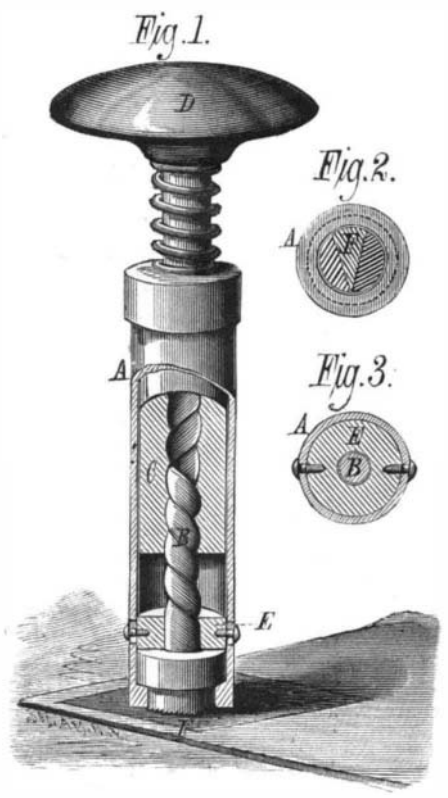
IMPROVED CANCELING STAMP.

Without doubt the amount lost by the government yearly from the reuse of canceled postage stamps is enormous, and so far no adequate means of canceling stamps, so that they cannot by any possibility be used again, has been adopted by the government.

A device which will effectually cancel a stamp by abrading its surface is shown in the annexed engraving. The



GROTHAUS' CANCELING STAMP.

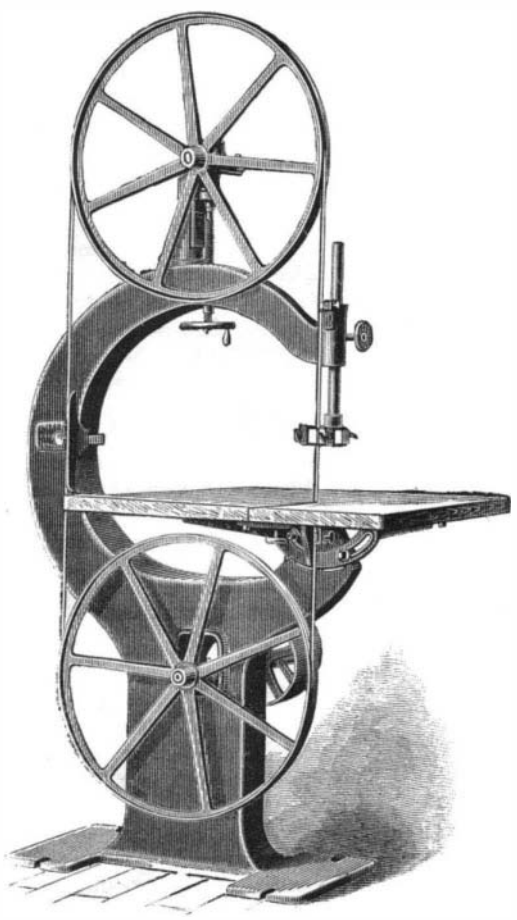
handle or body, A, of the canceler contains a sliding nut, C, which is attached to the handle, D, and receives the screw, B, attached to the revolving cutter head, E, which is retained in place by an internal flange at the bottom of the handle and by an inserted collar, E.

Between the handle. D, and the top of the case, A, there is a spiral spring which returns the parts to their normal position. The cutting head, which is shown in detail in Fig. 2, is cut like a file in different directions, so that when the head is revolved by the engagement of the nut, C, with the screw, B, the surface of the stamp is abraded, and if the canceling stamp is previously supplied with ink, the ink will be absorbed by the abraded surface, and the effects of cancellation are complete. The stamp cannot afterward be restored.

This invention was recently patented by Mr. Frederick E. Grothaus, of Borem, Texas.

NEW BAND SAW MACHINE.

This machine is new in design, and is adapted to the various requirements of a good tool of this size. The metal



CLEMENT'S BAND SAW MACHINE.

is distributed so as to obtain great strength in the arch, while the supporting parts of the frame are made comparatively light. The wheels have improved concave arms, and are carefully turned and balanced, and covered with pure rubber. The bearings are extra long on both shafts, and lined with a good quality of Babbitt metal. The upper wheel is made adjustable to strain the saw, and it is also adjustable across its axis to shift the saw upon its face; it is cushioned on the straining screw to compensate the contraction of the saw in cooling. The guides are of hardened steel, adjustable in every direction. The loose pulleys are self-oiling, and have extra long hubs. The shafts are of steel, and the table is made of kiln-dried hard wood, unless otherwise ordered, is arranged to tilt to an angle, and has the clamp bar across the slit.

