

POLYTECHNIC ASSOCIATION OF THE AMERICAN INSTITUTE

The Association held its regular weekly meeting at its room at the Cooper Institute, on Thursday evening, Oct. 16; Mr. Tillman in the chair.

MISCELLANEOUS BUSINESS.

More than the usual half hour was devoted to miscellaneous business; a large number of inventors having subjects of interest to bring before the Society.

Mr. DEMAREST presented a sewing machine, which was enclosed in a case about seven inches square and two inches thick, and which can be sold for five dollars. It sews a running stitch. The needle is stationary, and the cloth is corrugated and crowded upon the needle by a pair of cog wheels; the needle passing through the folds, and then the cloth is drawn along by hand upon the thread. The exhibitor said that this machine is designed especially for thin goods, which cannot be sewed well with the ordinary machine. He said that a person with one of these machines could do about seven times the work that can be done by hand.

The CHAIRMAN—I have the pleasure of introducing to the Society, Mr. Hamilton E. Towle, the engineer who devised the steering apparatus by which the *Great Eastern* was saved. He has a plan for ascertaining the form of ships' bottoms, which I presume will be interesting to the Society.

Mr. TOWLE explained his plan. It consists in a simple frame to be drawn under the ship's bottom, and when it is so placed, a number of sliding rods which had been held in place by a catch are released, and are carried up by buoys fastened to them, till their ends come in contact with the bottom of the vessel. The catch rod is then drawn back, when it holds all of the rods in place, and when the frame is removed, the upper ends of the rods form an exact mold of the vessel's bottom. The plan was suggested by the apparatus in use by hatters for taking the size and form of a person's head.

FUEL IN THE ARTS.

The CHAIRMAN—The time has arrived for the regular subject of the evening, "Fuel in the Arts," and we shall be pleased to hear from any one on that subject.

Mr. FISHER—A few months since, I read in one of the English scientific papers (*The Practical Mechanic*, I think) an article on the use of petroleum as fuel in steamers, in which the writer urged the economy of space which would result from the use of this fuel. It has occurred to me that, if this fuel can be bought at a price sufficiently low to be used, it might be stowed in iron steamers between the outer and inner skins of the sides. This space in the *Great Eastern* is, I think, two feet wide; and as it extends all around the vessel, it would hold an enormous quantity of oil. There would be some economy of labor in using this fuel, as, instead of being transported about the deck as coal is, it could be drawn by a pump through small pipes. In regard to heating the air which supports combustion, there seems to be a difference of opinion among authorities. In Siemens's furnace, the air and the gaseous fuel are both heated to some 1,300° before they are burned, and it is claimed that the heat is increased to the same extent. But Chas. Wye Williams says that there is no advantage in heating the air before it enters the furnace. We know that when the air began to be heated some 600° for iron furnaces, the process of making iron was accelerated. It was found that one bushel of coal used to heat the blast, did more good than several bushels on the grate. I have made no experiments myself, but it would seem as if there should be more intense heat in the combustion if the air was first heated. There is a difference of opinion, however, among authorities. Mr. Chairman, I will introduce to the meeting Mr. Coons, who will explain his apparatus for making gas for fuel as well as for light.

Mr. COONS—I have here, Mr. Chairman, a drawing of my apparatus. [The speaker proceeded at considerable length to explain his apparatus for making gas on a small scale. It possesses no feature of special novelty, but is claimed to be a compact, simple, and easily operated apparatus.]

Prof. SEELY—The habitual attendants of our meetings will remember that I have been talking from

time to time for the last two years about the practicability of obtaining intense heat by burning compressed gases, or burning fuel in compressed air. The quantity of heat depends upon the amount of oxygen consumed, and the intensity depends upon the amount consumed in a given space. If we burn hydrogen gas in pure oxygen under the pressure of the atmosphere, we obtain heat sufficiently intense to melt platinum, but by compressing the gases into half the space we ought to have heat twice as intense. It is perfectly practicable to apply an additional pressure of fifteen pounds to the inch, or one atmosphere, even in an ordinary furnace, and by proper arrangements it may be carried to fifty atmospheres. This would give us a new power to work with. We may perhaps volatilize all substances, including platinum; and if carbon can be melted and diamonds produced, this is the way to do it. I see that within a few months, three or four persons in England claim to have invented or originated the plan of obtaining a high heat by burning with compressed air, and I wish to revive the recollections of the Society to my discussions of the subject.

I proposed this subject of fuel, Mr. Chairman, as I stated at the time, with a view of obtaining information in relation to the various new modes of burning petroleum, and I have been much edified by the remarks which have been called forth. I will add my share to the information elicited, by explaining an apparatus which I have devised and tried. It consists of a cup to contain oil, with a number of tubes passing vertically through the bottom, and open at both ends. The spaces between the tubes are filled with wicking, and of the various substances which I have tried for this purpose, I prefer sand. The oil is conducted by capillary attraction to the surface of the sand where it is lighted, and the air draws up through the tubes to maintain the combustion throughout the whole body of the flame. It is in effect a combination of argand burners. If used without a chimney, a blast is required. I was led to this plan by searches for some mode of burning petroleum in the air engine, and in my opinion this will be found the best plan for that purpose.

