Foreign Bodies in the Nose and Ears.

Dr. Mason, in a lecture on the Surgery of the Face, published in the *Lancet*, says that foreign bodies, such as cherry stones, locust beans, brass rings, slate pencils, screws, buttons, pieces of wood, peas, etc., are not unfrequently met with in the aural and nasal cavities of children, and even of adults. Such substances have been known to remain in one or other of these cavities for nearly a lifetime, causing little or no inconvenience. Thus a case is related of a lady from whose nostril a foreign body was dislodged during the act of sneezing. It was found to be a button which had belonged to her little brother when they were both infants. Another case is recorded in which a piece of slate pencil was removed from a woman's ear, and which had been put there when she was at school forty years before. And a third instance, in which a cherry stone had been in an ear for sixty years. A case is recorded of a gentleman, aged forty-one, from whose ear a piece of cedar wood was removed by syringing. The patient remembered distinctly the fact of its introduction when he was a boy at school, at least thirty years previous. No attempt had been made to extract it, and its presence had not troubled him until now. It occasionally happens, however, that a good deal of inflammatory action is set up by the foreign body, as in the case of a girl who was under the author's care in the hospital, to which she had been admitted on account of a small stone in her ear. She subsequently had paralysis of the facial nerve. A case is reported of a child who not only had facial palsy, but died of meningitis, caused by the presence of a locust bean in the ear. Living larvæ have been found in the meatus of the ear. Dr. Routh publishes such a case. The patient was a gentleman who three years before was tormented by a fly near his ear. Convulsions followed the presence of the larvæ, but the patient recovered, although he remained deaf. Dr. Blake, of Boston, has seen four such cases. A case is reported which shows the curious course taken by a pin that had been introduced into the external meatus. It passed through the middle ear, probably along the Eustachian tube, and was extracted by the patient from her throat by hooking it with her finger. There are various instruments employed for removing foreign bodies from the ear, each good in its way—a loop of wire, or a needle with the point just slightly turned up, forceps, or an instrument like that devised by the author's colleague, Dr. Hone. This consists of two pieces of silk covered silver wire, wound together in a single strand, about three inches in length. The whole is insulated and stiffened with shellac, the ends being left loose for connection with a battery and galvanometer; the object of the electrical part being to detect the presence of metallic bodies.

In dealing with foreign objects situated in the external auditory meatus, syringing the passage will often suffice to effect their removal; but in many cases forceps and other instruments must be used, yet they should be employed with the greatest caution. As a rule, if left alone, the substance becomes loose, and falls out on the pillow as the patient lies in bed. In extracting foreign bodies from the ear, M. Debout has recommended that the mouth of the patient should at the same time be kept open. It is sufficient to introduce the end of the finger into the external auditory canal, and to make the lower jaw move, in order to become convinced of the enlargement that the canal undergoes each time the condyle of the jaw is made to move. Dr. Voltilini, in some practical remarks on the subject, says that in the removal of these bodies we should never employ force; not that foreign bodies should always be left in the ear, but that matters should not be made worse by violent manipulations. More recently Dr. Dolby has laid down the very practical law that no attempt should be made to remove a foreign body from the ear unless the auditory canal be thoroughly illuminated. Where this rule is broken, the tympanic membrane will most probably be ruptured, and the life of the patient be thus placed in imminent peril.

Niello.

The composition of the Russian tula, or niello silver, has been hitherto kept secret. According to the *Berliner Tagblatt*, the firm of F. Zacher & Co., in Berlin, have discovered the method of manufacture, and have made it in large quantities. It consists of nine parts silver, one part copper, one part lead, and one part bismuth, which are melted together and saturated with sulphur. This mixture produces the gorgeous blue which has often been erroneously spoken of as steel blue.

