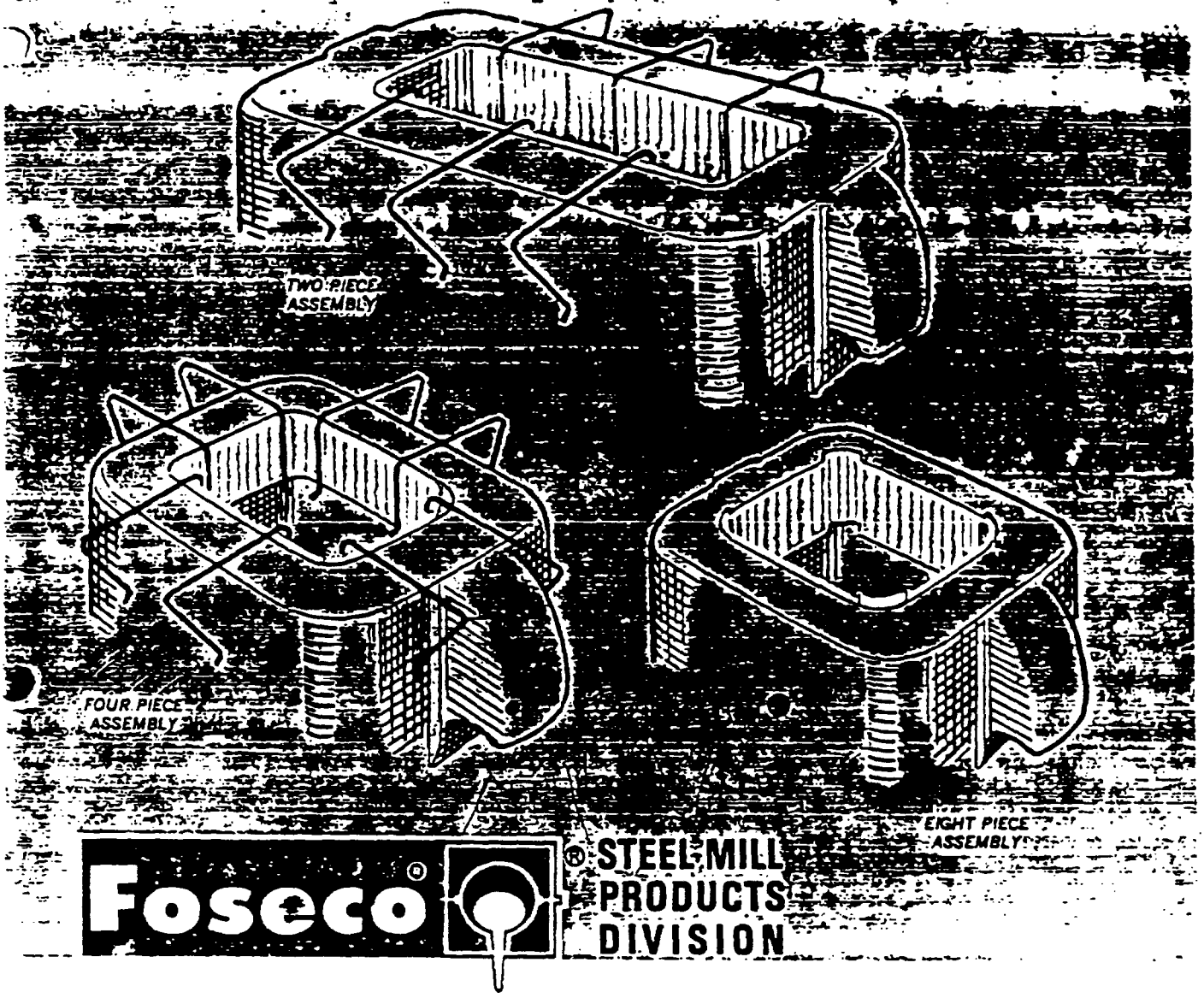

Foseco®

® STEEL MILL PRODUCTS DIVISION

FEROFAX® EXPENDABLE LOW VOLUME HOT TOP SYSTEMS

- ASSURE CONSISTENT HIGH PRODUCT YIELD
- IMPROVE INGOT QUALITY
- SAVE LABOR • SAVE TIME
- LOWER COSTS PER PRODUCT/TON
- INCREASE EQUIPMENT USE
- DECREASE STORAGE SPACE NEEDS
- CUSTOM ENGINEERED TO YOUR PLANT'S SPECIFIC NEED

* This product or its manufacture covered by one or more of the following U S patent numbers Re 25 905 Re 25 915 3 178 783 3 297 296 3 066 369 and 3 300 322.

