American Grape Vines in France.

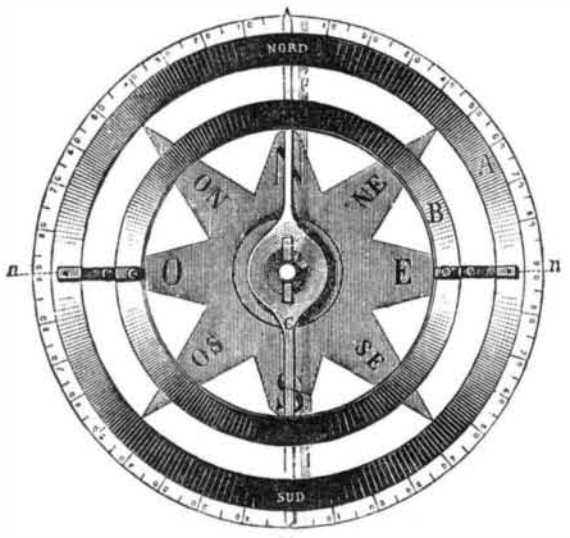
Mr. C. V. Riley, State Entomologist of Missouri, has lately returned from France, where he has been on a tour of inspection among the grape-growing regions. He was every where received and treated like a prince, dinners were given in his honor, and every possible attention shown to him in public and in private.

The particular reason for these civilities is the fact that Mr. Riley was the first to call the attention of the French to the fact that a simple remedy for all their troubles in connection with the grape vine disease was the substitution of certain species of American vines, by him named. These, he affirmed, would yield good wine in France and be free from the pest.

Some of the wine growers tried the experiment, which was continued the next year and that following; and the success has become so well established that extensive orders have now been sent to this country for vines. In fact it is believed the demand from France will be so great that our nurserymen will be unable to fill the orders for exportation this season. Mr. Riley saw plantations of American vines flourishing in France, where the native vines had been utterly destroyed.

A NEW CIRCULAR COMPASS.

M. Emile Duchemin substitutes for the ordinary compass needle two concentric circles, A B, in the annexed engraving, connected by a crosspiece, C, of aluminum or other metal. The maximum of magnetization starts from the N. and S. poles, and decreases to the neutral points, *n n*, as is indicated by the dark shading on the circles in the illustration.



This compass is said to be much more sensitive than the needle, to be less affected by rolling of the ship, and to be much less sluggish than the liquid compass. These facts were adduced by recent French naval tests of the instrument in comparison with compasses of the usual construction.

Centennial Notes.

About $3,500,000 have been subscribed toward the building fund, leaving a deficit yet to be made up, according to the reduced estimates, of $2,000,000. This is exclusive of the cost of Memorial Hall ($1,500,000), which is guaranteed by Philadelphia and the State of Pennsylvania, over and above their subscription. The latter amounts to $2,575,000 out of the $3,500,000, leaving $925,000 as representing the total received from the balance of the Union thus far.

France wants special laws enacted by Congress in order to protect her exhibitors from piracy of their inventions by the "grasping Yankees." The French say that they passed such enactments for the benefit of contributors to the 1867 show and that now we should go and do likewise. If we remember rightly, the French laws did not prevent sundry grasps of American inventions at the 1867 Exposition, and exhibition of the same in French shop windows, for sale, while the owners waited and sought for redress which they never got. We have no illiberal policy which prevents foreigners taking advantage of our patent laws, and thus securing full protection for their ideas with as much facility as our own citizens; and such laws we think will be found to answer every purpose of preventing piracy, without any additional legislative tinkering.

The Director General of the Centennial has issued the following rules for the information and guidance of exhibitors.

The space granted to an exhibitor within the building is available floor space, exclusive of the intermediate passages between the exhibits.

There will be no charge for space, but all platforms, counters, ornamental partitions, show cases, and appurtenances must be erected at the expense of the exhibitor; but they must not exceed the following hights without special permission from the Chief of Bureau:

Show cases and partitions: Fifteen feet above the floor.

