## shade and curtain fixture.

On the inner surface of each side bar of the upper sasb is fastened a metal plate, from which projects a lug that is provided with a vertical screw threaded aperture extending from top to bottom, and in which screws the end of a wire arm. This arm projects borizontally a short distance from the socket, and is then curved downward and outward, so tbat its free end projects beyond the plane of the window casing. In the upper part of the plate is held one end of tbin wire, whicb serves to put a strain on the arm and keep it from vibrating. The upper end of the wire arm passes through a sleere, which is provided with an additional aperture for receiving the bent end of the thin wire. Tbe sleeve is provided with a binding screw baving a beveled end, which passes between the two wires so as to hold them firmly in place. On the upper end of the arm is held a clamp that is provided at the top and bottom with a $\mathbf{V}$-shapee prong between which fits a bar extending transversely across the window frame. Held on this har are similarly shaped clamps, from which project brackets provided with notches for receiving theend pivots of the shaderollers. If curtains are to be beld in front of the bar, tbe curtain rod or window cornice from which the curtains are to be suspended is hung on the ends of hooks. (The arrangement of these parts is clearly sbown in Fig. 2, which is a front elevation, and in the sectional view, Fig. 3.) The curtain rollers, the shade, and all the appliances are thus suspended from two or more arms. This construction is applicable in all cases wbere the window bas a square top, or in windows baving

ingalls' shade and curtain fixture.
a curved or arched top in which it is not desired to bave the fanlight part covered by the shade; but if the fanlight is to be covered, and this shaded part is to be raised and lowered with the sash, a pointed or arched frame is used, on which the fanlight sbade is secured
Shades bung in accordance with this plan possess many advantages for ventilating both public and private rooms, and are especially adapted to sleeping rooms, sick rooms, and offices. By this means two or more shades can be used -a light one to admit light and cut off intrusive observation, a dark one to exclude light, or a colored sbade to give sucb a tint to the lioht as may be desired. The fixtures are easily adjusted to windows of different widths and depth of jambs, and are applicable to bay windows, narrow face casings, mullioned windows with narrow mullions. By being attached to the sash they save the face casings from being injured.
This invention bas been patented by Mr. John C. Ingalls, of Marquette, Mich.

## Sheep's Horn for Horseshoes.

A new horseshoe bas lately been experimented with at Lyons, France. 'The shoe is made entirely of sheep's horn, and is found particularly adapted to borses employed in towns and known not to bave a steady foot on the pavement. The results of the experiments have proved very satisfactors, as horses thus shod have heen driven at a rapid pace on the pavement without slipping. Besides this advantage, the new shoe is very durable, and though a little $m$ ore expensive than the ordinary one, seems destined sooner or later to replace the iron shoe, particularly for horses employed in large cities, wbere, besides the pavement, the streets are intersected by tramway rails, which from their slipperiness constitute a source of permanent danger.

## Endson's Bay as a Grain Ronte

The Newfoundland sealing steamship Neptune-the same which two years ago was sent in search of Lieut. Greelysailed from Halifax, N. S., July 22, in command of Lieut. A. R. Gordon, of the Canadian meteorological service, for the purpose of establishing stations for scientific observalion in Hudson's Bay. The stations are to be located in the fol lowing places, six on the strait and one on the west shore of the bay:
No. 1 at Cape Cbudley, at the southeast entrance to Hudson strait. No. 2 on Resolution Island, at the northeast entrance to the strait, and about 45 miles across from tation one. No. 3 at Cape Hope, or on tbe south side about the center of the strait, and about 250 miles from stations one and two. This will be the chief point of obser vation. No. 4 will be located directly north of No. 3 on the orth bluff of one of the islands close by, according to cir cumstances. No. 5 on the soutbeast end of Notingham Island, about 200 miles from station four. No. 6 on the north side of Mansfield Island, some 150 miles from station ive. Observations of the northern part of the bay will be made from thispoint. No. 7 at Fort Churchill, at the mouth of the Cburchill River, on the west shore of the bay and about 600 miles from station six
At all the stations the usual meteorological obeservations will be made; heavy tides will be measured ; the drift of water will be noticed, and the conditions and state of the ice. Each tation party will consist of two men and an Esquimau in terpreter, besides the officer in charge, and sufficient provi sions and fuel for fifleen months will be supplied. The ob servatories are made insections, and will be taken out by the steamer, and put up on the sites selected by the commande as the vessel progresses through the strait. Next year thes stations will be revisited, and other parties left in charge. The most important work the parties will be called upon to per form will be to carefully watch and note the breaking up o the ice, the tides, and all other characteristics pertinent to navigation.
The sum of $\$ 70,000$ has been appropriated by the Cana dian Government to make these explorations, but the imme diate end in view is practical ratber tban scientitic. It i thought that, notwithstanding all the unfavorable reports so far received, it may be found tbat Hudson Strait is open sufficiently long period in the late summer and early fall of each year to make it profitable to ship grain by that way to Liverpool from the Winnipeg Valley, which is directly connected with the western shore of Hudson's Bay by the Nel son and Churchill rivers. Lieut. Gorringe investigated this question about three years ago, on bebalf of the North ern Pacitic Railroad Company, but be reported that any successful trade in this way was impracticable, on account of the fogs as well as the ice, which would bardly leave an average period of six weeks for tolerably safe navigation, while even this period varied with the season, and during such time navigation was often interrupted. The Manitobans are not yet convinced, however, and the recent rapid growth of that province bas induced the Dominion government to send out this expedition to make a more thorough investigation.