Mr. FISHER—Have the gases ever been heated for the oxyhydrogen blowpipe?

Prof. SEELY—Not that I am aware of. I do not think much of the hot blast, however; the expansion of the air tends to diminish the intensity of the heat; counteracting to a considerable extent the effect of heating the air.

The CHAIRMAN—I see in the room our old friend, Mr. Everett. He is now located at Cleveland, Ohio, as a manufacturing chemist, and has made a great many experiments on coal oil. He can probably give us some interesting information on the subject.

Mr. EVERETT—Coal oil is not now manufactured. Petroleum is so cheap that the manufacture of coal oil does not pay. We call the petroleum "coal oil" from habit, but it is a misnomer. I have nothing of interest to say in regard to either substance.

Mr. COHEN—I came clear over here from Jersey City, and have sat all the evening hoping to hear something about fuel, but I have been disappointed. I am a chemist, but at present am engaged in distilling at Jersey City. I have adopted some improvements in burning fuel, by which I save twenty-five per cent of the cost. This saving is effected by burning a cheaper material. I burn the fine coal dust. The only difficulty is in getting a man to feed the fire properly. The dust must be thrown in very frequently, and spread evenly over the grate. I formerly paid \$12,000 a year for coal, but now it costs me \$9,000. Yet I have to turn round and pay a man three or four dollars a week more, in order to get one who can fire with this fine dust.

Mr. OVERTON—I will remark in this connection, Mr. Chairman, that my fan is just the thing for blowing a fire with fine coal. Unlike other rotary fans, it has a piston which will work against pressure. I believe that all you can do in generating heat from carbon is to burn it completely—combine with each atom of carbon, two atoms of oxygen. And I will further remark that I believe the time will come when a far more intense heat will be used for generating steam, with a small extent of boiler surface. You have probably seen the accounts of the locomotive that was altered in Jersey City. The pipes were

reduced in length one half, and the boiler made more steam.

Mr. DIBBEN—Was not the length of the fire-box increased to the same extent as that of the pipes was diminished?

Mr. OVERTON—I do not know how that was.

Mr. DIBBEN—It was.

Mr. FISHER—Several years ago a Mr. Bennett had an engine here in which the air was compressed, and I should like to know if there is any one present who is acquainted with the results of that experiment. The fire-box was enclosed and the air was forced into it by an air-pump; a safety valve opened when the pressure reached a fixed limit, and allowed the products of combustion to escape into the boiler. The engine was placed in a steamboat, and very good speed was obtained from a moderate sized engine. But the valves were cut out by the ashes, and the plan was abandoned.

Mr. CHURCHILL—I have found that the best plan for burning gas as fuel, is to surround the jet with a series of concentric chimneys. A slight draft is created through the annular spaces, and as the flame is spread out by the vessel above, over these spaces, the air comes in contact with it and completes the combustion. There is no smoke.

"Paper and its Manufacture" was selected as the subject for the next week, and the Association adjourned.

THE HOP IN ENGLAND AND AMERICA—BEER BEVERAGES.

Pleasant recollections arise as we behold the feathery clusters and graceful spirals of the climbing hop vine. Those who have spent their early years in some of our rural districts will remember the family hop vine that formed a familiar appendage to every homestead. In almost every land the harvest season presents scenes which are associated with rustic festivities and rejoicings. The merry Rhineland goes forth dancing to gather the grape, and he comes home singing with his purple clusters; and in "Merry England" similar scenes may be witnessed in localities devoted to the culture of the hop, which plays such an important part in the preparation of that ale which is the delight of the ruddy-faced Anglo-Saxon.

The last number of the London *Saturday Review* contains an article on M. Esquiro's work on "The English at Home," in which, a hop harvest scene in the county of Kent is graphically described as follows:—

At that period of the year, the vagabond shakes off his sloth, the wandering tinker puts out his fire, the beggar ceases to hold out his hand, the minstrel deserts his fiddle, the laborer bids farewell for a season to his plow, and all proceed to the hop festival. Then come together the poor man in decent clothes and the poor man in rags; the workman with an open face and the adventurer with suspicious looks—the honest man and the thief; still the latter does not steal, but works for a season. Among the women, the same contrasts are visible; sordid misery and coquettish misery; youth and old age; virtue and vice; but the latter now sanctified by virtuous employment. All these jostle each other along the road; from station to station, the parties stop to make their tea in the open air; the men, seated by the pot, smoke their pipes gaily, or sleep with their hats over their faces; while the girls ramble along the hedges picking nuts, or unharnessing the donkey, which drags in a small cart an old woman and a few household utensils.

Few sights, indeed, can be more exhilarating than a Kentish hop harvest. Little children, young girls, old men and young men are engaged in picking the hops, which are raised in large gardens. The hop harvest occurs in the loveliest season of the year, and jests, songs and merry laughter arise on every side. When the labors of the day are over, the hop pickers gather in clusters, tell stories and sing songs. Many an ancient, unprinted ballad, breathing love and bravery, is chaunted by the rustic vocalists. Many romantic attachments are formed at the hop harvest; all hearts seem to be happy, and each voice filled with melody.

The native English hop grows wild on the skirts of the wood. That which is cultivated was introduced from Holland during the reign of Henry VIII.