a straw. During the forty-eight hours which follow the then move the slide back and forth laterally to see if there taking of the salt, the appetite should be satisfied with is any play. Move the slide to the other end of the Vs, and chicken or beef broth only; it is especially necessary at the time to observe a severe diet, and to avoid taking cold. The author asserts that during the eighteen years that he has used this method of treatment, he has never been unsuccessful. The remedy is certainly harmless, and perhaps show the parallelism of the Vs. worthy of a trial.

### HOW TO TEST A LATHE.

To test if the cone spindle is parallel with the ways or shears, bore a long hole in a piece of cast iron, using a to determine how much it can be moved without moving stout tool holder and a short stiff tool, taking a fine cut with the slide rest. To test the fit of the feed screw to the feed a tool having its cutting edge slightly rounded, with a feed of 16 to an inch, at a speed of 25 feet per minute. Let the and forth. It has been assumed in this method of testing tool feed through the hole and back again, so that it may be definitely known that the tool does not spring away from the work. Then, without moving the tool from the cut, wind the tool to the entrance of the hole, and let it stand there while the lathe runs forty or fifty revolutions. Traverse the tool to the other end of the hole, and let it stand while the lathe runs again. Then stop the lathe and traverse the tool (without taking it from the cut) along the hole, and if it marks a line stronger at one end of the hole than at the other, the tool has sprung and another fine cut must be taken as before, but if not, and the hole is parallel, the spindle is true.

To avoid the wear of the tool it must be made as hard as possible. If the cut was started at the front and the hole easily and freely, in uniform and unshaded bored is smallest at the back, another cut should be taken. lines, over the paper. commencing at the back and feeding toward the front. If the hole is still smallest at the back, the lathe cone spindle is not parallel with the ways.

To determine whether the cross slide is at a right angle with the ways or shears, take a fine cut over a radial face. such, for example, as the largest face plate, and test the finished plate with a straight edge. If the face plate runs true and shows true with a straight edge, so that it is unnecessary to take a cut over it, grind a piece of steel a little rounding on its end, and fasten it in the tool post or clamp, with the rounded end next to the face plate. Let therounded end be about 1/4 inch away from the face plate, and then put the feed motion into gear, and, with the steel near the periphery of the face plate, let the carriage feed up until the the exact size and form of the pen. Further rounded steel end will just grip a piece of thin paper against the face plate tight enough to cause a slight strain in pulling the paper out, then wind the tool in toward the lathe center and try the friction of the paper there; if equal, the cross slide is true.

In taking a cut down a radial face, to test the truth of the cross slide of the rest, the cut should be started from the periphery, for the following reasons: It is obvious that to some degree (however slight it may, under careful manipulation, be) the tool will become dulled as the cut proceeds. Now with an equal depth of cut, and under equal conditions, there is more strain and wear upon the tool edge when

cutting the larger than when cutting the smaller diameter. Suppose, for example, that in the figure we have the radial face, A A, and that the tools, B and c, are each taking off a cut of  $\frac{1}{16}$  inch deep having an equal feed; then from the lines, D E, we may perceive that the metal in the act of be-



ing severed by the tool, B, is much better supported by the metal behind it than is the metal being severed by c, and it follows that by beginning the cut at the outer diameter the strain upon it will get less, while the tool edge becomes duller, hence better results will be obtained than if the duty increased as the tool edge dulled.

To test the workmanship of the back head or tailstock, place the forefinger on the spindle close to the hub whence it emerges, and observe how much the hand wheel can be moved without moving the spindle; this will show how much, if any, lost motion there is between the screw and might be of organic origin; accordingly he has made a carethe nut in the spindle. Next wind the back spindle as far as it will go, take hold of the dead center and pull it back and forth, when an imperfect fit between the spindle and the hole in which it slides will be shown by the lateral motion of the dead center. Wind the dead center in again, and tighten and loosen the spindle clamp, and see if doing so moves the spindle in the socket. Wind the dead center out again and slide the tailstock up the lathe bed until the dead center nearly touches the live one, and after bolting the tailstock to the lathe bed, bring the center points close together and see if they coincide. If the tailstock sets over for turning tapers, the setting screws may be operated to adjust the centers. In any event, the lathe centers should be of equal height, or the lathe will not turn true. It is as well to turn the back center partly in its socket while making this test, so as not to be deceived by any want of truth in the back or dead center. To examine the slide rest, move the screw handles back and forth to find how much they may be moved without giving motion to the slides; this will determine the amount of lost motion between the collars of the screws and between the screws themselves and the nuts in which they operate. To try the fit of the movable slides in the stationary interest that has made Minneapolis. The one hundred sliding ways or Vs, remove the screws and move the slide thousand available horse power that has not yet been utilized of the same size, and to be impervious to the effects of salt so that only about one half inch is in contact with the Vs, is left after over 8,000 horse power of water has been used water

make a similar test, adjusting the slide to take up any play the fit, while the power required to move the slide will