FOSECO INC. 1967

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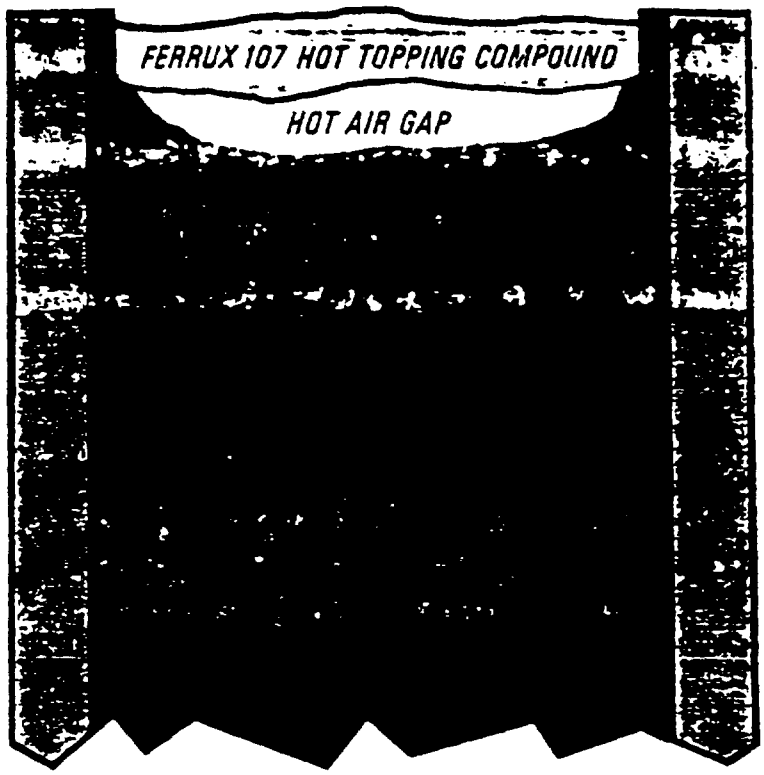
PLAINTIFF'S EXHIBIT FOS-40



THE PROFAX HOT TOP SYSTEMS FOR B.E.D. INGOTS*

Profax Hot Topping Systems provide a simplified, economical, highly efficient method of achieving maximum benefits from hot topping ingot molds. There is a Profax System available for use with any type of ingot mold.* Profax Systems are custom engineered to meet individual mills' production conditions.

1. **Two or four piece slab assembly:** for use in square and rectangular big-end-down molds,

or . . .

2. **Eight piece slab assembly:** consisting of four boards and four corner pieces for application in square and rectangular big-end-down molds

and . . .

3. **FOSECO Ferrux® 107:** exothermic insulating hot topping compound added to the mold after teeming.

Profax hot top boards are prefabricated, insulating liners produced on precision machines to tolerances impossible with conventional refractories. The exceptionally high insulating efficiency of the Profax material permits ¾" thin, tapered, low-volume hot top assemblies.

The wider, flat feed of the Profax Hot Topping Systems (due to the very thin hot top wall), plus the thermal efficiency of Ferrux 107 hot topping compound, results in an ingot with consistently dependable sound metallurgical structure.

Production experience at leading mills has shown that, with Profax, certain grades of steel generally made big-end-up can be acceptably and consistently produced big-end-down.

Profax is non-friable and promotes cleaner steel. When ingots are stripped, residual material falls away as a powder avoiding any carry-over of refractory material into soaking pits or rolling mill.

FOSECO's Profax systems are TOTALLY DRY . . . eliminating all dangers resulting from the residual moisture present in other hot topping systems during teeming.

PROFAX ADDS THE MAXIMUM YIELD

Because of its excellent insulating properties, the thin Profax wall alone provides the high thermal efficiency needed for a *low volume* hot top. The feather-edged bottom of the thin Profax liners results in ingots which

*FOSECO also has a one-piece Profax hot top liner for B.E.U. ingot molds. Request descriptive literature

are, to all practical purposes, shoulderless.

This permits full use of sound portion of the ingot. During rolling, the tapered shoulder disappears. (See Figures 9 & 17.)

The effectiveness of the Profax Hot Topping Systems results in ingots with pipe and segregation confined to the uppermost portion of the hot top metal resulting in extremely high product yield.

PROFAX SAVES TIME

Use of Profax Hot Topping Systems invariably results in significant savings of time.

Assembly of Profax hot tops is an easy, rapid, one-man operation. In the case of two or four slab assemblies, Profax boards are suspended into the mold, at controlled depths, from hanger rods. They are then secured with wire clips, powder-driven nails or other suitable fastening methods. (See Figures 1—4.)

