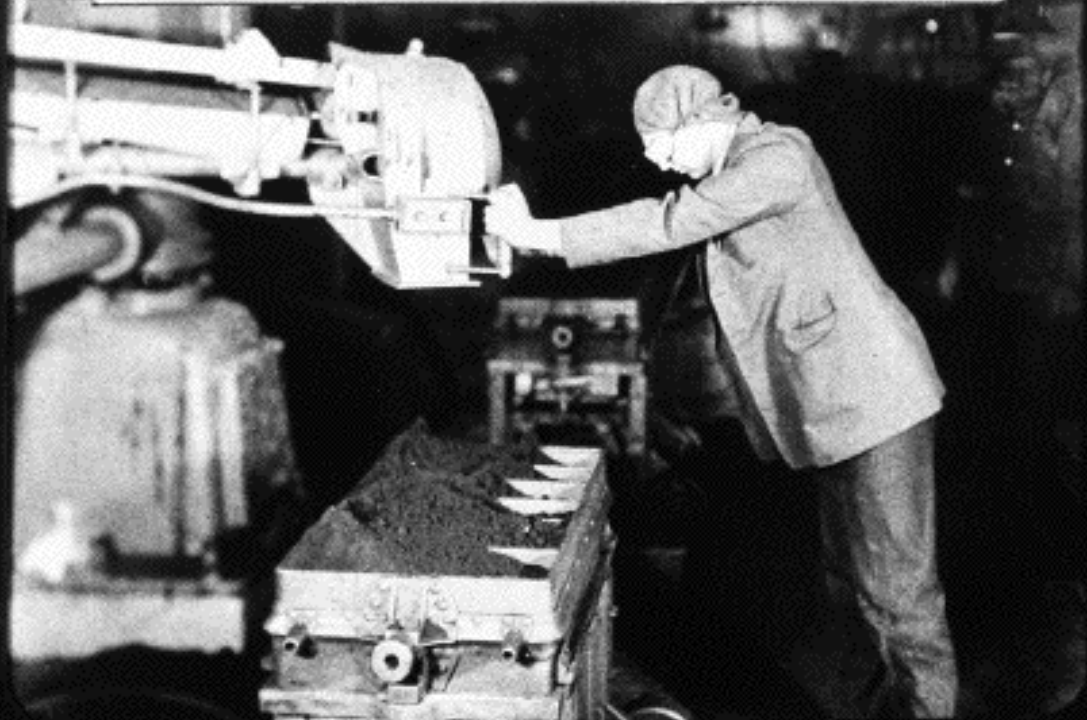


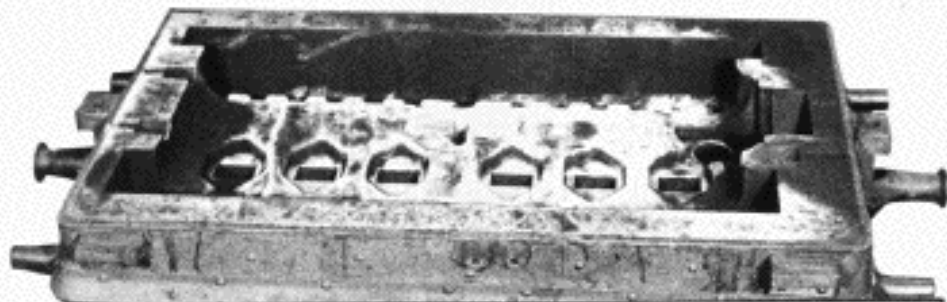
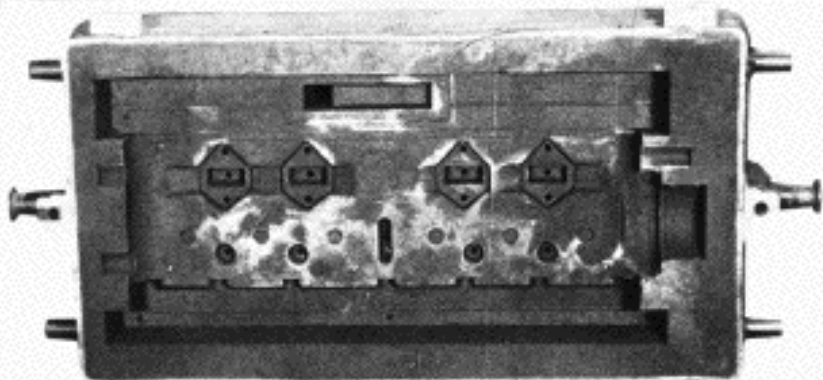
The mixing process is accurately timed over a period of 15 minutes in order that the sand will be of the proper consistency and contain just enough oil and water to hold its shape when formed.



We are now ready to form the mold.

An impression of each half of the outside surface is formed in a box of sand.





The two boxes when accurately fitted together provide the outside form of the cylinder block --

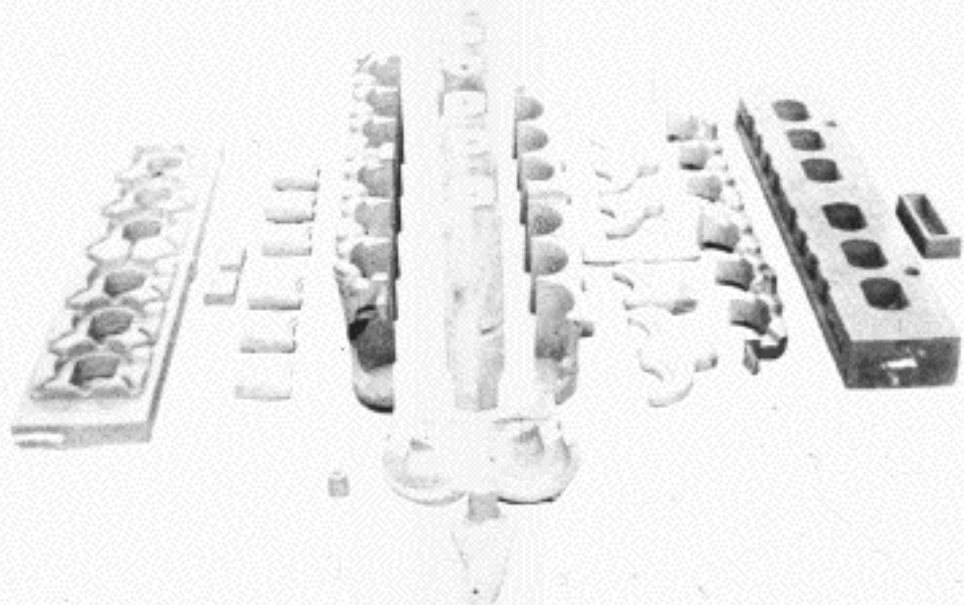
But since the block is not to be a solid mass of metal, we must provide a core to represent the inside surface and every water channel in the cooling system.

The treated sand, reinforced with lengths of heavy wire, is packed tightly into the mold.



Core boxes provide the form for the entire inside surface, cylinders, water channels, ports, etc.



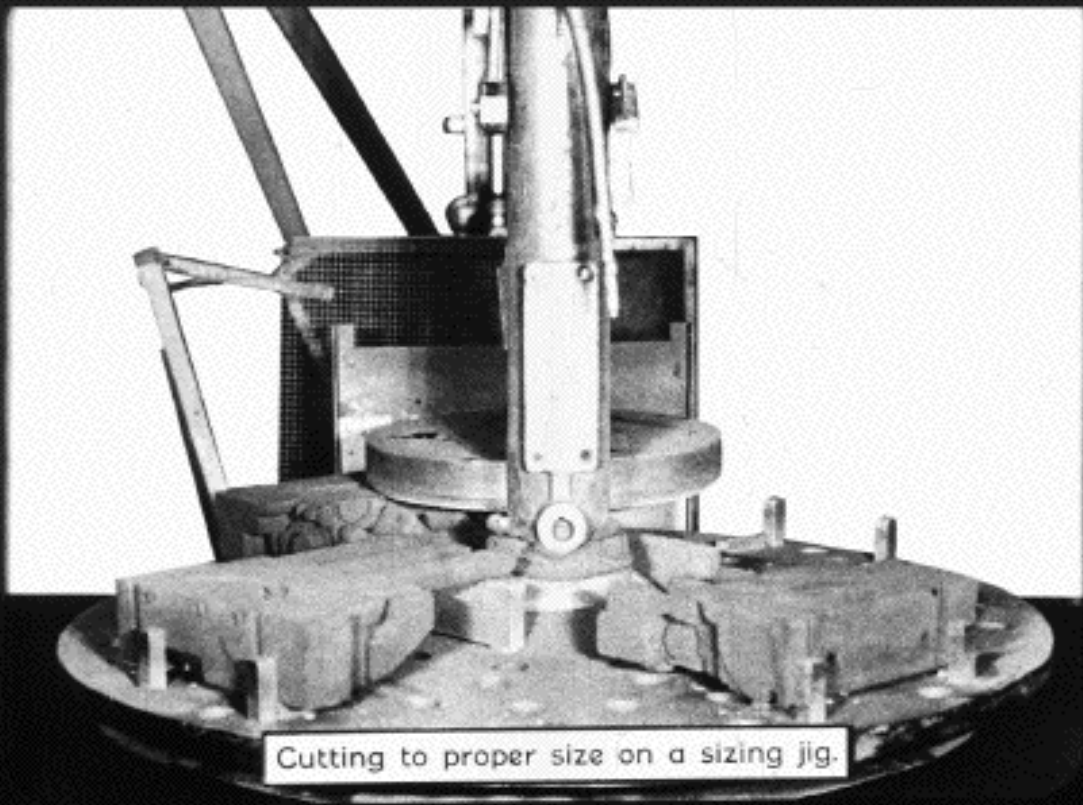


Many parts go to make up the completed core.

