SOME THINGS IN WIRE.

There is scarcely a limit to the number of useful and ornamental things that can be made from wire. Two examples are shown in the engravings, Figs. 1 and 2 representing respectively front and edge views of a newspaper and magazine holder formed of a wooden back and wire scrolls; Fig. 3 showing a small wire stand or card receiver having a zylonite top.

The scrolls of the newspaper holder are formed of three-sixteenths inch square brass wire; the several pieces being bent in the form shown and held in place by clips of the same material soft-soldered by means of a blowpipe. The overlapping portions of the scrolls are also soft-soldered. The lower part of each main scroll is held by a strong staple passing over the wire of the scroll and through the cleat and backboard and clinched on the back of the board. The three wires at the center of each scroll are prolonged below the cleat, as shown, to form a stop for limiting the swing of the scroll.

If care is taken in soldering the clips, the brasswork will require little preparation for lacquering. A stiff brush charged with finely powdered pumice wet with water and applied vigorously to the work will quickly remove all stains, and will give the work a uniform appearance. The backboard, which may be of walnut, mahogany, cherry, oak, ash, or maple, should be varnished and well rubbed down before the cleats are applied.

A holder of this kind will receive a large number of periodicals.

The wire stand or card receiver, shown in Fig. 3, is made of one-quarter inch or three-eighths inch round brass wire. It may be made of brass tubing three-eighths inch or one-half inch outside diameter and rather thick. In this case the tubes are annealed and filled with lead before bending. The lead is melted out of the tubes after bending. The spirals are formed separately by wrapping the tube or wire around a cylindrical bar of wood or iron in a close helical coil, then stretching out the coils, placing them together, as shown. They are then clamped on a smaller cylindrical bar and their upper ends are twisted together. Two rings surround the lower part of the spiral, and to these rings are secured the legs by means of solder or screws.

The small rings surrounding the legs may be purchased and secured in place by solder.

The top of the stand consists of a disk of wood, concaved at the top and furnished with an embossed disk of zylonite.

The under surface of the stand top is provided with a perforated block, which fits over the closely twisted end on the standard. This receiver may be made so small as to stand upon a table, or it may be made of the usual table height.

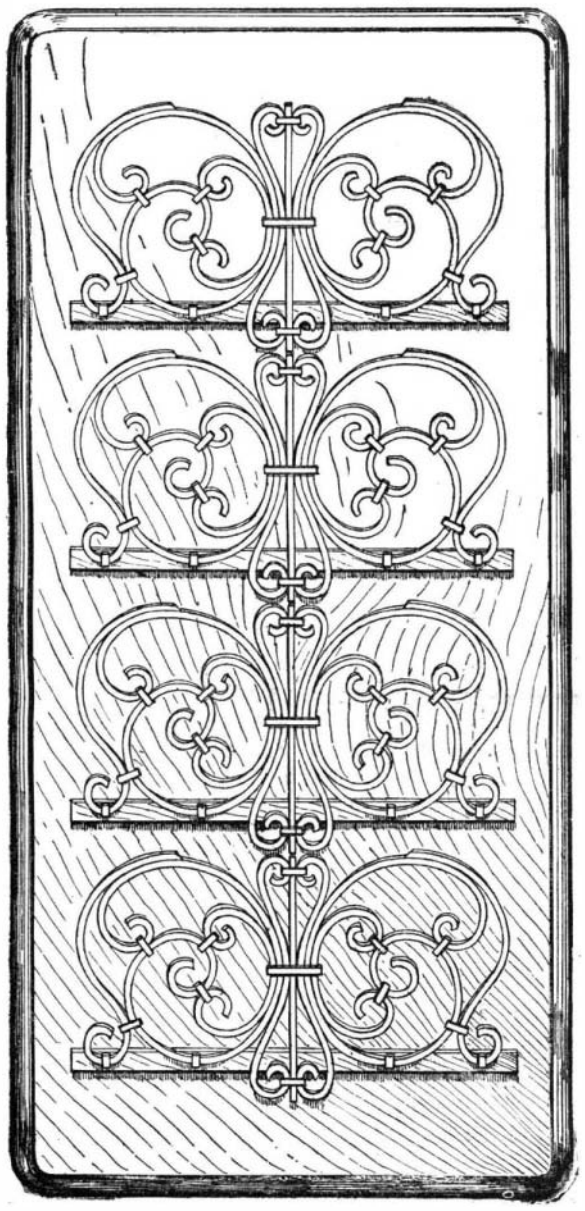

Fig. 1.—NEWSPAPER HOLDER.

