The Chiffonniers of Paris.

Ragpickers' Town reminded me of some ancient, tumbledown fishing village, and certainly it was hard to realize that this was positively the city of Paris at the end of the nineteenth century. Space, it would seem, was at a premium in the Cité Doré, for utensils of different kinds ornamented the outside walls, and here and there a cradle swung lightly from its rusty nail. Many of the houses boasted of but one room, in which were, often, neither furniture nor bedding; a bundle of rags did duty for the latter, and in truth it was a case of rags, rags, raggedest of rags everywhere. The ragpickers were seated on their thresholds, or as near the door or apology for a window as it was possible to get. Here and there an ancient chiffonnière was patching together old remnants, but most of the men were classifying their merchandise spread upon the floor. These were the trieurs or sorters, whose business lay in dividing the odds and ends into their various classes before reselling them to the merchants en gros. The white rags had to be sorted from the colored, and the silk from the cotton or woolen. The woolen ones, I found, were prized the most, as they brought in nearly thirty francs the 100 kilos, while the silk were worth only seven. The chiffonniers collect over 50,000 francs' worth of pickings in one day (statistics of 1889), and nothing comes amiss to them.

I begged permission of an old chiffonnière to sketch her as she sat at her mending, and then the motley crowd, which had all the time followed closely at my heels, promptly surrounded me. The elders did not appear to view my movements with much favor at first, but their scowls were soon turned into broad grins by a general distribution of the cigarettes. The packet could not go all round, it is true, but it went far enough, at least, to make the inhabitants of the Cité my friends. They were a tough enough looking set, on the whole, but most of the older women appeared to suffer with inflammation of the eyes, and many of the children also—a thing easily to be accounted for by a glance at their grimy hands. Still the eye trouble was the only one which affected them very much apparently. Though irredeemably dirty, the children looked bright, happy, and healthful. And they had reason to, living as they were in an open quarter of low houses, where the sun could stream down on them and the air play around them—a sensation rarely to be experienced in the narrower Paris streets, where the immense height of the apartment houses keeps off, for the greater part, these two most important health factors. The young girls, too, had evidently their share of hardiness, and, with it, a sturdy independence of manner, not unbecoming the daughters of this liberty-loving race, and there were several quite pretty enough to warrant the existence of that romantic play of Bourgeois and Emery's, La fille du Chiffonnier, which created so much interest on the boards of the Ambigu a little while ago.

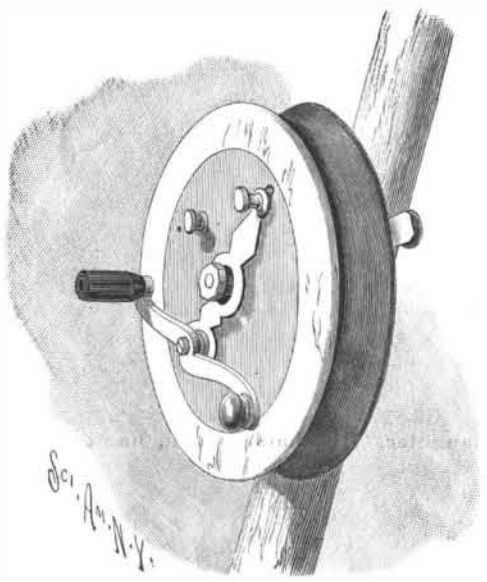
When I had made the round of the Cité, I attempted one or two sketches, and wherever I stopped, every window within sight would immediately become alive with heads partially obscured by the flapping rags which hung before most of the houses. I caught one old chiffonnière watching me complacently as she ate her supper, and called up to her to tell me, if she would, which was her quarter for collecting. She answered proudly, "The Opera," much to my surprise, for that part of Paris is five or six miles away. But I learnt that this neighborhood and the Chaussée d'Antin were the fat livings of the chiffonniers, and that a placeur will sell his right to empty the rubbish boxes of a few houses there for as much as 150 francs; for, although a coureur or roving chiffonnier's daily collection is seldom worth more than 1 franc 50 cents, that of the placeur, or chiffonnier with a regular situation, often amounts to seven or eight times that sum, and necessitates his bringing a hand or even a donkey cart.