The sand models are now placed in an oven at a temperature of 500° Fahrenheit.

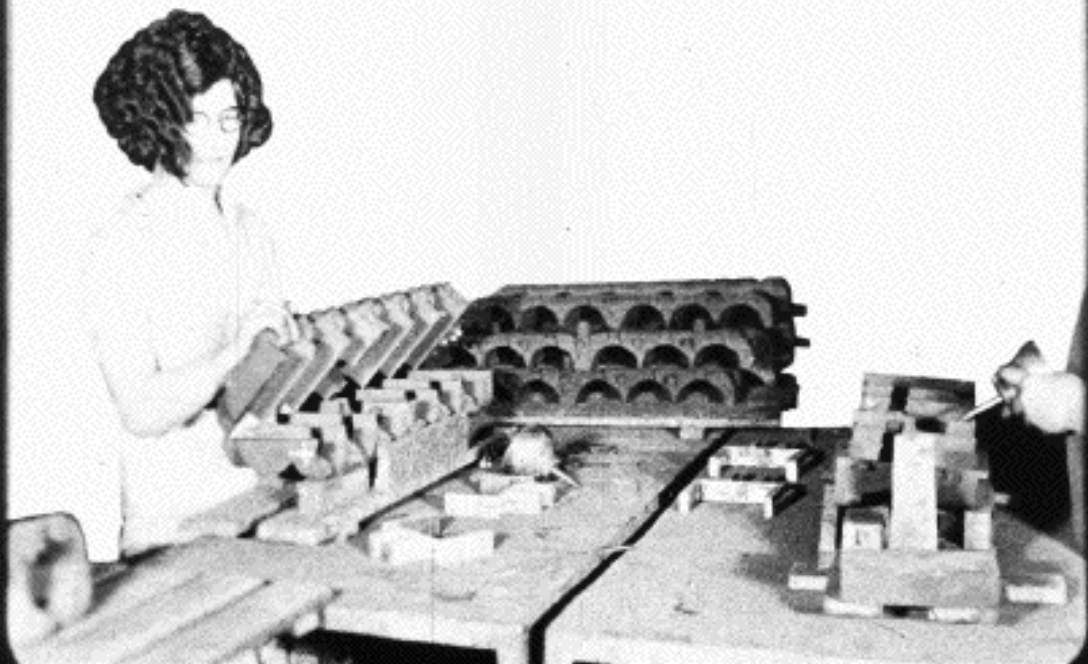


After baking from 1 to 5 hours, depending upon the size and thickness of the part, they are hard enough to permit —

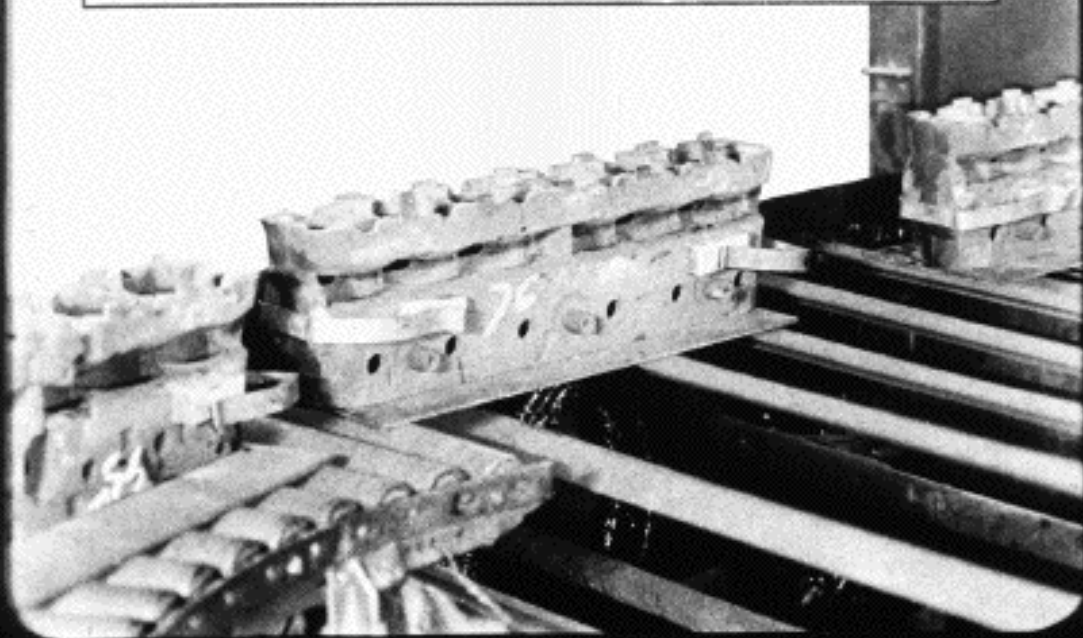


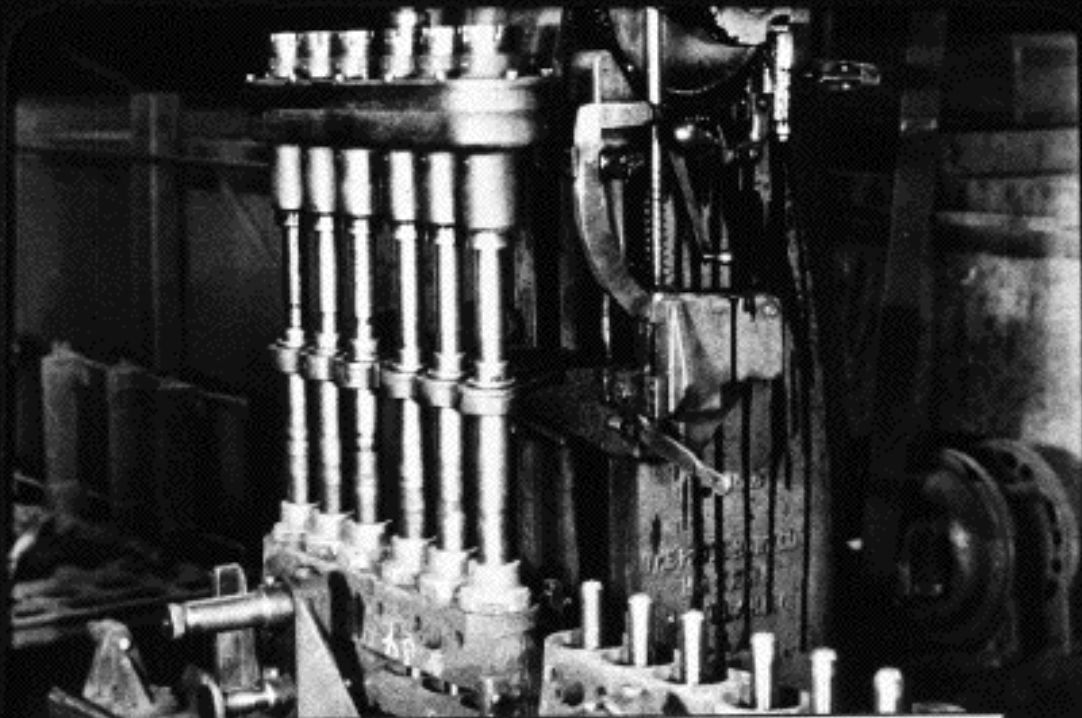
Cutting to proper size on a sizing jig.

After a thorough inspection the parts of the water jacket are assembled by pasting together.

