

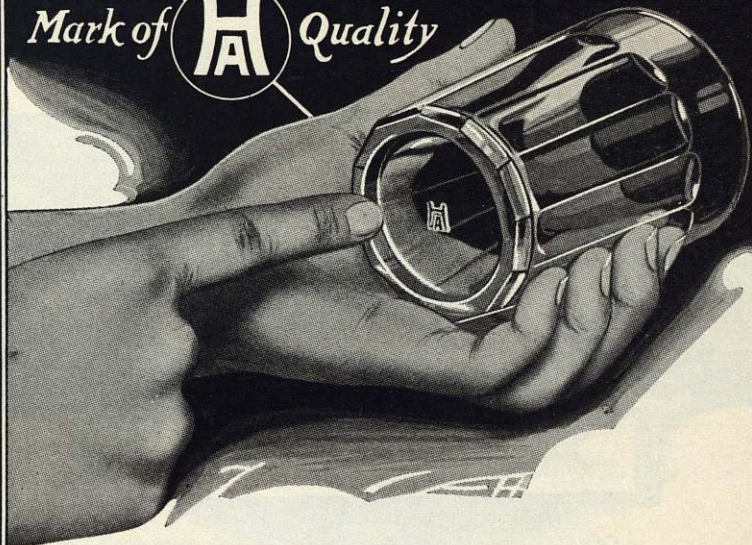
A  
TRIP THROUGH  
*The World's*  
*Largest Tumbler*  
*Factory*






LOOK FOR THE

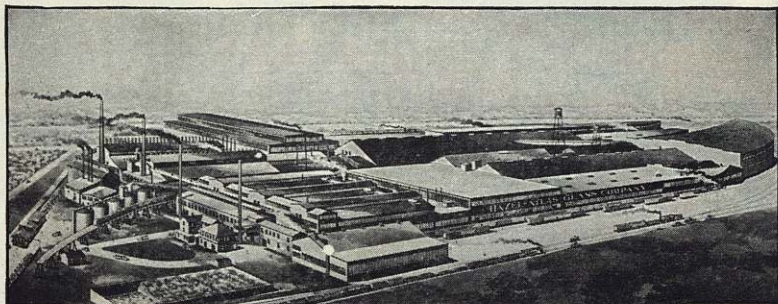
Mark of  Quality




The attractive  in the bottom of every Hazel-Atlas Tumbler is the High Quality Mark of Pressed Tumblers. A guarantee to you that they will stand up longest under hard every day usage. Clear in Color. Glazed Edges. Smooth Bottoms. All Sizes and Styles.

HAZEL-ATLAS GLASS COMPANY  
Wheeling, W. Va.

*World's Largest Tumbler Manufacturers*



CLARKSBURG, W. VA. PLANT  
Where  Tumblers are made  
*World's Largest Tumbler Factory*

*How **HA** Tumblers Are  
Made In The  
Largest Tumbler Factory  
In The World*



**T**HE pressed ware plant of the Hazel-Atlas Glass Company at Clarksburg, W. Va., is the largest pressed tumbler factory in the world. Started in 1900, this factory created the first workable automatic glass tumbler press ever used in the glass industry. The plant has had a steady and tremendous growth (it has never once suspended operations entirely) until now it covers eight acres of ground, has 15 acres of floor space and employs 1,200 people.

### *The Economy of Automatic Machinery*

All the glass is made on automatic presses and machines, and the work is done so efficiently that, although only the highest quality of raw materials is used, and only perfect articles are allowed to pass the inspectors, it is possible to sell this unequalled quality at the lowest market prices.

### *How the Sparkling Crystal Clearness of the Glass is Obtained*

The sparkling crystal clearness of our trademarked tumblers, noted for their fine quality in every country of the world, is obtained only by using the purest of white sand, white soda ash and white lime as raw materials.

### *Raw Material Storage*

The sand is quarried in large blocks from a vein of beautiful white sandstone at Hazel-Atlas Glass Company mines in the heart of a mountain back of Great Cacapon, W. Va. It is carried by a gravity railroad

to the selecting grounds and here all but the finest rock is thrown over the cliff into the waste pile. The selected rock is fed into huge Blake jaw breaker crushers which work the rock down into pieces the size of an egg or less. The rock then falls into Chili Mills and the big heavy Manganese wheels roll around on top of the small chunks of rock until they are crushed into fine sand.

The sand passing through a 30-mesh screen is then washed seven times with fresh mountain water in a system of Archimedes screws moving up hill, commonly called a log washer. The sand is sluiced down to the draining floor and, when drained, is lifted up by an electric crane and placed in steam dryers. When the last vestiges of water are evaporated from the sand, it is run over a powerful magnetic cleaner, which removes whatever small particles of iron may chance to be in the sand. (Iron is everywhere and must be particularly guarded against in glass sand, as it tends to give glass a green color.)

The sand is now carried by canvass belts and bucket elevators to storage bins, from which it is loaded by automatic loaders into specially cleaned and paper-lined box cars. For after so much trouble has been taken to prepare this pure sand, every precaution must be taken to insure its freedom from contamination.

The limestone is quarried from an exceptionally clean vein of dolomitic limestone. Just as great care is taken in the preparation of the stone as with the sand, and it also is shipped in box cars to our factory. Part of this limestone is calcined and part of it is used raw, but all is made from the same high quality of stone.