This size is adapted to pattern, carpenter, bracket, toy, cabinet, carriage, and general work, and to the lighter grades of sawing in all wood shops. It will carry blades to five-eighths of an inch in width, No. 22 gauge.

Every machine is furnished with a wrench, scarfing frame for holding the saw while soldering, and with tongs for melting the solder.

This tool is a favorite among pattern-makers, and well adapted to sawing of the lighter kind.

There are four sizes of the machine made. The particular one illustrated is known as the twenty-eight inch band saw machine. We give its dimensions below:

Extreme height, 7 feet 1 inch; floor room, 3 feet 2 inches by 4 inches; table surface, 30 by 34 inches; sawing space, 10 by 28 inches; pulleys, 10 by 3¼ inches; diameter of wheels, 28⅜ inches; revolutions, 500 to 550; length of saws 16 feet; shipping weight 675 lb.

These machines, in their various sizes and with all improvements, are made by Mr. Frank H. Clement, 122 Mill street, Rochester, N. Y.

Mortality of Brakemen.

The brakemen on our railroads find it quite difficult to get their lives insured. It is estimated that there are at least ten brakemen killed throughout the country every day. The reader of the daily newspaper learns how this class of men are killed or maimed while coupling cars and making up trains, while others are knocked from the tops of cars by bridges, or slip or fall, or are injured or killed in collisions. Then there must be at least three times as many brakemen injured as are killed, of whom the public knows nothing about or gets no account.

At the lowest calculation, if 10 brakemen are killed every day, that would be equivalent to 3,650 during the year, which, added to the number injured in various ways while on duty, would give the sum total of deaths and injuries about 14,600 a year These are frightful figures of a fatality, a loss of life, or injury to the body, that is attributable either to accidents, carelessness, or negligence.

We therefore venture to assert that it is a fact that the public has no idea of the number of accidents that occur on the various railroads throughout the country every day; and it is also true that there is no vocation so fraught with danger to life and limb as that of the brakemen on our railroads, particularly on freight trains, men on passenger trains having a great many lives intrusted to their care, and, consequently, have a greater responsibility resting upon them than that which rests with the freight men.

Indeed the life of a freight brakeman is a precarious one. Some insurance agents, in some parts of the country, do not take risks on employés on freight trains; but conductors and brakemen on passenger trains are insured by their paying an extra per cent. Railroad men say that only about 25 per cent of the brakemen of freight trains die a natural death; also, that the average life of the brakeman, after he goes on the road, is about ten years.—*Boston Commercial Bulletin.*

The New Chesapeake Bay Lighthouse.

What is regarded as one of the finest lighthouses in the world is being erected in Chesapeake Bay, off Cape Henry. From base to top it measures 155 feet, with a diameter at the base of 30 feet and at the top of 16 feet. There are six stories, above which are a service room, watch room, lantern room, and finally the roof. Its total weight is 1,700,000 pounds, 7,000 pounds of bolts alone being required to put it together. The exterior, which is octagonal in shape, is constructed of cast iron, while the cylindrical interior is of sheet iron. The castings of the base and first story are two inches in thickness, and the sheet iron lining ⅜ of an inch. The staircase, which has iron sill steps, goes around the cylinder instead of up a shaft as in the lighthouses now in existence. The "light room" is a circular steel frame 12 feet in diameter and 9 feet high. The glass to be used is now being manufactured in France, and a light of great power will be adopted. Every story is solidly bolted together by heavy cast iron floor plates 1½ inches thick, while the points and facings are finely planed, four planers having been kept running day and night for the entire eighteen months. So closely are the plates fastened together that from the outside each story looks like a solid piece of iron. The base and windows are elaborately ornamented with castings, while a handsome iron railing surrounds the watch room. Many of the bolts are 1¾ inches in diameter at one end, and ⅞ of an inch at the other. The iron work was furnished by Messrs. Morris & Trasker, Philadelphia.

Tin in the Sierra Madre, California.