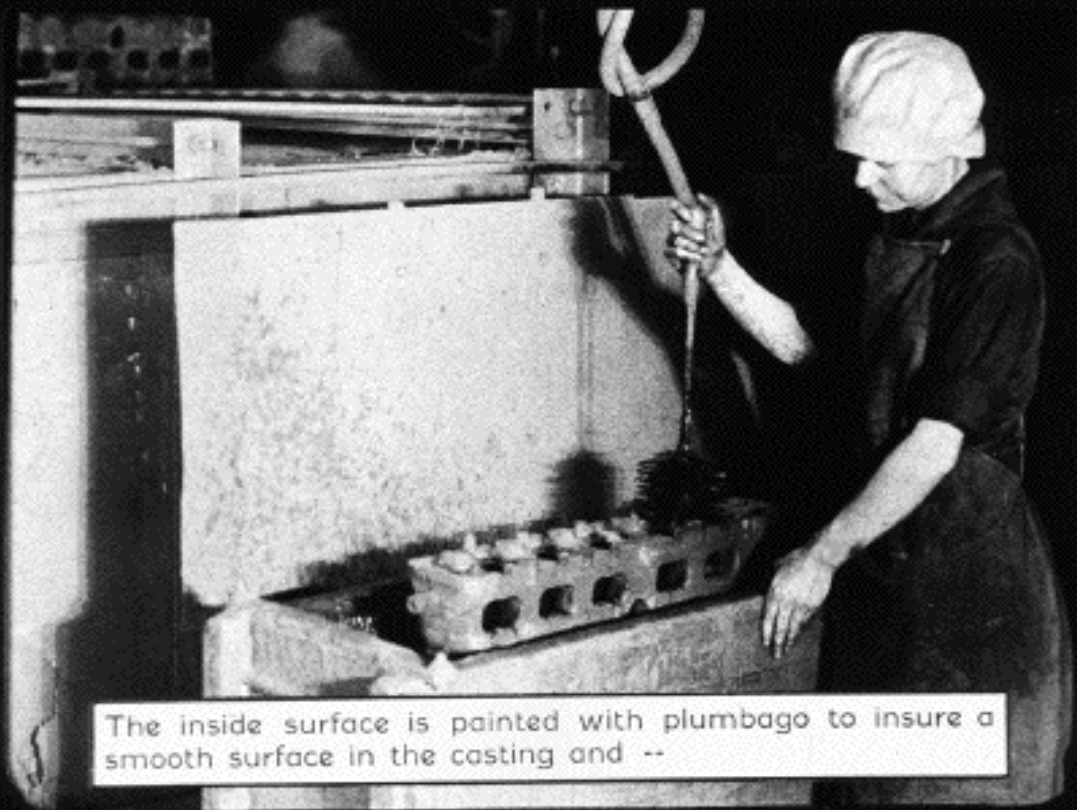


This assembly, clamped together, travels for 30 minutes through a drying oven, hot enough to dry the paste.



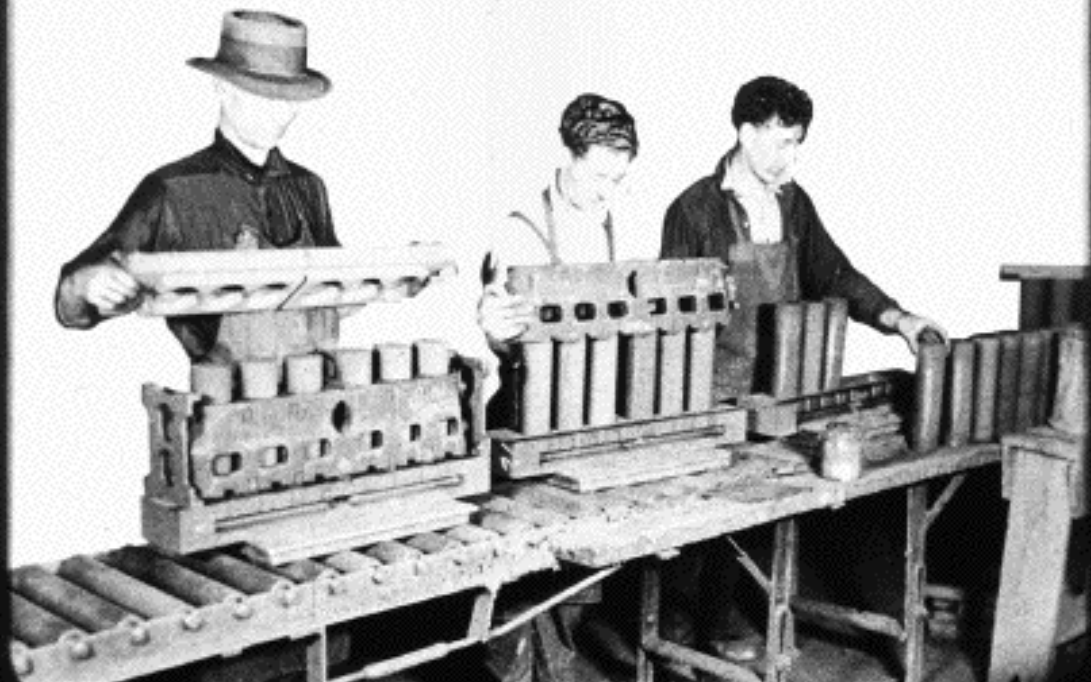


The bore of this sand core is now reamed to insure uniform thickness of the metal in each cylinder.

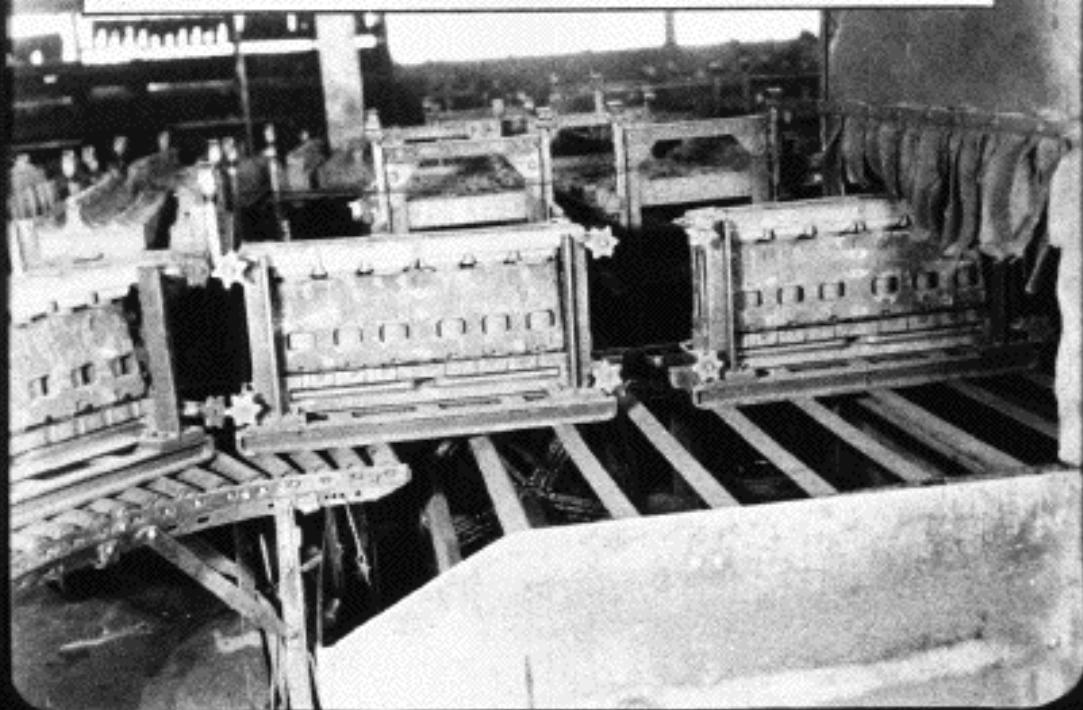


The inside surface is painted with plumbago to insure a smooth surface in the casting and --

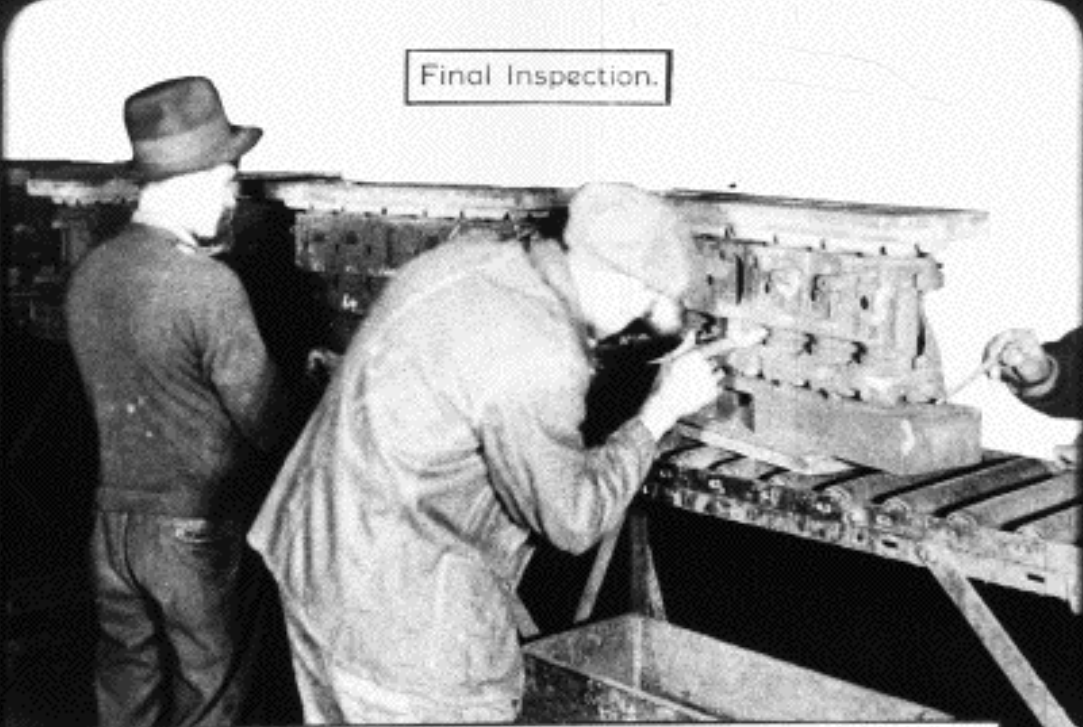
The water jacket parts are assembled with the inside core and slabs which form top and bottom surfaces.



