Telescope

25¢

VOL. 4 JANUARY 1955 NO. 1

A MONTHLY JOURNAL OF THE LAKES

HISTORY, BIOGRAPHY, MODEL SHIP BUILDING

EDITORIAL PAGE.

WE ACKNOWLEDGE WITH GRATITUDE

For three years we have been building TELESCOPE into a magazine of, for, and by the people of the Great Lakes. It has taken a lot of work, a lot of careful planning, and the entire income of the Guild, to accomplish what we have to date accomplished, but we have not yet reached our goal. That goal is a monthly publication that will do full justice to our subject, the story of the development of commercial shipping on the Great Lakes during the past three centuries, with attention given to maritime events as they happen. so that in the future there will be centralized records for the benefit of all.

From the beginning we have believed this undertaking to be well worth while. That we of the Guild are not alone in that belief is becoming increasingly evident and we are now able to announce that the Detroit Historical Society has made us a grant of five hundred dollars, to be used for the purpose of enlarging TELESCOPE so that we may be better able to present to our readers the materials that have been made available to us by such distinguished authorities as are listed here.

Mr. Ray Christianson, President of the Christy Corporation.
Mr. A.J.Zuehlke, Vice President, Manitowoc Ship Building.
Mr. R.A.Stearn, Naval Architect and Consulting Engineer,
and many others.

We are most grateful to the Detroit Historical Society for their generous cooperation and shall exert increased effort to carry out our program so as to merit their trust.

A CHANGE OF POLICY

As a result of several inquiries from commercial interests regarding advertising space in TELESCOPE the Board of Directors believes the time has arrived when it is in the interest of all concerned to accept such advertisements as may be offered, so long as these will in no way detract from the magazine. Manufacturers and vendors of merchandise related to our work and the needs of our members or subscribers may obtain space rates by applying to the editor.

J.E. Johnston,
Editor:

Telescope
PUBLISHED BY
GREAT LAKES MODEL SHIPBUILDERS' GUILD
BELLE ISLE DETROIT 7, MICHIGAN

R. H. Davison,
Associate Editor

Subscription....$2.50: Over seas subscriptions additional .50: Single copies.....25¢

ASHLEY AND DUSTIN

From the viewpoint of the average landsman there is a lot of romance connected with ships that the shipping fraternity misses as he goes about the many tasks that make up his daily work. The landsman sees a beautiful ship moving upon the water or feeling her way into her berth, with a few men in sight and going about their work with a deliberate air which belies the seriousness of their purpose. It all appears so easy, and so it is, after years of experience.

The higher the rank the less the officers and men seem to do. As for the Captain, he just doesn't do any thing at all, -apparently. Actually, it is the other way around, and in the shipping world everyone does his part, and is rewarded accordingly, except the owners and managers.

Owners do not, as the landsman may believe, just decide to place a ship on a run, for no particular reason other than wanting to do it. Before operations begin on any run it must be determined if there is going to be enough business to make it worth while. Many factors enter into it.

First: Is the business there, or can it be developed? Then, is there a ship available that is suitable for the trade? What will she cost to purchase (if not already owned) and how much will it cost to operate her in that particular run? What will it cost for port facilities? These and many other questions must be looked into before a decision is made.Every successful line of steamers on the Great Lakes has been the result of the vision, and the careful planning of its founder, or founders.

A little more than a hundred years ago the Mad River and Lake Erie rail road was completed between Sandusky and Cincinnati, making the former the gateway to the South for towns on and around Lake Erie, including Detroit.

John Owen, of Detroit, seeing the possibility of profit, built the old Arrow, and made her the connecting link between his home town and this promising gateway. The Arrow, as she appears to us in pictures, was not much of a boat, but to Detroiters of her day she was a fast,palatial ship for business or pleasure.

For some reason the Arrow was taken off that run and the Bay City put in her place. The railroad which put the Arrow in business brought an end to the successful operation of the Bay City when the Detroit,Monroe,and Toledo began running trains. The road captured so much business, both freight and passenger, from the settlements around the western end of Lake Erie, that Owen's venture could no longer show a profit.

For a while the T.Whitney made a try at the same run, but her speed of six miles an hour attracted few passengers.

The beginnings of the Ashley and Dustin company date from 1863 when W.O.Ashley and four other men put the sidewheel steamer Philo Parsons on the Detroit-Sandusky run. Ashley is said to have served as clerk on the Parsons, and sometimes as the captain.

The Parsons is best known for her part in an affair which has been, by some, classed as piracy. (The full story of that event in a later number of TELESCOPE.)

The Parsons stayed in the run only two or three years, and was followed by the City of Sandusky, which must have been unprofitable,since records show that after only a part of a season she was succeeded by the little steamer Island Queen, operated under charter by Ashley.

By 1867 there was both leisure and prosperity in the region and Put-in-Bay was becoming a resort place. Mr. Ashley, saw an opportunity for a fast, comfortable,boat in this trade and with the financial aid of John P. Clark, of Detroit, built the Jay Cooke and inaugurated the Put-in-Bay service on July 4, 1868.

After thirteen years in the run the Cooke was sold to a group of men on Middle Bass Island who ran her between Put-in-Bay and Sandusky.

Walter O.Ashley entered the picture as clerk of the Philo Parsons and by the time the Cooke came out he was a partner in the firm which eventually became known as Ashley and Dustin. His steamboating career began when he became clerk on the Dart, owned by Captain Selah Dustin, and operated between Detroit and Port Huron.

Born in Claremont, N.H.,October 26 1835, he came to Detroit when he was twenty-one years of age. It appears that he was with Captain Selah Dustin about six years and during that time must have been careful with his money for he was able to invest some of it in the Philo Parsons venture.