The *Commercial*, of Los Angeles, Cal., reports that an assay of tin ore from the mine discovered near Pomona, showed a result of $89.70 per ton in tin This mass of tin ore has hitherto been mistaken by prospectors for common rock stained with iron.

IMPROVED DIVIDERS AND CALIPERS.

The engraving represents an improvement in dividers and calipers, recently patented by Mr. Edward Soetbeer, of New Bremen, O. The invention consists in the adjusting device, which is arranged so that the instrument may be opened or closed and held firmly in any desired position. A swiveled bearing in one leg of the instrument and a swiveled nut in the other leg receive the adjusting screw, which is

SOETBEER'S CALIPERS.

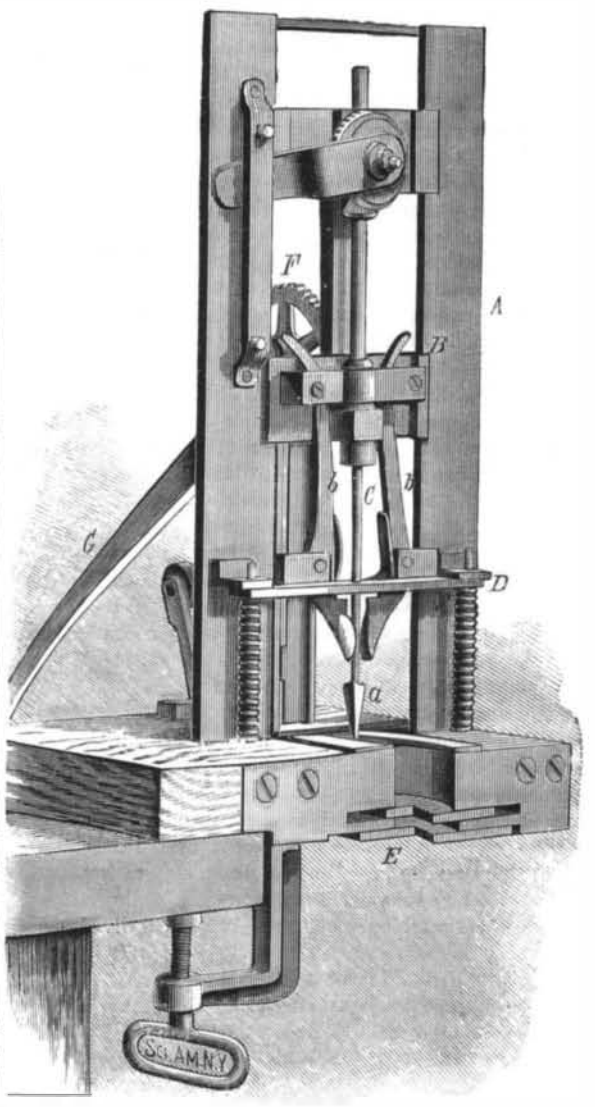
prevented from longitudinal movement by a circumferential groove in the shank of the screw, and a pin extending through the bearing and through the groove in the screw.

It will be seen that by this construction the bearing and nut of the screw are always parallel to each other, and the adjustment of the instrument is positive.

Further information may be obtained by addressing the inventor as above.

NOVEL CORK EXTRACTOR.

We give an engraving of a novel cork extractor lately patented by Mr. Chester C. Clark, of Brownwood, Texas, and designed for drawing corks from bottles containing champagne, beer, ale, mineral waters, etc. It is to be attached to



CLARK'S AUTOMATIC CORK EXTRACTOR.

a table, shelf, or counter, and is operated by the lever handle, G, projecting from the back of the apparatus.

The bottle from which the cork is to be extracted is placed between the jaws. E. which close and hold it securely when

the lever, G, is raised to drive the harpoon head, *a*, downward through the cork. The lever, G, has its bearings in a cross piece of the frame, A, and carries a segmental gear wheel, F, that engages a rack on the back of the slide, B. A shaft journaled in this slide carries at its lower end the extracting instrument, *a*, and is provided with a pinion near its upper end that is engaged by a bevel wheel journaled on the slide, B, and carrying an arm that extends laterally and between two stops on its frame, A.

Two bill-pointed levers, *b*, are pivoted in a cross bar, D, and extend upward through guides in the lower portion of the slide, B. The bar, D, slides upon two rods projecting vertically from the bed of the machine, and is supported by spiral springs.