It is chiefly in suburbs such as Malakoff, Ivry, and Gennevilliers that the chiffonniers now congregate, though formerly they were to be found in Le Petit Mazas, Le Passage du Soleil, La Cité Maupy, and La Cité de la Femme en Culotte, which last, though now destroyed, once brought its eccentric landlady, Mademoiselle Foucault, 12,000 francs per annum. But it is the Cité Doré as the home of the chiffonniers which is of special interest, partly on account of the historic records in connection with it in the reports of "Commission des Logements insalubres" (1853), on account of the many controversies over it, notably in the Revue Municipale (1859–60) and because of the personal supervision still exercised over it by Monsieur Doré's daughter from her manor overlooking it. This was once the Château of Bellevue, which up till 1848 was surrounded by its park of 10,000 square meters. After that date, Monsieur Doré cut the ground up into little lots, and let it out to horticultural-loving Parisians at 5d. the meter per annum.

An enterprising chiffonnier not only rented one of these, but with the aid of sardine boxes filled with clay, bits of old building material and tin, built himself a hut. He was the envied of all the crowd of chiffonnier friends who came to wonder and admire, and who were not long in following suit. They formed themselves into an independent republic to the number of 400, which by 1860 had increased to between two and three thousand. Until the speculators appeared upon the scene, the chiffonniers were thus their own landlords, which fact created in them that self-respect and independence which is not often found in others of a like class. Drink is their besetting sin, and it would seem that the fascinations of their special liquors, such as camphre, petit noir, fil en quatre, casse-poitrine, are not to be withstood. But though a liberty-loving race, these wild men and women of the outskirts are a peace-loving one too, and they are seldom in prison; yet from the beginning of their history they have been subjected to every kind of persecution. As early as 1698 they were forbidden by law to walk the streets before daybreak, and it is only since the Republic that the chiffonniers have been allowed to ply their trade without the once necessary adjuncts of government copper medal, certificate, basket, crochet (pronged stick), and lantern.—Englishwoman.

AN IMPROVED REEL.

The reel shown in the illustration is adapted to facilitate quickly throwing the gearing in or out of action, or retard the revolution of the pulley. It forms the subject of a patent issued to Thomas J. Halleck, of No. 506 West Thirty-ninth Street, New York City. From the plate fastened to the rod projects a pivot on which revolves the metallic hub of the pulley on which the line is reeled, the pulley having in its front face a recess closed by a disk on the forward end of the pivot, and the driving gear being located in the recess. On the



HALLECK'S FISHING REEL.

hub, in the recess, is a pinion engaged by a large gear wheel, whose shaft rotates in bearings on an arm that is adjustable on the front face of the disk, there being a handle on the outer end of the shaft, and the arm, which extends across the outer face of the disk, having at its center a larger recess for the outer end of the central pivot. On the opposite end of the arm is a knob and catch, the knob being connected with a spring disk, and, on lifting the knob, the arm may be pushed to move the bearing of the larger gear wheel, so that its gear will be out of mesh with the pinion on the pulley, the spring disk holding the arm in either position, as it may be placed. When the larger gear wheel is out of mesh with the pinion, the pulley is free to rotate loosely, permitting the line to unreel quickly for casting purposes, but such free rotation may be more or less checked, as desired, by a spring-pressed pawl, which also clicks on the pinion to give an alarm in case of a bite, or to prevent accidental unwinding. There is also a spring brake on the back side of the reel casing, to brake the pulley when casting.

Notable Engineering Achievements in the Great Lake Region.*

BY JOHN BIRKINBINE.