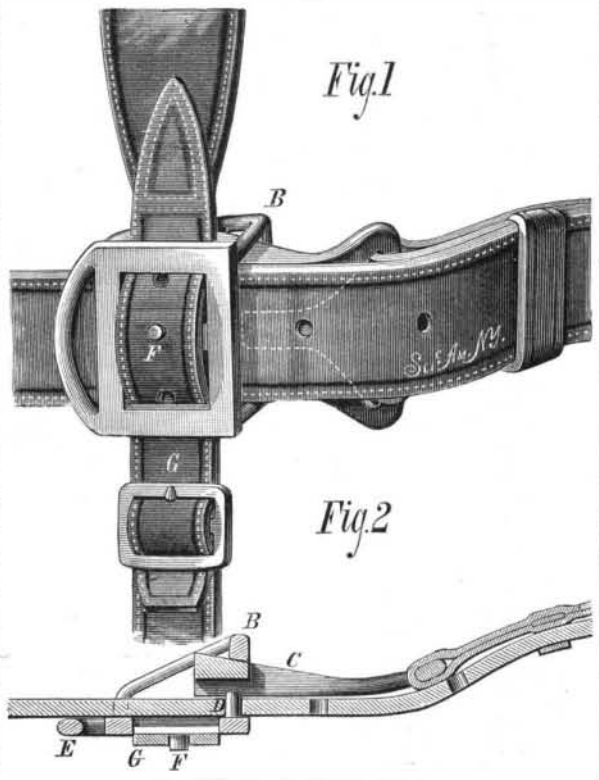
NEW TRACE AND PAD BUCKLE.

Our engraving represents an improved buckle for connecting the traces, hame-tugs, pads, and belly-band of a harness.

The main frame of the buckle is provided with a flange, B, which is slotted to receive the trace and the wedge-shaped block, C. The buckle frame has a rigid tongue, D, which enters a hole in the trace and prevents it from moving out of place before it is fully clamped by the wedge, C. The wedge is grooved longitudinally upon its outer side for the passage of the tongue. Upon the smaller end of the wedge, C, there is a loop to which is attached the end of the hame tug.

The buckle frame has a loop, E, for receiving the side straps of the harness; it also has a central bar from which a rigid tongue, F, projects for receiving the pad strap, G. To the lower end of the pad strap is attached the belly-band.

By this construction, the trace when under tension will be firmly clamped between the wedge block and the buckle frame, so that the entire strength of the material may be utilized in sustaining the draught



BATES' TRACE FASTENING.

For further information, address the inventor, Mr. George E. Bales, Seattle, King Co., Washington Territory.

QUICK SPEED HAND DRILL.

Our engravings represent a new and useful tool for light drilling in wood or metal, invented by Mr. C. L. Belamy, of Arlington, N. J. Its chief parts are a fly-wheel carrying the drill, and a pulley spring and clutch mechanism, all of which revolve loosely on a spindle held stationary by a handle (Fig. 1). The action is as follows: By drawing with one hand a string wound around the drum, the latter and the clutch, together with the fly-wheel and drill, are set in motion at a certain speed. At the same time the spring attached to the drum is tightened. As soon as the tension of the hand holding the string is relaxed, the movement of the pulley is reversed, taking up the slack at the same time. The fly-wheel and the drill do not, however, take part in the reversal of the motion, owing to the action of the clutch. A continuous revolving movement in one direction is thus insured for the drill, the speed varying from 500 to 1000 revolutions per minute. The necessary feed may at all times be felt, and be accordingly controlled by the hand grasping the handle. The drill may be used in any position, and drills of any kind can be inserted.

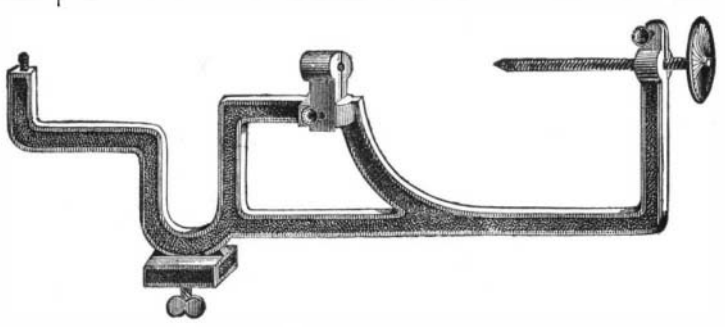


FIG. 2.—BRACKET FOR HOLDING THE HAND DRILL.