John Clark had acquired a fortune through successful business ventures of various kinds, his first being commercial fishing, out of Wyandotte Michigan. He had come up the hard way, and looked upon young Ashley as one of his kind, and worthy of great trust. Ashley in accordance with the best traditions of the times, married Florence Clark, one of the daughters of his wealthy associate.

One of Clark's enterprises was a shipyard, located in Detroit, at foot of Clark Avenue. Here he had built the Jay Cooke, and the Alaska, that succeeded her in 1882, making the Put-in-Bay run until she burned, at Detroit in 1889.

The Pearl and the Gazelle, both Clark-built boats, filled in for the following year and in June 1890 the famous steamer Frank E.Kirby entered the trade.

Up to about 1886, the operating company had been known as Ashley and Mitchell, but Mitchell dropped out and Oliver S. Dustin, then just a 17 year old high school student took his place. Later his brother,Edward A. Dustin, joined him, and the two managed the line until Edward died in 1922. After that Oliver carried on alone.

The Frank E.Kirby ran between Sandusky, Toledo, Cedar Point, and the Islands of western Lake Erie, with Detroit as her home port. The speed record she set was never beaten in her time. In August 1894 she made a run from 12th Street, Detroit, to Put-in-Bay, a distance of about sixty miles, in two hours, fifty-four and three-quarter minutes. In 1927 she was sold, and renamed Dover. June 23, 1932 she burned, along with several other boats, at the foot of Great Lakes Avenue, In Ecorse.

The Ashley and Dustin Company as we of today knew it, was organized in 1911, and one year later they brought out the steamer Put-in-Bay, a propeller-driven vessel which made the usual runs every season until Oliver's death,October 15, 1948,after which the business was taken over by Nicholas Constand, along with the name. Ashley had dropped out long before.

Constand made a valiant effort to continue the service, but the day of the excursion boats had passed. After two seasons the Put-in-Bay remained tied up at the dock in Detroit until, to satisfy a Federal Government loan, she was sold at auction, for a mere pittance, and bought in by Troy H. Browning of Detroit.

In the fall of 1953 she was towed out into Lake St.Clair and the wooden superstructure burned away in order to reduce the cost of salvaging the metal parts, and so ended the Ashley and Dustin story, so far as visible evidence is concerned.The A&D office at the foot of First Street, in Detroit was razed to make way for the grand buildings of the Civic Center.

The Dustin family had been active in steamboating for 114 years,leaving behind them an enviable record of good business practices, and general fair play. After the death of Oliver Dustin, the Museum of Great Lakes History was given the opportunity of preserving many of the objects which were associated with the company and its long history.

GUILD OFFICERS FOR 1955

President, Robert H. Davison
Vice President, John F. Miller
Secretary-Treasurer, J.E.Johnston

Board of Directors

John F. Miller.	J.K. Helgesen.
J.E.Johnston.	Walter Massey.
Frank Slyker.	Don Chown
Robt.L.Ruhl	Leo M.Flagler.

DONATIONS NOW DEDUCTIBLE

The Department of Internal Revenue has designated the Great Lakes Model Shipbuilders' Guild as an organization which may receive donations that are deductible for income tax purposes.

"STEAMER PUT-IN-BAY"

DESCRIPTION: A single screw passenger and/or excursion vessel (day service only) built by the Detroit Shipbuilding Co. at Wyandotte, Mich. 1911; five decks (including orlop deck), two masts, plain head, eliptical stern, guards, five watertight bulkheads.

Riveted steel construction to B deck (hull, guards, orlop and main decks, main deck cabins and trunks); B deck stringers of steel, deck and cabins of wood; C deck stringers of steel, deck and cabins of wood; D (boat) deck longitudinal stringers of steel, transversals of wood, deck and skylights of wood, pilot house and texas of wood, canvas covered. All wooden decks exposed to weather are canvas covered.

Powered with a four cylinder triple expansion engine; steam furnished by four single-ended Scotch boilers, burning oil for fuel.

Vessel fitted to accommodate a crew of 51 persons (berth and feed) and has sufficient deck area and equipment to be allowed 2,440 passengers May 15 to September 15).

TONNAGE: 1,182 gross tons; 731 net.

DIMENSIONS, etc.: Length 226.01', beam 46.5', depth 17.6', beam over guards 60.0', freeboard 4' 7", draft 8' 6" forward, 12' 62 aft.

ENGINE: One four-cylinder, triple-expansion 25"-40"-45"-45" x 36" #186 steam engine built by the Detroit Shipbuilding Co. in 1911.

PLANS OF THE PUT-IN-BAY

This month we feature plans of the Detroit and Put-in-Bay steamer "Put-in-Bay. The original builders' plans were made available to us by the American Ship Building Company, through the courtesey of Mr.Kent Thornton,the Chief Naval Architect of that firm.

The two upper decks will be in the February TELESCOPE, making a complete set. The three sheets comprising this set are now available for $3.50, plus 30¢ for packaging and postage.

MUSEUM NOTES

During the month of January there will be an exhibit of paintings by John Hopkin, at the Detroit Historical Museum, Woodward at Kirby, in Detroit. Not all of these will be marines, but there will be enough of them to make a special visit by any of our members well worth while.

Another exhibit, during February, is being planned by the Guild, and it is scheduled to follow the Hopkin showing, at the same place. This one will present watercolors by Alfred Pfister, of Niles, Michigan, who was mentioned in a recent number of this magazine.

