Correspondence.

Apprentices not Wanted, and Poor Journeymen Numerous because Machinery does so Much.

To the Editor of the Scientific American:

Dr. Walker's plan for directing the Boston boys toward industrial occupations, as noted in your issue of November 3, is, no doubt, practicable so far as regards some manufactures. But how about the facts as touching carpenters' apprentices? In times within my memory every carpenter shop held at least one apprentice, some of them half a dozen or more. Then the apprentice boy commenced at the very bottom of the business and learned it from there up. The first thing to learn was to hold the chalk line, next to rip out furring strips, then to plane boards. After a little practice in such rudimentary occupations he was taught to plane up and joint panel stuff, next to make, perhaps, a window shutter or a door, and so on up until "out of his time," so that when he commenced as a journeyman he was a pretty good mechanic—say a hundred per cent better than the average journeyman of the present day.

The principal cause of the present changed conditions is to be found in the large use of improved woodworking machines. The occupation of the apprentice boy of former days is gone. He has no chalk line to hold, no furring strips to rip, no boards to plane, no shutter or door to make. Machinery now planes the boards, saws the strips, rabbets the jambs, "sticks" all the mouldings and casings, stop beads, shelf cleats, etc., and planes all the bases, makes all the panel work, wooden mantels, window frames, and drawers. Much of the trimming of a house nowadays is even fitted together and glued up in the mill, so that about all the carpenter has to do is to put it in place, while he has only a small part to cut and fit together. It is not strange, therefore, that the "trade," as now professed by many workmen, is mostly "picked up."

Such tools as these "journeymen" have, too! If you could only see some of them, you would just turn round and *cough*. And what is true of the carpenter business is also true of plumbing, tinning, painting, etc., and to the same causes must be mainly attributed the "choking up of the paths of life leading to fame and fortune," as described by Dr. Walker.

Brooklyn, November 2, 1883. SAMUEL R. GOODSELL.

Storage of Power.

To the Editor of the Scientific American:

We notice considerable attention is lately given by the inventing public to furnishing a cheap and effectual method for storing power, to be subsequently used as desired. It seems that we must look to the electrician to supply this want, and we confidently expect, if we live long enough, to see a customer walk into a retail hardware store and buy 10 H. P. for one hour, which he shall carry home in his hand as would a commercial traveler his "grip." That some accumulator of electricity can be made thus much powerful and portable seems to us to be a destined fact, and the man with the pluck, luck, and brains to do this is already born. The ingenious individual who proposed to set a water wheel at Niagara and run a line shaft to Boston and New York, renting power along the line, would be commonplace beside the man who, using Niagara or other power, should so bottle up energy that it could be transported anywhere, regardless of a line shaft, and used for any of the thousand purposes for which power is used. Think of sending to market for a package of H. P. to run our electric light this evening or to run our sewing machine or to rock the baby! Further, it may not be convenient to always send to market. Suppose we have a good windmill, of which several good ones are built besides the Champion self-governing mill, which we make.

A small mill of this kind will produce an effective power of one horse, in a fair wind, equal to 24 H. P. for one hour of the day, provided the wind continues to blow. As the latter is uncertain, suppose we say it can in 24 hours store 10 H. P. for one hour, the power to be used as needed at any time.

Electric lights could be almost as common as kerosene lamps, much more common than gas now is outside of cities. It might seem that this power could be stored by means of raising weights, winding springs, raising water into reservoirs, or compressing air; but so far nothing has met the requirements of cheapness of plant and economy of using the power thus stored.

To lift 33,000 pounds one foot in one minute, and so continue for 24 hours, would require a tower capable of sustaining this weight 1,440 feet high; twice the weight, half the elevation, and like proportion, an estimate of the cost of which is fatal to its practicability. Springs have similar objections. Raising water requires, first, that you have the water; next, that you have the elevated reservoir into which to raise it; and then you have the wastage of leakage and evaporation. To store compressed air requires an expensive plant, and is attended with great wastage of power.

Now, Mr. Editor, we are driven to expect that the electrician is to help us out of this dilemma, and we trust in you to stimulate the experts in this science, so that before we leave this sphere we shall see marketable H. P. as common as soap boxes are now; and when we move on, that the undertaker shall send out and buy the motive power to move the procession, and let the horses rest.