The operation of the machine is as follows: The bottle being in position between the jaws, E, the lever, G, is to be raised to nearly a vertical position, forcing the blade, *a*, into the neck of the bottle, severing the wires which secure the cork, and cutting the cork in two in the center. Just as the blade passes through the cork the end of the lateral arm on the bevel wheel strikes the lower stop on the frame, A, and turns the blade, *a*, one quarter around. The lever, G, is now brought down, elevating the sliding frame and blade, and lifting the cork from the bottle. Before the frame reaches its highest point the end of the lever on the bevel wheel, G, comes against the upper stop, causing the blade to be turned to its original position, and at this time the jaws, E, release the neck of the bottle. The two bill-pointed levers, *b*, divide the cork and expel it in two parts away from the blade by the lateral motion imparted to the levers by the engagement of the curved ends by the guides on the slide, B.

This machine is very simple and rapid in its operation, and should find a large use in hotels, restaurants, and other places where a large number of bottles are opened.

PREPARATION OF TINNED IRON—TIN PLATE.

Pure tin melts at a temperature of 424° Fah., and when iron, thoroughly cleansed from oxide and other impurities, and heated somewhat above this temperature, is plunged into the melted metal and allowed to remain there for a time it receives and retains a coating of the white metal. The chief difficulty in this plating process is to get the surface of the metal properly cleansed. The process of tinning sheet iron as usually conducted will show how this is accomplished. It is briefly as follows: Charcoal iron of the proper thickness is cut into rectangular pieces of the required size—usually from 12¾x9½ to 16¾x12½—and bent U-shaped so as to stand on edge. The plates are then placed in an acid pickle, usually of diluted sulphuric acid, though sometimes hydrochloric acid is preferred. In Pittsburg a hot 10 per cent solution of sulphuric acid is employed, and the pickling operation continued for about twenty minutes. From the pickle the plates are transferred to a closed annealing muffle or oven heated to redness, where they remain for about six hours and scale or free themselves from oxidation, when they are allowed to cool, and are then straightened and cold-rolled between polished steel rollers under great pressure, which imparts smoothness and elasticity. After this the plates are usually again annealed for six or seven hours, at a much lower temperature than before. Then follows a second pickling—in warm dilute sulphuric or muriatic acid—for about ten minutes, and in some cases a slight scouring with sand and hemp. After quickly running through water from the last operation they are plunged into melted tallow (free from salt) or palm oil, and when the moisture has been driven off by the hot grease or oil and the plate itself has become thoroughly heated it is ready for the first dip in the tin.

The series of pots in which the tinning operation is performed are placed together on a low brick furnace called by the workmen the "stow." These pots are usually of cast iron. The first, the *tin pot*, is rectangular in shape, and holds about five hundred pounds of block and grain tin, on which floats about four inches depth of pure tallow to prevent oxidization of the metal. The furnace envelops the sides and bottom of this vessel. Alongside this is the grease pot. The *wash pot*, similar to but smaller than the *tin pot*, which it adjoins, is nearly filled with best grain tin, and is provided with a partition to prevent dross gathering at the point at which the last dip is given to the plates. The next vessel is called the *pan*, and is used for draining the plates; it has a grating at the bottom and no fire under it. The last vessel, the *test pot*, has only about one-quarter inch depth of tin in it.

The operation of tinning the plates is as follows: Each plate is lifted singly from the *grease pot* and stood on edge in the tin pot and allowed to remain immersed in the hot tin for about twenty minutes. (The *tin pot* is always kept nearly full of plates.) When lifted out the plate is allowed to drain for a moment, and is then changed to the first division of the *wash pot* for a few minutes, on leaving which it is brushed with hemp, dipped in the second division of the pot, and allowed to drain for a few minutes in the pan. The thick edge or list is removed by momentarily dipping it (the edge) in the hot tin contained in the *list pot* and jarring the plate. After this the plate is returned to the *grease pot* for a few minutes, from which it is drawn out between rollers which smooth and straighten the plates. They are finally cleaned by rubbing them with shorts or bran and leather, sorted, and boxed—each box of I.C. plate containing 112 pounds or 112 plates, the plates having a gauge of No. 30, and weighing one pound each. I.X. brand weighs 140 pounds to 112 sheets.