PLANS NOW AVAILABLE

Milton, a G.L. scow schooner. One sheet.	$1.50
Put-in-Bay. Excursion steamer Three sheets.	3.50
J.T.Wing, now the museum ship. Two sheets.	2.00
Walk-in-the-Water. First steamer above Niagara. One sheet	1.00
Onoko, first iron-hull bulk carrier or ore ship One sheet.....	1.50
Butcher Boy, a Huron boat. Two sheets.....	2.00
John Ericsson, whaleback bulk carrier. One sheet..... (Scale 1/8")	1.50
John Ericsson, 1/16" scale.....	1.00
Michigan (1833) sidewheeler.... Two sheets.	2.00
Wilfred Sykes, (1950) modern bulk carrier.One sheet. Scale 1/16"	1.50
U.S.Coast Guard Surf Boat,(1900) Two sheets.(1/4" scale)	2.00
Grampian, a three-mast schooner-rigged tow barge..... One sheet.	1.50

If mailed folded add ten cents,postage. Rolled, in mailing tube, parcel post, insured, add 30¢.

The above plans are the result of cooperative effort on the part of a number of Guild members and members of the staff of the Museum of Great Lakes History.

SUMMER TIME CARD
OF THE
PUT-IN-BAY STEAMERS.

The Steamers connect with each other at
PUT IN BAY
FOR AND FROM
BUFFALO, DETROIT, CLEVELAND, TOLEDO & SANDUSKY.

ALASKA AND PEARL

ONE OF THE ABOVE STEAMERS

Will leave BUFFALO FOR Cleveland and Put-in-Bay
Every Day, Sundays excepted, At 6 P. M.
Leave CLEVELAND for PUT-IN BAY, Daily, Sundays excepted, at 8:30 A. M.

Will leave PUT-IN-BAY FOR Cleveland and Buffalo,
Every Day except Sunday, at 3 P. M.
Leave CLEVELAND for BUFFALO, the same Evening, at 8:00 o'clock.

JAY COOKE

Will Leave DETROIT For the Islands & Sandusky
At 8.30 A. M., daily, Sundays excepted.

Leaves SANDUSKY for The Islands and Detroit,
At 5 P. M.

Leaves PUT-IN-BAY for SANDUSKY
At 1 P. M. Arrives at Sandusky 3.00 P. M.

Leaves PUT-IN-BAY for DETROIT
At 6.50 P. M. Arrives at Detroit 11.30 P. M.

CHIEF JUSTICE WAITE

Will Leave TOLEDO
Every Morning at 8 o'clock, arriving at PUT-IN-BAY At 11.30.

Returning, leaves PUT-IN-BAY at 3 P. M., arriving at TOLEDO At 6.30 P. M.

On Saturdays, during July and August, makes Two Trips.
Leaving TOLEDO 8 A. M. and 4:30 P. M.
Leaves PUT-IN-BAY at 12.30 P. M. and 9 P. M.
Previous to JUNE 18 and after Sept. 10, makes TRIPS TO THE ISLANDS WEDNESDAYS AND SUNDAYS ONLY UNTIL NOV. 5th.

GAZELLE

Will leave SANDUSKY FOR The ISLANDS
Daily, except Sundays, at 10.05 A. M. and 7.00 P. M.

Leaves PUT-IN-BAY for Kelley's Island & Sandusky
At 6.30 A. M. and 3 P. M.

On Sundays, makes One Round Trip, leaving Sandusky at 9 A. M. and Put-in-Bay at 3 P. M.

THE CALVERT LITH. CO. DETROIT.

A Daylight Ride Among the Islands of Lake Erie.

FROM JUNE 1ST UNTIL NOVEMBER 1ST INCLUSIVE

THE FAST & POPULAR STEAMER

JAY COOKE

CAPT. L. B. GOLDSMITH. ALVIN S. CLARK, Clerk.

WILL LEAVE

DETROIT

— FOR —

The Islands and SANDUSKY

At 8:30 A. M. Daily, Sundays Excepted.

Connects at Put-In-Bay with Splendid Steamers for Cleveland, Buffalo and Toledo.

Leaves PUT-IN-BAY FOR **SANDUSKY** At 1 o'clock P. M.
ARRIVES AT SANDUSKY AT 3.00 P. M.

LEAVES SANDUSKY FOR THE ISLANDS & DETROIT AT 5 P. M.

LEAVES PUT-IN-BAY FOR **DETROIT** AT 6.50 P. M.
ARRIVING AT DETROIT AT 11.30 P. M.

Ask for Tickets by the Put-in-Bay route.
Excursion from Detroit to Put-in-Bay every Wednesday and Saturday; tickets $1.00.
For further information, apply to or address,
ASHLEY & MITCHELL, Gen'l Agents, Detroit, Mich.

THE CALVERT LITH. CO. DETROIT.

SUMMER TIME CARD OF PUT IN BAY STEAMERS ON LAST PAGE.

THE ERIE ISLANDS EXCURSION BUSINESS WAS BOOMING IN THE SEVENTIES

The above advertisements indicate the magnitude of the Erie Islands excursion business in the seventies.

The number of steamers employed and the frequent sailings, show that W.O.Ashley's guess was a good one.We will, in our next number, attempt to publish pictures of all of the boats mentioned in the above cards.

Reading between the lines one may note an attitude, towards the Sabath which did not prevail in later years of the excursion business.The Pearl, the Alaska, and the Jay Cooke made no Sunday runs, and the Gazelle made only one. The Chief Justice Waite operated on a less God-fearing schedule on the run from Toledo to the islands. Another significant item is the length of the season,--June 1 to November 1. In the later years Labor Day was the end of the season.