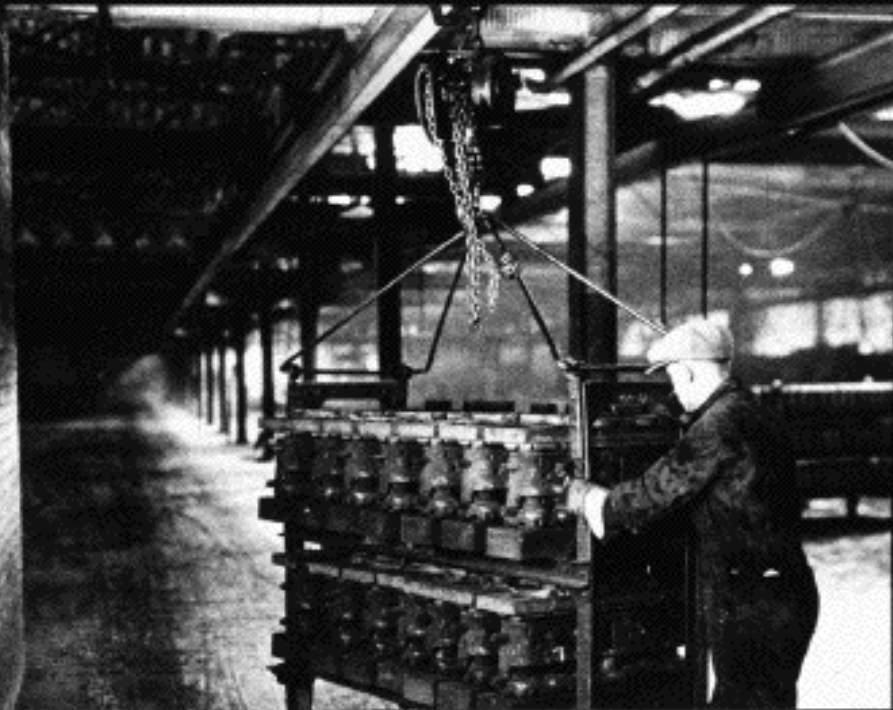
The pasting of this final assembly requires another drying process before the whole core is ready for --



Final Inspection.



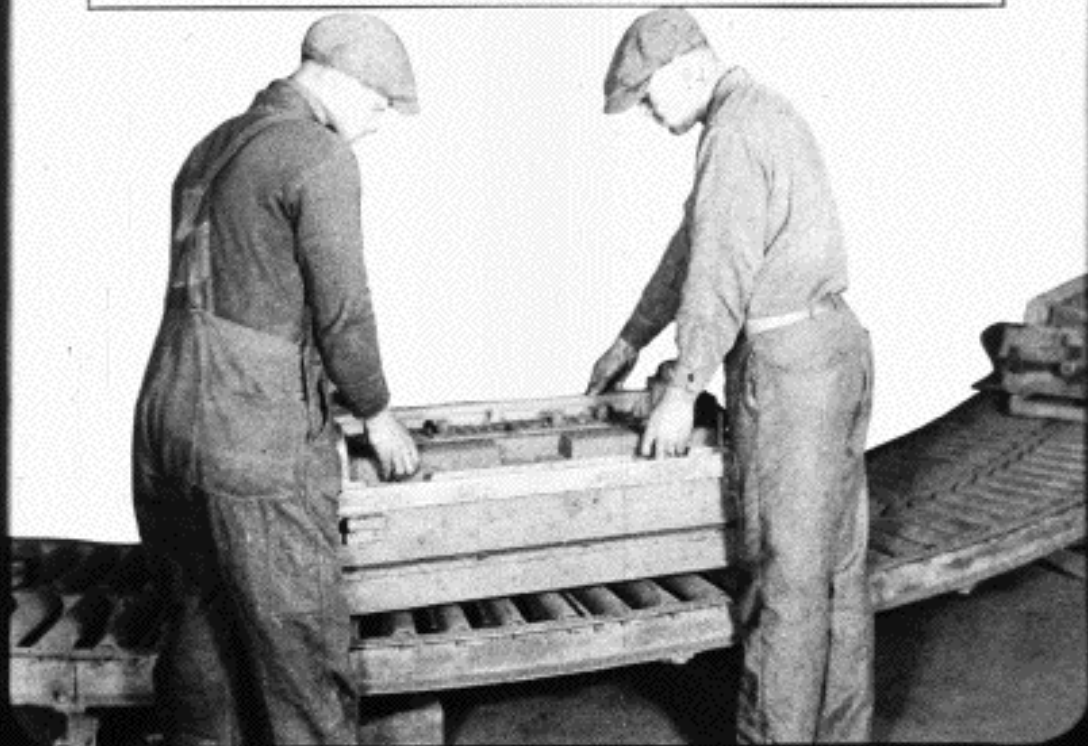
Every detail of the core is carefully scrutinized for any defect which might be molded right into the metal casting.



After a final O. K. the core is passed on to the foundry ready to be inserted in the outside mold.

When the core is suspended in the form for the outside surface, the space around and between parts of the core must be uniform in order to insure a uniform thickness to the metal which is soon to fill that space.

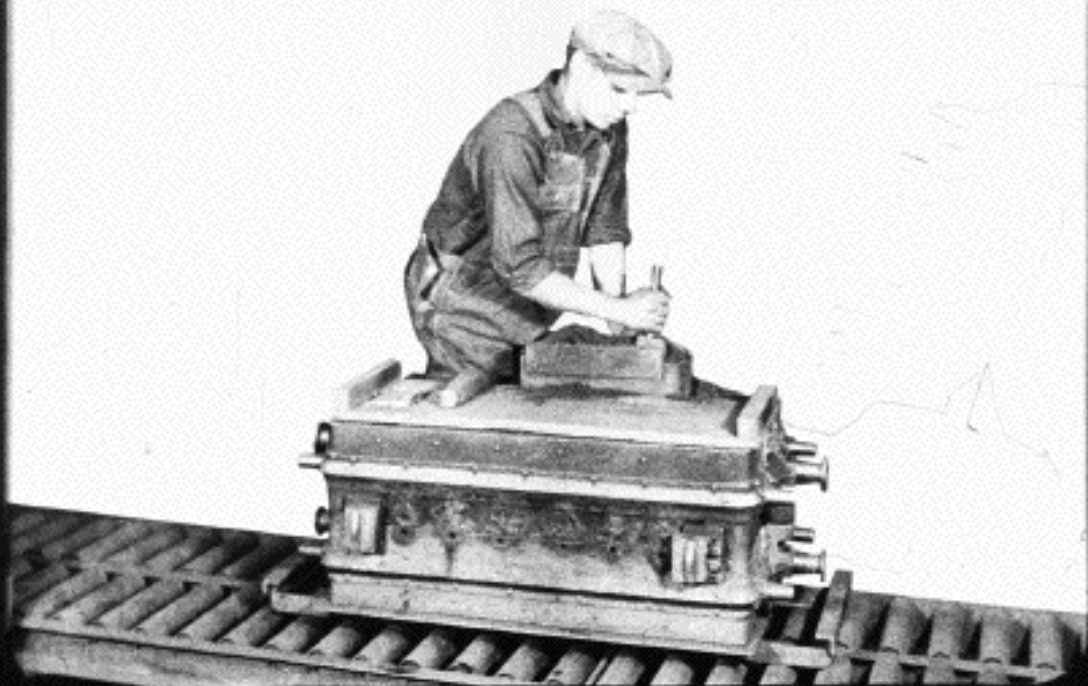
Extreme care must therefore be exercised in properly locating the core.

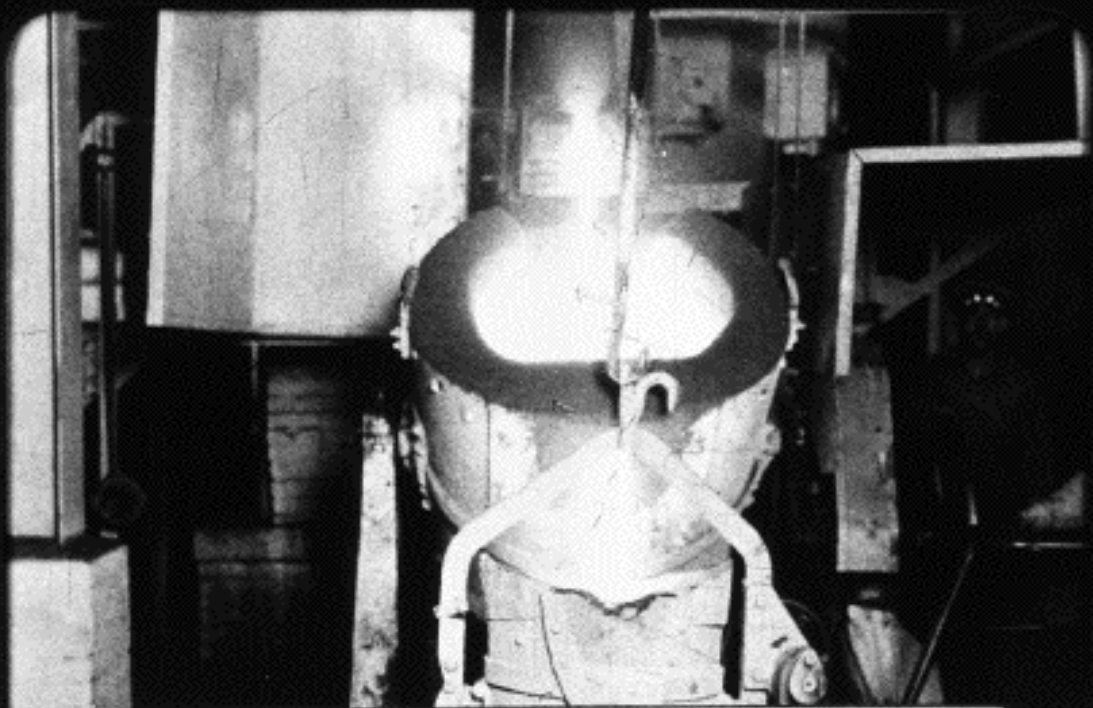


After an inspection of the entire mold and position of the core, the second half of the mold is put in place --



A pouring basin (funnel) is built up and all is in readiness for pouring the molten metal.