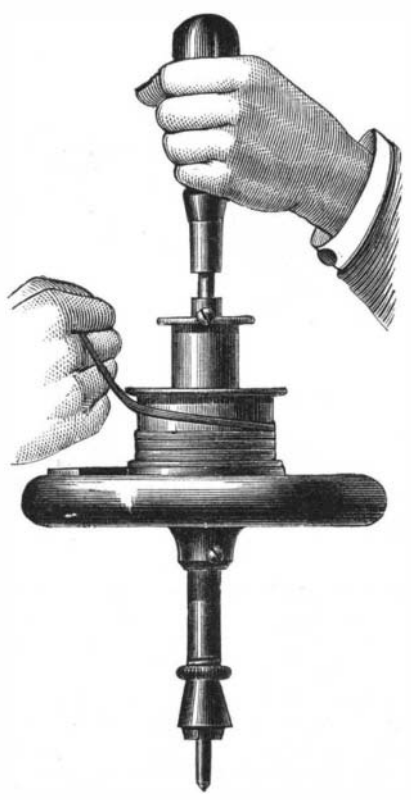


FIG. 1.—QUICK SPEED HAND DRILL

By the use of a simple attachment which is not shown in the cut, the instrument can be so arranged that it may be operated with one hand. Another attachment, shown in Fig. 2, is provided by which the drill can be worked by hand or foot; this consists of a bracket for holding the drill, converting it into a tool similar to a small lathe. The bracket is held by inserting the bottom in the jaws of an ordinary vise. In this case the drill can be used for polishing. The tool is a very neat and effective one, and seems capable of doing a pretty wide range of work.

For further particulars, address James D. Foot, 22 Platt Street, New York.

The "Germ Theory" in its Chemical Aspect.

Some of our principal daily papers, whose mission is, or at least should be, to diffuse useful and correct information among the masses, have succeeded in ferreting out a remarkable French chemist, who, having renounced for a time both his profession and the outer world, has betaken himself to the gloom of an old brewery cellar in Hoboken in order to devote himself to the cultivation of mushrooms. Now in the mere growing of mushrooms for the market there is nothing to call forth particular remark—it is a very laudable and a very honorable business, whether engaged in by a gardener or by an "exiled Frenchman and chemist and a friend of Gambetta;" but when we find the newspaper reporter giving credence to the marvelous fictions of this so-called chemist, and then giving them prominence in a lengthy article, we begin to lose our respect for the "professional" qualifications of both individuals. Of this exiled chemist we are told that, "having seen mushrooms grow in France by supplying the ground with the germs, he set to work to discover their chemical composition and to manufacture them artificially." We are further informed that the experiment is a success and that 150 pounds have been raised in a day, and that no poisonous kinds can possibly get among M. Mezzarelli's plants because nothing enters his "carefully manured soil but the germs which he makes in his little laboratory." This wonderful discovery in agricultural chemistry having duly gone the rounds of the press, we shall be fully prepared to read an account of the brilliant feats of some other exiled foreign scientist in the artificial production of the "germs" or seeds of our entire catalogue of field and garden plants, and the consequent ruin of all our large seed houses. Such a statement would be no less absurd than the former. It is hardly necessary to say that mushrooms and allied plants produce and are developed from small bodies which, although not seeds, are analogous to seeds, and that the manufacture of these is just as far beyond the reach of human talent as that of any other living organism.

The cultivation of these much esteemed delicacies is a remarkably easy matter, requiring neither the intervention of the foreign scientist nor the use of chemically prepared materials to make it a success; and the only wonder is that so simple and so inexpensive a process should not long ago have developed into a prominent industry in this country. To prove that it would be profitable it is only necessary to refer to the immense number of cans of "Champignons" annually imported from France into the United States, and which are held at a price out of all proportion to the costs of production and preparation for the market.

Official Paper.

Professor Reuleaux recently gave a discourse before a commercial meeting at Leipsic, upon the character of the paper employed in the public offices, which he regarded as a striking evidence that the giving of contracts to the lowest bidder exerts an injurious influence. The paper which is now delivered consists almost entirely of wood, and in the course of ten or fifteen years we may reasonably anticipate that the official records, which are of the greatest importance to our families, will be destroyed through the natural processes of decay. Such a serious evil would seem almost incredible if it was not sustained by weighty evidence. But as long as our officials hold to their present course, and so long as they buy only what is cheapest, and what, as a necessary consequence, is also bad, we have no right to anticipate any improvement.—*Pap. Zeit.*

How Grapes Ripen.

According to *Comptes Rendus*, St. Pierre and Magnien have arrived at the following conclusions in regard to the changes which grapes undergo while ripening. During the process they evolve carbonic acid in darkness as well as in light, when exposed to the air or placed in an indifferent gas. The amount of oxygen evolved in air is always in excess of the oxygen taken up; this has been remarked in the case of observations extending over a long space of time. Grapes can absorb or give off water according as they are placed in a moist or dry medium. As the change goes on the acids decrease in amount, while the quantity of sugar increases. The acids and the glucose are carried to the grapes by the sap. Here the acids are slowly consumed, while the sugar increases in point of concentration, and at a still later stage the sugar itself is consumed.

New Engineering Inventions.