The popularity of the Erie Islands as a resort area is indicated by the service that was maintained between them and Buffalo, Cleveland, Toledo, Sandusky, and Detroit.

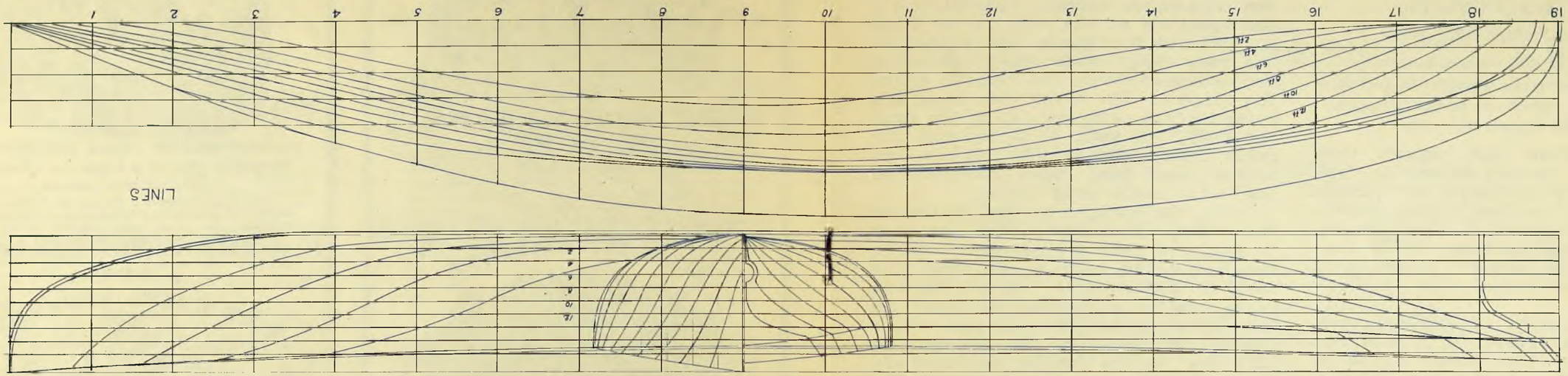
HOTEL ACCOMODATIONS ON THE ERIE ISLANDS LEFT LITTLE TO BE DESIRED

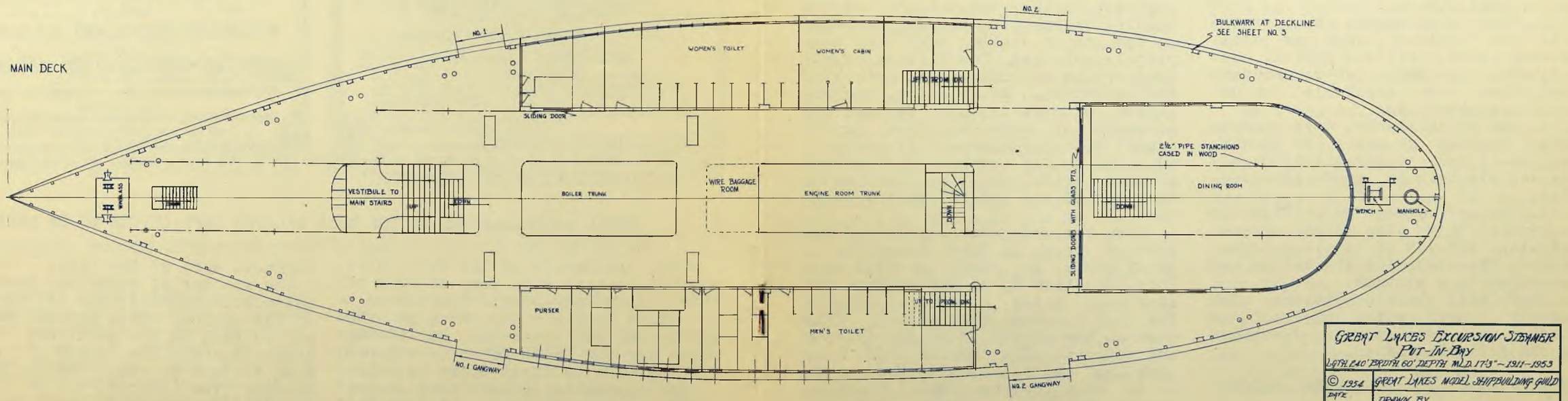
While the hotels of the Erie Isles may not compare with some of ours of today, they ranked well above lots of others of their day, both in size and in quality. Both the Put-in-Bay House and the Beebe House were known far and wide as first class hostels.

The islands still have some summer visitors, but the boats which in the old days were held in great esteem are all gone, and the few small ones which merely serve as ferries on the short runs from adjacent points like Port Clinton, Ohio, are considered a nuisance to be endured and not a delightful part of the trip.

The visitor of today may have his automobile ferried over to the isle of his choice, whisk around quickly and be back on the mainland, if not home, in about the length of time it used to take to reach Put-in-Bay ,by steamer from Detroit.

Island grapes which made possible such attractions as the Golden Eagle Wine Cellars, and made up deck loads of cargo for the steamers of eighty years ago, are scarcely heard of in the Detroit of our time.





GREAT LAKES EXCURSION STEAMER
PUT-IN-BAY
LGTH. 240' BRDTH 60' DEPTH M.L.D. 17'3" — 1911 — 1953

© 1954	GREAT LAKES MODEL SHIPBUILDING GUILD
DATE	DRAWN BY
DATE	CHECKED BY Capt A.G. Johnston
SHEET NO. 1	SCALE 1/8" = 1'-0"

SCRAPER TUNNEL
Self-Unloading Bulk Cargo Vessels

C. RAY CHRISTIANSON, *Member*

R. A. STEARN, *Associate Member*

Paper Presented Before the Spring Meeting of the Society of Naval Architects and Marine Engineers, Great Lakes Section, May, 1948.