## COMBINATION CELLAR GRATE

An invention recently patented by Mr. L. N. Byar re lates to gratings that are used for cellar windows, the object being to combine an inner door or screen with the outer frame and grating without employing the usual wooden frame. At each end of the inside of the frame, A, are pivoted the frames, $D$ and $F$, the former being provided with screens and the latter with pan€s of glass. When either or both of the frames are closed, they are held by a single turn buckle. By this means the window opening may he tightly closed by the glazed frames, or upon opening these proper ventilation will be effected through the screens without per mitting the entrance of in sects, and by opening tbe screens a still freer flow of air will take place.
In hanging the frames, the usual outer wooden frames are dispensed with. On the frame, A, and on each of the screen frames are formed ears, openings being made in both sets. On the frames, $F$, are pins, the upper pin being longer than the lower one is passed througb the openings as far as the recess to decide. will allow. The lower pin can then be swung over the openings in the ears, so that on depressing the frame the pivoting will be effected. When coal, wood, etc., are to be put in the cellar, the outside grate is unlocked and swing outward. The many advantages of these grates, which are being manufactured at the foundry and machine works of
Byar \& Bro., of Pottstown, Pa., will be readily perceived.


BYAR'S COMBINATION CELLAR GRATE.

and the upper bars of these frames have a recess formed stockings weighs about 2 to $2 \frac{1}{2}$ ounces, the antimony would | and the upper bars of these frames have a recess formed | stockings weighs about 2 to $21 / 2$ ounces, the antimony would |
| :--- | :--- | :--- |
| adjacent to the pin. In fitting the parts together, the | represent an appreciable though minute guantity, the effect | frame, $D$, is first adjusted in place, when the upper pin of whicb is a question, it is remarked, for medical experts

## FOLDING FIREPLACE FENDER

The front, A, and side panels, E, are of woven wire stretched on suitable frames, the sides being inclined backward from the bottom upward on the front edge. The sides and front re hinged together for holding the fender together when put away and for extending it to be put in use. The top panel, D , wbich may be partly of wire and partly of sheet metal or wholly of wire, is retained by studs projecting upward from the top of the front. On the bars of the side panels next to the freplace front and at a suitable distance below the top are clasps, $F$, to connect with the front plate


## SHOEMAKER'S FOLDING FYREPLACE FENDER

of the fireplace by thumbscrews, as shown in Fig. 1, or by spring clasps, as shown in Fig. 2, to book bebind the edge of the plate. To act as a blower to increase the draught when necessary, there is a sheet metal back plate, K, having a lug at each end, whicb drops down between the fender and the freplace. Screw eyes may be attached to wood mantel or connecting the fender by hooks, as in Fig. 3. Attached to the side frames are handle studs that afford a convenient means of lifting the fender when it is to be taken from tbe fireplace or replaced. When not iu use the fender can be folded compactly, and when in place it presents a neat ap pearance, and owing to the sloping point is not in the way and not liable to catch the clothes of persons near it.
This invention bas been patented by Mr. I. W. Shoe maker, of Rosston, Pa .