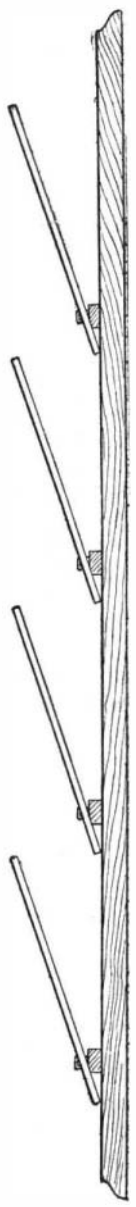

Fig. 2.—EDGE VIEW OF NEWSPAPER HOLDER.

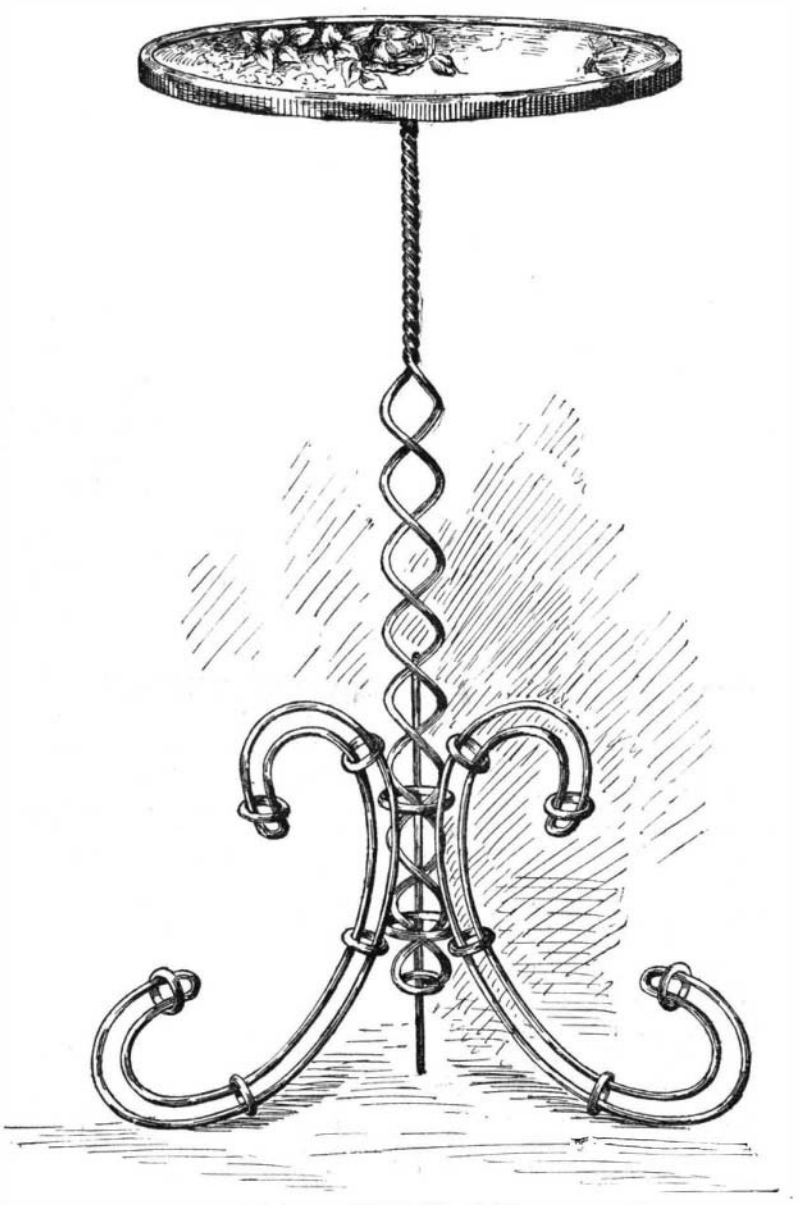

Fig. 3.—WIRE STAND OR CARD RECEIVER.

