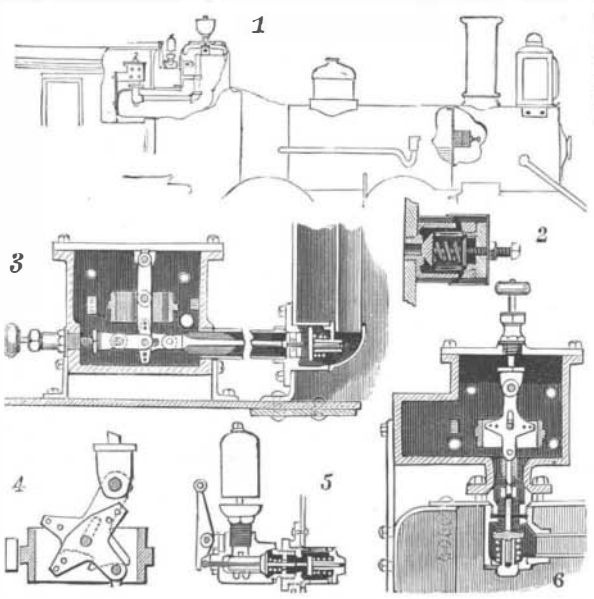
Dr. Roux's wonder cure. The 24 per cent represents the saving of the lives of 120 children in six months in one institution. The gain would have been more considerable but for the deplorable hygienic conditions of the Hopital des Enfants Malades. Many of the deaths, too, were a result of further complications, such as heart disease and broncho-pneumonia, which made the work of the physician very difficult. Generally speaking a single injection is sufficient, and Dr. Roux has never given more than two. The dose consists of two-fifths of amount of serum injected into the side by one puncture. The temperature then decreases, which is an excellent beginning. The leather-like membrane which is suffocating the little sufferer ceases, within twenty-fours, to increase, and after thirty-six hours it comes away altogether, and the diphtheritic bacilli disappear. The serum also has a marvelous effect on the appearance of the patient. The dull and leaden complexion, with its accompanying piteous cry, gives place to a healthy skin, and the patient becomes cheerful, if not gay.

THE NEW CURE FOR DIPHTHERIA—DRAWING THE SERUM FROM THE HORSE.

AN IMPROVED LOCOMOTIVE BOILER.

To prevent the escape of steam from broken pipes, valves, etc., in case of accident to the locomotive, thereby doing away with the danger from scalding, is the object of this improvement, which has been patented by Mr. G. A. Akerlind, Erie Hotel, Dunkirk, N. Y. The invention consists principally of a spring-pressed valve normally held open, and adapted to close automatically in case of a shock to the locomotive, or in case the steam conveying pipe of the boiler is broken off, there being also an auxiliary safety valve in a sheltered place on the boiler, set to a higher pressure than the ordinary safety valve. Fig. 1 is a side view, showing the improvements applied upon a locomotive, Fig. 2 showing the auxiliary safety valve in the smoke arch, and Fig. 3 being a modified form of the improvement as arranged for the general steam distributing box. Fig. 4 is a side elevation of the weight for holding the valve and parts in position after a shock to the locomotive, and Fig. 5 is a sectional plan view of the link connection for the weight, Fig. 6 showing in side elevation the application of the improvement on the steam distributing box for the injectors, air pump, blower pipe, steam heating system, lubricators, etc. The steam supply pipe from the dome leads to a valve connected with a bushing fitted into an opening in the shell of the boiler, as shown in Fig. 6, the outer end of the bushing being engaged by a general steam distributing box, from which the steam is distributed by pipes to the various parts of the locomotive. In case of an accident carrying off this box from its support on the shell of the boiler, or any sudden shock to the box, the valve will be automatically seated, the steam being in every case shut off. For the whistle, for the safety valve in the top of the dome, and for the injector check valve, similar automatically working check valves are provided. The inventor has lately received a prize as a successful competitor for a design for a consolidation engine to which this system was applied.



AKERLIND'S LOCOMOTIVE BOILER.

Regulation of Mineral Water Traffic.

The Academie de Medecine, of Paris, as the result of a close investigation of the trade in the so-called "natural" mineral waters of France, has arrived at the following conclusions, which are put in the form of recommendations to the legislative bodies:

1. That the sale of natural waters, impregnated with supplementary gases, should not be allowed.

2. Every application for permit to carry on the business of the sale of natural mineral waters should be accompanied by certificates, made before the proper authorities, that the waters handled or to be handled, by the applicant, have not been so prepared (i. e., by supplementary carbonification), and by a further certificate on the part of the owner of the spring, or of the source of the water, that he has not had recourse to supplementary gasification.

