

How large should the soil pipe be from the highest fixture to the roof?

Should any allowance be made for the expansion and contraction of soil pipes?

What is the regulation of the Board of Health in regard to soil pipes in cellars?

What fall per foot should a horizontal soil pipe have?

How can a soil pipe be cut after it is put into a building, to allow the insertion of a branch pipe?

What is meant by the peppermint test, and how is it applied?

In a building over seventy feet high, how is the water test applied?

It is not expected that the course of lessons given at these schools will make the recipients complete masters of their trades, and able at once to cope with regular journeymen therein; but, from the experience thus far gained, it is proved that the knowledge here imparted forms the very best groundwork for the quick making of a first-class workman. There have been several instances where workmen have gone from these schools and at once earned journeymen's wages as plasterers and bricklayers, but these cases have been considered exceptional, as, although the student may have gained a better theoretical knowledge of the business in one term than is possessed by ordinary journeymen, it generally requires a longer time and more practice to gain the manual dexterity; that is, the skillful journeyman will lay about 1,500 bricks in the time it will take the average student from these schools to lay 500 or 600, the increased speed being acquired by practice, and so it is comparatively in other trades. The walls of the building in which bricklaying is taught, and also those of the plasterers' room, were built by the students, who were paid for their work in proportion to the number of brick laid. The founder of these schools, also, last year, in order mainly to give employment to a number of the young bricklayers, built the foundations and heavy lower story walls of what will eventually be some tall buildings, and says the work of his graduates on this job will compare well with any other bricklaying in the city; it is, in fact, so satisfactory that he will employ some of the members of this year's class in putting up the walls of some five-story buildings to be erected during the coming summer.

Although, by the terms of admission to the various classes, instruction at these schools is intended to be limited to those between 16 and 25 years of age, there has been no earnest effort, until the past season, to enforce this regulation. Experience has proved, so far as the history of these schools goes, that men who have failed at various occupations, and who have not settled down to the learning of a trade until they are over 25 years old, do not take hold and stick to their work with that spirit and resolution necessary to become a skillful workman, and so it is the intention hereafter to confine the membership to those within the specified ages. Other men who desired admittance, although most of them would come under the preceding provision, were the janitors of various flats and office buildings, who simply wished to learn enough to enable them to do their own jobs; as such students did not intend to completely learn the trade, and their work was not likely to be particularly creditable, it was decided not to admit them to the privileges of the trade schools.

When these schools were first started, some difficulty was experienced in engaging competent teachers, the best mechanics being afraid that they might be expelled from their trade-unions if engaging in such work, but this trouble is now over, and many union men bring their sons to the school, and come in the evening to help the instructors teach them. The Master Free-stone Cutters' Association and the Journeymen Stone-cutters' Association have both passed resolutions indorsing the trade schools.

The question as to how the call for skilled labor in the United States is to be met, in the future, may possibly find its solution in the experiment now being worked out in the New York trade schools, or some plan on the same principle. In many of the old trades it would be difficult for an apprentice now to thoroughly learn a business, as it was learned a generation ago, even were it not for the opposition of trade societies. The introduction of machinery and the division of labor have greatly changed the conditions of industry. The carpenter finds that door and window frames, all kinds of mouldings, and in fact all the interior work of modern buildings, come ready-made from the factory; the blacksmith or machinist sees that the most difficult pieces of work in his line are now generally the product of the stamping or draw press, or that some other labor saving device shortens the old process; and so it is, in a greater, or less degree, through all our modern industries. But notwithstanding all these changes, that facility in the use of tools, that knowledge of the working of materials, that judgment of design and fitness in an article, which come only as the

