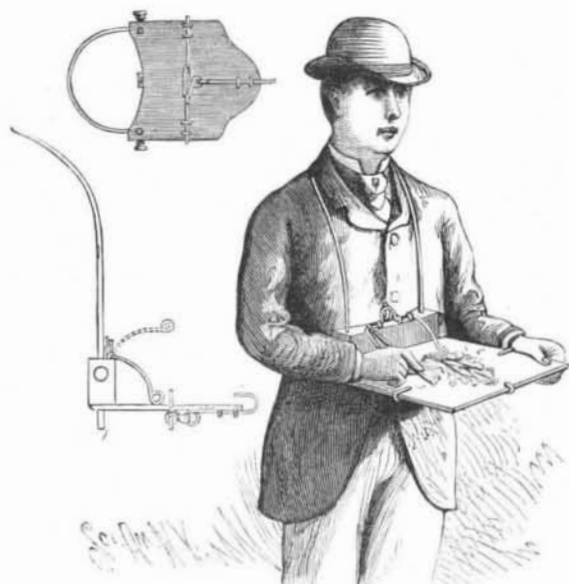


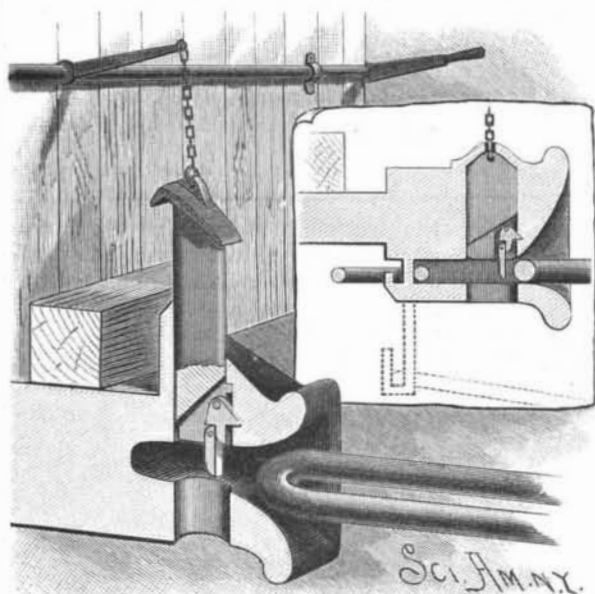
**A CONVENIENT SKETCHING BOARD OR BOOK REST.**

A simple device intended to facilitate reading while standing or walking about, or for writing, taking notes, or sketching, has been patented by Mr. Wilson Small, of No. 336 Lorimer Street, Brooklyn, N. Y., and is illustrated herewith, the small figures showing a



**SMALL'S SKETCHING BOARD.**

side elevation and an inverted plan view of the device. The support or table has a block or flange at the rear edge, which, with the adjacent edge of the table, is made concave, to fit against the body of the user, the table being connected to a yoke consisting of a small rod of iron bent in U form and curved backward, to fit over the neck and shoulders of the user. The lower ends of the yoke pass through small orifices near the ends of the block or flange, and in the ends of the block are set screws for locking the table high or low upon the yoke. For holding paper or the leaves of a book on the table, wire arms are pivoted to the upper edge of the block



**BYRNE'S CAR COUPLING.**

or flange, the arms being acted upon by a spring secured to the flange which bears against a central extension of the wire forming the arms. Side hooks and a front hook are attached to the bottom of the table, and adapted to move longitudinally, being drawn toward the center by a spring, preferably of rubber, the hooked ends reaching above the table to confine the paper or the leaves of a book.

