

## Two Stage CRUSHING IN ONE MACHINE!

GUNDLACH "Two Stage" Coal Crusher incorporates two crushing stages in one machine and is designed to reduce RUN-OF-MINE to 1/2" COAL in ONE operation. Compact design... utilizes structural supports and innovation. Rugged simple construction combined with engineering proved in the field makes this machine a profitable and reliable unit.

**MATERIAL SIZE CAN BE CHANGED WHILE MACHINE IS RUNNING**

Fulfilling an urgent need in the industry, the GUNDLACH "Two Stage" Crusher has delivered over 850,000 lbs. of coal from on-line mines in one lot.

All GUNDLACH Crushers are equipped with GUNDLACH Patented Crushing rollers. (Pat. No. 2,578,540)

**T. J. GUNDLACH Machine Co., Belleville, Ill.**

Crusher is patented without buyer and operator. **BUY TODAY FOR CRUSHER BULLETIN P-3**

## More TECHNICAL BRIEFS

Begin on page 154

ally rising cost of material and labor, larger equipment appears to be the best way of keeping unit capital and operating costs down. *ASME Paper No. 53-F-8.*

Directions for ordering papers on p 156

## Electricity

**Grounded Versus Underground Low-Voltage AC Systems.** By H B Thacker, Westinghouse Electric Corp.

Early industrial-plant distribution systems were almost all operated with the neutral insulated. This permitted operation with a ground on some device or part of the circuit. Also, the use of 440 or 550-v power-supplied from delta-connected transformer banks and the higher cost of wye-connected three-phase transformers with the neutral available for grounding discouraged the use of three-phase four-wire grounded-neutral distribution systems.

There has been a decided trend toward grounding low-voltage systems in industrial plants in the last ten years. Some reasons for this are: (1) More positive location of ground faults by tripping out only the affected circuit, and (2) reduction in the possibility of multiple failures of equipment and circuits from overvoltages resulting from ground faults.

Both of these reasons have assumed greater importance with the tremendous growth in industrial systems and electric power use. A third reason tending to increase the use of grounded systems has been the development and use of higher-voltage lighting supplied at 265-v. This makes attractive the use of three-phase, four-wire, 460 and 265-v wye-connected distribution systems.

This paper discusses advantages and disadvantages of grounded and ungrounded systems bringing out that, in general, neutral grounding is preferred, but that under certain operating conditions there are many applications where the ungrounded system provides an additional and highly desirable degree of service continuity. Methods of grounding both new and existing systems are discussed. *AISE paper. No number.*

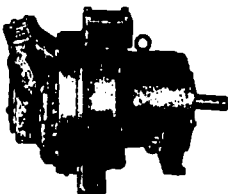
**Cathodic Protection of Mill Grounding Systems.** By J F Headlee, United States Steel Corp.

Great improvements have been made in circuit and equipment grounding systems. Two sources cause electrolysis in such a system: stray currents from dc generators and galvanic currents from two unlike materials in electrolyte.

## For QUALITY Specify

## PYLE-NATIONAL Turbines

1/4 to 120 h.p.



The Pyle-National line of highly efficient impulse type turbines is ideal for dependable mechanical drive of small machinery such as pumps, fans, blowers, stokers, abrasive wheels, agitators, and generators particularly where the exhaust steam can be used for heating and other purposes.

Since 1897 Pyle-National has manufactured their turbines entirely within their own plant... thus assuring positive control of quality and workmanship through all stages of production... from raw material to the final testing.

**SEND NOW FOR BULLETIN** containing complete information on these small and medium capacity turbines.

### TURBO-GENERATORS

Also available is bulletin on Pyle-National turbo-generators (500 to 15000 watts).

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FLOODLIGHTS • PYLE CONDUIT FITTINGS



POWER • DECEMBER 1953

## HI-LO LIMITORQUE

2 SPEED AUTOMATIC VALVE OPERATOR

..helps to prevent **SURGE** or **HAMMER** during closure of valves..

The name *Limitorque* has been for years synonymous with dependable **MOTORIZED VALVE OPERATION** in Refineries, Pipe Lines, Power Plants, Water and Sewage Works... throughout the World.

Now, a device is available for use with *Limitorque* which permits a valve to be operated at 2 different speeds. This device, known as the "HI-LO" attachment permits the speed of the valve stem to be **VARIED AT ANY PRE-DETERMINED POINT...** or if required, the valve may be opened at one fixed speed and closed at another pre-determined speed.

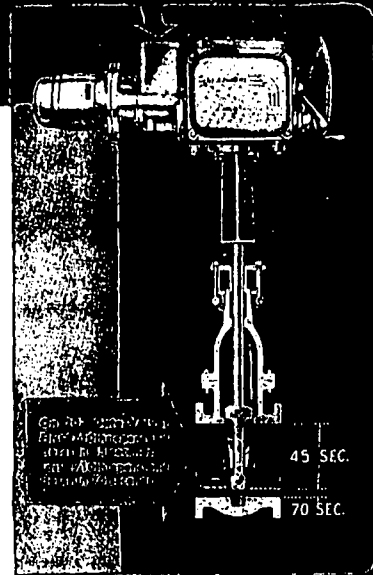
"HI-LO" is a device which prevents:

- DAMAGE to valves and station pumps.
- BREAKS in pipeline caused by "surge".
- DAMAGE to expensive equipment.
- INJURIES to personnel.

"HI-LO" is a device which minimizes or completely eliminates:

- LINE "SURGE" OR "HAMMER" during closure.
- NECESSITY OF BY-PASS VALVES because of greatly increased torque during initial valve opening.
- ELEMENT OF HUMAN ERROR, to a great extent, in operation.

The 2-Speed "HI-LO" is new, different, exclusive, and when combined with *Limitorque*, gives simple, positive, automatic and safe motorized valve operation.



Above illustration shows a 20" Gate Valve with first 9/10ths of travel closed in 45 seconds—and last 1/10th of travel to close in 70 seconds. However, change from high to low speed can be made at any pre-determined point of travel. Operation can also be fixed to obtain one speed closing, and one speed (either faster or slower) in opening of valve.

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247