Action of the Soil on Pathogenic Germs.

Pathogenic germs evidently exist in the soil. The bacilli of tetanus, typhus, and cholera have been observed, and it is probable that the bacillus of tuberculosis, the pneumo-coccus, will be found.

The superficial strata of the earth are extremely rich in pathogenic germs. At a certain depth there is a limit beyond which the number of germs rapidly diminishes, until they cease altogether.

In the deep strata of the bacilliferous zone, pathogenic species do not exist. Grancher and Deschamps have observed the arrest of the typhus bacillus at a depth of 50 centimeters. In the cultivated superficial strata there are fewer micrococci than bacilli. The bacilli exist in the soil chiefly as spores. Under this form they best resist destructive agents, and may remain latent for years, retaining their virulence.

It is probable that the pathogenic bacilli germinate in the soil.

The cholera bacilli form numerous colonies at a depth of 3 meters during the months from August to October; from April to June, at a depth of 2 meters there is no development, while at a depth of 1·50 meters the bacillus vegetates. At least 2 per cent of humidity is necessary for the development of the germs. Soil rich in organic material is most favorable to this development.

Causes of death of the pathogenic germs exist in the soil. The principal cause is exsiccation. Koch and Duclaux have demonstrated that this is especially hurtful to the micrococci, and here, according to Koch, is the explanation of the fact that micrococci are relatively rare on the superficies of the soil. The cholera bacillus dies rapidly under exsiccations. Netter fixes three weeks as the extreme limit at which the exsiccated pneumo-coccus preserves its virulence.

The two most potent causes of destruction which the microbes encounter are the saprophytic bacilli and solar light.

The saprophytic bacilli are in continual strife with the pathogenic microbes, and have generally the advantage. The bacillus of tetanus is exceptional, and may develop favorably in the presence of other species.

Solar light is injurious to very many bacilli. According to Duclaux, it is the most universal means of sanitation, and the most economical and potent to which public or private hygiene can have recourse.

The turning up of the soil liberates pathogenic germs, but when the soil is not disturbed for a long time, a colossal germination frequently goes on. Exhumation frees the bacteria long latent in the soil. Hence the epidemics that follow the turning up of the ground. Pathogenic germs leave the earth in many ways to attack men and animals. The soil which adheres to the body, to the feet of animals, and that which is carried by insects disseminates pathogenic germs. Currents of air transport superficial dust, and so propagate the spores which resist exsiccation. Water also carries germs.

Ordinarily, subterranean waters are on a level with the bacteriological zone. Sometimes this zone is exposed by fissures or by openings made in the earth. The walls of a well are a prolongation of the superficies, and are favorable to the life of the germs.—*The Sanitary News.*

The Panama Canal Again.

The report of the Commission of Engineers to the liquidator of the Panama Canal threw some light on the true situation as far as the condition of the work done and to be done on the great ditch is concerned, and now we are likely to have another inquiry which promises to be equally interesting and instructive. The unfortunate shareholders in De Lesseps' enterprise have petitioned the French Chamber, praying that the liquidator of the defunct canal company be required to make an exact statement of the expenditure of the money confided to M. De Lesseps and his co-directors, showing how much was spent on actual work at the Isthmus, with prices of the respective contracts, and how much was frittered away in secret service, home commissions, press subsidy, etc.

The petition suggests that, as the shareholders were practically induced to part with their money upon false representations, the amount of money subscribed being more than double that stated by M. De Lesseps to be sufficient for the completion of the work, the government should, through the Minister of Public Justice, recover for the shareholders, as in the case of the Comptoir d'Escompte, an indemnification from the directors of the canal company. The committee to whom the petition was referred has in its turn admitted the principle on which it is based, and has turned it over to the Minister of Justice to take action upon if he approves, so that, judging from the impartial investigation of the courts into both the Comptoir d'Escompte and the Societe des Metaux scandals, the *Engineering and Mining Journal* thinks a thorough investigation will now be made.