Counters: Two feet ten inches above the floor, on the side next the passage way.

Platforms: One foot above the floor.

Exhibitors have the privilege of placing railings of approved design around the space allotted to them, of the uniform hight of two feet six inches above the floor level. The floor space granted includes the area embraced by the railing.

Each column within the building will be lettered and numbered, the letters designating the lines of columns, lengthwise, from east to west, and the numbers the lines, crosswise from north to south. Each exhibitor will have his location defined with reference to the nearest column, and the official directory of the building will give the position according to this system.

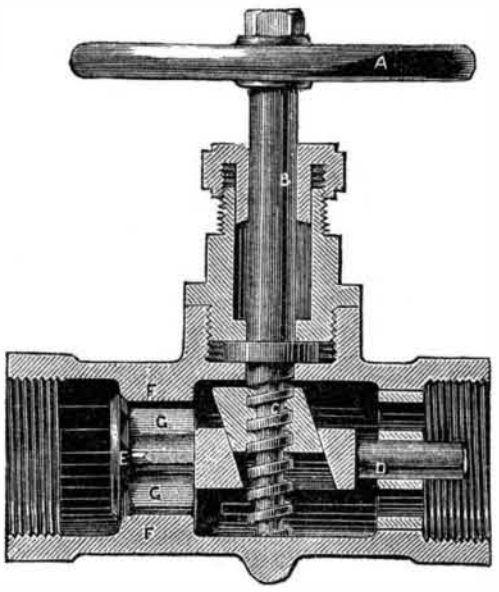
Exhibitors having space granted in close proximity to the columns or outer wall of the building will be furnished from the Bureau of installation with drawings showing the form of the columns, the water spouts, and the available wall space. Cards stating the exhibitor's name, class of objects, catalogue number, place of manufacture, and price will be affixed to goods under such regulations as the commission may prescribe.

All products arriving at the doors of the building by rail, wagon, or otherwise, will be received by the Bureau of Transportation and delivered on the space granted.

All exhibits must be arranged, completely and finally in position, not later than May 1, 1875.

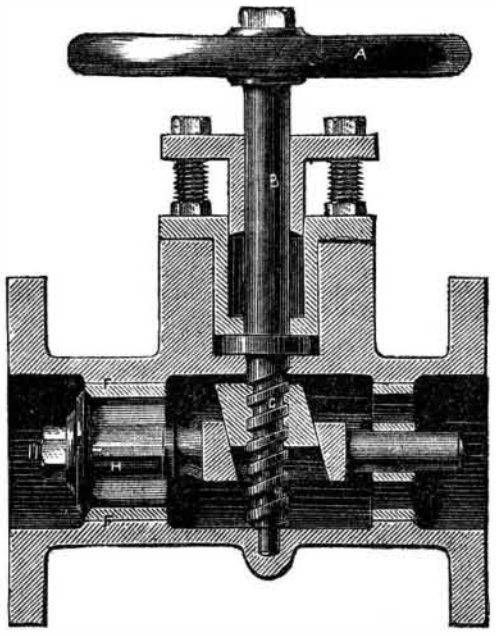
WHITTON'S STOP VALVE.

We publish herewith sectional views of two forms of a



stop valve recently invented by Mr. Whitton, and introduced by Messrs. Low and Duff, of Dundee, Scotland. Its chief characteristic is its powerful closing and opening movement, obtained by a combination of the screw and the wedge. This gives it a ready control over the supply of steam or water under great pressure, and especially adapts it for use as a throttle for a locomotive or as a water hydrant valve.

In Fig. 1, the spindle, B, has a square thread, C, cut upon it, upon which slides a wedge block, moving in an inclined slot in the valve spindle, O, by which arrangement it will be readily understood that the disk, E, is powerfully controlled by the wedge, which is again acted upon equally and uniformly by the action of the screw. It will be seen that the stuffing box and gland, through which the spindle, B, passes, are both screwed into the socket of the valve. In Fig. 2, however, the stuffing box arrangement is improved, the box being driven in tight and screwed down, and the gland being



adjusted by studs. The seat of the valve, being put in separately, can be easily repaired. The bottom of the screwed spindle is also recessed into the bottom of the valve, giving lateral support to the spindle.