Mr. Henry Bolthoff, of Central City, Col., has patented an improvement in Pulverizers for disintegrating ores and other substances; and it consists in a wheel containing several shoes, arranged at equal distances around its periphery, and arranged tangentially to a circle inscribed within the periphery of the wheel, every such series of shoes being provided with a heavy pulverizing ball that rolls along the shoes and drops from one to another as the wheel is revolved.

Mr. Martin Everhart, of Fort Worth, Texas, is the inventor of an improved Machine for Storing the Power of Wind Engines. It consists of a water power which is so constructed that the water may be stored up by the irregular action of the wind in such a way that it may be used for furnishing a continuous power.

Mr. David Horrie, of Keokuk, Iowa, has patented an improved Railroad Ditching Machine, which may be drawn forward on the railway track by the locomotive, and will rapidly form ditches at the sides of the track, and deliver the earth at the sides of the track, or at the center of the track, or to a car, by which it may be carried away.

Mr. Silas G. L. Morrow, of New Bloomfield, Mo., is the inventor of an improved Scraper for leveling roads, making excavations and other similar operations; and it consists essentially in a cart having attached to it a scraper, which is suspended and operated by levers attached to the cart.

Mr David M. Finlayson, of St. Paul, Minn., is the inventor of an improved Journal Bearing, which consists of a series of rollers surrounding the journal, and interposed between its surface and that of the inside of the bearing, the rollers being kept parallel with the journal by a pinion parallel with the axis of the journal, and gearing with the surfaces of the rollers; the pinion is mounted in bearings in the oil box underneath the journal, and acts as a lubricator to the rollers, and through them to the journal.

Mr. Benjamin F. McKinley, of Morning View, Ky., has patented an improved Hot Air Engine, in which the chamber in which the circulation of air is kept up by the displacer is made of two corrugated metal disks, and the displacer has wings which enter said corrugations to give a tortuous passage to the air and bring it into more intimate relation to the surfaces, thus securing a larger margin of difference in temperature. A special link motion controls the engine, and a new form of regenerating surfaces is employed in the regenerating chamber through which the air circulates.

Mr. William H. Plumb, of Mauch Chunk, Pa., has patented an improved Ore Jigger. The object of this invention is to improve the apparatus or jigger for separating ores from slate and other lighter products, for which letters patent were granted to the same inventor July 1, 1873. In this jigger the lighter parts are separated from the heavier parts, and discharged separately.

Mr. James H. Sparkes, of Clinton, Ill., has patented an improved Railroad Crossing. The advantages of this crossing consist in the firm and reliable connection of the joints of the castings, of their broad base that renders a rocking motion impossible, of the rounded off recesses of the flanges that dispense with separate guard rails in the crossing, and of flanges that take the place of the rails in case of injury to the same, and admit the easy and convenient repairs of the crossing by replacing worn out or broken rails.

Communications.

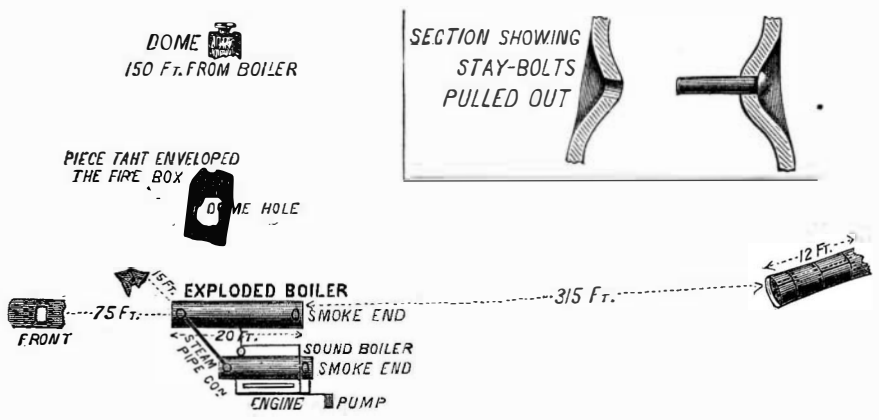
Boiler Explosion at Holland, Vt.