A REDWOOD tree, 90 ft. in circumference and 33 ft. in diameter, is being cut for the Chicago exhibition. The section to be sent to Chicago will be 9 ft. in height and 60 ft. in circumference, and will weigh 65,000 lb. The tree is taken from the forests of Tulare County.

California Asphaltum.

Asphaltum is mined to a considerable extent in California, but the annual production is quite irregular, being governed by the local demand. When a great deal of iron pipe is being laid, large quantities of the substance are used in coating it. Asphaltum is found in the counties of San Luis Obispo, Santa Clara, Ventura, and Santa Barbara. Between 2,000 and 3,000 tons a year are shipped from the deposits.

The mines of the Ventura Asphalt Co., in the Canyon Diablo, Rancho San Miguelito, have come into prominence since 1888, when they were discovered. The material is found at or near the surface. About 1,800 tons have been so far shipped from this deposit. More or less prospecting work has been done, but now large cuts or tunnels are being run into the deposit. At the point now being worked the elevation above sea level is 1,300 feet, but frequent fossils of shells, sharks' teeth, etc., are found, showing that the mass came up from the ocean.

The vein or bed crops out at many points in the shape of fingers or rounded masses connecting with the main body, the width and length of which are unknown, but upon which breasts of 45 × 16 feet have been worked.

The quality of this asphaltum is unique, possessing as it does great toughness and hardness, and a larger amount of fixed bitumen than other known deposits. The percentage of fixed bitumen is 24·40. It fluxes readily in oils, coal tar, and by hydrocarbons, and may be made permanently of the hardness of stone or the pliability of India rubber, according to kind and quantity of flux (solvent) employed and the manner and time of melting, etc.

It has been successfully employed in street paving, and is found not to soften by heat or crack by frost. It is in use for this purpose in several cities in California, Utah, Washington, British Columbia, Mexico, Guatemala, Sandwich Islands, and Australia. For cementing masonry it has been put to use in San Francisco, Santa Barbara County, and other places. The Southern Pacific Co. built a piece of sea wall along the seashore, Ventura County, which was built up of round cobbles cemented together by this asphalt. Two years' trial shows no indications of the wall being injured.

A peculiarity of the Ventura County asphalt is that it is elastic. The Santa Ana Water Co. used it for plastering a reservoir, having first laid up a wall of cobblestones on puddle and then plastering this with hot asphalt. In this open reservoir no change in the material is seen; even in places where the wall settled and cracked, the coating stretched and bent, remaining perfect and sustaining the water pressure. A pile coated with this asphalt was driven at Goat Island without destroying the coating. In doing this, the weight of 3,000 pounds was dropped 22 feet on the pile. The material can be used for coating iron, planks, pipes, etc. Inquiries for the substance from the Eastern States, England, France, Australia, and Central America promise an important shipping business, unless other deposits with such exceptional properties are found.—*Min. and Sci. Press.*

The Thunder Storms.

It is probably idle to tell people that there is a thousand times the danger in the sewer pipes that there is in the thunder clouds, but it is true all the same. The deaths by lightning are few indeed. Who of the readers of this paragraph, says the Hartford *Courant*, ever lost a friend that way? Who of them hasn't lost a score of friends by the less brilliant and less noisy destruction that comes up out of the drains? The trouble with the lightning, or the trouble that it gives the people, is in its indescribable suddenness and its absolute uncertainty. You know neither when it is coming nor where it is going, all you feel certain about is that every storm is pretty sure to leave a number of catastrophes to mark its course. The caprice of the lightning defies the explanations of science, and there is no predicting beyond a few generalities. This much it does seem safe to repeat, even in a lively lightning season, that the increased use of electricity, with the multiplicity of wires, has tended to fewer fatal strokes of lightning in cities.

In the storm a week or more ago in Hartford, a bolt burst near the *Courant* building, which shivered a few chimneys hereabout, but evidently lost most of its energy in dancing over telephone and telegraph wires. Moreover, a great deal of electricity undoubtedly works off quietly by such avenues and by lightning rods without a manifest disturbance. But all in all, it is a subject and an agency that people know comparatively little about. Our thunder storms come majestically along, the lightning plays about in the clouds, and now and then a bolt goes down to the ground or up from the ground to the clouds. But often there are equally severe electric storms when there are no clouds, and when the disturbance is in the earth itself. The telegraph and telephone are thrown into confusion, while the "spectator" sees nothing and knows nothing of what is going on, though he may feel the effects of the current in his mental condition without knowing its cause.