**AN IMPROVED CAR COUPLING.**

A car coupling device in which the coupling pin has a hinged catch, on which is pivoted an arm, which, with the catch, can be folded into a recess in the pin, and which is designed to be simple and durable, while being automatic in operation, is shown in the accompanying illustration, and has been patented by Mr. Samuel Byrne, of No. 197 McCaul Street, Toronto, Canada. The drawhead has a flange on top serving as a protection to the pin from contact with the dead wood, its front end being so formed as to protect the gravity pawl of the pin from snow and ice. The pin is elliptical in form, with a corresponding aperture in flange and drawhead, and has a recess in its lower part in which is pivoted a gravity catch, adapted to engage a rest in the proper position in the drawhead. On the lower free end of the gravity catch is pivoted an arm having on its upper end a shoulder which engages a projection on the front part of the gravity catch, preventing the arm from swinging to the rear, but permitting its forward swinging motion. When the coupling pin is drawn up, the gravity catch swings forward and its shoulder swings into the rest, whereby the pin is suspended in vertical position, the pivoted arm

extending downward, and its lower end reaching to within a short distance of the bottom of the drawhead.

As the link passes into the drawhead, its entering end strikes the pivoted arm and disengages the catch, so that the coupling pin drops down, causing the arm and gravity catch to swing out of the way, until the coupling is effected, when they drop down into their former position for uncoupling and resetting. The elevating of the pin is readily effected by means of a rod journaled across the end of the car, carrying an arm with a suitable short chain and hand lever, or by proper connection from the car roof. In the small figure is shown another form of construction, wherein there are two fixed pins, one of which will be always in the link, preventing its loss, the other being a stop to prevent the link retreating when entering an approaching drawhead, and having a space above it sufficient to allow the link to pass over and hang behind when not required.

**Beet Sugar at Two Cents a Pound.**

We have some interesting figures from Germany, showing at what price sugar is now being manufactured in sixty-four first class factories, as reported by the association of Oderbruch and Pomerania. To think that it is possible by existing improved appliances to extract 11.31 per cent sugar from the beet, and an additional 0.65 per cent from the molasses, or a total of 11.96 pounds per 100 pounds of beets, is calculated to cause a thrill of satisfaction in the breasts of Americans who contend for the best welfare of their country. The cost of this sugar was *only two cents per pound*. These, however, are actual facts, and could, with very little additional expense, be repeated in the United States. Unlike sorghum sugar, of an unknown future, this beet sugar is placed on the European market in quantities sufficient for the entire American consumption. We only have to follow the example given us, to become the *masters* and not the *slaves* of the world's sugar trade. Why these great opportunities are neglected remains a mystery to those who have the country's industries truly at heart.—*The Sugar Beet*.

**AN IMPROVED COTTON STALK CUTTER.**

A machine adapted to cut down the stalks or plants left standing after harvest, and whereby the stalks are cut and severed in such way that they may be easily plowed under in preparing the land for the next crop, is shown in the accompanying illustration, and has been patented by Mr. John P. Lockwood, of the Wando Phosphate Co., Charleston, S. C.

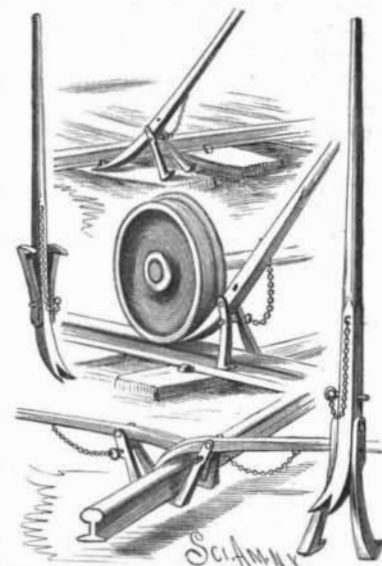
The sulky on which the rearwardly extending stalk cutting mechanism is supported has short axles, on which the wheels are journaled, the axles extending far enough inside the sulky frame to allow levers to be fulcrumed on them. To the back end of each of these levers is journaled a shaft carrying a toothed pinion which meshes with an internal gear wheel or circular rack fixed to the inner face of the adjacent sulky wheel. To each of the shafts is fixed a cutter-holding frame, made preferably of two long and two short bars crossed at the center, where they are fixed to the shaft, each of the bars carrying at each end a laterally projecting cutter, which as the frame rotates cuts the standing stalks. The cutters not only sever the plants at a point about four to six inches from the ground, but, from the arrangement of the cutters on the longer and shorter bars, the severed stalks are cut into comparatively short pieces, which, with the short stumps left standing, may be easily plowed under when preparing the land for the next planting. The long arms of the levers carrying the cutter-holding frame, and fulcrumed upon the sulky wheel axles, extend forward to opposite sides of the driver's seat, where they are provided with foot plates, which, when depressed, will raise the cutter frames and cutters, either at one or both sides of the machine, as may be required, to avoid projections in the field, as rocks or stumps, the raising of the cutter frames and cutters not unengaging them from the sulky wheel gear.