If the lathe carriage has a rack feed, operate it slowly by hand, to ascertain if it can be fed slowly and regularly by hand, which is of great importance. Then put the automatic feed in gear, and operate the feed gear back and forth, nut, put the latter in gear and operate the rack motion back that means of adjustment are provided whereby any play in the cone spindle bearings may be taken up. J. R.

# THE STYLOGRAPHIC PEN.

For several years past Mr. A. T. Cross, a pen and pencil

manufacturer of New England, has been engaged in perfecting a fountain pen, or more properly an ink pencil, which as now given to the public is certainly very useful and perfect. The holder or case, of vulcanized rubber, ornamented and beautifully mounted, contains<sup>c</sup> the ink, which is conveyed by capillary attraction to the point, whence it flows

For the past few weeks we have had some of these pens in practical use in the SCIEN-TIFIC AMERICAN office, and their working has so far proved very satisfactory. They write more smoothly and easily than a lead pencil, and can be used with facility upon any kind of paper. For long continued writing it is certainly a great convenience to take up one of these pens and be able to write page after page, for a whole day at a time, without being obliged to lift the hand from the paper, or resort to the inkstand, or change a pen, or sharpen a pencil. Our cut shows information may be obtained from the New York general agent, Mr. C. W. Robinson. No. 107 Duane street, New York, or Mr. M. R. Warren, No. 21 Milk street, Boston, Mass.

41+1+

## An Accident on the Mt. Washington Railroad.

The machinery for arresting the motion of a train in case of accident on the Mount Washington Railroad was happily tested, not long since. While a train was ascending the mountain the rear driving wheel of the engine broke, whereupon the ratchet brake on the forward driving shaft of the engine was instantly applied, stopping the train so quickly and firmly that its movement backward down the slope was less than four inches. There were about seventy passengers on the train, and but few of them suspected that an accident had occurred before the train was stopped. No one was hurt.

### London Lichens.

Hitherto the discoloration of London buildings has been chiefly attributed to the prevalent smoke and soot of the atmosphere of the city. It has been noticed, however, that the same way; while, on the other hand, in places entirely out of the range of London smoke and soot, certain walls became as black as those of St. Paul's. These contrary conditions led Professor Paley to suspect that the discoloration ful study of the matter, resulting in the conviction that the mischief maker was in reality a minute lichen, irregular in shape and extremely low in organization. It thrives best on certain oolitic limestones much used in London, in warm shady places. The problem now is to find some means for killing and preventing the return of the lugubrious nuisance.

by nineteen flouring mills with 214 run of stone; a large woolen mill, manufacturing some of the finest blankets and cassimeres in America; a cotton mill making seamless bags, at either end. Then clean the bearing surfaces and move yarn, etc.; three iron works, a railroad machine shop, a mill the slide back and forth on the Vs, and the marks will show machinery works, several planing mills, sash factories, two paper mills, two machine shops, a carding mill, a 300,000 bushel grain elevator, the city water works, twenty saw mills, many with immense gang saws, double circulars, etc.

### Where Our Hardware Goes.

A correspondent of the British Ironmonger has been examining the monthly reports of our Treasury Department to see what becomes of exported hardware. He finds the destination of some of the principal articles to be as follows:

Nails are sent chiefly to Great Britain, Germany, France, Danish West Indies, British West Indies, Porto Rico, Cuba, Africa, British Guiana, Hayti, Columbia, Brazil, Mexico, Australia, New Zealand, and Canada.

Cutlery is sent chiefly to Great Britain, France, Cuba, Honduras, British Guiana, Columbia, Brazil, Mexico, Venezuela, and Australia.