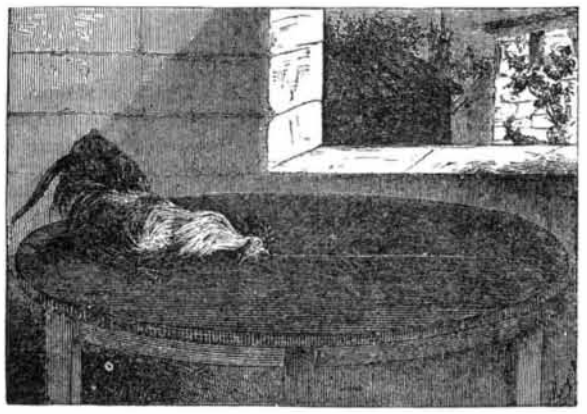
A New Textile Industry.

The government of India has been encouraging of late the culture of China grass (tschu-ma) or inner bark of the *Böhmeria nivea*, which yields a very beautiful fiber, some three times as strong as hemp, and as soft as flax, while possessing a luster equal to that of silk. Although the properties of this fiber have long been known there has been an absence of proper machinery for its preparation, and until quite lately it has been supposed that only the green stem could be operated upon. Since it has been discovered that the dry stems may be treated by ordinary flax and hemp machinery, producing a fiber but little inferior to that obtained from the green plant, their utilization bids fair to constitute an important addition to existing textile industries.

Although the vegetable is indigenous to China, India, Japan, and has been successfully cultivated in Martinique, Jamaica, Trinidad, Algeria, Queensland, and Mauritius, and to a limited extent on some portions of our continent, we are not aware of any extended efforts being made towards its acclimatization in the United States. It is said that the plant adapts itself to climatic conditions with considerable facility, and hence it may be inferred that systematic culture in southern states would be attended with favorable results.

THE CATALEPTIC ROOSTER.

There is a curious experiment which any one who is the possessor of a rooster can try for himself with success, and which has never been positively explained. It is an ancient one, in fact it is two hundred years and over old, since it was commented upon by Kircher in 1646. Still it is none the less curious, and almost as much a subject of speculation now as it was when first observed. It is performed thus: Select a dark colored table with a smooth top; place it so that a narrow streak of sunlight will fall across the surface. The sun light is not absolutely material to success, but we have found the desired result to be more quickly obtained when it is present. Then set the rooster on the table, and hold his head down so that his beak comes in contact with the wood. Now, with a piece of chalk and in the sunlight, draw a line straight from the bird's beak, as represented in our engraving. Move the chalk very slowly, and by the time the line is a couple of feet in length the rooster will fall into a cataleptic or trance-like condition; and although the hands are removed from his body, he will remain perfectly rigid for a minute or two. It is said that a black line on a white surface will produce the same effect. Hens may be similarly treated, but it takes much longer to get them into the trance state, it being necessary to hold the head down several minutes before they come under the influence.



This phenomenon is termed hypnotism, or the result of a curious sleep-producing property incident to the fixation of the attention upon some bright object. It is by some considered a partial paralyzation of the brain. The same can be done upon human beings. The person should fix his eyes steadfastly on any glittering object, say a disk of silver paper, fastened on a black surface and brought within ten inches of his face, for about twenty or thirty minutes. A state of torpor supervenes, during which, if the limbs be gently raised, they will rigidly remain as placed. Surgical operations have been performed under these conditions without causing suffering to the patient.

A Method of Increasing the Solubility of Salicylic Acid.