## Antimony in Clothing.

The Centralblatt fur Textil Industrie records the fact that antimony is to be found in cotton yarn which has been dyed with aniline colors, and remarks tbat unless great care bas been taken in the cleansing of the yarn, it is possible for such a quantity to remain as to be injurious to the skin. Experiments made on different classes of yarn produced re sults varying according to the nature of the dyeing substance. The samples in which bot water acted as a dissolv ent showed only a small propertion of antimony, the highest proportion being found 0.014 per cent. The proportions of antimony which were soluhle in muriatic acid varied from 0.036 to 0.31 per cent of the weight of the yarn. Of course, practically speaking, only the portion soluble in water comes under consideration, but as a pair of long to decide.

Emigration from Italy to foreign countries is yearly increasing; in 1883 it reached, according to official statistics, 169,101, mostly peasants and the lowest lazzaroni. The two Americas receive a little over a third of all the emigrants, and latterly a drift from the Buenos Ayres coast to the United States bas been noticeable.

## Why Buainess Men Fall

Let me give your readers, says a correspondent of the United States Economist, the benefit of the replies I bave received from leading men of our country to the question, "What, in your observation, have been the chief causes of the numerous failures in life of business and professional men?"
Governor St. John answers: "Idleness, intemperance." Alexander H. Stephens answers: "Want of punctuality, bonesty, and truth." Hon. Darwin R. James answers: "In correct views of the great end and aim of life. Men are not contented to live plain lives of integrity and uprightness. They want to get ahead too fast, and are led into temptation." President Bartlett, of Dartmouth College, names as causes of failure: "Lack of principle, of fixed purpose, of perseverance." President Eliot, of Harvard, replies: "Stupidity, laziness, rasbness, and dishonesty." Dr. H. Mi Dexter, of the Congregationalist, answers: " 1 . Want of thoroughness of preparation. 2. Want of fixedness of purpose. 3. Want of faith in the inevitable triumph of right and truth." Anthony Comstock's answers are: " Unholy living and disbonest practices, lust and intemperance, living beyond one's means." Mr. H. E. Simmons, of the American Tract Society, replies: "Fast living, mental, spiritual, and bodily; lack of attention to the details of business." General O. Howard answers in substance "Breaking the divine laws of the body by vice, those of the mind by overwork and idleness, and those of the heart by making an idol of self." Professor Homer B. Sprague, of Boston, answers: "1. Ill bealth. 2. Mistake in the choice of employment. 3. Lack of persistent and protracted effort. 4. A low ideal, making success to consist in personal aggrandizement, ralber than in the training and development of a true and noble cbaracter." Dr. Lyman Abbott answers: "The combined spirit of laziness and self-conceit that makes a man unwilling to do anytbing unless be can choose just what be will do." Mr. A. W. Tenney, of Brooklyn, replies: "Outside of intemperance, failure to grasp and hold, scattering too much, want of integrity and promptness, unwillingnese to achieve success by earning it in the old-fashioned way." The attorney-general of a neighboring State replies "Living beyond income, and speculating with borrowed funds; unwillingness to begin at the font of the ladder and work up. Young men want to be masters at the start, and assume to know before they have learned." And another reason in the same line: "Desiring the success that another bas, without being willing to work as that mandoes. Giving moneymaking a first place and right-doing a second place."
Judge Tourgee, author of "A Fonl's Errand," considers the frequent cause of business collapse to be: "Trying to carry too big a load." As to others, he says: "I don't know about a professional man's failing, if be works, keeps sober, and sleeps at bome. Lawyers, ministers, and doctors live on the sins of the people, and, of course, grow fat under reasonable exertion, unless the competition is too great. It requires real genius to fail in cither of these walks of life. Hon. Joseph Medill, ex-mayor of Chicago, answers: "Liquor drinking, gambling, reckless specnlation, disbonesty, tricky conduct, cbeating, idleness, sbirking lard work, frivolous reading, lack of manhood in the battle of life, failure to improve opportunities."
Among the causes of failure given by my correspondents many may be classified under the general fault of wavering, such as "wavering purpose," "non-stick-to-it-iveness," " failure to grasp and bold," " scattering too much," "trying to do too many things, rather than stick to the one thing one knows most about." A young man spends seven years in a grocery store, and when be bas just learned the business be concludes to go into dry goods. By failing to choose that first be bas thrown away seven years' experience Probably, after learning the dry goods business, be will con clude to hecome a watchmaker, and at last become a "jack at-all-trades," good at none. A prominent merchant says: "Nearly all failures in legitimate business come from not serving an apprenticeship to it," that is, from leaving a business one knows for another which be does not understand.

