

Subject: Oil Storage System at Calumet & Hecla Mine.

The oils and greases used at the above mine are stored at and distributed from a building located at a point about 300 feet east of the line of shafts on the Calumet conglomerate lode and about midway between the north and south boundary lines of the property.

The building is a one story structure, of solid brick construction, concrete floors and wooden roof, with an addition thereto in which the caked wax is stored when prepared for delivery.

A solid brick wall divides the main floor of the building into two large rooms, one room being used for a paint shop and the other and larger room, 26' x 100', is used for oil storage.

In the larger room, also, is located the equipment for melting and caking petroleum wax.

Oils and greases are received at this building in carload lots of about 70 barrels. No shipments in tank cars have ever been received. In fact, the storage capacity is not adequate for such large quantities.

The barrels, filled with oil, are rolled into the building, lifted by a chain hoist to a height about three feet above the floor level and emptied by gravity, one by one, into tanks or wells, which tanks are fitted with brass wire cloth strainers, which serve to collect any foreign matter that may be in the barrels.

A small steam pump is located near these tanks and forces the oil through 1½" pipes into large storage tanks. These tanks, cylindrical in shape, are made of ½" steel plate. These tanks stand upright or vertically, and are placed at such height above the floor level as will permit the filling of 5 gallon oil cans by gravity through an oil gate or spigot located on the side and near the bottom of the tank. The location of this oil gate is such that from one to five barrels of oil always remain

in the tanks, depending on the diameter of the tank, which would not be the case were the oil drawn off from the bottom of the tanks, instead of the side. The tanks are provided with manholes to permit the same to be entered by an employee when necessary to clean out the accumulation of sediment and foreign matter. The oils are distributed mostly in 5 gallon cans to the buildings where used, some of the cans being marked with metal labels, permanently affixed for regular deliveries, and with heavy manila tags for deliveries that are made intermittently. The filled cans are delivered by a one-horse dray which performs no other work. The cans are emptied into the stationary oil tanks in the engine houses and other buildings, and the empty delivery cans are brought back to the oil house on the return trip of the dray. Petroleum wax, packed in inexpensive cooperage, such as second hand sugar barrels and other like barrels, (from which, by the way, no returns are obtained for empty barrels, as they have no marketable value), is also received in carload lots. When the wax is removed from the barrels, it is in the shape of a solid mould conforming to the shape of the barrel in which it was packed. This mould of wax is sufficiently solid to permit of its being handled by a chain hoist with which it is raised from the floor to the melting vat, the latter cylindrical in shape, about 7'0" diameter by 2'2" deep, made of steel plate, about $\frac{3}{8}$ " thick, and having a false bottom, and false sides up to within about 12" of the top of the vat. The space between the outer shell of the melting vat and inner shell or false bottom is about 4". Steam is piped to the false bottom of this vat and heats the wax until it becomes soft enough to flow by gravity through a pipe, when it is drawn off into trays made of galvanized iron. These trays measure 3" wide at the bottom, $3\frac{1}{4}$ " wide at the top,

$2\frac{1}{2}$ " deep and 8'0" long. The melted wax is poured into these trays until it reaches a depth of about $1\frac{3}{8}$ ". The trays of wax are placed on a rack, made of wrought steel pipe, four tiers high, as shown on the accompanying sketch. At one end of the rack, which holds the trays of melted wax, is a latticed opening in the north wall of the building, through which air, cooled by dripping water, enters and circulates around the trays.

After the wax in the trays has cooled and has become hard enough to permit of its being handled, the trays are taken, one by one, to a table and inverted and the long mould of wax, when removed from the tray, is cut into cakes of uniform size by a knife operated by the foot of the employee assigned for this task. The length of the cakes is regulated by a gauge placed at the end of the table and about $4\frac{1}{2}$ " beyond the blade of the cutting off knife. The cakes of wax fall into a chute and are carried by gravity to a receptacle on the floor of the oil house. The cakes of wax are then packed by hand into old fuse boxes, powder boxes, brought up from underground, or any other boxes in which supplies for the mine are originally received, and these boxes containing the moulded cakes of wax are placed in storage in a shed adjoining the oil house until required for use, when the same are delivered by dray to the several change houses. About 30,000 lbs. of wax, made up in cakes, is kept in stock at all times.

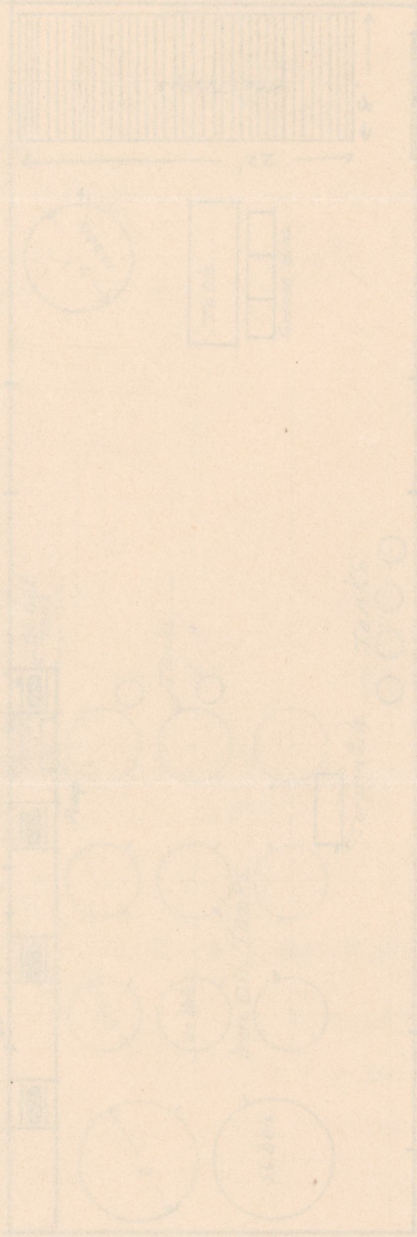
The wax which adheres to the staves of the barrels is removed by hand, steel scrapers being used for this purpose. The hoops are removed from the barrels and the staves placed upon a table and scraped.