The solubility of salicylic acid is enormously increased by the addition of borax to the water, so that as much as ten parts of the acid can be dissolved in 100 parts of water, if eight parts of borax be present. This discovery we owe to Dr. H. Bose, assistant in the Surgical Clinic at Berlin, who has contributed a paper of much interest to the *Berliner Klinische Wochenschrift* (No. 28, July 12), to which we are indebted for the following details. The solution should be made by first dissolving the borax with the aid of heat, and then gradually adding the salicylic acid to the boiling fluid. Since commercial samples of both these drugs are not chemically pure, a small amount separates, and requires to be filtered off on cooling. The filtrate is a clear yellowish or light brown fluid, according to its concentration. The proof that the addition of borax does not convert more than a part of the salicylic acid into salicylate of soda—a salt devoid of antiseptic properties—is easily shown; for if we dissolve 6·9 parts of the acid in 100 parts of boiling water, and then add 2·89 parts of bicorbonate of soda, the carbonic acid in the latter is set free, while the soda combines with the salicylic acid, and on cooling there is such an abundant deposition of the excessive acid that the whole liquid becomes nearly solid, owing to the formation of crystals. Now, if the whole be reheated until the acid is completely dissolved, and then 3·58 parts of boracic acid added, no deposit of any kind occurs on cooling. The most suitable strength in which the above solution can be used for direct application to wounds is, according to Dr. Bose's experience, one which contains from 2½ to 5 per cent of salicylic acid, and 2 to 4 per cent of borax. Solutions containing more than 5 per cent of acid are too irritating, and give rise to a very abundant capillary hemorrhage if applied to the surface of a fresh wound. Dr. Bose speaks highly of the result obtained with the boro-salicylic dressing in a number of cases of removal of small tumors. The operations were all performed without the spray, and only the sponges and forceps used were cleansed antiseptically with the above solution. The wound was thoroughly washed with the same liquid, and then a thick layer of salicylic wadding, also soaked with it, was laid on its apposed edges, so as to reach several finger's breadths beyond them

and fixed by means of a bandage; catgut was used to tie any vessels requiring ligature. In those cases where the edges of the wound could not be accurately brought together, Dr. Bose put in catgut sutures, and then filled the spaces between the edges with the salicylic solution by means of a small syringe, and applied the wadding over all. The greater number of the cases thus treated healed by first intention, without the formation of a drop of pus.

Dr. Bose concludes his paper by stating that he has as yet no experience of the value of the boro-salicylic acid solution in dressing large wounds, and that he has not found it invariably successful in the case of small ones.—*Medical Times and Gazette.*

Correspondence.

Death by Strychnin.

To the Editor of the Scientific American:

On Saturday, July 24, Dr. J. O. Hill, of Ithaca, New York, in a hurry to go out, took thoughtlessly a drink of water from a graduated glass, in which he had previously dissolved some strychnin. He walked a quarter of a mile, and then felt dizzy, and this and an exhausted feeling seem to have been the first effects of the poison. These increased, and they seem to have enfeebled his mind somewhat, but not seriously. At the end of about a half mile walk, his lower extremities had become so affected that he could not move. It is not know what the exact form of this action of the poison was; but as seen by me a few moments later, it is probable that it was possibly numbness, and certainly spasm of the extremities, with quivering of the muscles on every attempt to use them; with congestion, or its opposite, anemia, of the brain, such as a ghastly pale face would show. In 5 or 8 minutes later, I saw him. His condition was that of constant spasms of the lower limbs, with occasional spasms of the arms; and in every half minute or minute, a spasmodic convulsion of the greater part of the involuntary muscles would take place. His mind was clear when no convulsions were on; but it was affected, but not suspended, during the convulsions. A death-like paleness preceded each general convulsion, with a stoppage of the pulse at the wrist, which soon took definite shape. In the brief intervals between the spasms or convulsions, he was able to speak, and to describe his case accurately. His vision was clear. He was cool and accurate in verbal expressions, but had that excitement that underlies danger. Being of a hopeful and mirthful turn of mind, he at this moment had no fear of death; for he wished still to take the railroad train, and said: "I shall be over this soon." If I am correct, and I think I am, his case shows that, beginning with a serious impression on the brain, the poison begins its fatal action on the extremities, the hands and feet, and by degrees proceeds up the extremities of the body to the trunk. When he spoke to me, this had reached the hips, pelvis, and shoulders, as was evidenced by his pointing to these parts and saying: "I am sick; it is cramps here," that is, on the circumference of bowels and ribs, and in the hips and shoulders. A few minutes later, he evidently felt that the poison was invading the involuntary muscles of the heart and lungs, as a sorrowful and allarmed expression evidently showed. A convulsion came on, and was followed by his clear statement: "What I fear is that a clonic spasm of the heart and lungs will take place, and I shall go, go soon in it." And after the next general convulsion, he said: "Doctor, you know what I fear," meaning the clonic spasm of heart and lungs.