Pumps are sent chiefly to Germany, Great Britain, France, Cuba, Columbia, Brazil, Venezuela, Australia, Mexico, New Zealand, Sandwich Islands, the East and West Indies, China, Japan, and many other countries.

Machinery is sent to Great Britain, Germany, France, Cuba, Hayti, San Domingo, all the South American States, Mexico, Central America, all parts of Europe, Africa, Australia, China, Japan, and elsewhere.

Articles classed as general hardware go to Great Britain, Norway, Sweden, Denmark, France, Germany, Spain, Italy, Russia, British North America, West Indies, East Indies, British colonies in Africa, British Guiana, China, Japan, all the South and Central American States, Australia, New Zealand, and many other countries.

Agricultural implements, clocks and watches, firearms, and many other manufactures, seem to go in greater or less amounts to nearly every country of the world.

### Filtration of Sea Water through Sandstone

Mr. Isaac Roberts, at a recent meeting of the British As-. sociation, stated that he was led to investigate the effects produced on sea water by filtration, in consequence of the constantly increasing salinity of the water drawn from several wells in Liverpool, which are sunk below the sea level in the Bunter sandstones of that locality. He found that one of the wells, which he selected as the type of the rest, yielded water which increased in salinity at the rate of 4.91 to 5.81 per cent annually, and inferred that the sandstone rock had the power of removing salts out of sea water. To prove this he filtered sea water through blocks of the sandstone, and found the inference to be greatly borne out by the results of his experiments. Two cubic feet of the stone removed, from the first filtrate of 31/2 fluid ounces of the water, 80.8 percent of the salts held in solution, and each measured quantity of four ounces, which were afterward filtered through, regularly showed an increase of the salts in solution, until 931/2 fluid ounces had filtered through the stones. Then these ceased to be operative as filters, and the waters passed through unchanged. After allowing the stones to dry he passed the spring water through them, and found that the salts which they had taken up were again removed and washed out, thereby showing the action to be mechanical.

### Miss Hosmer's Improved Sculptor's Model.

In a very appreciative account of Harriet Hosmer's "Sentinel of Pompeii," the London Times describes the ingenious method by which that artist overcomes the difficulties attending the use of clay models and casts. "To get rid of these," the Times remarks, "Miss Hosmer has devised the other towns, with an atmosphere equally vile, and using the plan, after settling her design in the shape of a small model, same sort of stone for building purposes, did not suffer in of building up a rough model of the figure in plaster of Paris round a strong iron skeleton; on the surface of this she marks the more exact contour, after her small model, by steel points, such as are used in fixing the contour of a marble to be carved from a cast, and then works over the rough plaster, up to the heads of these points, in wax, applied warm, to a thickness varying from an eighth of an inch to nearly an inch, till she obtains the surface she desires, which in texture, color, and effect most closely resembles old marble.

> "In this way is obtained a model which can be put aside at any moment and resumed when convenient, which can be preserved without liability to crack or shrink as long as may

### A Promising Western Town.

A correspondent of the Daily Bulletin prefaces a long account of the growing industries of Minneapolis, Minn., with the remark that Horace Greeley said, ten years ago, that the child was then living who would see the day when mills at the Falls of St. Anthony would produce more cotton goods than the mills of Manchester, and more woolen goods than the mills of Leeds. This was a big prophecy indeed, but as at that time Minneapolis and the village of St. Anthony, surrounding those falls, contained only about 15,000 inhabitants, and was a small manufacturing town, and has since swelled into a city of 47,000 inhabitants and become the largest flour milling city in the United States, and is still rapidly increasing its prominence in every respect, the prophecy was not so wild as it might seem; and its truth may yet be realized. It is not alone, however, the milling

be desirable, and which bears the living impress of the sculptor's hand, like the clay, without the difficulty of keeping it in working order, and the liability to accident and disaster which beset the clay so sorely. How far these advantages outweigh any difficulties there may be in the preparation or working of the model thus treated, and what other advantages not here indicated the method may have, are. of course, questions for practical sculptors, to whom Miss Hosmer is ready to give full explanation of her new way of working.'

In thus breaking through the immemorial customs of the art world, as in her womanly in dependence and energy, Miss Hosmer illustrates the true American spirit.

THE fiber of a variety of the aloe, peculiar to the Mauritius, is reported to be the best known material for ropes. It is said to be very pliant, to exceed in toughness an iron wire