3. All reservoirs used for mineral water should be made air-tight, and should be emptied at least once in every twenty-four hours; they should be so constructed that the water of the spring flows directly into them; and, further, all bottles and containers should be thoroughly sterilized, and all impurities of every description should be removed before they are offered for sale.

4. These regulations should be at once imposed and all proprietors of springs of mineral waters should be forced to put them in practice within three months from date.

In France the recommendations of the Academie carry almost the weight of an order, and there is but little doubt but that the above regulations will soon be in force, so far as commercial waters for home consumption are concerned. If they are made to apply to all waters, those for export as well as those for domestic use, there will be a fearful falling off in exports, as it is well known that every single bottle of foreign, so-called "natural" carbonated waters—not merely those of France, but those of Germany, Austria and other countries—that goes abroad, goes charged with supplementary gas. Not merely this, but nearly every one of them is doctored otherwise to an extent that should remove them entirely from the category of natural waters.

Every one who has given the matter any attention knows that the mineral contents of nearly every natural spring vary with the seasons, becoming more concentrated in long dry spells and correspondingly weakened by rainy periods. In order to make the yield uniform the proprietors are forced to add water from other sources in the first instance, and to supplement the natural salts by the addition of artificially prepared chemicals in the second. The gasification is nearly all supplementary.

From "doctoring" the true waters of the springs to manufacturing the product outright is but a slight step, and hence we find some of the great mineral water companies annually exporting to America, alone, millions of bottles of water in excess of the output of their springs. By a strange ruling of our customs officials, these manufactured mineral waters have been allowed for years past to come into this country as "natural waters," and thus not merely to enter into competition with our domestic products, natural and manufactured, but to "hold the age" on the latter as "the product of nature's laboratory," a fetich of great power among the unthinking multitude.

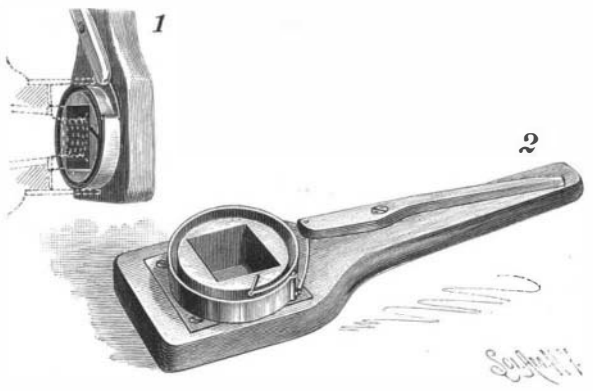
The steps suggested by the Academie, by showing the French people what poor stuff their natural waters really are, may have the effect of waking other governments up, and thus lead to legislation in this direction. If so, nothing but good can come of it.—National Druggist.

Annual Convention of the American Institute of Architects.

The twenty-eighth annual convention was held in this city, October 15, 1894, in the Fine Arts building; 105 members being present—a larger number than usual. President D. H. Burnham of Chicago delivered an interesting address, in which he deprecated the practice of showing designs to customers without payment. Other interesting papers were read and discussed. Secretary Stone read the annual report of the Board of Directors, from which it appears there is a membership of 475 fellows. There are also 26 chapters, chartered by the Institute, having an aggregate of 600 members, of which about 500 are practicing architects, and from these members the fellows are chiefly selected. The New York Chapter has the largest membership, namely 86, of which 60 are practicing members, the remainder honorary and junior. Illinois has 82 members, of which 80 are practicing. Philadelphia 55, of which 31 are practicing. The other chapters range from 8 to 20 members. The next convention meets at St. Louis. Daniel H. Burnham, of Chicago, was re-elected president; William S. Eames, St. Louis, secretary.

A CARRIAGE WRENCH.