Next the tetanic or clonic spasm was evidenced by his saying: "My jaws are becoming locked." The word "clonic," used by the dying doctor, means an irregular spasm. It is also used, probably without authority, as he used it, for violent closing or locking spasm, suddenly coming on. Very soon after, he was unable to swallow camphor and water I offered to him, and the teeth were locked as in tetanus, though not so rigidly. Then follow the fifth and sixth general spasm or violent convulsion within twelve to fifteen minutes, during the brief intervals of which he spoke: "I am gone," "it is over," "raise me up," "lift me up," and he turned purple or livid in the face; the clonic or closing tetanic spasm of the heart and lungs took place, and he who, forty-five moments before, had taken, into an empty stomach, a drink of water with the poison in it, was dead.

The action of the poison was, as I have said, first on the brain and voluntary muscles, then on the ganglia of the voluntary muscles; and it ended in death as soon as the involuntary muscles of breathing became involved, the breast being the last involuntary muscular organ that stopped. The spasms evidently were very painful, but not remarkably so. His mind was clear, so much so that he saw and spoke of what was best to do, and what was being done for and about him. Had not the celerity and the certainty of the progress of the poison been known (being absorbed by one in violent exercise, in water or solution, on an empty stomach), we might have well thought that such a self-possessed, strong, well reasoning, and conscious man was not at the gate of death.

Thinking that these facts are of interest to the medical profession, I have sent them to you.

S. J. PARKER, M.D.

Weighted Silks.

To the Editor of the Scientific American:

I noticed in your issue of July 10, an article headed "Weighted Silks." It states that the increase is by means of salts of iron and astringents, and salts of tin and cyanide; and that it cannot be too widely known that, by this adulteration, silk is rendered very inflammable, and, under certain circumstances, spontaneously so. I admit that silk in the process of dyeing, and where heavily weighted, receives all of the material named. Iron is the base; cyanide of potassium forms with the iron Prussian blue, giving the blue ground; it is then given a bath of tannin, which is precipitated with tin salts, fixing the tan insolubly on the silk. The result of all this is: Silk being, like hide, an animal gelatin, having an affinity for tan, becomes leather, and is about as inflammable.

I enclose a skein of black silk; one half of the weight is silk, the other half iron, cyanide, tin salts, and astringents, used as I have named. It is true the weighting of silks is carried to the extent of ruining the fabric. Although the goods thus weighted appear firm and solid, they will not wear. This weighing process adds bulk, so that the weighted silk will make two yards, where the unweighted would only make one. The silks will not last like those our mothers wore; to redye them is out of the question; but they have a decent appearance for a time, and I think no lady need fear spontaneous combustion.

A SILK DYER.

Pittsfield, Mass.

The Recent Wet Weather.

To the Editor of the Scientific American:

Among the many probable causes to which the exceptionable weather of this year is attributed, there is one which I have not yet seen mentioned in print, and which appears to be worthy of consideration. Advices from Europe tell us that, over a very large area of the north of that continent, quantities of ashes have fallen, having been wafted on the the winds from the Iceland volcanoes. This does not take into account the quantity which must have fallen unobserved on the intervening seas. To lift this immense mass of material to so great a hight requires an immense force, and an amount of the gaseous products of combustion terrible to think of. The question it would present to the meteorologist is: What effect would be produced on the atmosphere by this body of gas? Or if, as seems reasonable, there is an atmosphere of hydrogen above our atmosphere of combined oxygen and nitrogen, what would be the effect on it, and the resulting effect on the lower atmosphere?