After exhibiting on the screen a map showing the proportions of the lakes as compared with Eastern States, and reference to the fact that three thousand vessels of total capacity of one and a quarter million tons float at elevations practically equivalent to the height of the statue of William Penn on the city hall tower in Philadelphia, the various methods of mining pursued in the region of Lake Superior were discussed. Starting with the preliminary log cabin, the first winch was illustrated, then the shaft, and finally the operating mine. Similarly, instances of the steam shovel and milling system of mining on the Mesabi Range of Minnesota; the deep underground exploitations of the hard iron ore mines of Michigan, and of the copper mines were referred to. A diagram was also presented, showing the great depth to which mining operations have been carried on, and the relation of these to ocean level and to that of Lake Superior. Views of hoisting and pumping machinery, methods of timbering, a timber squeeze, man engine, ore pockets at the mine, etc., were illustrated and referred to, a number of flash light views taken under ground by Prof. Denton, of the University of Minnesota, being part of the display. The docks from which ore is shipped, consisting of several hundred pockets with adjustable spouts, were described, and instances given where 2,500 tons of iron ore were deposited in a boat within forty-five minutes.

The "whale-backs," the steel canal boats, and other forms of vessels in use on the great lakes were discussed, and the facilities which they offer as means of transporting heavy freight referred to. The ore receiving docks on the lower lakes were then described. At these ore is handled from a vessel's hold after the buckets are loaded by stevedores, and conveyed several hundred feet back from the water for a cent or less per ton. The coal docks, both for shipping and receiving coal, and some of the special appliances were noticed.

In the matter of harbor improvements, special attention was given to the artificial entry to the harbor of Duluth and of the new breakwater at Marquette. The latter is a series of "beton" blocks, each about 100 tons in weight, formed in place, but leaving alternate spaces of 10 feet between each block, which was subsequently filled in by similar blocks, this being done to prevent any local settlement disturbing more than one 10 foot section. The enormous shipment through St. Mary ship canal was said to have been 13,000,000 tons in the eight months in which navigation was open in 1894, and it will probably approximate 17,000,000 tons the present year. The statement was also made that the average distance the freight was carried by water was over 800 miles, and the cost slightly less than 1 mill per ton-mile. The growth of this canal was demonstrated by the fact that although in 1856 a lock 350 feet long, 60 feet wide and 12 feet deep was considered ample for a century, by persons then well versed in local progress, in 1880 a new lock, 515 feet long by 80 feet wide and 16 feet deep, was opened, and the congestion was so great in 1894 with this canal that the average detention of vessels was over seven hours. A new lock, 800 by 100 feet and 20 feet deep, is now practically ready for service on the American side, while another lock on the Canadian side, 900 by 60 feet, will help relieve the congestion. These locks are to overcome the difference of level between Lake Superior and Lakes Michigan and Huron.

The Chicago drainage canal was then liberally illustrated, and facts concerning the 40,000,000 cubic yards of material handled were given. Among these was the average cost of rock excavation at 76 cents and dirt 22 to 28 cents per cubic yard. The material was largely handled, after the top lift had been removed, by means of cantilevers, cable-ways or swing derricks, which met with favor in the order named—a cantilever costing, however, about $28,000, while a cable-way cost but about $12,000. Few of the contracting firms owned their conveying apparatus, most of the work being sublet to conveyor companies. Drills which have bored from 90 to 130 feet per day in the limestone rock through which the canal is cut could penetrate but from 6 to 20 feet in the harder Lake Superior iron ores.

The propeller pump used at Milwaukee to flush the river by delivering about 40,000 cubic feet of water per minute was illustrated. The improved methods of constructing vessels for the lake traffic and the unique way of launching them sideways also received attention and illustration.

The railroad tunnel under the St. Clair River was shown in section and the statement made that during the season of navigation a greater tonnage passed through the St. Clair River than elsewhere in this continent.

The paper closed with a reference to the improvements at Niagara, and a statement that the engineering features of Lake Ontario and the canal between Lake Erie and Lake Ontario had necessarily been omitted to make the description complete so far as the upper lakes were concerned, although it was not claimed that all of the remarkable achievements of the engineer had been mentioned.

At the close of Mr. Birkinbine's remarks there was some discussion on the temperature of deep mines, and in answer to a question the statement was made that with fair ventilation it need not be uncomfortably warm. In some mines water found at a depth of about 1,500 feet is quite salt, and at a greater depth becomes acrid. Large masses of pure copper are often mined, sometimes with pure silver attached to them. The Quincy mine was cited as having yielded masses that were cut down to pieces weighing 10 tons so as to be put into the furnace.