Many articles and papers have been written on self-unloading vessels covering practically all phases of bulk cargo self-unloading development. The authors of this paper, therefore, will confine their discussion to the scraper tunnel part of the scraper tunnel type of self-unloader.

The development of the scraper tunnel self unloader, which made its appearance on the Great Lakes in 1923, with the conversion of the steamer "Andaste," was brought about by the following conditions prevailing at that time:

1. Many bulk cargoes were available for hauling, such as coal, crushed stone, riprap, gypsum, cement, etc., to docks where no dock facilities were available for unloading at that time.

2. The vessel owners were endeavoring to find a means of placing many small and comparatively obsolete vessels back in productive service.

3. The system has to be flexible to handle this wide range of commodities, and yet be simple in order to keep the cost of installation and operation to a minimum.

To fulfill these conditions, the scraper tunnel system of self- un loading was developed as described in the following paper.

OPERATION OF SCRAPER TUNNEL SYSTEM

The scraper tunnel system of self unloading operates on much the same principle as a drag line scraper commonly used in dredging and gravel pit operations. In a vessel operation the scrapers work in tunnels as shown in fig. 1. To unload a cargo with a scraper tunnel system the procedure is as follows, with some variation depending on the type of commodity handled. Reference is made to figure 1.

Starting with the scraper over the discharge hopper (position A) the operator at the base of the ramp at position B engages the clutch on the back haul cable drum, starting the scraper down the ramp to enter the tunnel. In order to keep the scraper from sliding down the ramp too fast, as well as to prevent the cable from becoming snarled, the operator must keep some pressure on the hoist cable drum brake.

With the scraper at the bottom of the ramp, Position C, the operator is ready to take the scraper back in the tunnel for a load. To lift the back of the scraper up to position D, he applies additional pressure on the hoist cable drum brake. This causes the back of the scraper to lift due to the double purchase effect created by the sheave in the back end of the scraper. This same feature keeps the scraper in this position during the balance of the hauling travel even though the brake on the hoist cable has been completely released. The lifting of the scraper is an important detail of the operation. By so doing, degraduation of material is reduced and movement of material back in the tunnel with the scraper is prevented. The double purchase lift effect reduces brake wear by eliminating the use of the brake on the backhaul.

When the operator has pulled the scraper back in the tunnel to a point where he wants to pick up a load, Position E, he disengages the back haul hoist clutch and engages the hoist cable drum clutch. This changes the direction of the scraper and automatically slacks off t he back haul cable, allowing the scraper to drop to the tunnel floor in proper hauling position, and the hauling operation to the discharge hopper (Position A), begins, c o mpleting the cycle.