**LOCKWOOD'S COTTON STALK CUTTER.**

**AN IMPROVED COMBINATION TOOL.**

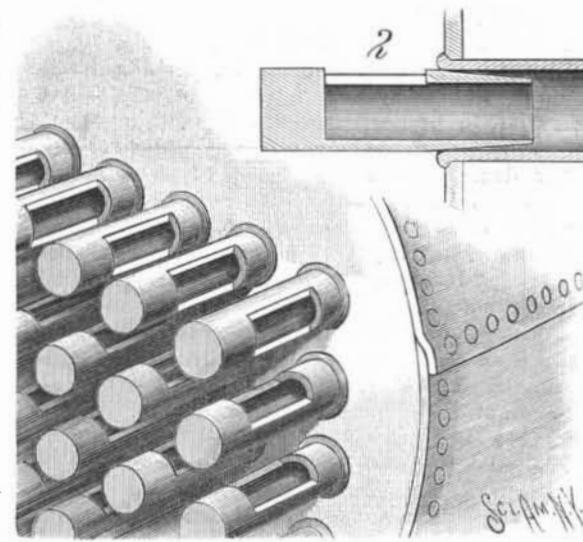
A tool which can be effectively used either as a cant bar, pry bar, pinch bar, spike claw, or rail lifter is illustrated herewith, and has been patented by Mr. William W. Allen, of No. 1126 Tyler Street, Topeka, Kansas. The tool consists of a claw bar with the usual claws, with dogs pivoted on each side of the bar on a pivot common to both, the dogs being each flared outwardly and slightly beveled on their inner edge, and having their front edge curved to prevent them being pushed off of a close grip. The dogs also have transverse apertures through which can be passed a pin to hold them in a locked position when not in use, the pin being hung on a chain, while to the outer end of each dog is secured a forwardly and slightly downwardly extending hook.



**ALLEN'S COMBINATION TOOL.**

**AN ANTI-CLOGGING BOILER FLUE PLUG.**

A boiler flue attachment which is designed to prevent dust, sparks, or unconsumed portions of the fuel from entering the flues is represented in the accompanying illustration, and has been patented by Mr. John Kelly, 24 Ann St., Los Angeles, Cal. It consists of a plug, preferably slightly tapered at one end, provided with a central recess opening into the boiler flue, and an opening through the wall of the plug communi-



**KELLY'S BOILER FLUE ATTACHMENT.**

cating with such central recess. The plug is driven with its tapering end into the front end of each of the boiler flues, the outer openings in the plugs being turned to the sides in the top row of flues, and upward in the following rows. The plugs are thus arranged so that the dust and cinders thrown up against the crown sheet, on being downwardly deflected, will, on striking the top row of plugs, fall again into the fuel, the next rows of plugs having their upwardly turned openings partially protected by the top rows, to prevent cinders from being drawn into them. The outward opening in each plug is to be made of about the same area as the cross section of a flue.

**Frogs in Commerce.**

Almost all the frogs used for experiments in vivisection in the European universities are supplied by an old fisherman of Kopenich, who, for forty-five years past, has devoted himself to this pursuit. Sometimes he has succeeded in catching as many as a thousand in one night. The traffic must be quite profitable, as the frogs sell for an average of two to four cents apiece.—*Period. Espan.*

**A ROADBED OF SALT.**—In the Colorado desert, near Idaho, there is a large bed of rock salt, and the Southern Pacific Railroad, in laying the track to the salt bed, has been obliged to grade the road for 1,200 feet with blocks of these crystals. This is the only instance where the roadbed is laid and ballasted on salt. The sea, which once rolled over this place, dried up and left a vast bed of salt nearly fifty miles long. The supply is inexhaustible and the quality excellent.

