THE UTILIZATION OF OLD TIN CANS.

In the suburbs of great cities an industry has sprung up, having for its object the recovery of the solder used in making and sealing tin cans. In consequence the formerly despised and useless tin can has acquired sufficient commercial value to rescue it from the back lot dumping ground and garbage scow.

Uner the present system of street cleaning, New York City's refuse is loaded on scows from docks located at convenient intervals along the river front, and then taken to sea and dumped. These docks have double decks, the upper projecting sufficiently to allow the contents of a cart to fall upon the middle of the scow, and be distributed by the trimmers who keep the vessel on an even keel. The trimmers also select everything of value with the greatest care; rags, fat, bone, metal, paper stock, etc., being stored on the lower deck of the dock. The silver and jewelry form no small item of the contractors' profit, and the total value of a scow load is estimated at an average of two hundred dollars.

The space between the dock platforms is often closed in with odds and ends, and the interior converted into a miserable habitation by the trimmers, men and women, who thus herd together, their supplies being drawn from the dump.

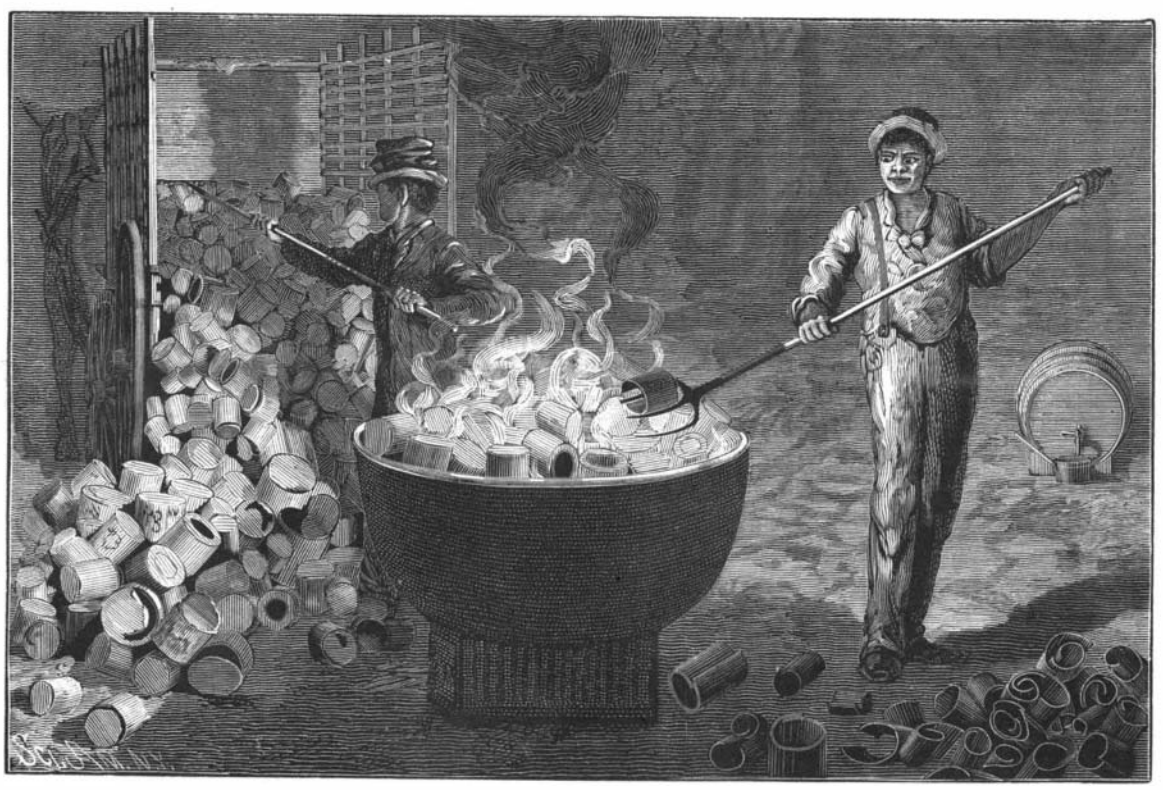
These dumping docks are the principal source of supply for the industry we illustrate, and a wagon load of tin cans can be bought at such places for four or five dollars.