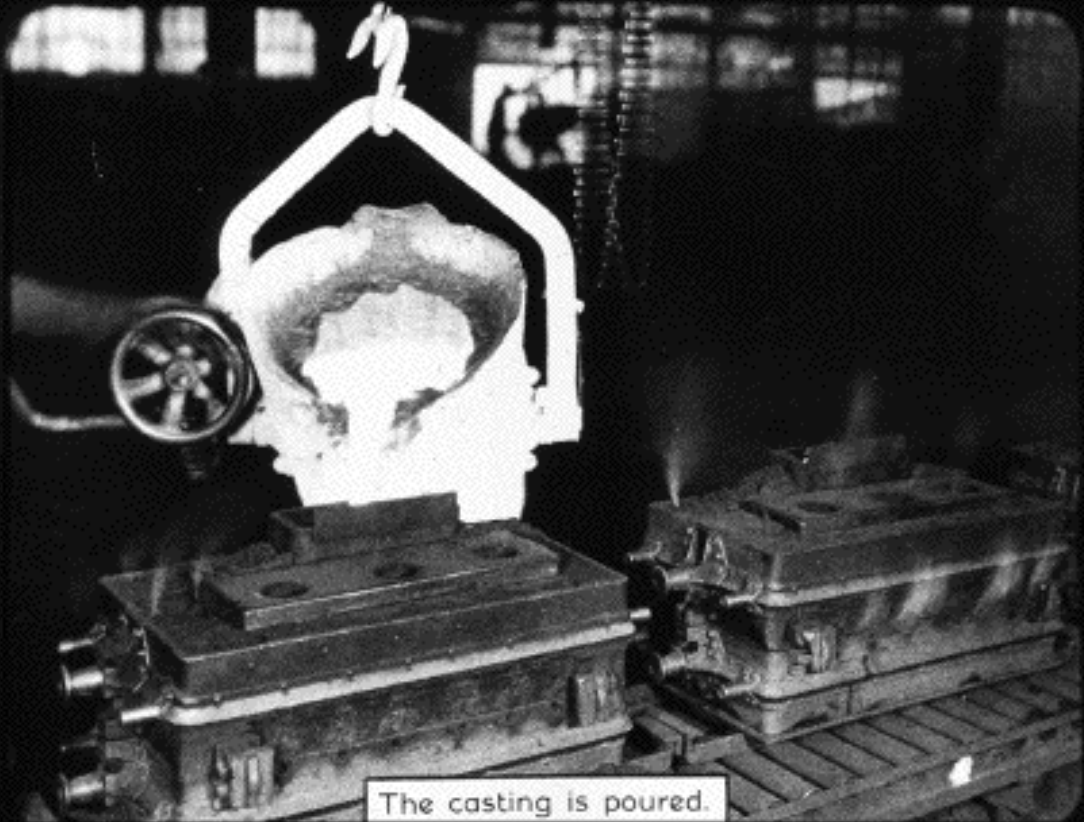




A constant stream of molten metal runs from the cupola into the receiving "bull" (bucket), from which portable pouring "bulls" are filled.

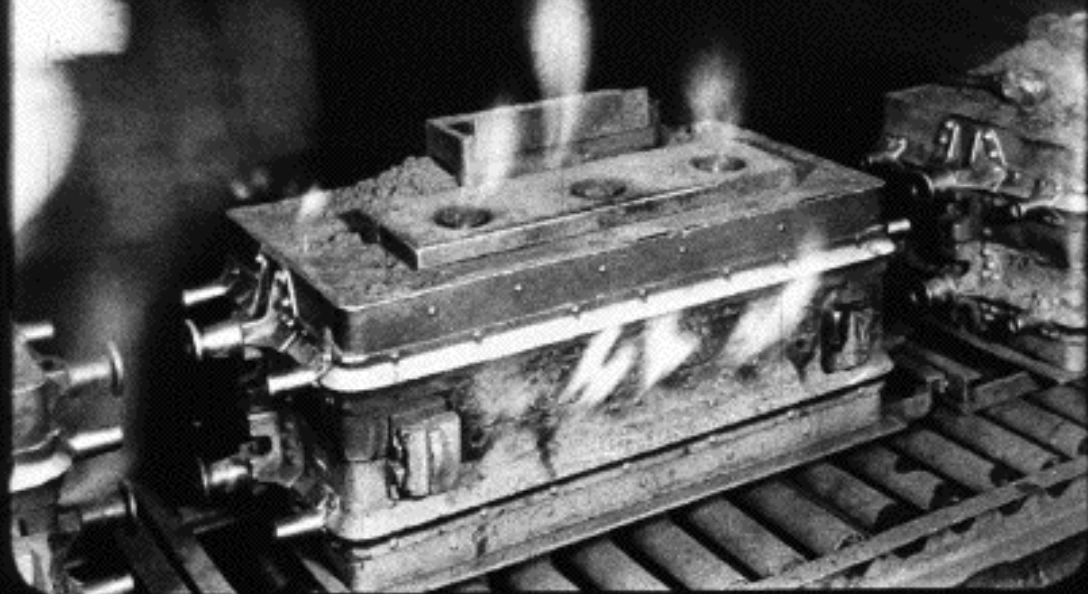
The pouring "bull" full of molten metal travels via an overhead track to the location of the mold and - -

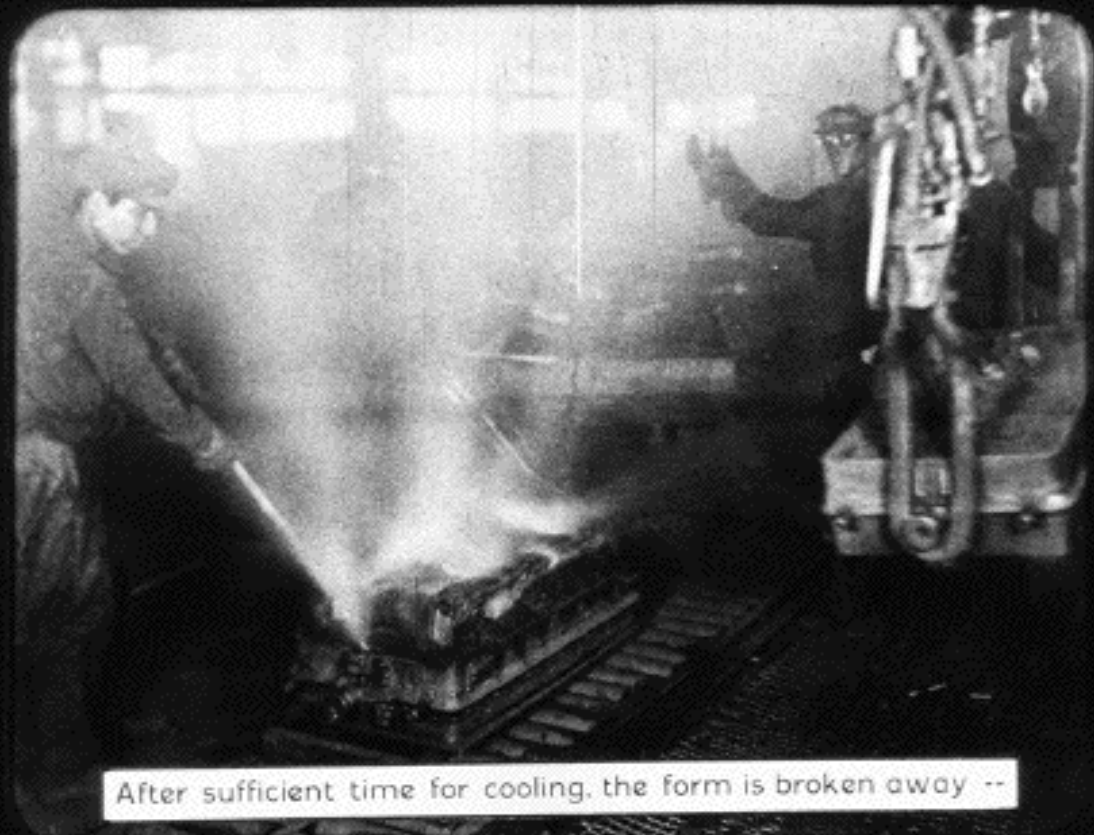




The casting is poured.