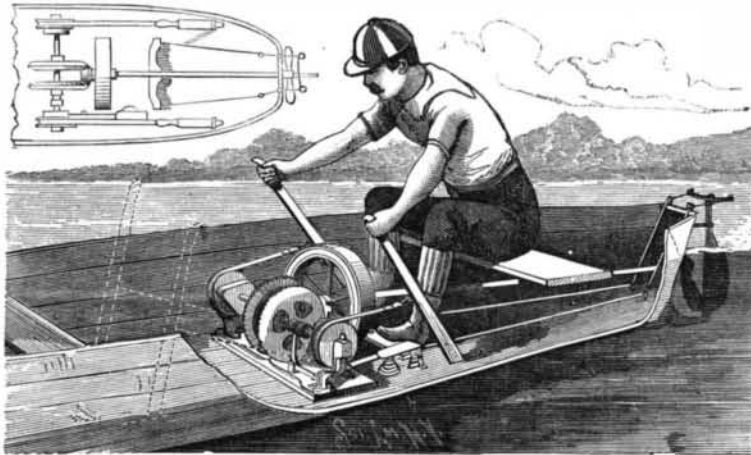
result of practice and study together, are still most important requisites for the workman in any branch of industry. And yet the American employer now troubles himself but little on these points; the whole tendency is to engage boys in the same way as men, simply for what they are worth, which causes so many, taking only casual employment, or following unskilled pursuits for temporary gain, to grow up without any higher ability than that of laborers. It is easier for a young man to get an opportunity to learn a trade in the country than in the city, as there are not such rigid trade-union restrictions in the country, but the standard of workmanship is not as high as it is in the cities. In the city there are thousands of young men whose education and bringing up admirably adapt them for the mechanic arts, but their places are now largely filled by foreigners and mechanics from the country. For such young men, whose lives have in many cases been marred by the efforts of trade unions to limit the number of employes, these trade schools offer an opportunity hitherto unattainable to learn a trade, or to improve themselves therein should they be already so engaged; and to such extent as they are sustained, they promise to prove a not inefficient substitute for an apprentice system.

Pneumonia.

This disease has been very prevalent in this city, and in other northern places, the past winter.

The chilly winds of March have not been the means of lessening the fatality of the disease, and persons in middle life, as well as old people, are stricken down, and die within a few days after their attack. B. V. French tells in the *Boston Journal* what pneumonia is, and what to do in the first stages of the disease.

His mode of treatment seems rational; certainly, it is simple enough, and most of the remedies can be



BATZ'S HAND PROPELLER FOR BOATS.

found in out-of-the-way places, away from physicians. Pneumonia, says the writer, is inflammation of the lungs. When the inflammation is on the lining of the chest, it is pleurisy. The two may be combined. Pneumonia is a dangerous disease, and requires prompt action. It is preceded by a chill, from which it sometimes is difficult to restore the natural heat. This chill is followed by a high fever, in which the heart beats rapidly.

Chills may come from other causes than pneumonia, but unless sure of the cause and sure that it is not dangerous, it is safe to suspect a coming pneumonia, and to send at once for a physician. On no account attempt to manage the case without one. The disease is too serious to warrant such an attempt. Until he arrives, do what you can to equalize the circulation and temperature. Keep in bed between woolen blankets or sheets, increase the temperature of the room, apply to the affected parts old soft cotton (not linen) cloths wet in hot water, in which has been mixed one-half of a teaspoonful of mustard to a quart of water, and to this apply heat from tins or bottles of hot water or hot bricks. Rubber water bags are best; apply heat in the same way to the feet. Do not increase the quantity of mustard. The object is to excite action in the skin, but to avoid an irritation that would hinder or destroy action. As these cool, replace them at once with others, not allowing the temperature to reduce at all. On no account must the patient get out of bed.

For medicine give aconite, four globules, every half hour; this is homœopathic. When the perspiration returns and the patient can sleep, let him sleep; continue the heat for a time, and when it is reduced let it be done with great care. If the patient needs food, let it be of a plain, simple kind. Avoid cold drinks until the natural condition of the skin is restored.

MR. IVAN LEVINSTEIN, in conclusion of his defense of aniline dyes against the charges, in the *London Times*, of their poisonous effects upon human health, cautions against the use of chrome yellow and chrome orange in dyeing cotton articles which are to be worn next to the skin, because these dyes consist in a salt of lead, which may be absorbed by the skin and produce disease.