To the Editor of the Scientific American:

An investigation, last Saturday (22d), of the boiler explosion at Mr. Henry Pinney's mill, at Holland, Vt., on the 6th of June, revealed the following facts:

Last February a supplementary boiler was put in the mill by a man named Foley, the steaming capacity of the first boiler not being sufficient to supply the engine. This second boiler was in the form known as "locomotive." It was 20 feet long, the cylindrical portion of the shell being 32 inches in diameter, and contained thirty-four 2¼ tubes. The positions of the boilers were north and south, the fire ends being to the north. Looking to the south the second boiler was on the left hand side of the first, the engine being on the right hand side of, and on a cast iron frame with, the first boiler. The two were connected by a 1½ inch pipe, and were 4 feet apart. The connecting pipe had no cock and reached from dome to dome of either boiler. The supply of steam for the engine was taken from the first boiler by a 2½ inch pipe. Each boiler had a safety valve and steam gauge, with water gauge cocks (three to each), all in good working order. The water supply was from a pump of ample capacity through an inch pipe. This pipe entered a T coupling on the water supply pipe connecting the boilers near the bottom of each. Between the T coupling and the first boiler a globe valve was located, while a brass check valve of the globe pattern was placed close to each boiler, all being in good working order, as shown by the testimony of the engineer and others who were at work in the mill.

Fifteen or twenty minutes before the explosion the engineer had stopped the engine to get up steam, it being too low to carry all the machinery. Having gotten up a pressure of 95 lbs. by the steam gauges, which, according to the testimony, worked about alike, and which also agreed with the figures marked on the lever of the safety valve of the second boiler, the pea of the same being set within 5 lbs. of its utmost limit, namely, 95 lbs., he started the engine and ran a few minutes, when a cedar wedge in the steam chest blew out. It appears that this wedge was a temporary means of stopping a leak where a small portion of the packing had blown out. While he was in the act of doing this the second boiler exploded, throwing the cylindrical portion (which is 12 feet long and filled with the tubes) 315 feet to the south, tearing through the heavy timbers of the mill, clearing away everything in its track, and striking a pile of logs, which were scattered in every direction. The fire front was thrown 160 feet to the north, where it struck a tank

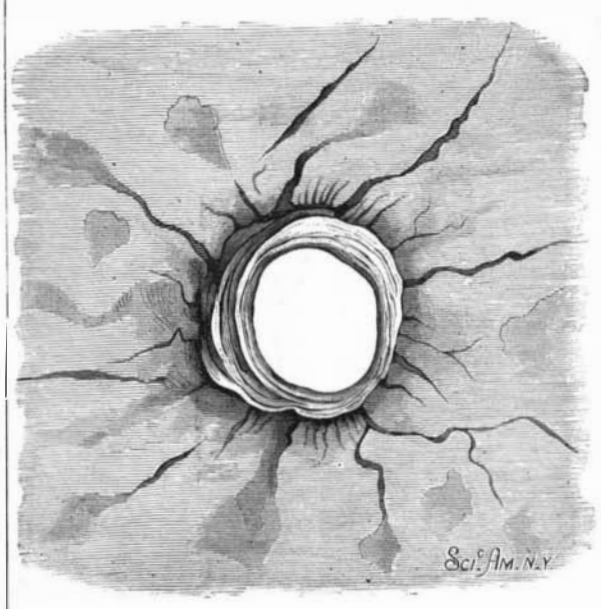


PLAN OF BOILER EXPLOSION.

with great force. The interior portion of the firebox was completely collapsed and thrown about 15 feet, while the outside of the firebox was ripped off like so much paper and landed about 60 feet to the east of the dome, being thrown 250 feet to the east, where it landed in a brook. Other but smaller portions of the boiler were thrown in various directions.

The examination was made by me. My report states that the boiler was not safe to carry over 60 lbs. had the boiler been new, the construction of the boiler being such as was intended to mislead. The edges of the plates where they lapped on the outside were wedged or hammered up to represent thicker iron, which was but $\frac{5}{32}$ of one inch thick. Imitation stay bolts were so placed as to lead one to think they secured stay rods, which was not the case. The upper tier of tubes show evidence of having been burned at some time, but not lately, as the deposit of scale bears the same appearance as that of the lower tubes. None of the tubes were collapsed.

The testimony given shows that the gauge cocks in this boiler had been tried by two persons two or three minutes before the explosion, and two good gauges of water were there. The appearance of the fire box indicates the origin



of the explosion to have been by the giving way of the stay bolts in the vertical sides, which would permit the crown sheet to drop down, at the same time liberating the lower edges of the outside sheets of the firebox, ripping off that portion, and throwing it, with the dome, to the east, while the reaction of the escaping water and steam in the shell carried it, end over end, to the south. The havoc made is not easy to describe: it is sufficient to say it was and is the personification of chaos. The examination also showed places in the boiler not one eighth of an inch thick, having been eaten by rust. Evidence was also produced by which it was proved that the crown sheet and sides of the firebox were badly bulged between the stay rivets, this being conclusive evidence that the boiler was unsafe and unfit for use before it was brought here; and it is hoped that the parties who sold it, recommending it to be safe at 140 lbs., will be made to pay damages.