Waukegan, Ill. POWELL & DOUGLAS.

The Ice Industry.

In an article in the *Franklin Journal*, Prof. W. P. Blake says the cost of cutting ice and packing it away in the ice house varies greatly, according to the varying conditions and the perfection of the arrangements and the skillful use of all the appliances. With an unlimited supply of good ice, say 10 to 12 inches thick, the cost may be as low as 12 cents per ton. At an ice house where some 10,000 tons were harvested during the past winter, the cost was estimated at 15 cents per ton. The average cost is nearer 25 cents.

When the crop is abundant, it is not unusual for the owners of the plant for filling large ice houses, after the houses are filled, to continue cutting for the benefit of persons who wish to fill private ice houses. This is practiced near some of the populous cities and villages within carting distance from the lake or river. Ice, the past winter, was sold in this manner at Lake Whitney, two miles from New Haven, at 40 cents per ton on the platform by the road side ready to load into wagons. The cost of carting to the city was from 50 cents to 60 cents per ton, being more than the cutting and raising the ice to the platform.

But the first cost of the ice, as stored away in the ice houses, is not a just basis of an estimate of its final cost to the ice dealer when it leaves his hands and passes into those of the consumer.

The loss in weight of ice by melting, evaporation, and breakage is very great, and is an important item in the business, for although ice may be gathered and housed at an apparently trifling cost, only a fractional part of the quantity harvested is utilized. One dealer who puts up some 10,000 tons yearly, estimates the wastage at 25 per cent by melting in the houses during the season, 25 per cent in taking out and carting, and of the remaining one-half there is often a loss of 33 per cent in retail vending, or a total wastage of four-sixths of the entire amount stored. This is probably a large estimate. Others place the loss by melting from the close of winter to the end of the season at 25 per cent, and an additional loss of 25 per cent to 30 per cent in carting and delivering to consumers.

It is estimated that the consumption of ice in the city of New York is upward of 700,000 tons annually, with an annual increase of 15 per cent. There are fifteen or more ice companies, besides small dealers who buy of the large companies. The manufacture of artificial ice does not appear to affect the demand for the naturally formed article.

The Upper Hudson is a great source of ice for the New York market. Those who travel between New York and Albany, either by boat or by rail, cannot fail to notice the many large ice houses which crowd the banks in some places from Troy and Albany as far down as Rhinebeck, Rondout, and Kingston. The river not only yields the product, but in summer gives it cheap transportation.

The conditions for the ice industry are thus exceptionally favorable. Full statistics for the present year* show that there are nearly two hundred ice houses along the river, with a storage capacity of from 500 tons to 60,000 tons each. The total amount harvested this year is not less than 3,000,000 tons—one of the largest harvests of ice ever gathered along the river. The ice crop for the past six winters has been as follows:

Year.	Harvested tons.
1878	2,408,500
1879	2,061,500
1880	150,000
1881	2,500,000
1882	2,000,000
1883	3,000,000

The Leopard Frog.

The leopard frog (*Rana halecina*) is the most common species of our five American genera. If there is any beauty to be seen in the lowly members of this order, he might also be called the handsomest of the species. His color varies from light to dark green, or brown above and white or yellow beneath. There are two dorsal and two lateral rows of dark oblong spots extending longitudinally the length of his body; the lateral rows continuing along the thighs and legs. These spots are often margined with yellow. The tympanum is green; the nostrils are lateral, and about midway between the eyes and muzzle. His length, including legs, is eight or nine inches.

The leopard frog is a great leaper. I was once sitting in the woods at some distance from a little mountain stream when I was startled by a shrill peeping cry, rapidly repeated, and surprised to see one of these frogs leap by me, covering fully ten feet at every jump. It was pursued for a short distance from the stream by a large water snake which was the cause of its fright.

This frog inhabits wet places in marshes, the borders of streams, and woody pools. Often in the summer evenings, and especially during wet weather, they wander long distances in search of their prey, and may be found in the meadows far from the water. It is widely distributed throughout the United States, and if we include, with many authorities, the marsh frog (*R. palustris*), as a variety, it has representatives in all the Southern and Eastern States. This species is the analogue and nearest representative here of the European green frog, being like that sought after for food. The meat is delicate and very nutritious, and the establishment of "froggeries" in various parts of the country will in time make it a popular dish.

