

THE MECHANICS OF HERCULOCK

1 Preformed locks of high tensile strength alloys (which might be likened to the carpenter's corrugated fastener) are inserted into accurately prepared slots along the entire length of the crack or joint as illustrated. These locks, of varying sizes, are peened into slots with pneumatic tools, to a depth limited by the casting thickness and determined by the strength required, at intervals of from 3/4 inches to 1 1/4 inches apart. It will be noted that since the locks transverse the crack or joint, each of the serrated edges of the locks are placed in shear, in much the same way as would be a key in a key-way.

2 After the installation of locks, which may be from one to ten or more deep, illustration (of three locks deep) shows holes drilled and tapped to depth equalling the depth of installed locks. Metal studs or dowels or a combination of both, are placed, tangent and overlapping each other, along the entire length of crack. These, after cold working, ultimately fill the crack or joint with new metal. Purposes served are: (1) pre-stressing the metal locks; (2) insuring against leakage of pressure, i.e. water, steam, gas etc. and (3) by the added means of the threaded walls of studs, working in the parent metal is prevented as is looseness of joint in any direction, this completely rigidizing the area under repair.

3 Another form of lock is this metal inlay. Size, shape and metal used for inlay varies with the requirement of each repair or equipment operation. This is used in areas of high stress concentration, particularly where it is necessary to dissipate local stress over wider area; gain strength from internal ribs; or to obviate local cavitation such as sand holes, etc.

GENERAL — EACH REPAIR PRESENTS A SEPARATE ENGINEERING PROBLEM AND THE SIZE, SHAPE AND MATERIAL USED AS LOCKING DEVICES DEPENDS UPON THE UNIT UNDER REPAIR.

MATERIAL IS CHOSEN FOR ITS DUCTILITY, HIGH STRENGTH AND EXPANSION QUALITIES. BECAUSE OF THE POSSIBILITY OF VARYING THERMAL CONDITIONS OF THE UNIT UNDER REPAIR, EXTREME CARE IS TAKEN IN THE CHOICE OF MATERIAL TO MATCH THE CO-EFFICIENT OF EXPANSION OF THE PARENT METAL.

ALL REPAIRS ARE FINISHED SMOOTH AND FLUSH WITH THE PARENT METAL AND ARE DIFFICULT TO DETECT. ALL PICTURES IN THE PRECEDING PAGES ARE "TOUCHED UP" TO SHOW THE AREA OF REPAIR.



HERCULOCK
COLD CASTING REPAIRS

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