Many years ago, Professor Epsy claimed that the atmospheric disturbances caused by large fires produced rains; but so far as I know, he did not assign a reason. If fire is wanted to bring rain, here is an amount of fire and heat to which the heat of the fires of Chicago and Boston combined would be nothing, and an amount of matter raised high into the air that would make many such cities.

Louisville, Ky. N. B. G.

Useful Recipes for the Shop, the Household, and the Farm.

The best remedy for currant and gooseberry worms is powdered white hellebore, obtainable at any druggist's. Put the powder in a common tin cup, tying a piece of very fine muslin over the mouth. Fasten the apparatus to the end of a short stick, and dust the powder through the muslin lightly upon the bushes. Do not work on a windy day, and stand to windward during the operation, as, if taken into the nostrils, the hellebore excites violent sneezing. The same material is a good remedy for cucumber beetles.

Sawdust can be converted into a liquid wood, and afterwards into a solid, flexible, and almost indestructible mass, which, when incorporated with animal matter, rolled, and dried, can be used for the most delicate impressions, as well as for the formation of solid and durable articles, in the following manner: Immerse the dust of any kind of wood in diluted sulphuric acid, sufficiently strong to affect the fibers, for some days; the finer parts are then passed through a sieve, well stirred, and allowed to settle. Drain the liquid from the sediment, and mix the latter with a proportionate quantity of animal offal, similar to that used for glue. Roll the mass, pack it in molds, and allow it to dry.

The following table for boiling fruit in cans will doubtless prove useful, as the present is the time for putting up such preserves for winter. The first figure after the name of the fruit refers to time of boiling in minutes, the second to ounces of sugar to the quart: Cherries, 5, 6; raspberries, 6, 4; blackberries, 6, 6; gooseberries, 8, 8; currants, 6, 8; grapes, 10, 8; plums, 10, 8; peaches (whole), 15, 4; peaches (halves), 8, 4; pears (whole), 30, 8; crab apples, 25, 8; quinces (sliced), 15, 10; tomatoes, 30, none; beans and peas, three to four hours.

The following soluble glass is best adapted for coating brick and stone: Dry carbonate of potassium, 10 parts; powdered quartz, 15 parts; charcoal, 1 part. Sand, free from alumina and iron, may replace the quartz. Fuse together and dissolve in boiling water of 5 or 6 times the weight. Filter.

Handsome ornaments can be made by mounting fern leaves on glass. The leaves must first be dyed or colored. They are then arranged on the mirror according to fancy. A butterfly or two may be added. Then a sheet of clear glass of the same size is placed on top, and the two sheets secured together at the edges and placed in a frame.

Photography of Children.

W. A. Nicholas, Australia, says; As nearly all children are photographed in white dresses, and the faces are a great deal tanned through exposure to the sun, I have found a useful help in a simple wax match. If I have been unable to get full exposure through the restlessness of the little sitter in dull weather, by lighting a match and holding it just under the face only, so as to make that part of the plate hot during development, it is astonishing the increase of detail I get. There is no danger of the plate cracking through uneven expansion.

PRACTICAL MECHANISM.

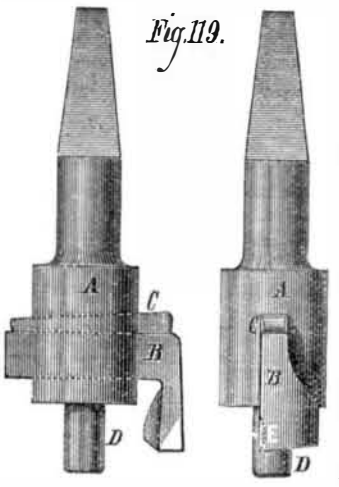
BY JOSHUA ROSE.