**Professor Horsley on Alcohol.**

Professor Victor Horsley, F.R.S., F.R.C.S., speaking on the subject of temperance at the recent annual meeting of the Church of England Temperance Society, said that although he was unable to pose as a Nestor, and review the history of the temperance question from the medical point of view, yet he asked to be allowed for a moment to assume that part, and give a kind of apologia for the past position of the medical profession. Medical science, unfortunately, from the very nature of her general knowledge, was necessarily still in the chains of empiricism. It was thus bound, in common humanity, to receive the statements of any one based upon fair evidence, and to try and test the results which such a one might claim to have obtained from his own experience. It was in this way that the medical profession became enamored of alcohol as a drug, more especially in the treatment of acute disease and fevers.

The example and experience of the late Dr. Todd appeared to have great weight. Unfortunately, to his writings was due the universal employment of alcohol by the medical profession. Things had greatly changed. Physiological science had advanced immensely. They were now gradually freeing themselves from the slavery to which they were before subject, and that they knew that position of alcohol, from the medical point of view, had to be considered in the two opposite conditions of a food and of a drug. Researches of men like Parkes, who headed the movement, had given the medical profession the true scientific value of alcohol, and the value they knew to be very nearly zero. He should substantiate from clinical experiences what he was about to say.

With regard to alcohol as food, he reminded his hearers of a certain symposium that was written in the *Contemporary Review* in 1879. In the most brilliant of papers contributed by the medical profession, that by Sir James Paget, their most revered teacher in surgery, reference was made to the popular belief that, as the drinking of alcohol existed as a general custom, it was a good thing. Dr. Parkes, twenty-five years ago, pointed out that because one thing was a custom it was no evidence of the truth. Cannibalism was a custom in some parts of the world, and was it therefore good?

There was one scientific point ascertained beyond all doubt with regard to alcohol in its first influence upon the human system and animal body, and that was that, in proportion to the dose, it checked the tissue changes of the body. Alcohol did, in greater or lesser degree, check the activity of these processes. This could be produced with even a small dose. Carried to a greater extreme, its effect was not that of a regulator, but it proved an extra blocker of the machinery. "It seems," said the speaker, "a kind of chronic suicide that they were always to put the brake on—to put the brake on the development of their natural energies. What they wished to do without infringing the laws of nature was to get the greatest amount of energy out of their bodies. Why hinder it?"

Professor Horsley alluded to the series of experiments on the influence of alcohol upon plant life carried out by Dr. Ridge, of Enfield, who found that one sixteenth per cent of a solution of alcohol checked the growth of watercress, and that a tenth solution of alcohol killed its seeds. The position of the medical profession with regard to alcohol as a food was becoming more and more defined.

Professor Horsley next drew attention to the researches of Dr. Hare as to the use of alcohol as a medicine, and to the fact noticed by him—the large decrease in the use of alcohol at the London hospitals and the largely increased use of milk and other forms of nutrition. They had a large amount of evidence to show that the medical profession estimated at its full value alcohol as a drug. Referring to the London Temperance Hospital, where, since 1873, the experiment as to whether alcohol was useful had been tried to the uttermost, the evidence was perfectly wonderful to those who, like himself, used alcohol occasionally as a drug. It is true that they required even yet more statistics and more figures in the profession, and must wait before receiving the statistics as those upon which they would absolutely rely in the treatment of patients; but the result so far gained was so wonderful and so overwhelmingly contradictory to many preconceived notions, that he had no doubt as to what the verdict would be in the half jubilee of the Temperance Hospital.