In our Northern States frogs grow very fat during the fall and spend the winter in a dormant state. The length of their hibernation seems to depend entirely upon the severity of the season, and in captivity, if kept in a warm place, they show no desire to hide themselves or undertake their long sleep.

About a year ago the writer captured a leopard frog in a meadow. It had not lost the direction of the water, for, on being pursued, it took long leaps toward the brook, which it could not see. It was brought home and a place prepared for it in a fern case. A vessel of water surrounded by moss and stones and growing ferns was covered by a large glass case. In this prison the frog passed the entire winter. He had for company two red salamanders and a younger brother of his own kind. The latter disappeared during the first day, eaten by the larger amphibian, and after him went every creeping and flying thing whose size would permit it to be swallowed, except the salamanders. It was amusing to see Rana undertake a meal of salamander meat. He tried it several times before he learned better. His little victim would almost disappear from view down the capacious gullet, but the pungent liquid thrown out from all parts of the body seemed too much for the frog's palate, and it was invariably ejected. After this trial of strength the three prisoners became great friends, and the salamanders would often crawl over the frog, he winking at their familiarity and rarely paying any attention to them.

If the case were allowed to become cold, Rana would dig out a cavity in the moss where he would sit buried up to his eyes, always, however, spending the greater part of the night in the water. During nearly two months nothing was given to him to eat, and when spring brought back the insects his voraciousness knew no bounds. Flies, grasshoppers, bugs and bees, all were given to him and all devoured. Large beetles, such as the June bug, were tried, but their tough coats protected them. Though taken into the mouth they were finally thrown out. It was very amusing to watch him capture a wasp or bee. Instinct or experience had taught him to dread the sting, I suppose, as his method with them differed from other insects. He would first crush them between his jaws and then swallow them; sometimes he would drop them from his mouth and take them up again, as if seeking a better hold. Frogs will attack nothing unless it is alive or moving. A piece of meat drawn by a string was enough to attract my prisoner, but one of those curious insects, the walking stick, escaped his attention for a long time. It was amusing to see the frog jump at flies which were on the outside of the glass case. He would even spring at the point of a lead pencil if slowly moved over the glass.

In the early spring a large grasshopper fully as long as my frog was put into the case, and immediately seized. Then followed one of the most curious and laughable scenes imaginable. About half of the insect's body was easily swallowed; the other end was then placed against a stone, and the frog gave a succession of little leaps, thus pushing himself over the remainder. One leg of his victim refused to go down, and after protruding from the corner of his mouth for a day and night, was finally brushed away with his hind foot.

My animals and plants lived well together under the air tight glass case through the entire winter, mutually benefiting each other, I have no doubt, just as water plants and fish preserve the purity of an aquarium. I recommend the plan to those who desire an opportunity of studying this class of animal life, and learning much of their habits and peculiarities.

W. W. THOBURN.

Decisions Relating to Patents.

The Commissioner of Patents holds that although a party may be first to conceive and embody an invention in practical form, where it appears that his invention was laid aside, lost sight of, forgotten, and abandoned, and other means adopted for securing the same result, he forfeits his right in favor of a subsequent and independent inventor. His original efforts must be regarded as an abandoned experiment, and cannot be revived after the subsequent invention of the same device by another.

On an appeal from the Primary Examiner the Commissioner has decided that two independent inventions cannot lawfully be included in one application for a patent. The law contemplates that a patent shall be granted for each distinct and independent invention, not for a multiplicity of inventions. In a case where there can be no question that there are two independent inventions embraced in the application within the meaning of the patent law, to grant a patent covering both would be a violation of duty on the part of the officer granting the patent and a violation of the law when it was granted. It is possible that the court would sustain the patent if granted, if there was any doubt as to whether the matter covered by the patent was a single invention; but if it was clear that two distinct inventions were embraced in the patent, not dependent upon each other, I have no doubt that the court would hold such a patent invalid, and the patentee remediless thereunder. With such view of the law but one course can be taken. Applicant must divide his application as required by the Examiner, and if he desires to cover both inventions by patents, embrace them in separate applications.

IN boring an artesian well in Monroe County, Miss., a petrified log was struck at a depth of 214 feet.

* Published by the Albany *Evening Journal*, January, 1883.