Commercial soda ash, or sodium carbonate, is obtained almost chemically pure by a special process.

When the sand, soda and lime arrive at Clarksburg, they are unloaded from the box cars into nine large tanks having a capacity for holding a total of 110 carloads. These tanks feed down through hoppers from which the sand, lime, etc., is drawn, as needed, into scale cars. These scale cars run on a track in a tunnel beneath the storage tanks and carry the weighed



amounts of raw materials to a large rotary mixer.

These materials are mixed into the proper proportions mechanically, and then cullet is added to form "batch." (Cullet is the broken glass made in the process of manufacture.) This "batch" is elevated into great storage towers from which it is drawn, as needed, to make the "melt."

### *Fuel*

A word must here be said about fuel, for fuel is a very important and large item in glass making. The annealing and general purpose heating about this plant is done with natural gas, of which there is great abundance in this vicinity, and fully half of all we use comes from our own gas wells. But the melting of the glass in our great melting furnaces is done entirely with the regenerated producer gas made in a battery of four 40-ton gas producers. Producer gas is made by partly burning bituminous coal—which we obtain from our own mine—in a closed iron shell with steam and insufficient air for complete combustion.

## *Melting and Refining*

The glass is melted and refined at a temperature of 2,600 degrees F. in five "tanks" (glass melting furnaces) now producing at the rate of 1,200 tons of glass per week. Each glass tank is so large that it takes approximately 10 days for the raw material to work through it to the end, where it is drawn off and formed by the machines into finished articles. And all this great length of time and this tremendous heat is absolutely necessary to refine and purify even these purest of raw materials before we are satisfied with the resulting product.

### *Pressing the Glass Into Tumbler Shape*

About the far ends of these tanks are grouped twenty-six automatic tumbler presses. The refined and molten glass is drawn out in a golden stream, cut off in globules by an automatic knife which cuts each globule the same size as the last to a fraction of an ounce in weight and the globule drops down into an open mold. The mold, of which there are eight on each

machine, now moves one station so that the next globule can drop into the next mold. It rests a moment and then moves to the second station. At the second station a plunger descends into the mold and shapes the globule into a tumbler. The plunger then withdraws and an air draft cools the newly made tumbler for three stations. Then the bottom of the mold raises up and lifts the tumbler free of the mold.

### *The Glazing Machines.*

The tumbler (still red hot) is conveyed to a revolving merry-go-round—or glazing machine—which has room for a score of tumblers. The tumbler sets on a little rotating pedestal and as the machine revolves, the pedestal also rotates. Burning jets of natural gas play against the sides of the tumbler to give it a high, lustrous polish known as the "Hazel Polish." Then, after an interval of cooling, other jets play on the upper lip or finish of the tumbler to gently melt smooth any rough edges and make a perfectly smooth rounded lip, known as the "Hazel Glazed Edge."

### *Annealing*

Conveniently located beyond the presses and machines are twenty-three chain belt annealing ovens, each six feet wide and sixty to seventy feet long, each belt being individually driven at a very slow rate by its own motor and reduction gear drive. Each oven is individually heated by jets of natural gas, which burn in such a manner that the oven is graduated in temperature from 1100 degrees at the entrance, to room temperature at the exit.

Immediately after being fire finished, the tumbler is placed in one of the annealing ovens where it gradually cools to room temperature as it passes through to the exit end of the chain.

### *Inspection*

Coming off the chain at the exit end, inspectors carefully look over each piece of glass and examine it for flaws, cracks, lop-sidedness or other imperfections in quality. All but perfect ware is broken and thrown into cullet. The perfect ware is placed on trays and conveyed to the packing tables.

### *The Polariscope and Boiling Water Test*

To test out the effectiveness of the annealing on the glass toward removing strains, glasses from every run are examined under the polariscope for strains. The polariscope is a wonderful instrument which makes use of the properties of light and refraction in such a way that any strain or cord in the glass can be recognized at once, and proper correction in the annealing temperatures made. This is in addition to the severe hot water test to which the tumblers are subjected.

### *Shipping Facilities*

The Clarksburg Factory is on the main line of the B. & O. Railroad between New York City and St. Louis, and has five tracks and switches in its own factory yards, so that it is always able to make prompt shipments anywhere.

### *Warehouse Capacity*

This factory has enormous warehouse capacity and can store fully one thousand carloads of finished glass at one time so that very large shipments can be made immediately upon receipt of the customer's order.

## *Molds*

Two large and completely equipped machine shops are devoted principally to making molds and repairs on the many complicated automatic machines.

### *The Physical Chemical Laboratory*

This factory has the finest and best equipped laboratories in any glass plant of the United States. All raw materials are tested here for their chemical content. Gas analyses are made on the producer and natural gas and also on the flue gases, and the calorific values determined. Physical tests and photomicrographs are made in such numbers on the finished glass articles that the effects of heat treatment have been reduced almost to an exact science.

### *Have Pride in Our Work*

Notwithstanding the size of the Hazel-Atlas tumbler plant, the old-fashioned spirit that gives attention to every detail still prevails. Each and every man working all the time to give the best that is in

him, which insures a quality of the highest standard at all times. Hazel-Atlas famous "A" tumblers for restaurants, hotels, hospitals, soda fountains, cafeterias and household use are guaranteed to stand up longer than any tumbler made, a guarantee of superior quality to every user of glassware.













Printed in U. S. A.