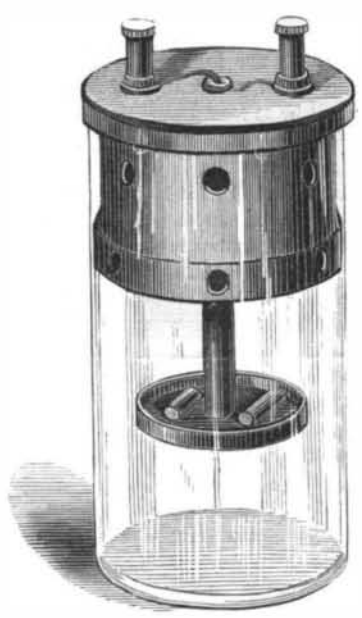
In the trade the grade, weights, and sizes of the plates are indicated by certain marks, as shown in the following table:

Names.	Sizes—Inches.	Number in a box.	Weight in a box—Pounds.	Box Marks.
Common No. 1	13¾x10	225	112	CI.
" No. 2	13¼x 9¼	225	105	CII.
" No. 3	12¾x 9½	225	100	CIII.
Cross No. 1	13¼x10	225	140	XI.
Two Cross No. 1	13¼x10	225	161	XXI.
Three Cross No. 1	13¼x10	225	182	XXXI.
Four Cross No. 1	13¼x10	225	203	XXXXI.
Common Doubles	16¾x12½	100	77	C.D.
Cross Doubles	16¾x12¼	100	126	XD.
Two Cross Doubles	16¾x12¼	100	174	XXD.
Three Cross Doubles	16¾x12¼	100	168	XXXD.
Four Cross Doubles	16¾x12¼	100	189	XXXXD.
Common Small Doubles	15 x11	200	168	C.S.D.
Cross Small Doubles	15 x11	200	189	XSD.
Two Cross Doubles	15 x11	200	210	XXSD.
Three Cross Doubles	15 x11	200	231	XXXSD.
Four Cross Doubles	15 x11	200	252	XXXXSD.
Wasters Common No. 1	13¾x10	225	112	W C.I.
Wasters Cross No. 1	13¾x10	225	140	WXI.

MAICHE'S BATTERY.

The inventor of this entirely original form of battery, of which we give an illustration, has endeavored to fulfill all the conditions necessary to make his battery work for an indefinite period, and this ideal result is obtained—thanks to the means of depolarization which he employs.

A porous vase, pierced with large holes, is fixed to an ebonite cover, which closes an earthenware vase filled with retort carbon, broken in pieces and platinized. The porous vase is traversed by an ebonite tube supporting a small porcelain cup, in which is placed a small quantity of mercury and two small pieces of zinc. A platinum wire, connected to a terminal fixed on the cover, dips into the mercury, and establishes a good contact with the zinc.



MAICHE'S BATTERY

Another platinum wire connects a second terminal with the carbon fragments placed in the porous vase. The contacts are thus completely assured. The zinc is not attacked, except when the circuit of the battery is closed; it is plunged entirely in the liquid, consequently it is entirely used up without any loss.

Under the influence of the platinized carbon the hydrogen of the water, which tends to polarize the carbon, combines with the oxygen of the air. That this novel effect, sought for in vain for a long time, can take place, the carbon should only be partially immersed in the water; the rest becomes wetted by capillary action, and presents a considerable surface to the air.

The water produced by the combination of the hydrogen and the oxygen contributes, to a certain degree, to replace that which passes off by evaporation, and which the cover keeps from being lost.

The electromotive force of this battery is about 1·250 volts; but it is necessary to work it through an external resistance of about 3 kilometers of ordinary telegraph wire in order that it may work well. The exciting liquid may be water saturated with sal-ammoniac, or acidulated by sulphuric acid, or the bisulphate of soda, in the proportion of 10 to 1.

An element working a bell about 100 times a day would not require to be looked after for a very long time, and, in this case, it would only be the zinc that would require replacing, as the platinized carbon preserves indefinitely its catalytic properties.

The Maiche battery is particularly well adapted for electric bells. Maintenance not being required, its fitness and the care taken in its whole construction make it the most perfect bit of apparatus of its kind.—*L'Electricité.*

American Philological Society.