Gold by Electricity.

The last number of the Pall Mall *Budget* received at this office describes as follows an invention recently patented in England, by Mr. Molloy, a member of Parliament, for separating gold from the ore by electricity in connection with mercury.

Mercury, of course, is man's greatest ally in the work of getting gold out of ore. Its affinity for the precious metal has been known and used for a thousand years. Having crushed your ore to powder, a simple process in which the "gravitation stamp" is only the stone-breaker's hammer of the roadside multiplied by the power of machinery, you pass this powder by means of a shallow flow of water over copper plates faced with the compelling mercury. Each minute particle of gold which is thus brought in contact with the mercury is absorbed by it, and goes to form an amalgam of mercury and gold. Then all you have to do is to scrape your amalgam off the plates, put it into a crucible, and apply sufficient heat. Away goes the mercury in the form of a vapor, which subsequently regains its original form and lives to fight another day. What you are left with in the retort is pure gold. There are, however, two difficulties, the familiar bugbears of every mining community.

1. The difficulty of bringing every particle of gold into contact. Th mercury does not attract the gold as a magnet would iron. If the particles of gold come and touch it, it gobbles them up, but it declines to go running after them. Now, if you don't crush fine enough, many of the particles will carry a speck of gold within a shell of ore. In that case the mercury cannot crack the nut, and it flows away, kernel and all, into the "tailings." If, on the other hand, you crush too fine, you get "float gold," that is, particles so tiny that they are carried on the top of the water without touching the mercury at all. But even if this difficulty be overcome, and contact with the mercury secured, you have a second to face.

2. The demoralization of the mercury itself from contact with the ore. There are certain "refractory" ores which contain properties inimical to mercury (such for instance as arsenic, iron oxide, sulphur, antimony, or zinc), under the influence of which the mercury oxidizes. It "sickens," as the miner puts it, and "flours," forming into a sort of scum on the surface which interposes between the "quick" mercury and the gold with which it ought to be in contact, and which also keeps flaking off and running to waste with the water. In this way not only is there a great loss of gold, but there is a loss of mercury, too, which is not the least part of the miner's trouble, seeing that it is a most expensive metal.

On these two difficulties, in many cases, depends the question whether a gold mining enterprise does or does not pay. It is clear, then, that to dispose of them forever would mean something like a happy revolution in the conditions of the industry. And that, no less, is Mr. Molloy's ambition. What he claims for his invention is shortly this, that it keeps the mercury absolutely "quick," and insures the absolute contact with it of every particle of gold. The point at which Mr. Molloy steps in is after the crushing of the ore. His invention is a substitute, not for the "stamps," but for the "plates." As, however, for his purpose, the finer the ore is crushed the better, he prefers a crushing apparatus consisting of two great rollers playing in a circular box, with the double action of a carriage wheel when the carriage is both moving and turning round. That, however, is nothing to do with his invention, which I will now describe.

Reduced to its simplest elements, the machine is an iron disk spinning in a shallow iron saucerful of mercury, on the surface of which the disk floats. In the middle of the disk is a hopper, through which the flow of water and crushed ore descends upon the mercury. There the centrifugal force due to the rotation of the disk drives it from the center to the rim, pressing it down upon the surface of the mercury all the time, and insuring that every particle of gold shall be absorbed. The residue is driven to the edge of the saucer, and there, freed from the pressure of the disk, it continually wells up, overflows, and runs away as "tailings." All you have got to do, then, is to crush as fine as possible to begin with.

The bugbear of "float gold" loses its terrors. However light the particles may be, they are spread, and squeezed, and scrubbed, and radiated over the surface of the mercury between it and the revolving disk which floats upon it. So much for difficulty No. 1. As for No. 2, Mr. Molloy appeals to the powers of chemistry and electricity to rescue him from that. He cannot prevent the hostile elements in "refractory" ore from coming in contact with his mercury, nor can he deprive them of their "sickening" influence. But he can prevent the mercury from oxidizing under that influence by keeping it constantly charged with a supply of nascent hydrogen which has absolute power to cure, to counteract, and to prevent its oxidation. Nothing easier. In permanent contact with the mercury he places a solution of certain salts. This solution is connected with the positive pole of a battery, the negative pole of which is connected with the mercury.