* Abstracts from a paper read recently before the Engineers' Club of Philadelphia.

SIXTEEN new steamers of the largest class for passenger and freight business have been contracted for by the owners of the principal lines of steamers plying between New York and European ports.

The Detroit Boiler Explosion.

Without a doubt the most disastrous boiler explosion which has occurred in this country, that is, so far as loss of life is concerned, was that in the Detroit Journal building, on Larned Street, Detroit, Mich., Wednesday, November 6, which reduced the four story building to kindling wood and resulted in the death of thirty-seven people, while many more were badly injured. The following account is given in Lord's Magazine:

The day force had just gone to work at nine o'clock in the morning when the building was seen to swerve and shake, the front and back walls fell outward, and in a few moments what had once been a handsome building was a mass of ruins.

Cries for help and shrieks from the wounded went up from the wreck. The general fire alarm was turned in and ambulances and engines hurried to the scene.

The concussion caused by the explosion was so terrific as to shake every building within several blocks of the Journal office.

Windows were broken and many persons were injured by falling glass. The Calvert building across Shelby Street from the Journal shook like a reed. Nearly every window on the Shelby Street side was blown in, including two heavy plate windows on the second floor.

The building directly opposite the Journal structure on Larned Street, occupied by the Free Press Printing Company, had scarcely a whole light of glass left intact, while the Arcade building, adjoining the Free Press, had the appearance of having gone through a wreck of its own.

The cause of the explosion at this date yet remains a mystery.

After part of the wreckage had been cleared away the rear end of the fatal boiler was found lying near the Larned Street wall. The sheet was torn straight across, just back of the steam dome, three-eighths inch of iron having parted like cardboard and heavy rivets broken as if they were matches. This piece of iron was spread out until almost flat, and was hurled with such force against the cylinder head of the engine that it was crushed and battered as if it were made of glass.

The east boiler did not come out, but was carried off its foundation and through the solid stone wall into the Davis cellar. The force of this blow bent the boiler near the steam dome, parted the seams, and bent the tubes. The crashing of this boiler through the foundation caused the collapse of the two buildings.

The safety valve of the low pressure boiler was found, but so badly broken that the inspectors were unable to tell whether it was in good condition when the explosion occurred or not.

The steam gage was found so badly damaged that no one could tell what pressure was registered at the time of the explosion.

There was not a solid joint left in the building, the west wall being driven out several inches and the east wall badly cracked and thrown several inches out of plumb. In fact, the entire building was moved on its foundation.

The boilers were in charge of Engineer Thomas M. Thompson, who was painfully but not fatally injured. His statement concerning the accident was as follows: He was in the mailing room when the explosion occurred, having left the boiler room ten minutes before. At the time the west boiler showed 65 pounds pressure on the gage and the glass tube indicated two gages of water. There was a low fire under the east boiler, the gages showing 15 pounds pressure and three gages water.

The boilers were licensed to carry 90 pounds of steam, the safety valves being set at 80. The boilers were plain tubular, 5 feet in diameter, 14 feet long, with 3 inch flues, and built by Stephen Pratt in 1884.

They were connected by a 5 inch main, from which ran the main steam pipe to the engine, with 3½ inch branch to the elevator pump. Smaller pipe connections conveyed steam to the heaters in the various rooms in the building.

The boilers were fired by oil, the supply being carried in two tanks with a joint capacity of 55 barrels. They were coupled with a T, from which 2½ inch pipes conveyed the oil to the burners beneath the boilers.

Mr. Thompson states that about two weeks before the explosion the blowing out of a manhole gasket caused him to place the east boiler in service until repairs on the west could be made. The west boiler was fired up the day before the accident and found all right, the engineer noting that the safety valve blew at the stated pressure.

He further said that one of the blow-off valves leaked, and Tuesday evening, when he shut down, he started the injectors and gave the boilers over three gages of water in order to have enough to start with in the morning.

On coming down the morning of the explosion the glass showed that about one inch of water had leaked out during the night. In this connection the engineer states a fact that may be an explanation of the cause of the accident.