The furnace is an old soap boiler, into which a few sticks are thrown; the bowl is then filled with cans, a quart of kerosene poured over them and ignited.

The heat developed by the oil is not great enough to attack the tin, but melts the solder, which flows to the bottom of the bowl. The solder recovered from a load of cans averages forty pounds. After this process is completed the tin plate scrap is sold to make what is called "acid."

Into a large open vat containing waste acid, acid ferric sulphate, sulphuric or hydrochloric acid, the scrap is thrown and allowed to remain until the tin is stripped from the iron underneath; more scrap and metallic iron is added until the solution is neutral. The tin thus dissolved is used as a basis for the preparation of stannates or other tin compounds, and by dyers.

The iron plate is rolled into balls for melting, the ferrous sulphate purified and sold as commercial copperas, and the remaining acid used in repetition of the process.



THE UTILIZATION OF OLD TIN CANS.

Chemical Notes.

At the last meeting of the Manchester section of the Society of Chemical Industry, Dr. Carl Otto Weber read three short papers. The first touched upon "The danger attending the presence of ammonium nitrate in nitro-cellulose." He described an explosion which had occurred when he was preparing a small quantity of di-nitro-cellulose. In order to obviate washing out the last traces of acid, he had used a dilute solution of ammonium hydrate for the last washing. On drying the nitro-cellulose at about 70° C., a violent explosion occurred.

He had observed on a previous occasion that a mixture of ammonium nitrate and acetic acid, when evaporated, subsequently ignited with almost explosive violence, and he deduced from the experiments which he had made that the presence of small quantities of ammonium nitrate in such bodies was a source of considerable danger.

The second paper referred to the dyeing of woolen goods in copper vessels. He mentioned that the action of alkalies and acids in such vessels often affected the shades of the dyes in a prejudicial manner. To overcome this difficulty he instanced the use of strips of zinc on the Continent, which, with the copper, formed an electric couple, the zinc passing into solution instead of the copper.

The third paper was on the oxidation of cotton in bleaching and cop dyeing, which led to a somewhat chatty discussion between Dr. Schunk, Messrs. Terrey, Crippin, Levinstein, and Dr. Weber, during which the chairman, referring to the former paper, pointed out that the presence of zinc salts might be as objectionable assaults of copper, and also that the hydrogen gas evolved might form an objectionable element in some cases. The discussion turning to the conveyance of corrosive liquids in dye and other works, Mr. Levinstein mentioned, for the benefit of the members, that he had overcome the difficulty formerly experienced in transporting nitric acid about his works by using the glass-lined tubes made by a firm at Barnsley (Messrs. Dan Rylands, Limited), the adoption of which had, in his case, been attended with highly satisfactory results.

Fire Service of New York City.

The present fire department is organized in companies of 12 men each, including a foreman, assistant foreman, and two engineers. A truck company has the same number of men and officers without the engineers. These companies are formed into battalions to the number of 12, each battalion consisting of 5 to 10 companies, and being in charge of a chief. These 12 battalions are again divided into two divisions, each division being under the immediate supervision of a deputy chief, and the whole under the direction of the chief of the department.

The engine companies are equipped with a steam fire engine, drawn either by one or two horses, according to the size of the engine, its weight varying from 5,500 to 9,500 pounds. On some of the heavier engines three horses are used. The truck companies are supplied with ladders which reach to a height of from 16 to 85 feet. They carry all the modern appliances used in putting out fires, such as tin cutters, hooks, cellar pipes, and other implements which are likely to be of help.

Each fire company is assigned by a regular order to respond to fire alarms in certain localities, on the first, second, third, fourth, and fifth alarms, and in special calls if necessary. So that every company when called knows exactly by the signal where to respond and report for duty. This they do at the signal box nearest the fire.

The first alarm covers a territory about a mile square; the second, two miles; the third, three, and so on, the territory growing wider at each alarm. The calls, regularly numbered, are printed in a book, a copy of which is at the central fire station, and also in the possession of each engine house in the city. For instance, we will suppose that the call is "485." The book will show what companies are to respond. The record in the book in this particular case appears as follows:

485	Engine Companies.	Hook and Ladder Companies.	Chiefs of Battalions.
3d Avenue and 40th Street.	21, 8, 16, 25, 1, 54, 54, 39, 14, 2, 5.	2, 7, 4.	8, 9, 6, 7.