The thirteenth annual meeting of the American Philological Society began in Cleveland, Ohio, July 12, with about thirty members in attendance. The papers and discussions of the first day embraced "Homer and Strabo," by Prof. Egrihler, of Johns Hopkins University; "Latin Words in the Talmud," by Prof. James S. Blackwell, of the University of Missouri; and "The Home of the Original Semitic People," by Prof. Loy, of Howard University. In the evening the annual address was delivered by Prof. Lewis R. Packard, President of Yale College.

On the second day papers were read as follows:

"History of the 'A' vowel, from old Germanic to Modern English," by Dr. W. Weelsey, of the Johns Hopkins University, Baltimore; "Verses of Text respecting the Precious Stones of Scripture," by Prof. Blackwell, of the University of Missouri; "Mixture in Language," by Prof. W. D. Whitney, of Yale College; "Language of the Isle of Man," by Mr. W. S. Kerruish, of Cleveland; "The Use of Abstract Verbal Nouns in Thucydides," by Dr. E. G. Sihler, of New York; "The Vowel Scheme of Melville Bell," by Prof. Samuel Porter, of the National Deaf Mute College, Washington.

The Patent Laws.

We are asked by a Pawnee City, Neb., correspondent if we are not mistaken, when we say that the owner of a patent can collect a royalty of an innocent purchaser. Certainly not; that is one great defect in our patent laws, and one which calls most loudly for a remedy. A farmer goes to the village or city, and among the score or hundreds of stores he sees hundreds or thousands of manufactured articles, and it is utterly impossible for him to know whether they are patented or not, unless they are marked, and it is perfectly unreasonable to expect him to know. Amidst this ocean of implements and tools he sees something that he needs, and innocently purchases it, paying for it all that it is worth, and probably all the patentee would ask for it, if it were purchased of him; but the article being unmarked, he is not informed that it is patented, and if it were marked, the patent mark might be forged. He takes home his purchase, and after awhile the patentee discovers the article in his possession, and compels him to pay a royalty. The principle has been carried out in connection with the drive well swindle. Nobody supposed that there was any patent upon drive wells, but one turned up at last, and the man who had a drive well upon his premises was called upon for a royalty.

There is no shadow of justice in such a law. Nobody has a right to ask of the law immunity from all liability of loss, and in the vast majority of cases the seller of a patented article is sufficiently responsible to save the patentee harmless. As the law now stands, it is dangerous for a farmer to purchase anything unless he knows all about the patent, when it was granted, to whom it was granted, who owns it at the present time, and by what authority the seller presumes to sell it. All this is unreasonable, and every unprejudiced person in all the world must unite in that conclusion. The courts are open for a patentee to obtain an injunction against parties wrongfully selling his patent, and furnish him all the means of protection which the owners of other property have. Let him, therefore, resort to those means, and keep his hands off the farmer, whom the patent man seems to especially select for the purposes of oppression.—*The Western Rural.*

The Laws of Property.

We are asked by an Erehwon correspondent if we are not mistaken when we say that the owner of a horse or a farm can retake his property from an innocent purchaser (the seller having no legal right to sell), or compel the buyer to pay a second time.

Certainly we are not mistaken. That is one great defect of our property laws which thieves and swindlers complain of most loudly.

A city mechanic wants to live in the country, and out of the scores and hundreds of houses and farms and animals there, the history of which he cannot be expected to know, he selects something which he wants, and pays a fair price for it to the man who offers it for sale. When he takes possession the real owner turns up and dispossesses him, or makes him pay a second time. In this way hundreds of innocent mechanics have been swindled in the purchase of farms and horses and cattle and such things.

There is no shadow of justice in such a law. Nobody has a right to ask of the law immunity from all liability to loss, and in the vast majority of cases, the farmer whose property has been sold without his consent should find the seller sufficiently responsible to save himself from loss. It is cruel in him to dispossess the innocent mechanic, who has already paid a fair price for what he has bought.

As the law now stands, it is dangerous for a mechanic to purchase a horse or a house unless he knows all about the owner of it, by what authority the seller offers it for sale, and has a lawyer make a search of the title deeds and all that.

All this is unreasonable, as every unprejudiced land-sharp and horse thief will agree. The courts are open for a farmer to obtain an injunction against parties wrongfully selling his horse or his house or his farm; and he has in that all the protection he can reasonably ask for. Let him therefore resort to those means and keep his hands off the innocent mechanic, whom land-sharps and horse thieves would be glad to prey upon if they found him foolish enough to "go it blind" in his purchases.—*Scientific American.*