The illustration shows a wrench more specially designed for conveniently removing the nuts on the axles of vehicles. The improvement has been patented by Mr. Julius L. Stambaugh, of Standart, Texas. Fig. 1 shows the wrench applied to the nut in the wheel hub and Fig. 2 is a perspective view, with the clamping spring closed, ready to apply. The device comprises a cap adapted to engage the nut, and a spring band encircling the cap has one end secured to the body adjacent to the cap, while the outer end of the spring band is connected by a link with the forward end of a lever fulcrumed on the handle. The spring band engages with sufficient force the hub of the wheel, so that when the latter is turned in the right direction the wrench is carried around with the wheel, and the nut is thus unscrewed from the threaded end of the spindle.



STAMBAUGH'S CARRIAGE WRENCH.

A Horse's Sense of Locality.

About the year 1856, says the Lewiston Journal, a little colt was born on a farm in Aroostook County, in the State of Maine, a colt that was soon sold away from the place, to come shortly after into the possession of a physician in the town of Houlton, who at the opening of the civil war went "to the front," taking with him for cavalry service the colt, that had now reached maturity. Through all the vicissitudes of a five years' campaign this horse followed the fortunes of his master, being wrecked on the Red River expedition and suffering various other disasters, to return at the close of the war to the State of Maine, across which he carried his master horseback until the town of Houlton was again reached.

On the journey through Aroostook County the road traversed lay past the farm where some ten years before this horse had been born. Neither his life between the shafts of a doctor's gig nor five years of war campaigning had caused him to lose his bearings, and when he reached the lane that led up to the old farm house he turned up to the house as confidently as though he had been driven away from it but a half hour before.

How Birds Sing and How They Fly.

This was the subject for consideration at a recent meeting of the Boston Scientific Society. The Boston Commonwealth says: The speaker was Mr. C. J. Maynard, the well-known naturalist. This gentleman has been interested in birds from an early age, and more than twenty-five years ago he began making anatomical studies of them, with particular attention to the larynx. He has himself examined the throats of the majority of the birds of the east coast of this country and the Greater Antilles.

A general division may be made into birds which sing and birds which do not. The anatomy shows clearly this division, and from the position and kind of muscles or membranes the bird may be referred to one or the other of the classes independent of auricular evidence. The larynx which birds use in singing is not the upper larynx, but an inferior one, placed just at the top of the bronchial tubes. There has always been a difficulty in bringing the matter to the attention of students in the lecture room, but recently Mr. Maynard has succeeded in making casts of the vocal apparatus of certain birds, which are soon to be introduced into certain schools. He exhibited these casts and made clear by them the muscular arrangement of the larynx of the crow, which he had selected because it can really sing and can modulate its voice to a considerable extent. This fact is not generally known, but at certain seasons the male crow has a very pretty song. The vocal apparatus of the crow is very perfect, some crows being able to talk, as can the raven.

Aided by the models, of which a dozen or more were distributed among his auditors, Mr. Maynard named and described the different muscles of the larynx and stated their purpose, these muscles being not the mechanism producing the sound, but serving to control the tension of the larynx or of the vocal membranes which lie at the top of the bronchial tubes. Of the vocal membranes, there are normally two, but in some variations there may be but one, and in some cases even this is wanting. The different tension of these vocal membranes in conjunction with air expelled through the throat produces the sounds which we hear from the birds.

While the vocal chords are usually present, there are, as might be supposed, some very wide variations in the exceptions. The humming bird, the note of which resembles very closely the squeak of a mouse, has a sphincter muscle governing the tension of its larynx. The turkey buzzard has no chords at all, and the only sound which it can make is a hiss, such as would result from the expulsion of air through an open tube. The owls hoot by the vibration of air within their great larynx. The swan has a very long larynx, which is bent about much like the convolutions of a trumpet, and the note is resounding and trumpet-like. In the wild goose, the vocal mechanism is of exceeding delicacy and beauty: the bronchial tubes are themselves the vocal chords or membranes, being delicate and transparent throughout their entire length. By means of this, the clear and musical note of the wild goose is produced. The most singular of all the vocal mechanisms of birds is that of the American bittern.

The note of this bird resembles "pon-ka-pog, pon-ka-pog," or, as described by some, the bubbling of a note up through water. Mr. Maynard thinks that our pond may readily have taken its name from the note of the bittern. How the bird has been able to produce such a note has always been a puzzle to naturalists. A short time ago, Mr. Bradford Torrey, the writer of so many charming bird sketches, and Prof. Faxon, seeing a bittern in Concord, watched him, and came to the apparently ridiculous conclusion that the bird sucked the air. In proof or disproof of this supposition, Mr. Maynard sought out the bittern and, on making an examination, found that these gentlemen were right. The bird was fitted with a peculiar muscular arrangement of the throat which serves exactly this end, the sucking in of air and the production of a note by its expulsion. The throat is flexible and may be greatly distended, being, when filled with air, some six inches in diameter. A muscular compressor prevents the air from entering the stomach of the bird, and two muscles in the lower mandible of the bird, together with the tongue, form an airtight valve at the mouth, which, being slightly relaxed, allows the air to bubble forth, making in its course two impacts against different parts of the bird's bill. This explains very satisfactorily the curious note.