Another cause of failure is the disposition to escape bard work, and get rich in baste-" desiring the success another man bas, without being willing to work as that man does, and begin, as be did, at the foot of tbe ladder." How many who were in baste to get ricb, to reap without patient indus try in sowing, bave learned the truth of the old proverb "Tbe more baste, the worse speed"

## Photographic Printing in Colors.

In this process it is necessary to use colored negatives-tha is, ordinary negatives wbich bave been band painted in their proper tints with transparent colors.

1. Take a piece of ordinary sensitized paper, and wash it to remove any free silver nitrate.
2. Place the washed paper in a solution of protochloride of tin, and expose to weak light until the silver chloride is reduced to subchloride, and the paper assumes a uniform gray color
3. Float the paper in a mixed solution of chromate o potasb and sulphate of copper, and dry in the dark.
The paper is now sensitive to all the culors of the spectrum, and by printing on it with a colored negative the colors of the negative will be reproduced. After printing, wasb with cold water, and dry.-J. Sherlock, St. Helen' wash with
Photo. Assoc.

## INSERTIBLE SAW TOOTH.

The accompanying engraving shows an invention recently patented by Mr. John H. Brown, of South Trenton, New York, which provides crosscut and circular saws capable of doing the greatest amount of work with the least effort and at the least expense. The inner parts, $\mathbf{B}$, of the seats for the teeth are made circular, and the outer parts, C, are made flaring, forming inclined shoulders. Two of the teeth, Fig. 3, are place ineach seat, and are so formed as to fitagainst the curved and inclined walls. The edges of the teethare grooved to fit upon the correspondingly shaped edge of the saw plate, thus preventing lateral movement. Tbe


BROWN'S INSERTIBLE SAW TOOTH.
rear edges are straight and at right angles to the lengtb of the saw. The teeth are made of such a size as to leave a narrow space between the straight edges of each pair to re ceive the tracer spur, F, Fig. 4. These spurs are made of bardened steel wire, a gauge or two tbicker than the saw plate, and are slightly tapered upon the outer sides to prevent binding. They fil into grooves in the straight edges of the teeth, are a little longer than the teeth, and their outer ends are notched in live with the saw plate to form points or spurs, which trace parallel lines in the bottom of the kerf, thereby forming a kerf a little wider than the thickness of the saw plate, so that the teeth will not require setting. The inclination of the points, $E$, is such tbat they will operate upon the wood in the same manner and at about the same angle as the iron of the ordinary band plane. In the edge of the saw plate, between the teeth, are formed semicircular recesses to receive the shavings and carry them ont of the kerf. In the inner part of each tooth is a bole, H , I, to receive a rivet to press against the tracer spur and lock it in place. With this construction the teeth will not require to be either set or filed, and when dulled or broken can be readily removed and replaced with new ones at a trifling ex pense.

## IMPROVED OAR.

Tbe blade of the oar is made of sheet metal and is providen at its upper end with a tapered metal socket for receiving the tapered stock of the bar. The socket is firmly held by

rivets, as shown in Fig. 2. The blade can be made flat and in the same plane throughout, or it can be constructed to form a spoon oar, or its side edges can be rounded to form a paddle for a canoe. An oar constructed after this plan possesses many excellent features: the metal blade is more durable than a wooden one, it will not warp nor split, springs easily and the upper end of the blade and the lower end of tbe socket can be made very slender, so as to cause very little back water.
This invention bas been patented by Mr. George B. Stan-