In eight piece assemblies, where ingot size may vary, the four side boards are held in proper position by a collapsible jig. The locking corner wedges are then inserted and the jig removed. Where molds are used only for maximum size ingots, Profax boards are available with integral ledges or attached hangers to facilitate assembly.

Assembling 20 Profax hot tops per man-hour is a common accomplishment! The Profax boards are lightweight, moisture resistant, have good handling strength and are not easily damaged under steelworks conditions. No skilled labor is required and there is no need for cranes or other material handling tools.

PROFAX SAVES LABOR; INCREASES PRODUCTION FLEXIBILITY

The lightweight Profax material results in significant savings in labor at all stages of ingot production.

No cranes or other mechanical material handling equipment is required to install Profax hot tops. Therefore, hot topping can be accomplished at the pouring platform. A change in production scheduling, from rimmed to killed steel, can be easily met with rapid mold preparation even after the molds have been moved to the pouring site.

PROFAX REDUCES STORAGE SPACE REQUIREMENTS

The compactness of Profax materials results in great savings of storage space required for bulky, ordinary refractory materials. 120 palletized Profax hot tops for a 30" x 65" ingot mold can be stored in an area only 42" x 60".

PROFAX REDUCES COSTS

Adoption of a Profax expendable hot top system reduces net cost per product ton as a result of:

- Low cost hot tops
- Rapid, easy installation
- Reduced labor costs
- Elimination of installation cranes
- Reduced storage and freight costs
- Consistent, high-quality metallurgy
- Maximum ingot yield



FIG. 8. Typical four-slab Profax hot top install Recommended for use on large slab molds whe length to width ratio is less than 2:1.



FIG. 9. Slab (top) produced from an ingot mad a conventional hot top. Note over-roll and poc surfaces. Top discard of this slab was more than long. Slab (bottom) produced from same type but hot topped with Profax. Note excellent sur lack of over-roll. Sound product required a top only 3½ feet.



FIG. 10. The above pallet (measuring only 44" x 5 47" high) contains 75 eight piece hot tops for a 2 ingot mold.

COMPONENTS FOR A PROFAX 8 PIECE 22" SQUARE HOT TOP:

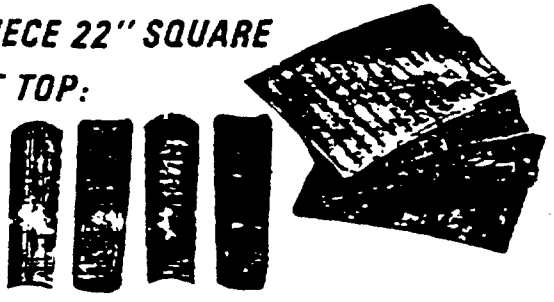


FIG. 11. Components for a Profax 8 piece 22" square hot top. Each side slab weighs 4½ pounds; each corner post 1½ pounds. Total weight: only 24 pounds.



FIG. 12. The 4 side slabs are held securely in place by an automatic jig as the 4 corner wedges are driven in. Complete assembly of the 8 piece Profax hot top is accomplished in less than two minutes.





FIG. 13. Profax 8 piece hot top assembled 6" below the top of the ingot mold (left) to produce a shorter hot topped ingot.

FIG. 14. Cross section view of ledged Profax boards which automatically position the hot top's depth location in the mold. This style of Profax is recommended where required ingot size does not vary from heat to heat.



FIG. 15. Profax 8 piece hot topped ingot treated with Ferrux 107 exothermic/insulating hot topping compound. Note the unbroken crust and absence of smoke.



FIG. 16. The same 22" square ingots are shown above after stripping. Notice the absence of any refractory material in the hot top area; the clean tapered shoulder at the hot top and ingot body junction; the flat feed which assures good center quality.