Station 485 is at Third Avenue and 40th Street; engine 21 is just around the corner; engine 8 is at 50th Street. Those are the two nearest companies, and they respond to the first alarm. In case the fire is a large one, there is a second alarm, which brings out three engines, one truck, another chief of battalion, a deputy chief, and the chief of the fire department. A third alarm brings five engines and another chief. When the fire is a very large one, the signal called the "two nines" is sent out, which means that all the companies due on the third alarm at that particular station shall report there.

In fighting a fire, the first object of the chief in charge of the firemen is to ascertain the locality and extent of the conflagration. Sometimes he does this by sending one or more messengers into the building; but generally, in order to make sure of the matter, he makes the investigation himself. He is then obliged to make up his mind on the spot as to the best positions from which to attack the fire, and assigns his men accordingly. Sometimes he is successful in the plan he has laid out, while often he is compelled to abandon it. This change is made necessary on account of the combustible material in the building, which throws out such an intense heat that the men cannot remain at the original points decided upon. At other times he is successful in forcing an entrance into the building, in which case he is generally able to extinguish the fire.

Fires are strange things to handle; they have a certain individuality. Each fire burns in a different way, and it requires a technical knowledge and long experience as a fireman before a man is able to form even an approximate judgment as to the cause of a fire and the best way of putting it out. The decision must be made instantaneously. There is no time for thoughtful deliberation or consultation. You must judge of the surroundings, the size and character of the building, the material that is inside of it, and the possibility of the extension of the fire under certain emergencies. When the fire breaks loose from the building in a seemingly furious effort to escape from its confinement, then you must be ready to meet it and prevent its extension to adjoining buildings, or possibly across the street.

All these conditions are such that no man can possibly foresee them, and therefore no general plan can be laid down for putting out a fire, because, as I say, each one burns differently.

A man entering the fire department of New York is appointed under the civil service rules for the probationary term of 30 days. He is sent to what we call our school of instruction, where he is taught the use of the different apparatus, the scaling ladders, the life lines, and the tools and implements used in the department. His days are devoted to the school, his nights to service in the department where he has been assigned. At the expiration of the probationary term, if he is recommended by his commanding officer for actual fire duty, and also by the instructor of the school, he is regularly appointed a fireman, but after his appointment continues his instruction for 30 days more. He is required to become perfect in the use of the scaling ladder, life lines, belts, etc., and to display an ambition to become a proficient worker. He is taught to lower people from the roof, to raise ladders up to windows to the height of 90 feet, etc.

After a man has attended the school of instruction for 30 days he is assigned to a company. After the first year's service at $1,000, if he proves himself efficient, he will be advanced to the second grade, which gives him $100 a year additional salary. He is always on his good behavior, and even one charge of improper conduct of any kind will prevent his promotion in the ranks.—*Hugh Bonner, Boston Globe.*

Tempering Large Armor Plates.

A new process of tempering a 14 inch Harveyizing armor plate was tested in Bethlehem, Pa., recently. Heretofore this was done by ejecting ice water against a red hot plate in a vertical position, with the result that the water was made boiling the instant it touched the upper end of the plate, and the heated water running down did not have the proper effect on the rest of the plate. In the new process the plate was laid down in a specially prepared frame; the water was made ice cold by treating it with salt, and was then led to a large sprinkler lowered within one foot of the plate. The water was forced through the sprinkler under great pressure, while the under side of the sprinkler was kept cool by water running over it from a fixed spigot. The sprinkling continued for 1½ hours, and the plate was then taken by a crane and immersed in the oil baths, there to remain 30 hours. The government officers present regarded the new process as highly successful.—*Manufacturers' Gazette.*

New Invention Wanted.

Electric gutter for melting snow and ice, in towns and cities, to prevent accumulations, such as now are impeding travel, and costing more to remove by cartage, etc., than would pay for electric gutters, if economically constructed.—IDEALIST.