## Tempered Glass.

It is not very long since the discovery of M. Alfred de la Bastie filled all our newspapers with paragrapbs, more or less ridiculous, about the properties of this glass. Some claimed it was malleable; others that it could not be broken In fact, tempered glass was called upon to supersede all other materials. The excitement being over, tempered glass may now take its rank among valuable inventions, subject, owever, to many defects in its present state.
The process of tempering glass, as is well known, consists in beating a piece of glass, say a window pane, to such a degree as to approach malleability, but not bot enough to lose its shape; the glass in this state is instantly plunged into a batb composed of fatty and resinous matter, which is beated and maintained liquid at a temperature ranging from $300^{\circ}$ to $600^{\circ}$, according to the quality of the glass The dif ference of temperature between the malleable state about $1,400^{\circ}$, and that of the bath constitutes the temper.
Glass in the plastic state, when plunged into cold water, will fly to pieces if dropped indiscriminately, but if a piece of very fluid glass is allowed to fall into water in the shape of a tear or drop, it will be perceived that the outside of the glass cools at once, while the inside remains partly fluid for some time, as can be distinguished by the red color showing through the water. This cooling will continue until the mass is perfectly solid. Tbis indicates that the outside layer becomes at once condensed by cooling, while the inside remains fluid and consequently more distended. This cooling process goes on, the outside layer compressing the next adjoining, uutil the wbole mass is thoroughly cooled. This peculiar form and state of glass is known a Prince Rupert's drops. Though a bard blow may be struck upon the thick part of these drops, it bas no perceptible effect, but if the thin tail end is ruptured the whole mass in stantly flies to pieces. The glass appears to be under great state of tension, and the least rupture of the equilib rium, such as the breaking of the slender thread terminating the drop, is sufficient to destroy the nass.
Until the discovery of tempered glass by M. De la Bastie it bad always been considered tbat unless a lamp chimney or any other piece of glass was perfectly annealed, differences f temperature brought on suddenly would invariably cause breakage. Tbe Bastie glass would seem to prove this view to be erroneous, as the tempered glass can sustain sud den and extreme cbanges of temperature witbout breaking. Molten lead bas been poured into a glass bowl or tumbler without producing a fracture. A piece of plate glass tem pered by the Bastie process, having been beated among coals, was suddenly plunged into cold water without producing any effect. This experiment, repeated five times in suc cession, did not seeur to impair the qualities of the glass, for n dropping it from a fifth story window it did not break It may be said, bowever, tbat if in the beating the tempera ture should reach the point at which it wonld be annealed the temper would be destroyed. This action does not seem to take place when the period of rebeating is not continued too long. A plate of glass $61 / 4 \times 43 / 4$ incbes and three-sixteenths inch thick could only be broken under the shork of a weight of 7 ounces falling 13 feet, while an ordinary piece of glass of the same dimensions would break under balf of that weight falling about sixteen inches.
M. Siemens, of Dresden, says that the strengtb of glass is ncreased fifty times by being tempered. A bent plate o glass laid upon the floor with the convex side upward i capable of resisting the weight of an ordinary sized man with out breaking. The glass while subjected to the weight will flatten out, but as soon as the pressure is removed it will spring hack at once to its original shape. Hardened glass seems to be less dense than ordinary glass; it isbarder, how ever, and is more difficult to cut by the diamond and tempered tools; it also possesses a much superior elasticity ove the ordinary glass.
Since tempered glass, bowever, cannot be cut with the diamond without flying to pieces, its use must necessarily be limited to definite sizes not requiring to be modified; tbis is quite a drawback to its use. It would seem, bowever, that some of the defects have already been overcome, for a the Paris Exposition quite a display of tempered goods was made by the Societe Anonyme du Verre Trempe, of Paris Among other things was quite a display of druggists' and Among otber things was quite a display of druggists' and
chemical glassware, mortars, pestles, beakers, covered bowls, funnels; also a variety of plain and cut glass tum bowls, funnels; also a variety of plain and cut glass tum-
blers, goblets, decanters, globes, and chimneys; opal plates a depolished bowl with cut facets; colored glass, engraved cut, etc. It is said that the making of articles varying in thickness is bazardous, as many of them are apt to fly to pieces either in the making or cutting.-Glassware Reporter

## Medical Photography.

Dr. A. L. Cory says: "As to the use of photographic out fits in medicine, I would say I find mine a great benefit. I bave used it in cases of skin diseases, small pox, spina be fida, etc., and can see now where I sbould bave kept photos of many cases if I had possessed it before. Wbile in cbarge of Lake bealth department I took frequent copies of smal pox cases. It is so little trouble to keep the plate holde filled and the camera in one corner of the consultation room A photo of any case can be bad at a minute's notice, the plate to be developed when convenient. I frequently take mine in the buggy when called to a case I think may be interesting, and use it if opportunity offers. Nothing that I know of offers us so easy and accurate a nethod of record ing interesting cases."