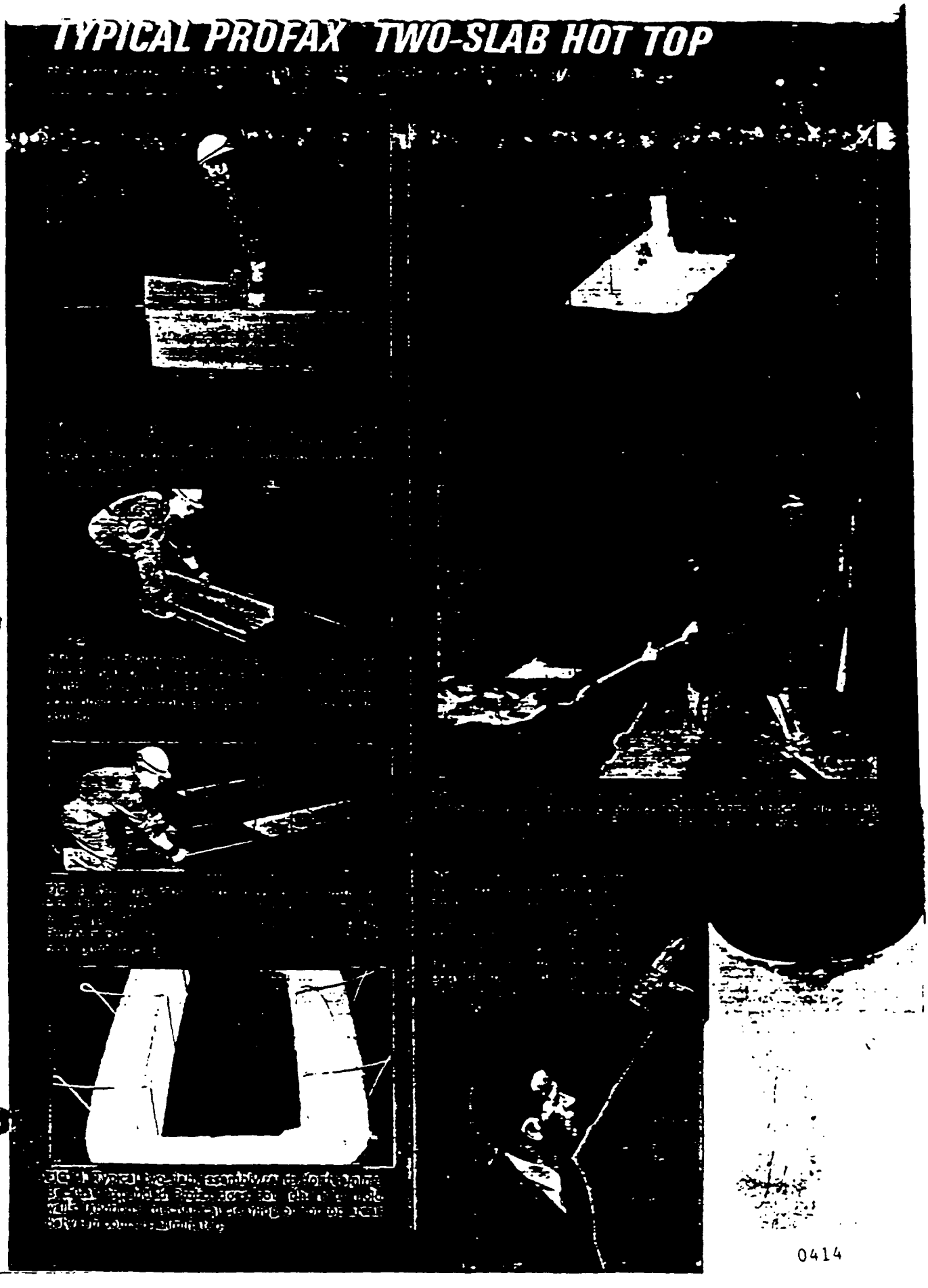


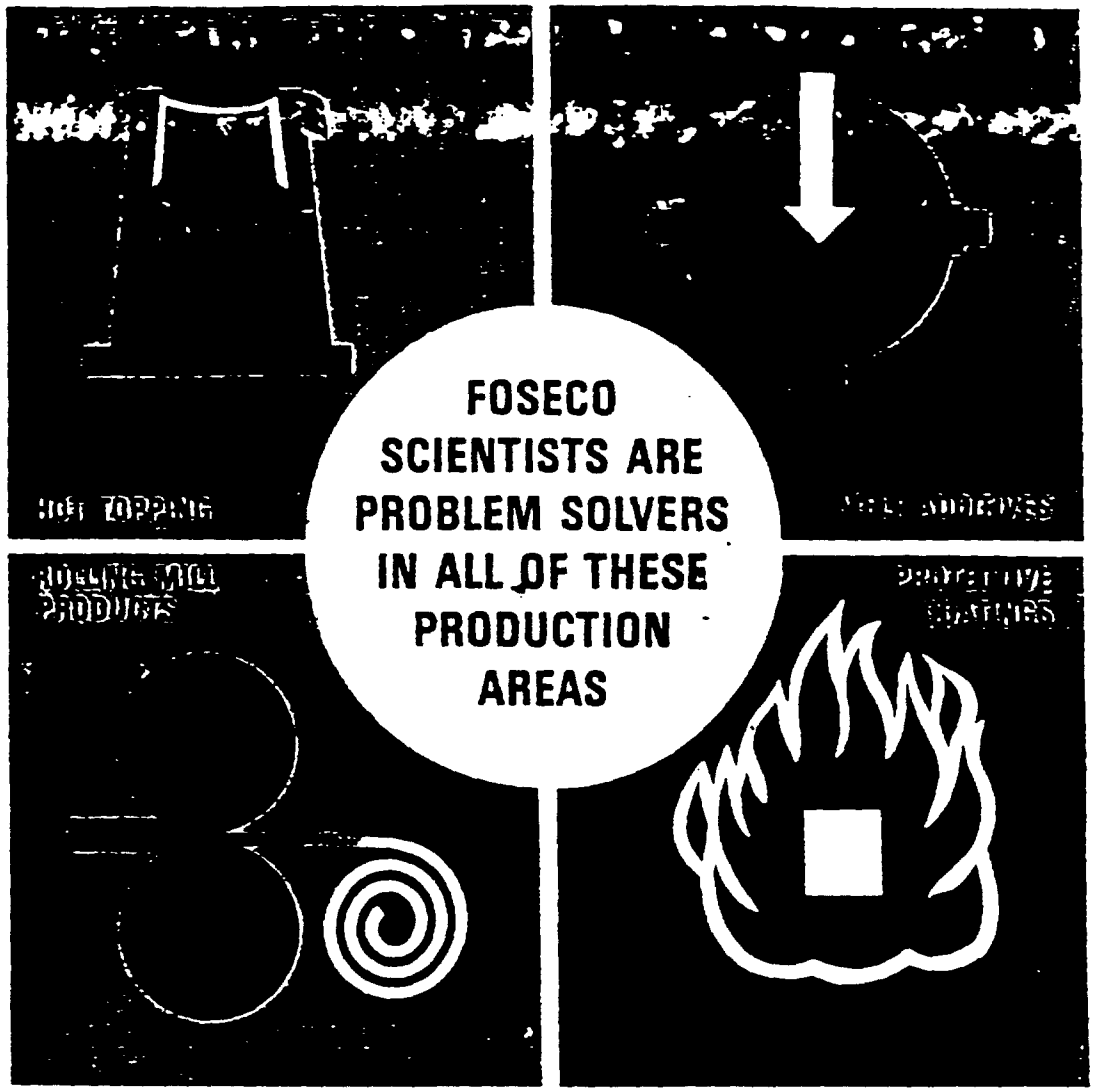
FIG. 17. Blooms made from the Profax hot topped 22" square ingot. The junction of the hot top and body is located approximately at the position of the rails. The lack of over-roll and absence of any entrapped refractory results in higher product yield.



FIG. 18. This is a macro-etch made from the top bloom of a 22" square, big-end-down ingot. Note the complete absence of pipe or segregation below the 3½% top discard area. Also note the cleanliness of the hot top/ingot junction and the sound metal in the undiscarded heat area.

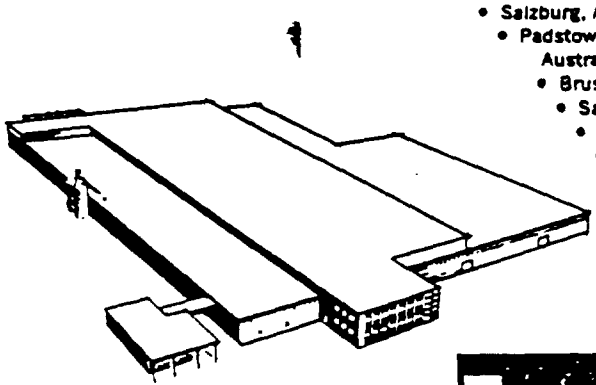
TYPICAL PROFAX™ TWO-SLAB HOT TOP





FOSECO MANUFACTURING PLANTS ARE LOCATED IN:

- Birmingham, England
- Buenos Aires, Argentina
- Salzburg, Austria
- Padstow, New South Wales, Australia
- Brussels, Belgium
- Sao Paulo, Brazil
- Guelph, Ontario, Canada
- Chelles (S. & M.), France
- Borken/Westf., Germany
- Woerden, Holland
- Bombay, India
- Milan, Italy
- Osaka, Japan
- Mexico City, Mexico
- Johannesburg, South Africa
- Barcelona, Spain
- Zug, Switzerland
- Tamworth, England
- Cleveland, Ohio, U.S.A.
- Mt. Braddock, Pa., U.S.A. (Eureka Fire Brick Works, Inc.)



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