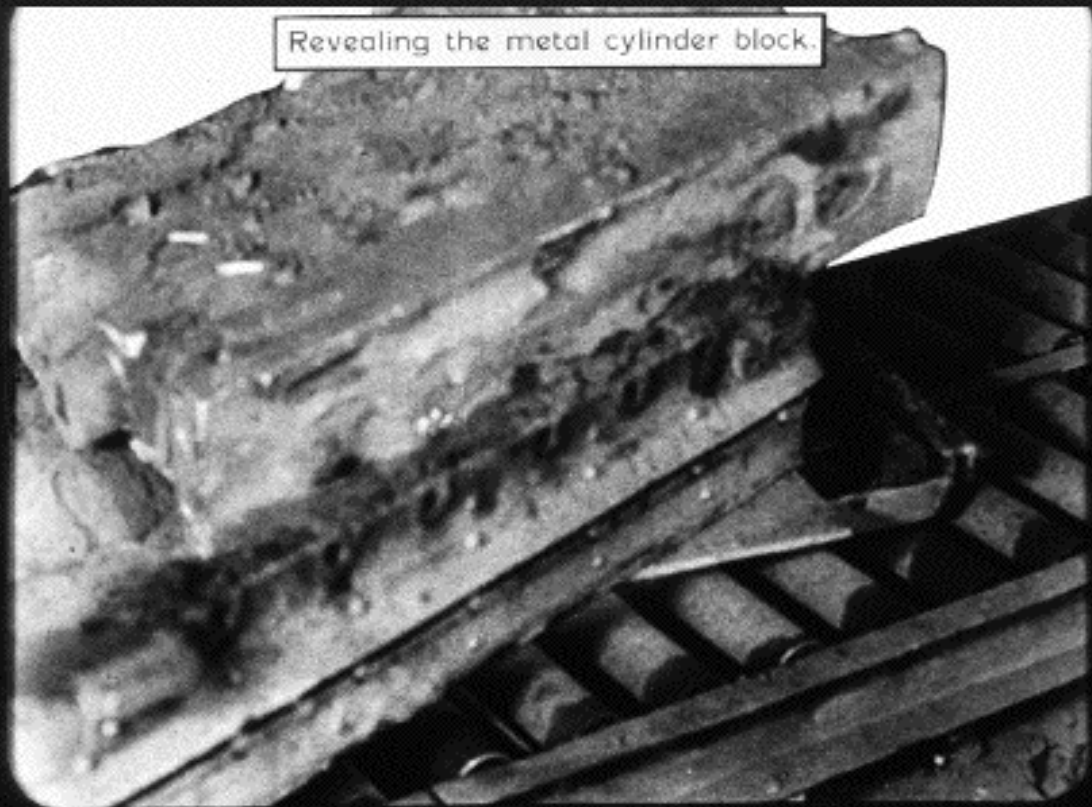
Vent holes in the form allow the gases to escape and insure against bubbles forming in the metal.



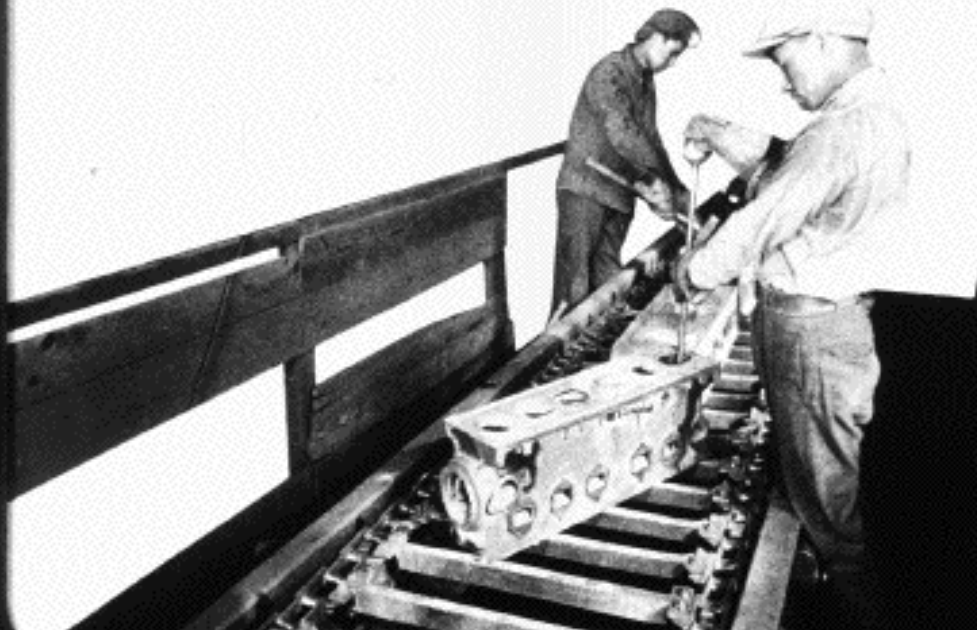


After sufficient time for cooling, the form is broken away --

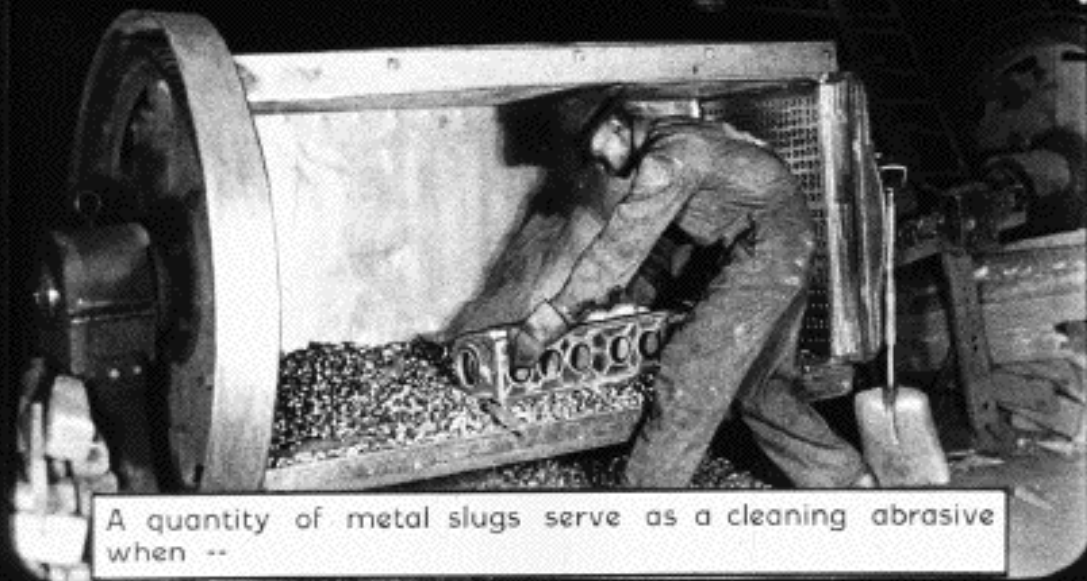
Revealing the metal cylinder block.