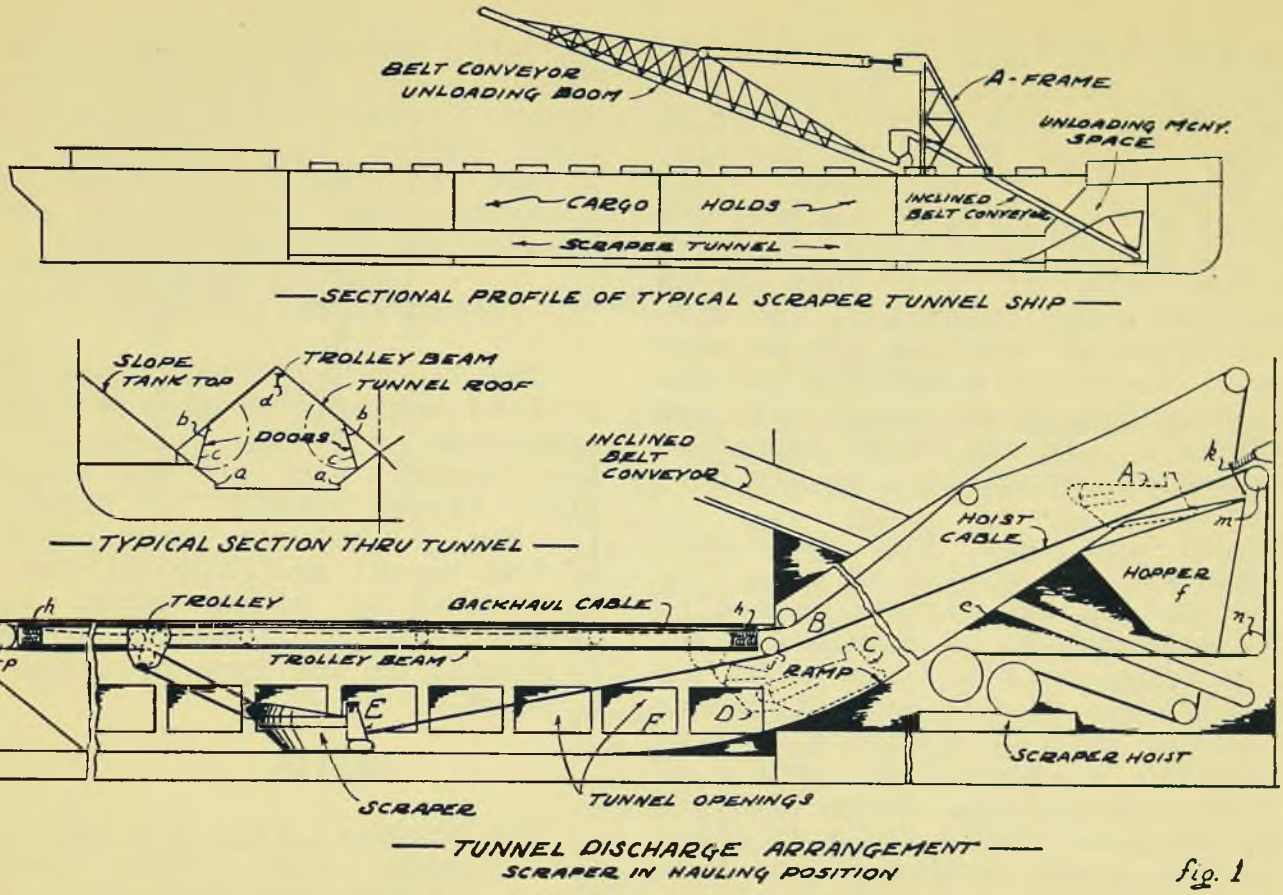


fig. 1

It is important to note here that should the scraper pick up a larger load than the power in the hoist is capable of pulling, the operator, by slight pressure on the back haul drum brake, can lift the back end of the scraper, thereby releasing some of the material , and take only as large a load as the hoist will handle. On many long tunnel installations unloading is expedited by hauling a very large scraper load of material to the head end of the tunnel at Position F, and then dividing this load into two or more loads for the trip up the ramp and over the discharge hopper.

To complete the unloading of the vessel, the operations outlined above are repeated until all cargo has been removed. On vessels having two tunnels, both are operated simultaneously in the same manner.

In an operation when handling material of a fairly sticky nature, the vibration of the tunnels due to the movement of the scraper and trolley, and the raising and lowering of the scraper on the tunnel floor, creates sufficient vibration to make such material flow freely. This is particularly desirable and advantageous when handling gypsum and riprap stone.

CARGO HOLD AND TUNNEL ARRANGEMENTS

In a typical tunnel scraper ship, two tunnels of uniform section run through the length of the cargo holds. The floors of these tunnels may either run on top of the tank top (figs. 5, 8) or may be recessed in the double bottom to rest on the bottom shell frames (Fig. 1). Slope tank tops (Fig. 1) are installed outside of the tunnels, running through the tunnel walls and then dropping vertically to the tunnel floors. This vertical drop (a, Fig. 1) provides a guide for the scraper, and also encourages flow of material into the path of the scraper.

Tunnel walls (b, Fig. 1) extend at an angle from the sloping tank top to give clearance for the scrap-

er on its back haul travel, and to assist in regulating door size. These tunnel walls contain openings to admit cargo into the tunnels, with doors (c) fitted over these openings as required to control the flow of cargo. With this arrangement the trim of the ship can be controlled while unloading, and different types of cargoes can be separated. Doors are sometimes not installed in the after cargo hold and sometimes not in any holds depending on operating conditions required by the owner.

Tunnel tops and side tank tops are sloped at angles varying from 37½ degrees to 45 degrees depending on the material to be handled. Before welding became widespread in shipbuilding, tunnel top stiffeners were in the form of channels or angles riveted to the upper surface of the tunnel top plate. Newer designs incorporate inverted angle stiffeners welded to the inside of the tunnels; thus affecting a better cleaning surface in the cargo space without appreciable loss of cargo capacity.

DOORS

The doors (c, Fig. 1-3) are hinged at their upper edge and are manually opened and closed on all present installations, although means for power operation have been developed. On a recent installation, the Permanente Cement Company "Silverbows", the doors open automatically by releasing a trip at the lower edge, counterweights swing in hollow wing brackets outside of the tunnels, and the tunnel sides are run in a straight line sufficiently high that the doors swing through 180 degrees and come to rest along the side of the tunnel. At present doors are closed by hand.

TROLLEY BEAM

A trolley beam (d, Fig. 1 also Fig. 2) is run longitudinally for the length of the tunnel under the peak. The purpose of this beam is to provide a track on which the scraper carrying trolley operates. To achieve maximum wearing qualities the lower flanges of the beam are fitted with harden steel liners. This levels the track for better trolley operation and at the same time increases the life of the beam.

TUNNEL FLOOR AND RAMP

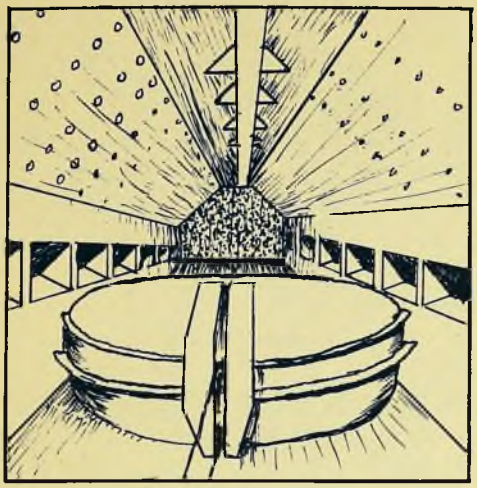
The floor of the tunnel is installed entirely flush for the smooth operation of the scraper. At the forward end of the tunnel the floor slopes upward to form a ramp (e, Fig. 1) between the forward end of the tunnel and hopper. This ramp is flanked by sides which vary in height from 42" to entire enclosures depending on the type of cargo being handled.