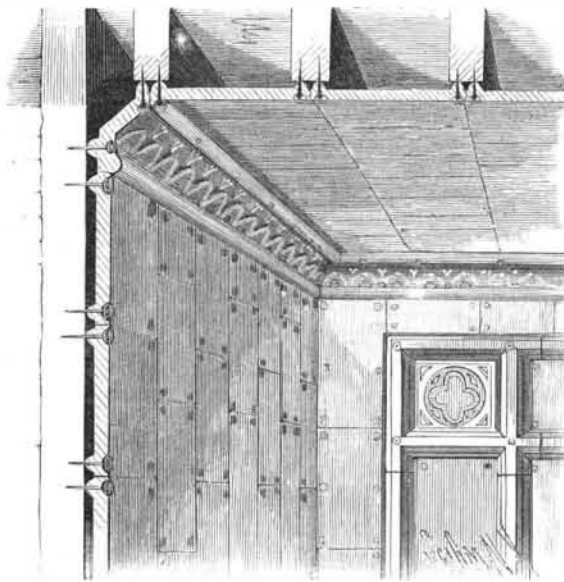
In this hospital, which had admitted 4,153 persons as in-patients and 23,000 as out-patients, alcohol had only been administered as a drug in four cases. Dr. Edmunds, the senior physician, writing in 1884, stated that among fifty-three typhoid fever cases there had been five deaths, and at the examination it was found that no administration of alcohol could have possibly saved them. The cases of recovery had done remarkably well, and on the whole there was a mortality of rather less than 1 in 10. This mortality was smaller than the mortality in any other hospital in London at that period, and there had not been given to one of

these a particle of alcohol either as diet or medicine, and yet a large number ought to have died, according to the old view of the treatment of the disease.

Figures spoke for themselves, but it seemed to him the use of alcohol as a food and its excessive abuse were dependent upon what must be regarded as possible from the view of causes which led to its abuse. The abuse of alcohol was produced from three groups of causes: From mental and moral failure of strength; secondly, from the general prevalence of unsanitary conditions; and, lastly, from the unjust and wicked facilities for getting the poison.—*British Medical Journal*.

**IMPROVED CONSTRUCTION OF BUILDINGS.**

An invention which presents some novel features in the construction of buildings, whereby thorough ventilation and increased security against fire are obtained, together with great durability and economy, is illustrated herewith, and has been patented by Mr. William Dryden, of No. 106 Hopkinson Avenue, Brooklyn, N. Y. To the sides of the wall studding and to the under side of the floor studding are directly fastened an improved form of building blocks, taking the place of the usual laths and brown coat of plaster. The composi-

**APPLICATION OF DRYDEN'S BUILDING BLOCK.**

tion of these blocks may be of any of the usual plastering compounds, but it preferably consists of whiting, plaster, glue, straw pulp, and alum. The block is formed with vertical depressions on one side and corresponding spherical projections on the other side, the projections resting against the joists to leave an air space, the blocks being secured in place by nails driven centrally through the depressions, the nail heads resting against washers, and the depressions formed in the face of the blocks serving to hold the plaster coats firmly thereto. The air space thus left extends continuously around and between the walls of adjoining rooms on the same floor, and between the ceiling and flooring of rooms over each other, the ceiling space of each room being connected by a registered opening with the usual chimney flue. An opening is formed centrally in the ceiling of the room, a circular block being arranged beneath it, so as to leave an annular passage for the air and gases from the room into the ceiling space, and openings are also formed in the blocks around the base of the wall for the entrance of cold air, all these openings being covered with wire gauze. By this construction a perfect and thorough ventilation of all the rooms in the building is readily obtained.

**Army Boots and Shoes.**

Captain Pope, prison quartermaster, says:

In accordance with my recommendation in last annual report, approved by the commandant and quartermaster-general, the welt machine has been gradually done away with, as the new facilities have admitted and as new hands have become trained, so that in this fiscal year all welts will be sewed by hand.

In May, 1886, a pair of cavalry boots were tap-soled (by putting a half sole over the ordinary sole, with brass screws going through the outer sole only), and sent to Captain A. R. Chaffee, Sixth Cavalry, in Arizona, for trial. It was found that they wore from May until the latter part of October. Complaint having been made that the boots and shoes failed to wear well in the Department of Arizona, on the recommendation of the commandant, all boots and shoes in said department were sent to the prison to be tap-soled, which has been done.

Certain boots and shoes, such as were worn in the late Apache campaigns, have been sent here for inspection. One pair of these were post shoes, which are only made for light garrison duty, and not intended for field service. Another pair were field shoes—a pattern discarded in 1885. Three pairs of cavalry boots were also

sent. They were badly run down at the heels, and showed evidence of hard usage, which no boots could well endure.