The core is removed from the water channels and --

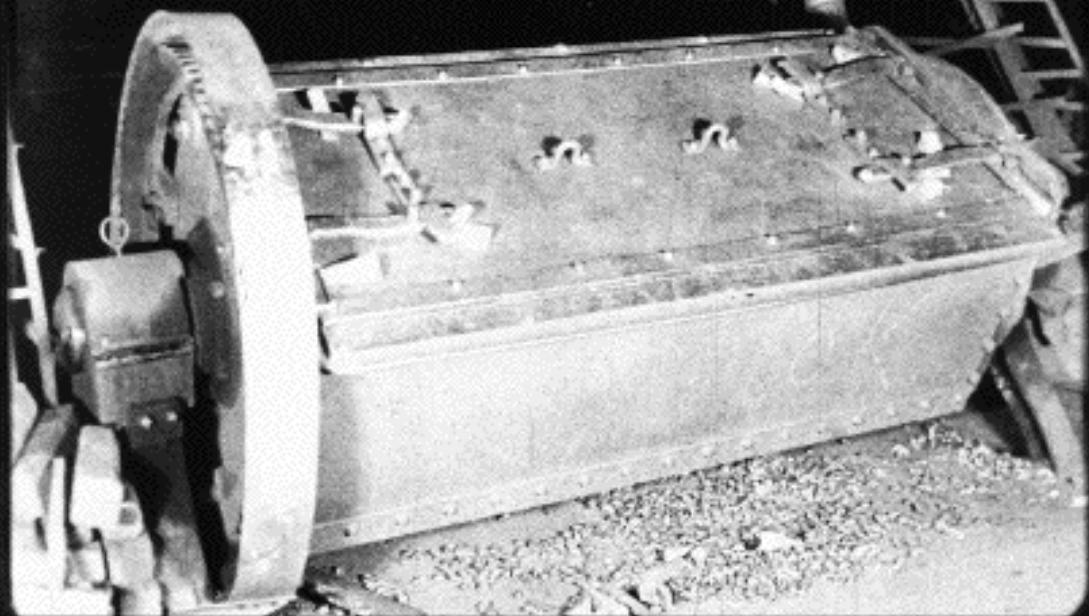


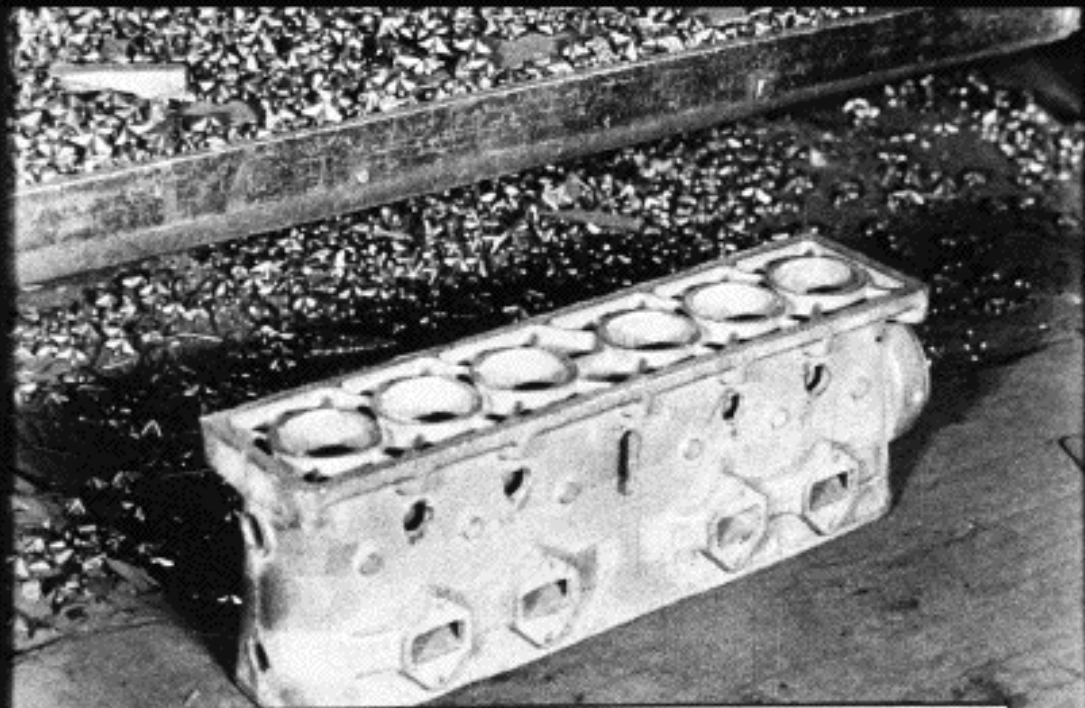
The casting is placed in a tumbling barrel for cleaning.



A quantity of metal slugs serve as a cleaning abrasive when --

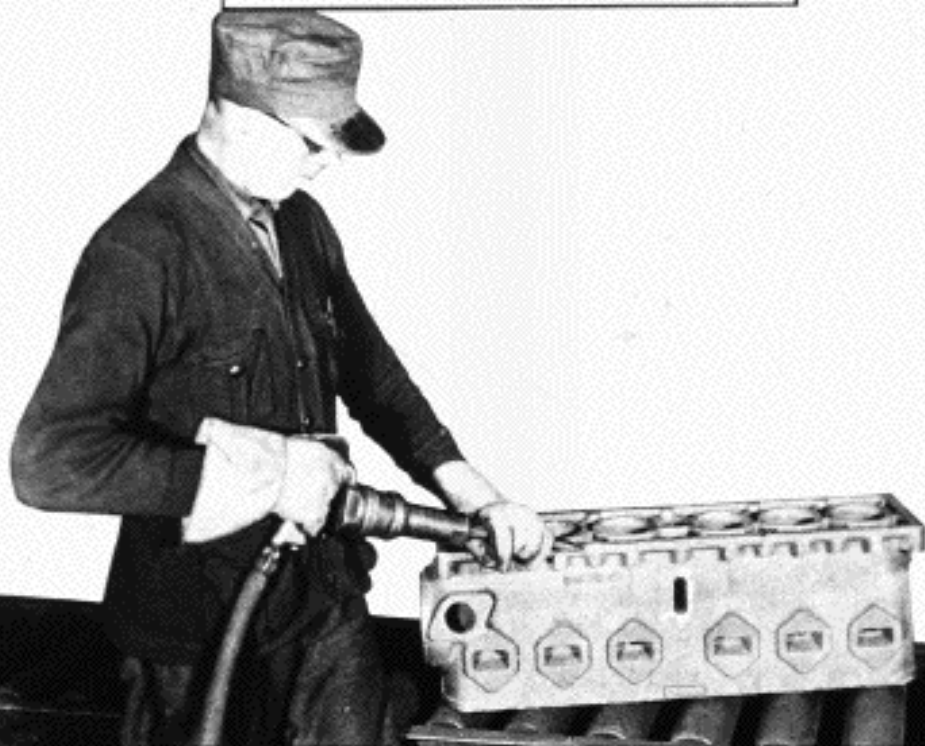
The barrel containing slugs and castings is rotated rapidly.



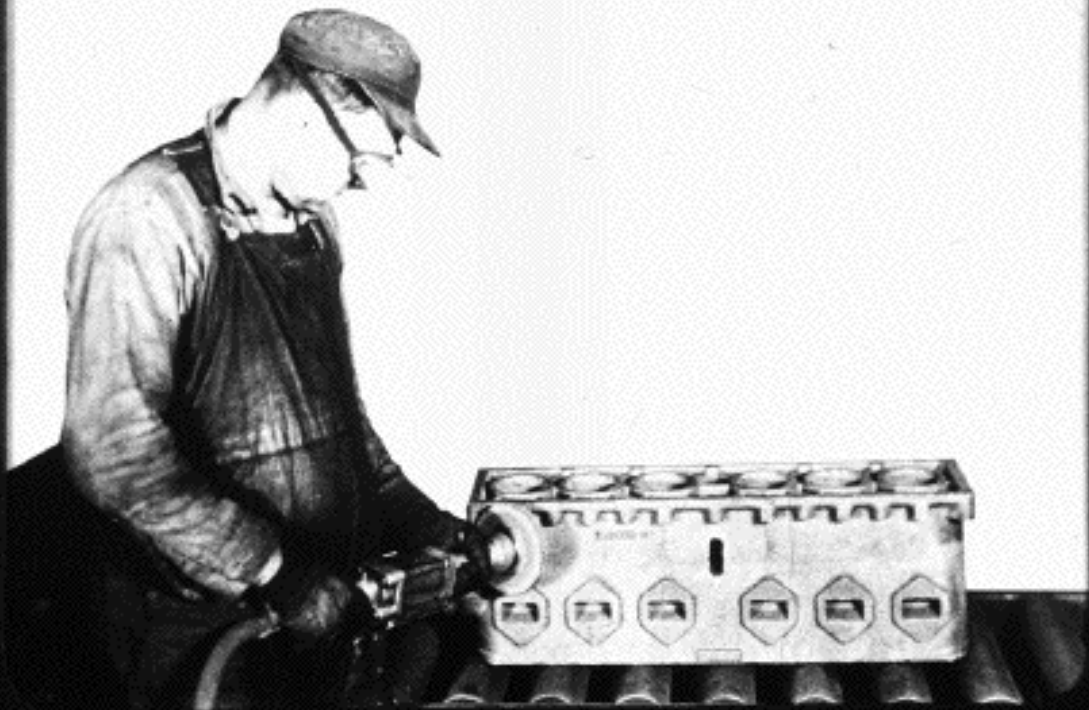


The casting is now free from all clinging sand and presents a fairly smooth surface.