A few words about methods of communication in birds followed. Mr. Maynard is satisfied that they can communicate by sound. He had at one time a tame crow, which had never learned crow language, and, when liberated among the birds that ought to have been his friends, was always attacked and obliged to seek the protection of his master.

Following this came some considerations of the flight of birds. The most interesting feature of this was the comparison of the breast bones of different birds. Those birds which attain very high rates of speed and which from necessity must suddenly swerve in their course have a re-enforcing mechanism, permitting them to withstand that sudden pressure of the air which is of necessity resultant from their changes of direction. Some interesting facts were stated in the course of the discussion. The frigate bird, which is an exceedingly powerful flier, can ride out the fiercest West Indian hurricanes. The duck hawk is the swiftest bird known to naturalists. Ducks themselves have been known to make speed at the rate of one hundred and fifty miles per hour, but the duck hawk can overtake ducks at maximum speed with such superior velocity as to make a great shock when striking its prey, while its flight at such times is so rapid as to elude the eye.

A CYCLE CAB.

Lately there has appeared in London a new vehicle in the shape of a cycle cab, of which we give a sketch. The driver in front works pedals and steers, while a footman, mounted behind, also assists the propulsion, as shown. Horses are at a discount wherever this vehicle prevails.

A CYCLE CAB.

Coating Aluminum with Other Metals.

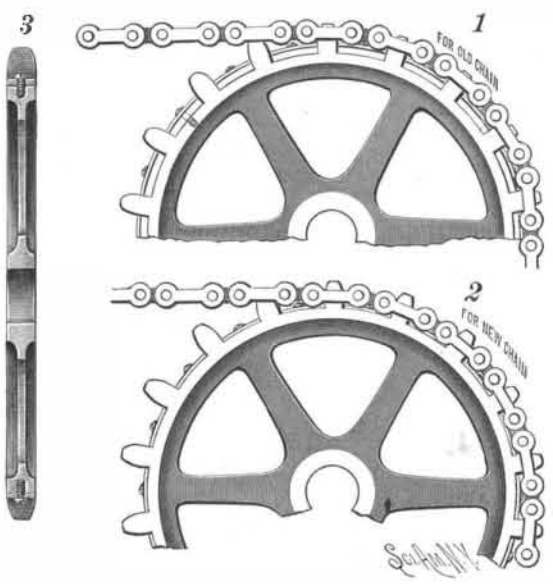
The processes ordinarily used for covering metals with zinc, tin, and lead have not, up to the present, appeared to be applicable to aluminum. When a plate of aluminum, mechanically or chemically cleaned, is immersed in melted tin, zinc, or lead, these metals slide over the surface of the aluminum without alloying therewith.

Mr. Oliven has found that, in order to fix the above-named metals, it suffices to submit the surface of the aluminum to a vigorous brushing in the metallic bath. For this purpose a steel brush or any other analogous instrument may be used. Under such circumstances, the aluminum becomes covered with a regular layer of the molten metal.

The want of success of the operation was due, it appears, not to the want of affinity of the aluminum for the metals in question, but to the immediate formation, in contact with the air, of a thin stratum of oxide of aluminum, which friction removes.—Le Genie Civil.

A SPROCKET WHEEL IMPROVEMENT.

This illustration represents a simple means of causing the sprocket chains of bicycles to fit the wheel at all times, no matter how much the chain may be stretched. A patent has been allowed upon this improvement to Messrs. P. D. Murphy and Edward Kolb, of No. 75 Main St., Lockport, N. Y. When a chain does not fit, on account of its stretch and the wear of the teeth, one has only to place under each of the plates which separate the teeth, the required thickness of paper, soft metal, or any other material. Fig. 1 represents such placing of packing on an old wheel, which is not needed on a new wheel, as shown in Fig. 2. The filling also deadens the rattle of a wheel and does not add appreciably to its weight. With this improvement the life of sprocket chains may be greatly increased, and the chains caused to fit the wheel until entirely worn out.