HOPPER

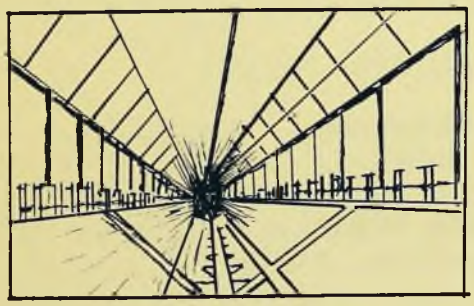
The hopper (Fig. 1) located in the forward end of the machinery space, is constructed in such a manner as to receive the discharge from both scrapers, thereby automatically storing the overload and at the same time uniformly feeding the conveying device used for elevating the cargo to the deck.

Many variations have been developed and used in the hopper; some have been made for discharging directly to inclined conveyor belts; others have been made to discharge into an inclined pan conveyor. In the cement trade the hopper has been designed to operate and feed directly into cement pumps of the Fuller-Kinyon type. In the latest combination design the hopper is arranged to discharge either into cement pumps when handling cement or to a conveyor belt when handling other commodities (See Fig. 5).

The top of the hopper is fitted with center scraper riding angles which automatically lifts the back end of the scraper, Position A, thereby assuring the complete discharge of all the material carried up in the scraper. The shelves on which the scraper carries over the hopper are reduced to a minimum

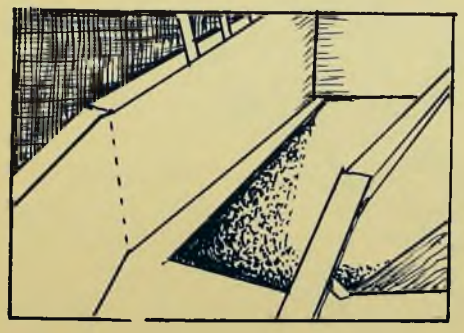


—FIG. 2—
SHOWING DETAILS OF
SCRAPER AND TUNNEL
IN "CEMENTKARRIER"



—FIG. 3—
SCRAPER TUNNEL
FITTED WITH DOORS

—FIG. 4—
TOP OF HOPPER



width to assist in the free flow of material (See Fig. 4).

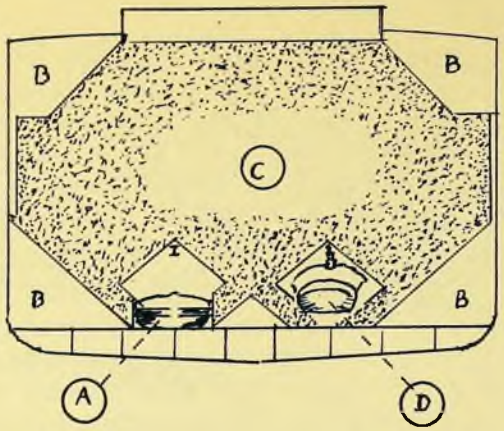
The hopper gates are commonly controlled from a platform over the conveying mechanism and between the scraper ramps, but many desirable arrangements can be worked out depending on the type of installation desired.

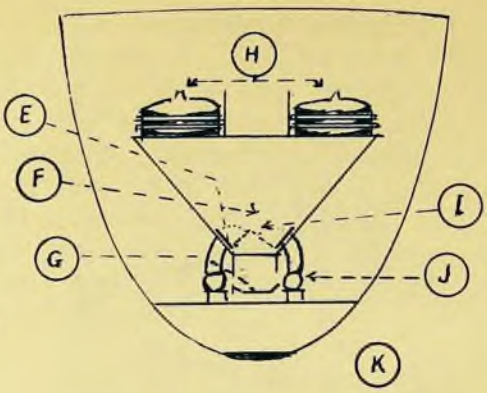
SCRAPERS

After considerable experimenting with scrapers of all shapes and sizes the crescent type open bottom scraper was found to be the most efficient under all operating conditions. This scraper is constructed of steel with a heavy steel arch support on the front reaching from side to side. This arch prevents the scraper from pulling together due to the strain on the bridle. The bridle hauling chain is attached to the forward lips of the scraper directly below the cross arch by means of shackles, the height of which may be varied for adjustment to unloading conditions. The forward end of the bridle is attached to a wedge socket shackle which in turn is connected to the hoisting cable. The after end of the scraper is fitted with a sheave housing and sheave. This sheave receives the loop of the back haul cable and is used for lifting the back end of the scraper over the cargo on the back haul movement. The scraper is also fitted with hardened wearing shoes on the bottom which are readily demountable for replacement. (See Figs. 1,4,5).

The trolley consists of two heavy cheek plates of either cast or fabricated steel bolted together on machined surfaces and with fitted bolts. The four wheels that carry the trolley on the trolley beam have self-contained bearings. The forward and after ends of trolleys are made very substantial with heavy bumping blocks attached. These bumping blocks are for stopping the trolley when they come in contact with the bumper spring arrangement at the ends of the tunnels (h, Fig. 1). The trolley is also fitted with a sheave over which the back haul cable is run,

MIDSHIP SECTION





SECTION AT HOPPER.
Looking Fwd.

A, Scraper loaded.
B. Nallast tanks.
C. Bulk Cargo.
D. Scraper on backhaul.