Rough edges are chipped off and --



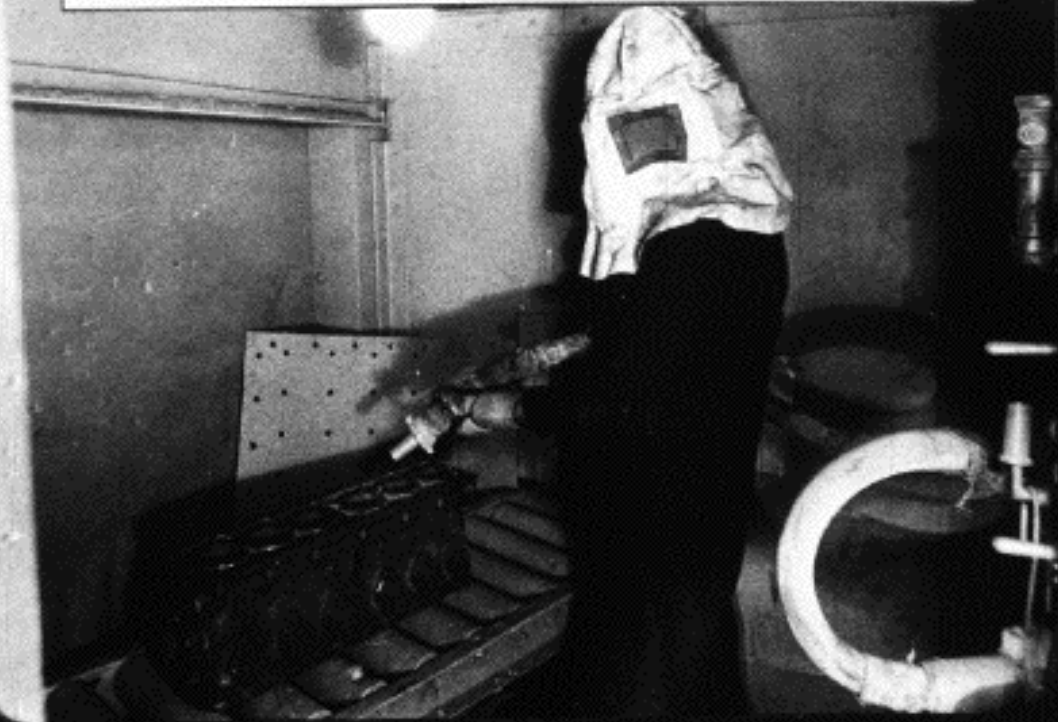
After a rough grinding operation --



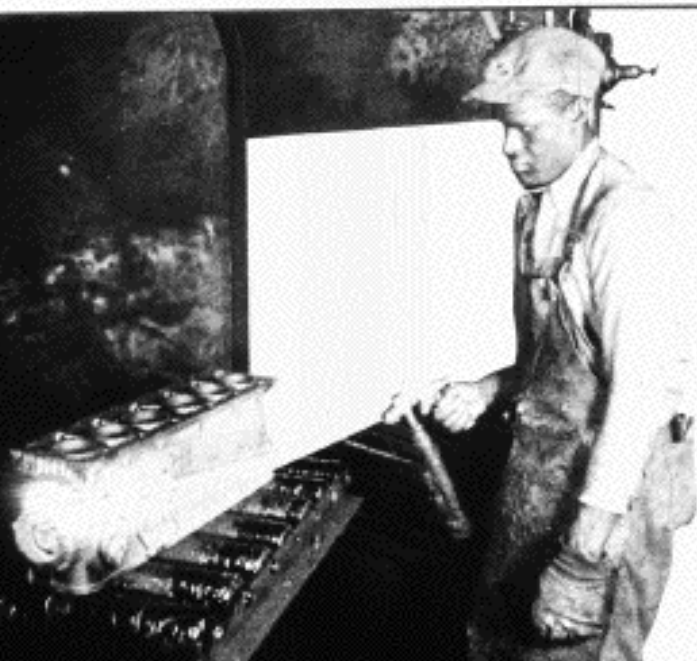
The casting undergoes a thorough inspection and is passed to --

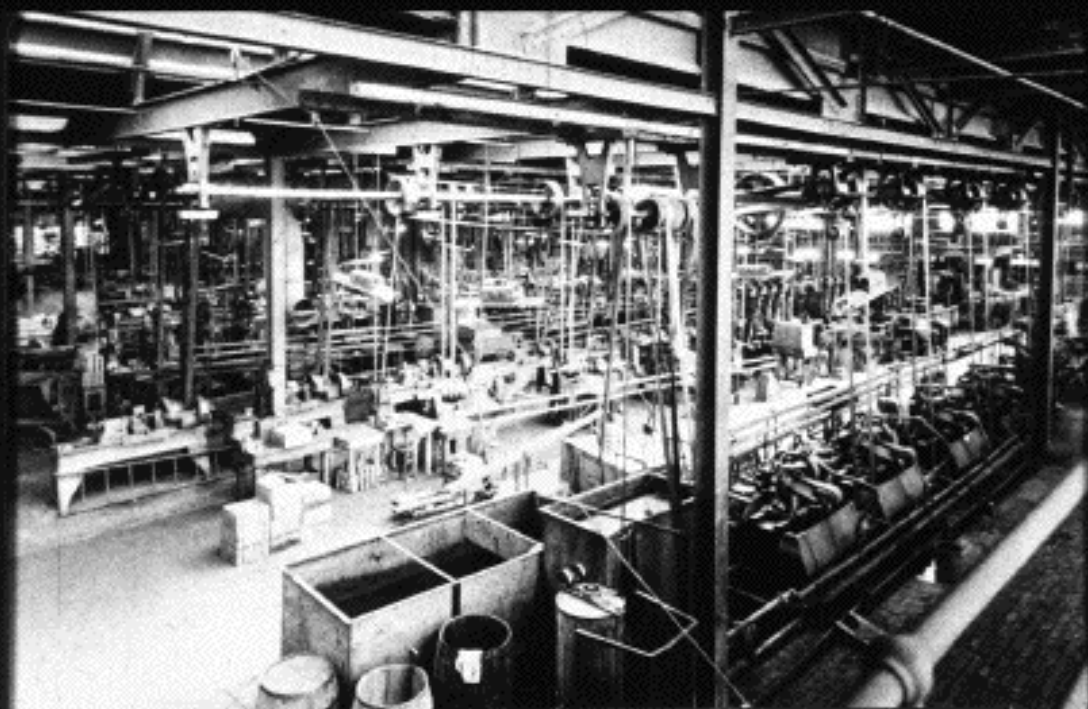


The sand blast room where the entire casting is thoroughly cleaned, presenting a smooth surface.



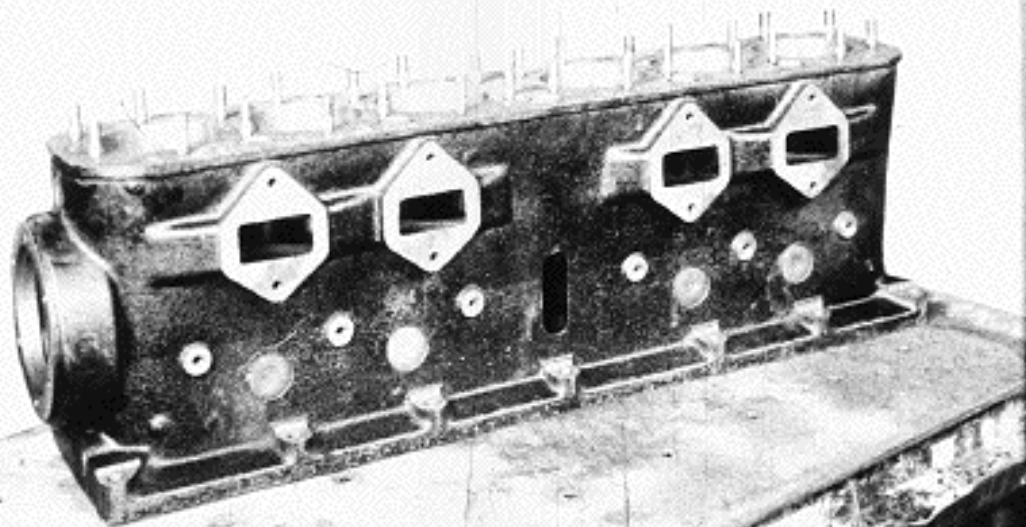
After a final inspection the block is painted, to seal any particles of sand that may still be held to the metal, before it is --





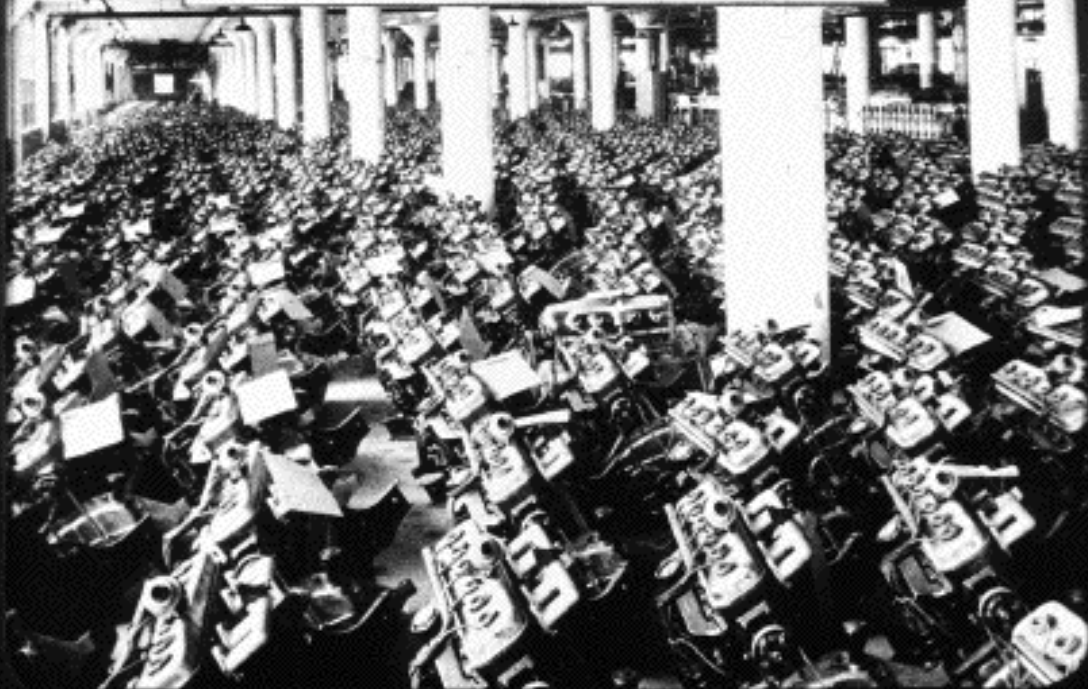
Passed on to the machine shop where skilled operators of specially constructed machinery produce --

The finished cylinder block.



All of this preparation, baking, pasting together and the many other operations required to make an accurate mold, produce but a single casting. When we consider the number of parts required to build just one engine and —

The number of engines produced in a day --



We gain a new conception of the skill and accuracy that go to produce a quality automobile --



FOR THOSE WHO WANT THE FINEST.

A dark, grainy image featuring a silhouette of a person in profile, facing left. The person's right arm is extended, pointing towards the word "End". The word "End" is written in a white, serif font and is positioned in the lower-middle part of the frame, overlapping the silhouette. The background is a dark, textured gradient.

End