NUMBER XXX.

CUTTERS.

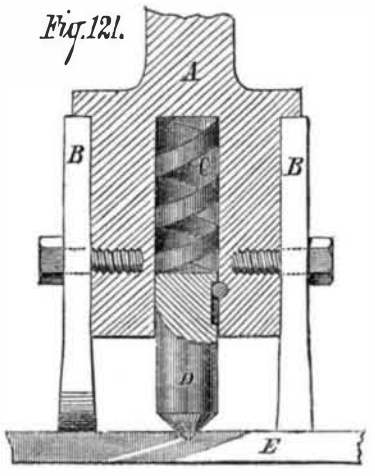
Cutters are steel bits, usually held in either a stock or bar, being fitted and keyed to the same; by this means, cutters of various shapes and sizes may be made to fit one stock or bar, thus obviating the necessity of having a multiplicity of these tools. Of cutter stocks, which are usually employed to cut out holes of comparatively large diameter, as in the case of tube plates for boilers, there are two kinds, the simplest and easiest to be made being that shown in Fig. 119.

Fig. 119.



A is the stock, through which runs a slot or keyway into which the cutter, B, fits, being locked by the key, C. D is a pin to steady the tool while it is in operation. Holes of the size of the pin, D, are first drilled in the work, into which the pin fits. To obviate the necessity of drilling these holes, some modern drill stocks have, in place of the pin, D, a conical-ended pin which acts as a center, and which fits into a center punch mark made in the center of the hole to be cut in the work. Most of these devices are patented, and the principle upon which

Fig. 121.

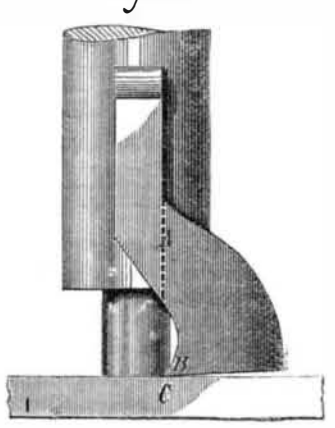


they act will be understood from Fig. 121, A being the stock to which the cutters, B B, are bolted with one or more screws. C is a spiral spring working in a hole in the stock to receive it. Into the outer end of this hole fits, at a working fit, the center, D, which is prevented from being forced out (from the pressure of the spring, C) by the pin working in the recess, as shown. E is the plate to be cut out, from which it will be observed that the center, D, is forced into the center punch mark in the plate by the spring, C, and thus serves as a guide to steady the cutters and cause them to revolve in a true circle, so that the necessity of first drilling a hole, as requirred in the employment of the form of stock shown in Fig. 119, is obviated. The cutters are broadest at the cutting end, which is necessary to give the point clearance in the groove. They are also, at the taper part (that is to say, the part projecting below the stock), made thinner behind than at the cutting edge, which is done to give the sides clearance. It is obvious that, with suitable cutters, various sized holes may be cut with one stock.

In cutting out holes of a large diameter in sheet iron, a stock and cutter such as shown in Fig. 120 is generally employed; but the great distance of the cutting from the cutting edge, that is to say, the extreme length of the cutter, renders it very liable to spring, in which case these, and other tools having a slight body and broad cutting edge, are almost sure to break, unless some provision is made so that the tool, in springing, will recede from and not advance into the cut. To accomplish this end, we must shape the cutter as shown in Fig. 120, which will, at the very least, double the efficiency of the tool.

In Fig. 120 the cutting edge, B, stands in the rear of the line, A, or fulcrum from which the springing takes place; hence, when the tool springs, it will recede from the work, C. To avoid springing and for very large holes, the cutter may be a short tool, held by a stout crossbar carried by the stock; but in any event the cutter should be made as shown above.

Fig. 120.



Cutters of a standard size, and intended to fit the pin stock, shown in Fig. 119, should be recessed as shown in Fig., 122; A being a facing or recessing cutter, shown in the stock, and B a countersink cutter out of the