MURPHY & KOLB'S IMPROVEMENT IN SPROCKET WHEELS FOR BICYCLES.

The Torpedo.

A naval officer writes as follows in a recent number of Engineering:

The torpedo is essentially an immoral weapon, depending mainly for success upon secrecy, subterfuge, and deception. It was offered to our grandfathers in its first crude form as a fixed submarine explosive, but it was declined with thanks, or rather with scorn, as being unworthy of honorable combatants. Our morals are more elastic; and although it may be doubted whether the locomotive torpedo will have a governing influence in any fair stand-up fight of the future, it must be regretfully acknowledged that its moral—or rather immoral—effect will be considerable; and when accompanied by its proper handmaidens—secrecy, subterfuge, and deception—it may prove very troublesome.

Vessels will endeavor to approach under false colors, fire their deadly missile and run. The use of false colors has always been recognized as perfectly fair for reconnoitering purposes, and so long as ships did not fight under them. But now the true colors and the torpedo will be exhibited at the same moment, with awkward results. Hence it will behoove men-of-war at sea to be extremely shy of allowing any ship to approach within torpedo range, and they will do well to fire at everything that attempts to do so, until they are quite satisfied as to her identity and intentions.

The records of the Chile-Peruvian war afford us numerous instances of the diabolical use of various sorts of torpedoes during that conflict; and although European nations may not descend to such cruel and useless methods of destruction as were then employed, yet it seems very probable that torpedo warfare will lead to the terrible cry of "No quarter." It is difficult to see how it will be possible to give quarter to an enemy's torpedo boat caught at sea. Her success depends upon the tactics of the stealthy midnight murderer; and if caught in the daylight, she and all on board of her must be destroyed like vermin, surrender or no surrender.

As an illustration of this point, let us imagine that a group of six torpedo boats (they will probably act in groups) comes out from a hostile port, and attacks the ships at anchor in one of our harbors in the middle of the night, with the deliberate intention of sending as many ships as possible to the bottom, with all hands. The attack may or may not be successful, but in any case the boats will endeavor to get clear of the land, and if possible to regain their own port before daylight. Supposing, however, that they are so unfortunate as to fall in with one of our cruisers, and that in consequence of the weather being rough the cruiser is able to overhaul them. The last of the flying group will come first within effective gun range, and will doubtless surrender. Is the cruiser to stop and capture her, and allow the other five to escape and attack again to-morrow night? Such a course would be ridiculous, and she would have no option but to sink as many as possible of them without stopping to pick up the crews. This, no doubt, would lead to reprisals and counter-reprisals; and the end thereof is not apparent, save that the advent of the torpedo is not likely to help in humanizing naval warfare.

The Panama Canal.

The new Panama Canal Company was legally constituted at the meeting of shareholders held on October 20. MM. Baillet, Brolemann, Carraby, Chanove, Jonquieres, Lebegue, Ramet, St. Puentin, and Souchin were appointed administrators for six years, while MM. Barbier, Lemoine, and Fougen were named commissaries. Before closing the sitting, M. Lemarquis, the legal representative of the old bondholders, who presided, announced that a cablegram would be at once sent to M. Mancini, at Bogota, who would on its reception announce the constitution of the new company to the Colombian foreign minister, and that on October 21, 800 workmen would resume the so long abandoned work of the Culebra cutting. Though the list of administrators proposed by M. Lemarquis was adopted unaltered by an overwhelming majority of the shareholders, the meeting was very tumultuous. M. Thiebaud protested against the constitution of the new company, and declared that the proposed new administrators were the representatives of the men who had ruined the old Panama Company. The proposed new administrators represented MM. Eiffel, who subscribed ten million francs; Hugo Oberndoerffer, who subscribed three million five hundred thousand francs; Buno Varilla, who subscribed two million two hundred thousand francs; the administrators of the old company, who subscribed eight million francs; and the credit establishment, which subscribed ten million francs. In all nearly thirty-four million francs or not quite $7,000,000. With such persons at the head of the enterprise, it would be useless to hope the public would subscribe the remaining five hundred million francs required to complete the canal. M. Thiebaud's remarks were received rather coldly, and did not prevent the list of administrators prepared by M. Lemarquis from being adopted almost unanimously.