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DOORS ★ HARDWARE ★ ROOF SUMPS ★ OPERATORS ★ CONTROL

R. V. HARTY CO., INC.

MANUFACTURERS OF

HARCO PRODUCTS

1433 SLOMAN AVE. ○ PHONE TOwnsend 8-6990

DETROIT 11, MICH.

April 4, 1957

Att: B. A. Groff
Carbide and Carbon Chemical Company
South Charleston, West Virginia.

Gentlemen:

A #300 type Source Elevator has been designed especially for your requirements.

Our Drawing # N-76, Sheet #1, shows a section through the well and a general arrangement of your cell. You will note that the platform raises two (2) feet above the floor of the cell when in up position. The operating machinery is placed entirely outside the cell. The equipment is made of stainless steel. Our Drawing # N-80, Sheet #5, shows a plan view of storage well with the elevator in position.

Note that the platform travels on its own set of guides which are entirely independent of the operating mechanism. Drawing #N-79, Sheet #4, shows the elevator in the up position and the locking mechanism locked. Note that on the bottom of each of the four angles forming the frame for the platform, there is a hydraulic check. Because of the fact that this platform sets in a well with one side open, it is necessary that in case of emergency, the platform is dropped and that it would be brought to a cushioned rest. This is to prevent the source from tipping off the platform. Drawing # N-78, Sheet #3, and Drawing # N-81, Sheet #6, shows the locking device and release. Drawing # N-78 shows an elevation showing the locking device and release device of the releasing mechanism for this locking device, that locks the platform in the up position and the hand and fuse link releasing device for dropping platform in an emergency. Drawing #N-81 shows two (2) sections of N-78. Section AA shows how the platform is carried to the up position by a pair of chains connected together by a bar. This bar (called lift on drawings) continues to travel for about 6"

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after the left hook is locked in position. The platform is now completely free of the hoisting mechanism. Section BB shows a cable for lreasing the lift hook. It is only necessary to push the lift hook off the top of the bearing blocks and the elevator platform will drop to the bottom of the cell.

The lifting mechanism consists of two (2) #41 stainless steel chains running over two (2) 3" sprockets mounted on a 1" shaft with Graphalloy bearings. This shaft is extended out through the side of the well under the floor of the hot cell to a lifting mechanism drive under the floor.

This consists of a steel box outside which houses a torque type motor with resistors, and a gear box with a proper reduction to lift the source at an approximate five (5) feet per minute.

A torque motor is used to drive the lift because we can insert resistors in series to the leads to the torque motor and regulate the torque to suit our needs.

By using a torque motor, we can limit the power thus insuring our hoisting mechanism against overloads.

A special fixture is mounted on the two (2) #41 chains and a bar called the lift bar, extends across between these two chains. This bar engages in the lift hook and raises and lowers the elevator platform. When the platform reaches the top, this bar rotates around the sprockets, pulls the hook in and drops it so that it engages the top of the bearing block of the two sprockets. The left bar continues to travel for approximately 6" and leaves the lifting hook and platform free of the hoisting mechanism. The lift hook can be pushed off the top of these blocks first, by a cable running to a hand release and second, by a cable running to a fuse link and weight so that should the fuse link melt, the weight will drop, pushing the lift hook off of its position and dropping the platform to the bottom of the cell.

When the platform is dropped manually to the bottom of the well, it is necessary to disconnect the limits to the operator and run the lift bar on around until it engages in the lift hook in the bottom then the limits are reset. The limits are so designed that resetting the limits at the bottom automatically sets the limit at the top.

The entire hoisting mechanism can be lifted out of the well at any time without interfering with the well platform. Any repairs that have to be made to the chains, etc., thus can be made with the platform in the bottom of the well.

The elevator hoist motors are controlled by open, close and stop push buttons. If the hoisting equipment is stopped on the way up, it will automatically reverse itself and go to the bottom of the well. In other words, in case of power failure when the source is being raised, the source will go back to the bottom of the well.

This insures that the source will either be locked in the up position or in the bottom position. There is no intermediate position.

Each one of the #41 chains has a breaking strength of about 2,800 pounds. Two (2) of them, approximately 5,600 pounds and the total that they will have to lift at any time is 250 pounds.

All bearings are of Graphalloy, water lubricated and are not affected by radiation.

Provisions are made in the limit switches to actuate signals when the platform is moving. Visual signals show the position of the platform either up or down. Unlocking circuits for the radiation meters, cell doors, and other safety requirements.

When the elevator is dropped mechanically either by the fuse link melting of the hand release, none of the warning signals will indicate properly, as these are connected into the hoisting mechanism and only indicate the position of the hoist.

This elevator is made of all standard equipment and throughout has a safety factor of approximately 20 to 1. This is necessary to give the reliability required by a unit of this type.

I am,

Yours very truly,

R. V. HARTY CO., INC.

R. V. Harty,
President.

RVH: gp