How to Make a Paper Pan.

I recently required a dish to silver some paper on, and none could be obtained near where I live. I made a dish in the following manner: First cut out a block of wood the exact size and thickness of dish required. Then take a sheet of cartridge paper, paste it with flour paste and rub in the paste well, letting the paper be thoroughly soaked with it. Then place the paper evenly on the wooden block, turn down the edges smoothly and double the corners back, rubbing them down well. Be very particular with the first sheet, because if you get that smooth, the rest is easy. Follow with another sheet of cartridge paper, turning the surplus or slack paper at the corners, the opposite direction to the last. Follow with five or six sheets of old newspaper in the same way, and cap with another sheet of cartridge. Put the block with the paper on it into an oven, and bake till dry. Then take out the block and trim the edges. Paint the outside of the paper dish with varnish. Pour some varnish inside the dish and let it soak in, and then pour off the surplus. Bake in the oven again. After the varnish is hard and dry, warm the dish until it is hot enough to melt paraffine wax. Pour some melted paraffine into it, and tilt it about till the bottom and sides are evenly covered; pour off the surplus, and when dry you can use for toning, developing, or even silvering paper. Of course the above is only recommended as a substitute for glass or porcelain when the latter cannot be readily obtained. Paraffine alone may be used if you like.—F. Whitehead, *Photo. Times*.

HAND PROPELLER FOR BOATS.

The engraving herewith shows a device for propelling and steering a boat which is very simple in construction, easy to manage, and which will drive the boat at good speed with the expenditure of but little muscular power. Journaled transversely is a shaft carrying two beveled wheels, between which is a third beveled wheel mounted on the forward end of the propellershaft. By means of a lever placed within easy reach of the foot of the operator, the transverse shaft may be shifted so as to make the third beveled wheel engage with either the right or left hand wheel on the transverse shaft, thereby turning the propeller shaft forward or backward. To hand levers pivoted to the bottom of the boat are secured the ends of straps, the opposite ends of which are attached to barrels mounted loosely on the transverse shaft, one at the side of each beveled wheel. When the levers are drawn toward the operator, the barrels revolve the shaft through pawls and ratchets. The levers are brought forward by coiled springs placed within the barrels. The boat is steered from the feet, which rest on a centrally pivoted cross bar, to the ends of which the tiller ropes are attached.

The boat is easily steered, and can be as easily reversed, the work to be done by the occupant being continuous and always in the same direction, and since he faces forward, he is enabled to keep a good lookout ahead. Power as well as speed can be changed by attaching the straps higher or lower on the hand lever. These levers can be worked together or independently, and when additional power is needed, a second pair may be placed just forward of the machine, as indicated by the dotted lines. This apparatus is applicable to life saving boats, as it takes up but little space and is always in position ready for use.

Further information concerning this hand propeller can be obtained from the inventor, Mr. Michael Batz, of 357 Flatbush Avenue, Brooklyn, N. Y.

Progress of the Tehuantepec Ship Railway.

The Government of Mexico has lately made important additions to the concessions heretofore granted to the Tehuantepec Ship Railway. Mexico guarantees the net revenue of the Company to the extent of \$1,250,000 per annum for 15 years after the completion of the road, and gives the Company the right to ask for additional guarantees from other governments to the extent of \$2,500,000 per annum, or a total of \$3,750,000, being four per cent on \$93,000,000.

Other guaranteeing governments may have a rebate of 25 per cent. on their commerce for 30 years, and a representation of two-ninths in the Board of Directors. The Company has the right to establish coaling stations and to import coal free of duty, to furnish ships in transit, and also the right to collect all tolls, except those from Mexican commerce, in gold, a difference in favor of the Company of about 18 per cent. There are several other minor concessions granted, such as the right to establish two tow-boat lines independent of taxation, and to collect harbor dues.

In our last issue we omitted to give credit to *London Engineering* for the illustrations of twin screw engines of the Italian ram Etna. We herein acknowledge our indebtedness.