There had been such a demand for steam that one boiler was not sufficient, and after he had thrown the west boiler into service, he fired the second furnace, with the intention of coupling them as soon as the gage on the east boiler should show 60 pounds of steam. As stated before, this boiler only showed 15 pounds when he left the room, and had not been coupled.

There is a possibility that the leaking valve had allowed nearly all the water from this boiler to escape during the night.

Mr. Thompson had just entered the mailing room when the accident occurred. He was hurled against a wall surrounded by clouds of steam. Near him was a chute leading down to the press room, down which he slid. Here he was found later by the members of the fire department and taken out through a window.

Mr. Thompson says that it has been his custom to blow off steam through his glass gages once a week in order to be sure they are not clogged. He is positive that he tried the water cocks the morning of the accident. He further stated that the oil gage showed about twenty-five barrels in the tank.

W. H. Wells, of the firm of Wells, Angell & Boynton, attorneys for the Newbury estate, which owned the building, says that Engineer Thompson was a thoroughly competent engineer and machinist, strictly temperate, and an associate member of the Y. M. C. A.

In October, he entered the classes in algebra and mechanical drawing at the night school of the association, and it is hardly likely that a man who at his age has strong character enough to study nights would become careless at his work.

As is usually the case, the engineer comes in for a large share of the blame for the casualty, and the grand jury have indicted him for manslaughter.

Tests of the boiler plate which are in progress may throw new light upon the case, but should the decision show that the cause was from low water, it, of course, will have to be laid at Engineer Thompson's door.

The public at large fails to realize how little stands between safety and danger in a boiler plant. The apparatus which has furnished heat and power for years without an accident is never noted, and the engineer is considered as an unskilled laborer to a great extent, or one whose duties consist of starting and stopping an engine or shoveling coal into a furnace; but, let an accident occur, and all this is changed. The engineer always comes in for censure until he is proved not guilty, and, as in the present case, is indicted for manslaughter. His character and habits are closely inquired into, and his ability—the first time that has been considered—is investigated.

In fact, then, and not till then, do the public for a moment think that the engineer should have been possessed of anything like ability which would carry him above the plane of an unskilled laborer.

It is to be hoped that some developments may come out of the investigations which will prove that the responsibility for the terrible catastrophe does not rest upon Engineer Thompson, and that all judgment will be suspended until the thorough investigation which is in progress shall have been completed.

Accident on the St. Paul.

A serious accident took place on the American line steamer St. Paul, at her pier in New York, on December 18, in which nine men lost their lives and several others were severely injured. The fatality was caused by the fracturing of the main starboard supply pipe just as the machinery was being started to test it before sailing. No definite statement of the cause of the accident will be made until a thorough investigation, which the company is now conducting, is completed. The explosion occurred about seven in the morning. The noise brought the officers and crew to the engine room. The steam was at once shut off and the work of rescue began. All of the men in the engine room were killed and all except two of the fifteen men in the boiler room and electrical compartment were badly injured. The pipe, which was 15 inches in diameter, snapped off at the elbow. The steam pressure was less than usually carried, being only 130 pounds.

Similar accidents have occurred on vessels of both the English and American navies. Two accidents of the same kind have occurred in stationary plants in New York City within a month. On November 26, the elbow in a pipe which supplied steam to the engine which runs a lighting dynamo in Hammerstein's new music hall, called the Olympia, blew out, resulting in the death of two men and the injury of several others. The main steam pipe is 10 inches in diameter. From this a 6 inch feeder runs to the engine, and fastened to this 6 inch pipe was the elbow which blew out.

It is suggested that the accident may have been due to a too rigid connection, causing the elbow to burst by the expansion of steam, or to the presence of cold water in the pipe, or to a defect in the elbow, which, it is said, appeared to be about one-sixteenth of an inch less in thickness in one place than in another.

On December 19 a steam pipe leading into the generator of a stationary engine in the Consolidated Gas Company's works at the foot of East Twenty-Second Street exploded, killing one man and injuring several others.

These sad examples show that steam supply pipes, as at present constructed, need improvement, and we trust that the subject will be carefully studied by inventors.

To Make Cloth Waterproof, but not Airproof.