There were three men and a boy in and about the mill at the time, and it is a great wonder that some of them were not killed outright. The foreman, Mr. Garrish, was knocked down by a flying piece striking his forehead and cutting a severe gash; the sawyer was simply blown out of the mill, with the chew of gum he was in the act of biting off when the explosion occurred; the engineer was knocked insensible, and he came to himself as he was crawling among the débris; and the boy was blown into a brook near by and severely scalded, not being yet out of danger. The engineer is in a fair way to recover, though being injured internally.

The report was heard from a distance of three miles, a peculiarity of this being noticed, that is, it was more distinct at a distance than close by. F. A. WISEWELL.

Beebe Plain, June 22, 1878.

[This is a fearful commentary on the too ordinary practice of buying a boiler because it is cheap, and putting it to work before it was examined or tested, with nothing, in fact, but the statement of an irresponsible dealer. Steam users who wish to avoid explosions have long since learned that they can be prevented by a system of careful and intelligent inspection.—EDS.]

Boiler Explosion at Hillsboro', O.

To the Editor of the Scientific American:

There was a boiler explosion near this place a few weeks ago, killing three persons instantly; there were some peculiar developments connected with this explosion to which I desire to call the attention of the public and the users of boilers.

The boiler that exploded was of the form known as the locomotive boiler, used to drive a circular saw-mill of about 20 horse power; had been in use about ten years; had been repaired about four years ago, when a new crown sheet was put in; previous to the explosion the boiler was considered safe and had repeatedly carried 125 lbs. of steam; at the time of exploding was carrying about 70 lbs.; showed two gauges of water, and was running; it blew up just as the sawyer was about to start the saw into the log, and had opened the steam valve for that purpose. After the explosion, the boiler was examined, and was found to be of fair to good iron at all points except around the stay bolts, and here there was a peculiar deterioration of the metal; around every one of the stay bolts the metal had shriveled up or shrunk away from the bolts until there was only a thin shell left standing, and that on the outside, so that there was nothing left to hold on to the stay bolts but this thin shell and the head of stay bolt formed by riveting; this shriveling up only occurred where the bolts were under the water line in the steam room; the iron around the bolts was in perfect condition; so also were all other parts of the boiler plate around the rivet heads, etc.; the iron around the bolts looked like iron that had been burned, and showed about the same on the outer shell as on the inner one.

In the explosion about half of the stay bolts were pulled out of inner shell and left in the outer shell, and the other half *vice versa*. The water used usually was what is known in this country as hard water impregnated with lime, but no scale of lime was shown at any point except on the flues. The initial point of giving way was on the right hand side of the fire-box; the outside shell being thrown out and upward, and finally tearing itself loose on the left hand side, being caused to do so by the giving way of the metal around the stay bolts.

Now the question is, What caused the metal around the stay bolts to shrivel up or deteriorate? Is this a common thing in boilers of this class?

Your opinion in this matter is respectfully asked.

Hillsboro', O., July 3, 1878. C. S. BELL.

[The first thought that occurs to us on reading your letter and examining the sketch (for which you are entitled to great credit) is that the boiler was weakly stayed, so that there was a constant expansion and contraction of the sheet. At all events, similar causes have before this been productive of like results.—ED.]

That Hundred and Fifty Million Dollars.

To the Editor of the Scientific American:

I see that a paragraph which has been extensively published in agricultural papers has at last found its way into the columns of the SCIENTIFIC AMERICAN, page 90. This I regret, because said paragraph represents a great deal of imagination and very little fact. Ambitious reporters are too apt to contort casual conversation, and the item above referred to was born of just such ambitious reporting. How thoroughly out of time and place the last paragraph is will appear from the fact that the appropriation of $5,000 therein mentioned was, in reality, made to the Department of Agriculture, which is now carrying on the cotton insect investigation called for. C. V. RILEY.

Washington, D. C., August 3, 1878.

Machinery as an Educator.

In his lecture on the "Reign of the Common People," Rev. Henry Ward Beecher says: "New labor, especially manufacturing industries and commercial industries, are most powerful educators; they stir up the brain; they make it nimble; they make it various; they make it fruitful, and drive men forward in the way of life."