The expense of melting and caking the wax is estimated by Mr. Johnston to cost one-tenth of a cent per pound.

Only a limited storage capacity is provided for grease, three bins, made of sheet steel, with a total capacity for about $1\frac{1}{2}$ barrels of grease, are located near one end of the room.

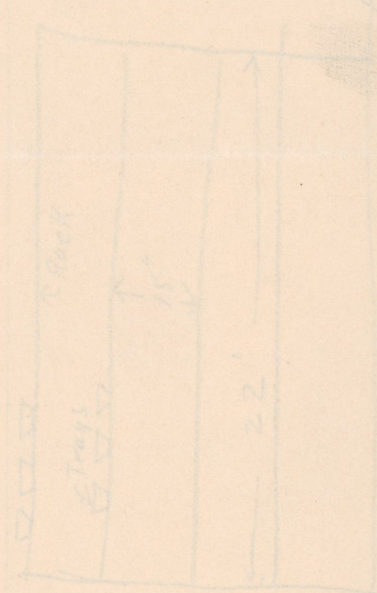
The enclosed sketch shows a floor plan of the building and the general layout of the equipment therein.

W. J. Richards
H. T. Mercer
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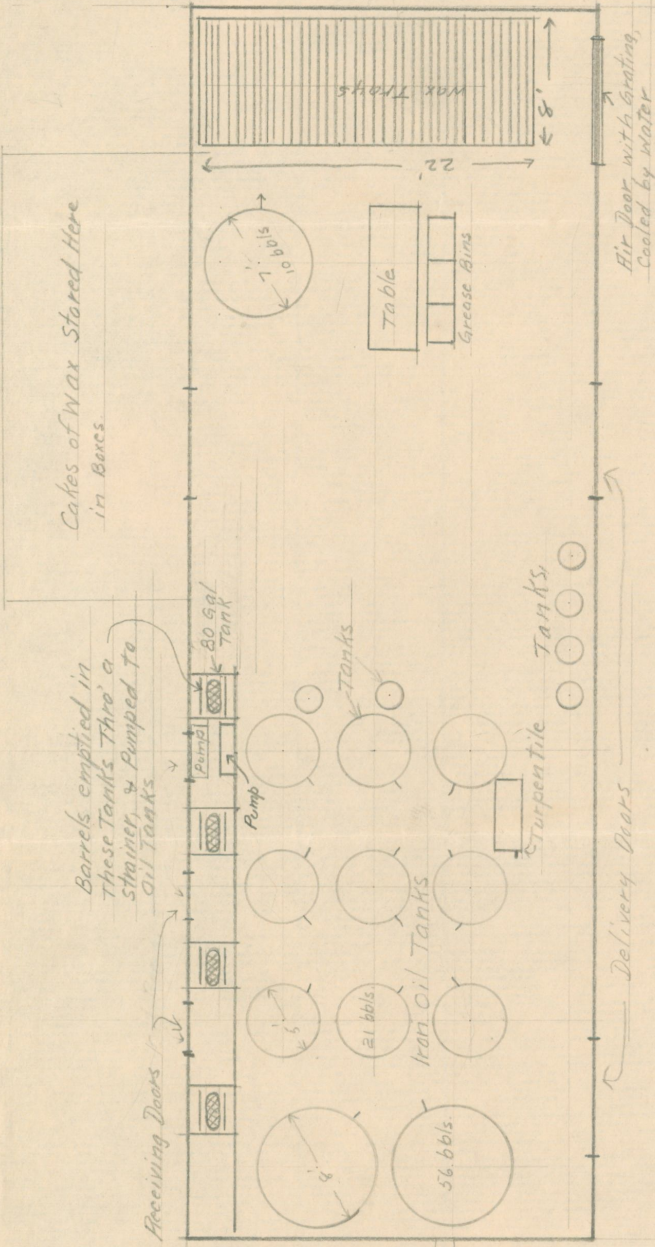


ROUGH PLAN
OF
C.V.M. OIL HOUSE
1 1/2 20'

Each iron was trays 3' wide at bottom, 4' at top, 4' deep, 8' long
5' and one eye position 4' long 2' apart vertically
Center of iron 4' long 1' apart, 4' apart
Oil House, about 26' x 20'



Rough Sketch of C. & H. Oil House



Cakes of Wax Stored Here in Boxes

Barrels emptied in these Tanks thro' a strainer, & pumped to Oil Tanks

Galv. Iron Wax Trays 3" wide at Bottom, 3 1/4" at Top, 2 1/4" deep, 8'-0" Long
 Set on Pipe Rack, in 4 Layers, 15" apart vertically
 Cakes of Wax = 4 1/2" Long, 1 3/8" Thick, & weigh 8 lbs.
 Oil House = about 26' X 100'

ROUGH PLAN
 of
 C. & H. OIL HOUSE,
 1" = 20'