Under the influence of the electric current the solution is being constantly decomposed, sending a constant supply of oxygen into the air and a constant supply of hydrogen into the mercury. This being all a bubble with nascent hydrogen never gets a chance of "sickening," but is always kept "quick" and fit for work. This electrical process Mr. Molloy manages in the center of his gyrating disk, the solution being contained in a sort of little ebonite moat within the hopper. One horse power suffices to drive both the machine and the dynamos required for the electrical process, and it can put through ten tons in a day. The salts required are "dirt cheap," and the mercury practically lasts for ever, and the whole apparatus weighs only five hundredweight.

Rumination in Man.

"By rumination, or 'chewing the cud,' we designate a condition in which the food returns, without nausea, in small portions, from th stomach, through the œsophagus into the mouth, some time after meals; here it is chewed anew and swallowed.

"Rumination belongs to the normal physiological processes of most herbivora, and forms the most marked characteristic of the whole class of mammals which we call 'ruminants.'

"Here the rumination is a most appropriate arrangement. The herbivorous animals are obliged to partake of great quantities of food, as the nourishing value of the grasses is relatively a small one. On the pasture they must make use of their time for gathering and swallowing the grass. Afterward, when they have more time and leisure, they reduce the food to smaller particles and mingle the same with saliva, by the act of rumination.

"In view of this circumstance the stomach of ruminating animals differs in construction from that of other animal classes. It consists of four compartments: Paunch, or rumen, honeycomb bag, or bonnet, manyplies, or psalter, and reed, or rennet. The first two serve more or less as reservoirs, whereas the two latter contain the glandular elements for digestion.

"At the first act of swallowing, the food materials enter the rumen and the bonnet, whereas after chewing the cud the food passes directly into the psalter and rennet.

"Chewing of the cud, which is so very important and appropriate for the whole class of ruminants, occurs, though quite rarely, in man, and is designated then as rumination or merycism.

"For man rumination is unnecessary, and more or less a hindrance. One can hardly define rumination as a disease, for the bodily functions are in no way harmed by that process, but as an abnormal, anomalous condition, which must be socially an uncomfortable and disagreeable burden to its owner."

The above is extracted from a paper read before the German Medical Society of New York by Max Einhorn, M.D. The learned doctor described a number of cases of rumination in man, which had come under his knowledge, and he quotes from a large number of authorities on the subject, dating back to the year 1618.

Rumination, as treated in Dr. Einhorn's lecture, is very interesting, and appears in full in the *Medical Register* of May 17.

Fictitious Dividends.

Were the law in France in relation to the payment of fictitious dividends in force in this country, the *Railway Review* thinks, the social status of our State prisons would be considerably elevated by the influx of a large number of now reputed respectable citizens. It was only recently that the head of a large company in France, together with his other directors, were sentenced to a severe fine and term of imprisonment for the offense of declaring a fictitious dividend. France is evidently behind the times, or else we are. The practice of declaring and paying dividends with borrowed money has become so common in this country as to attract no more than passing notice, and it is to be feared that were the French law in force, very many stocks which are now sustained by a process of that kind, in order that present holders may unload on favorable terms, would soon seek their natural level, although their promoters might at the same time be forced to take up a temporary residence at some public institution at the expense of the State.

Snuff for Colds.

Dr. C. H. Stowell, of Washington, recommends the following in place of solution of cocaine:

Sodii bicarb.	ij grs.
Magnesiæ carb. (levis)	iij "
Menthol	j "
Cocaine hydrochlor.	iv "
Sacch. lactis	iss 3

M. Sig.: Use as snuff.

The most marked relief, says the *Chemist and Druggist*, will follow the use of this powder, and a few applications will do much to abort the catarrhal attack. Its effects are immediate, highly agreeable to the patient, and continuous for a number of hours.