Six pairs of new shoes were sent from Arizona as samples of shoes worn by the troops in the field. Four pairs were issued to prisoners doing hard prison labor. They were, all but one pair, which were campaign shoes, of the old, discarded pattern of field shoes. One pair issued April 3, to No. 408, doing general outside work, were half-soled June 6, and are still in use. One pair of field shoes issued to No. 440, April 10, were half-soled June 4, and were worn out and thrown away July 10. One pair of field shoes issued to No. 399, April 10, doing quarry work—the hardest work on shoes that can be done—were half-soled June 16 and July 19, and are still in use, and one pair field shoes issued to No. 313, April 28, are still in use, and have not been repaired.

There have been made for trial shoes sewed with thread called "metalin," composed of strands of flax and brass, copper, or steel wire. These were found to endure so well that all boots and shoes are to have the outer seam stitched with this thread in future.

The Campbell Lockstitch Machine Company was permitted to set up a machine in the shop and stitched 1,000 pairs of shoes for trial. As far as tested the stitch is found durable and satisfactory, but the use of metalin thread, which is somewhat more easily sewed on the Goodyear & McKay stitcher, renders a change in machines undesirable.

There were also made 1,000 pairs brass-screwed post shoes for trial. As far as tested they have been found durable and likely to prove a great improvement on the sewed calfskin shoes. I believe these to be fully as durable for ordinary wear in garrison as sewed campaign shoes.

During the past year the manufacture of calfskin shoes was ordered discontinued as soon as the supply of calfskin now on hand should be exhausted.

I cannot refrain from expressing the conviction, acquired from much study of the subject and discussion with officers and soldiers, that the post shoes were the most desired shoes ever issued to the army, and their discontinuance will be generally regretted by officers and soldiers; that substituting brass screwing for sewing, they make as good and strong shoes for dress purposes as can be made at any reasonable price. The cost per pair of these brass-screwed, calfskin shoes is only \$2.72.

The cost of the labor of prisoners at 50 cents per day is now charged into the price of boots and shoes, as with other articles, and credited to the prison. As the boots and shoes are bought and paid for by the soldier on his clothing account, this requires him to pay for the labor of the prisoners. On many considerations, it seems to me the soldier might be allowed the benefit of this labor without charge, and I, therefore, renew the recommendation, formerly made, that the charge for prisoners' labor be omitted in making up the price of boots and shoes.

**Nitro-Glycerine Shells.**

At Sandy Hook, recently, Serge D. Smolianinoff made experiments in firing nitro-glycerine from a 100 pound Parrot rifled gun, using eighteen pounds of service powder for a shot. The shells used were of about ninety-two pounds weight, and were charged with five pounds of nitro-glycerine each, and provided with the inventor's igniter. The gun was fixed in an ordinary cradle, and shots were directed against a fourteen inch thick target of wrought iron. Mr. Smolianinoff himself had to fill the shells with nitro-glycerine and place them in the gun.

Five officers of the Ordnance Department were present—Col. Mordecai, Major Farley, Capt. Greer, Capt. Morrison, and Lieut. Howard. The cannon was discharged by an electric primer. The officers present and Mr. Smolianinoff hid themselves in the fortress, about 300 yards distant from the gun. At the first firing the shell duly exploded on the impact of the target, making a depression about four inches deep, and displacing the target about three inches. Some fragments of the shell were scattered over the fortress, scaring those inside. The second shell exploded, made a crack in the target about fifteen inches long and a quarter of an inch wide, and broke two rivets, one three and a half inches and the other two and a half inches in diameter. The third shell also exploded, making an impression about five inches deep.

After three shots the target was found displaced about 18 inches and torn off from the wooden base to which it was fastened. Up to this time this target had stood all kinds of shots, even gelatine-filled shells. The inventor believes that if he could have had steel instead of iron shells, the target would have been blown to fragments. Only three shots were made, further experiments being prevented by darkness. The 18 pound charge of powder has developed, in the gun used, pressure about 25,000 pounds to a square inch, and giving the initial velocity of about 1,600 feet a second. With these three shots Mr. Smolianinoff has to his credit 327 shots, all of which are said to have been successful.