To the query how can I waterproof a cloth without making it airproof at the same time? the following reply is given:

To make a cloth waterproof, but not airproof, is a demand that is difficult, if not impossible, to comply with. Let us simply imagine what is necessary, and we have: 1. The spaces between the threads must be filled; and 2. The sponge like condition of the textile fibers, by the force of which they absorb both air and water, must be neutralized. It is evident that the inlets for water cannot be closed without at the same time affecting in like manner the passage of air. It is true that air is finer than water, and the question could doubtless be answered, if figuratively speaking, such a treatment of the cloth were possible that the doors were barred against the entrance of the coarser fluid and the finer element were allowed to squeeze through.

By studying this question, we would come to the conclusion that such a thing might be possible, if we understood how to neutralize the spongy condition of the textile fibers referred to without having recourse to filling the interstices between the threads. As water passes through a cloth essentially because of the absorptive capacity of the latter, it would be necessary to annihilate this property of the fibers in order to effect the desired purpose. The way to do this is plain, and that is to impregnate the threads before weaving, but as this cannot be done for a number of reasons, the treatment of the ready cloth is the next recourse.

Several formulas for effecting this have recently been patented, and in one of them James G. Smith dissolves gutta percha and India rubber in paraffin. The latter melts between 122° and 165° Fah., and when heated to 212° or 230° Fah., it dissolves 100 per cent of its weight of gutta percha or India rubber. Upon this fact is based its adaptability for waterproofing cloths, but not airproofing them; 15 parts gutta percha or India rubber are to be dissolved in 100 parts paraffin and the solution, at a temperature of 158° Fah., is applied direct to the cloth to be impregnated, or what is still better, the solution is dissolved either with benzine or benzol, and the cloth is then drawn cold through this diluted solution until thoroughly saturated. any excess being removed with a current of air or else in a suitable manner by steaming.

Similar to the above method is one of Napoleon Lefebvre and Edmond Aron, who propose a fluid 1,000 parts of which contain 987 benzine or sulphide of carbon, 3 parts India rubber, and 10 parts paraffin.

Frangois Joseph Pescuard and A. P. E. Tardieu make a cloth waterproof without at the same time excluding air, which is necessary to carry off the perspiration from the body, by the use of the following fluid: 55 grammes India rubber, 2 grammes gutta percha, 300 grammes benzine, 25 grammes sulphide of carbon, 10 grammes essence of turpentine (terrebinthe), 200 grammes ordinary linseed oil, 70 grammes boiled linseed oil, and, according to circumstances, a little black or white (charcoal or zinc white).

It is said that the first formula is adapted in every respect for the object in view.—Industrial Record.

New Variable Star of the Algol Type.

Dr. Edward C. Pickering reports in Harvard College Observatory Circular No. 3 that the star B. D. + 17° 4367, magn. 9 1, whose approximate position for 1900 is in R. A. 20h. 33·1m., Dec. + 17° 56', appears to be a variable star of the Algol type. On July 18, 1895, Miss Louisa D. Wells found that no trace of this star appeared on the photograph I 4359, taken with the 8-inch Draper telescope on September 26, 1891, exposure 16 m. On 71 other plates taken from June 30, 1890, to October 5. 1895, the star appears of its normal brightness. On December 12, 1895, at 10h. 42m., Greenwich mean time, Prof. Arthur Searle, who had watched this star on several nights, found it more than a magnitude fainter than usual. During the next half hour it diminished about half a magnitude more. Meanwhile, a photograph taken with the 8-inch Draper telescope, I 14036, confirmed the diminution in light.

Gas Engine Economy.

It is stated that the electric railroad at Lausanne is operated from a power house in which the dynamos are driven by two gas engines of 130 horse power each, built by Crossley Brothers, in England. They use a gas which is made in producers in the power house. The dynamos are run by belt. The working is said to be very economical, and the best result obtained has been an expenditure of 550 grammes of anthracite coal per horse power hour in ordinary service. The engines are run on an average 18 to 20 hours per day. A careful calculation has shown that the amount of fuel used is 1,300 grammes of anthracite per car kilometer.