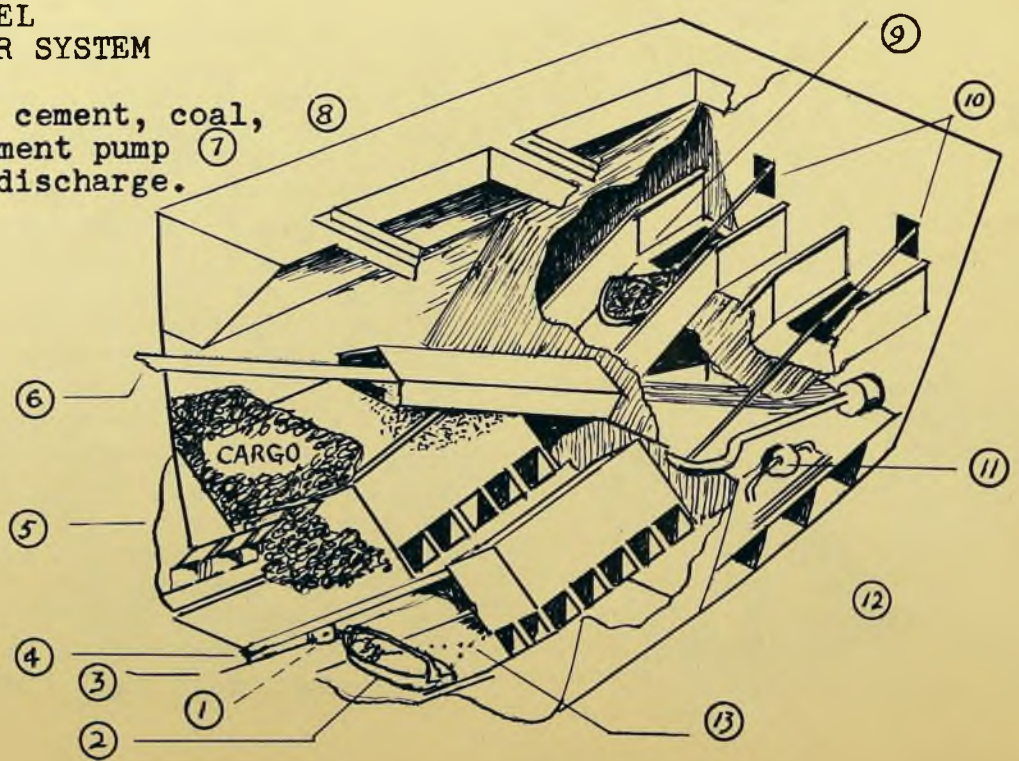
E. Doors on shafts, gear operated.
F. Hopper.
G. Conveyor belt.
H. Scrapers.
I. Doors at center when using cement pump.
J. Cement discharge pump.

(FIGURE 5)

1. Trolley.
2. Scraper on backhaul.
3. Backhaul cable.
4. Track.
5. Port tunnel doors open. Cargo on tunnel floor.
6. 60" Belt conveyor. 22 degree incline.
7. Weather deck.
8. Hatches.
9. Scraper at top of ramp. Ready for dumping.
10. Digging sheaves.
11. Scraper hoist.
12. Doors from cargo space to the starboard tunnel.
13. Digging cable, slack.

SCRAPER TUNNEL
BULK SELF-UNLOADER SYSTEM

For handling bulk cement, coal, or stone, with cement pump or conveyor belt discharge.



and on the bottom forward end of the trolley is fitted a wedge socket to receive the dead end of the back haul cable. The bottom of the trolley has another bumper plate to take the shock when the scraper is brought up tight under the trolley for the back haul travel.

GUIDE ROLLER

At the forward end of the tunnel the guide roller (j, Fig. 1) is an important detail of the scraper tunnel system. This guide roller takes the thrust of the hoist cable during the time that the scraper is in the tunnel. This roller is generally made of manganese steel with bearings inserted in the roller turning on a stationary shaft, and the average width of this roller is 30" allowing some variation in the travel of the scraper up the tunnel without any danger of the cable leaving the guide roller.

SPRING BUMPERS

The spring bumpers (h, Fig. 1) are installed either end of the tunnel to take the shock of stopping the travel of the trolley. These spring bumpers have either four or eight sets of coil springs mounted on heavy fabricated steel attachments to the trolley beam.

SHOCK ABSORBER

The shock absorber (k, Fig. 1) is mounted over the hopper just aft of the hoisting sheave. This shock absorber is installed to take the shock when the operator fails to stop the scraper soon enough on its travel over the hopper. This shock absorber is constructed much the same as the spring bumpers in the tunnel, only on a considerably heavier scale.

SHEAVE HOUSING

Because the tunnel scraper system depends entirely on the use of cables for handling cargo, the installation and alignment of sheaves over which these cables must operate at very high speeds, is a most important part of an installation. The hoist sheave (m, Fig. 1) over the hopper and the swivel sheave (n) at the base of the hopper are the only two sheaves used on the hoisting cable. They are installed of as large a diameter as the space available on a particular installation will permit, and in no case are they installed below the minimum size recommended by wire rope manufacturers for this type of service.

The swivel sheave housings are mounted on pillow blocks to allow this sheave to swing horizontally while at the same time maintaining alignment with the hoist sheave above. This is necessary to prevent side wear on the sheave and also to assure even distribution of the cable on the hoist drum under the heavy loads applied. The bearings for these sheaves are mounted in the sheaves and the shafts are held rigid in the housings. On the back haul sheaves the load is considerably less, but because of the increased speed these sheaves are also important. There are either one or two main back haul sheaves (p, Fig. 1) located in the after end of the tunnel, and besides the sheave in the scraper and in the trolley the balance of the sheaves on the back haul cable are for guiding the cable to reduce wear. The hoist cable most commonly used is an improved plow steel 6x19 wire rope with wire center, and the back haul cable is usually an improved plow steel 6x19 hemp center wire rope, because of the extra flexibility needed at the scraper end.

HOISTS

The hoist most commonly used for the scraper tunnel self-unloader are two-drum steam operated units. The hoisting drum has a cable speed varying from 300 to 50 feet per minute. The back haul drum has a cable speed varying from 500 to 700 feet per minute. The drums are controlled by friction clutches either mechanically or hand-operated, depending on the installation.

(Concluded in our February number)