#### SHADE AND CURTAIN FIXTURE.

On the inner surface of each side bar of the upper sash 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 horizontally a short distance from the socket, and is then curved downward and outward, so that its free end projects beyond the plane of the window casing. In the upper part of the plate is held one end of a thin wire, which serves to put a strain on the arm and keep it from vibrating. The upper end of the wire arm passes through a sleeve, which is provided with an additional east entrance to the strait, and about 45 miles across from aperture for receiving the bent end of the thin wire. The station one. No. 3 at Cape Hope, or on the south side of sleeve is provided with a binding screw having 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 V-shaped 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 held in front of the bar, the 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 shown 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



INGALLS' SHADE AND CURTAIN FIXTURE.

a curved or arched top in which it is not desired to have 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 shade is secured.

Shades hung 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 shade to give such a tint to the light as may be desired. The fixtures are sects, and by opening the easily adjusted to windows of different widths and depth of screens a still freer flow of jambs, and are applicable to bay windows, narrow face cas- air will take place. ings, mullioned windows with narrow mullions. By being attached to the sash they save the face casings from being injured.

#### Hudson's Bay as a Grain Route.

The Newfoundland sealing steamship Neptune-the same which two years ago was sent in search of Lieut. Greelvsailed 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 observations in Hudson's Bay. The stations are to be located in the following places, six on the strait and one on the west shore of the bay:

No. 1 at Cape Chudley, at the southeast entrance to Hudson strait. No. 2 on Resolution Island, at the northabout the center of the strait, and about 250 miles from stations one and two. This will be the chief point of observation. No. 4 will be located directly north of No. 3 on the north bluff of one of the islands close by, according to circumstances. No. 5 on the southeast end of Notlingham Island, about 200 miles from station four. No. 6 on the north side of Mansfield Island, some 150 miles from station five. Observations of the northern part of the bay will be made from this point. No. 7 at Fort Churchill, at the mouth of the Churchill 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 station party will consist of two men and an Esquimau inwhere the window bas a square top, or in windows having terpreter, besides the officer in charge, and sufficient provisions and fuel for fifteen months will be supplied. The observatories are made insections, and will be taken out by the steamer, and put up on the sites selected by the commander as the vessel progresses through the strait. Next year these stations will be revisited, and other parties left in charge. The most important work the parties will be called upon to perform will be to carefully watch and note the breaking up of the ice, the tides, and all other characteristics pertinent to navigation.

The sum of \$70,000 has been appropriated by the Canadian Government to make these explorations, but the immediate end in view is practical rather than scientific. It is thought that, notwithstanding all the unfavorable reports so far received, it may be found that Hudson Strait is open a 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 Nelson and Churchill rivers. Lieut. Gorringe investigated this question about three years ago, on behalf of the Northern Pacific Railroad Company, but he reported that any successful trade in this way was impracticable, on account of the fogs as well as the ice, which would hardly 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 has 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 relates 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 pivscreens and the latter with panes of glass.

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 permitting the entrance of in-

#### 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 are hinged together for holding the fender together when put away and for extending it to be put in use. The top panel, D, which 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 fireplace front and at a suitable distance below the top are clasps, F, to connect with the front plate



SHOEMAKER'S FOLDING FIREPLACE FENDER.

of the fireplace by thumbscrews, as shown in Fig. 1, or by spring clasps, as shown in Fig. 2, to hook behind 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, which drops down between the fender and the fireplace. Screw eyes may be attached to wood mantels for 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 the fireplace or replaced. When not iu use the fender can be folded compactly, and when in place it presents a neat appearance, and owing to the sloping point is not in the way and is not liable to catch the clothes of persons near it.

This invention has been patented by Mr. I. W. Shoemaker, 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 that unless great care has 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 results varying according to the nature of the dyeing substance. The samples in which hot water acted as a dissolvent showed only a small proportion of antimony, the highest proportion being found 0.014 per cent. The proportions of antimony which were soluble in muriatic acid varied from 0.036 to 0.31 per cent of the weight of the yarn. Of oted the frames, D and F, the former being provided with course, practically speaking, only the portion soluble in When either or water comes under consideration, but as a pair of long



This invention has 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 horses employed

In hanging the frames, the usual outer wooden frames are dispensed with. On the frame, A, and on  $\epsilon$  ach 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,



BYAR'S COMBINATION CELLAR GRATE.

in towns and known not to have a steady foot on the pavement. The results of the experiments have proved very satisfactory, as horses thus shod have been driven at a rapid pace on the pavement without slipping. Besides is passed through the openings as far as the recess will allow. The lower pin can then be swung over the this advantage, the new shoe is very durable, and though a little more expensive than the ordinary one, seems destined openings in the ears, so that on depressing the frame the pivoting will be effected. When coal, wood, etc., are to be sooner or later to replace the iron shoe, particularly for horses employed in large cities, where, besides the pave- put in the cellar, the outside grate is unlocked and swing [169,10], mostly peasants and the lowest lazzaroni. The two ment, the streets are intersected by tramway rails, which outward. The many advantages of these grates, which are Americas receive a little over a third of all the emigrants, from their slipperiness constitute a source of permanent being manufactured at the foundry and machine works of and latterly a drift from the Buenos Ayres coast to the Byar & Bro., of Pottstown, Pa., will be readily perceived. United States has been noticeable. danger.

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 quantity, the effect frame, D, is first adjusted in place, when the upper pin of which is a question, it is remarked, for medical experts to decide.



EMIGRATION from Italy to foreign countries is yearly increasing; in 1883 it reached, according to official statistics,

#### Why Business Men Fail.

Let me give your readers, says a correspondent of the United States Economist, the benefit of the replies I have 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, honesty, and truth." Hon. Darwin R. James answers: "Incorrect 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, rashness, and dishonesty." Dr. H. M 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: "Unboly living and dishonest 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 health. 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, rather than in the training and development of a true and noble character." Dr. Lyman Abbott answers: "The combined spirit of laziness and self-conceit that makes a man unwilling to do anything unless he can choose just what he 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, unwillingness 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 foot 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 has, without being willing to work as that man does. Giving moneymaking a first place and right-doing a second place."

Judge Tourgee, author of "A Fool'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 he works, keeps sober, and sleeps at home. 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 either of these walks of life." Hon. Joseph Medill, ex-mayor of Chicago, answers: "Liquor drinking, gambling, reckless speculation, dishonesty, tricky conduct, cheating, idleness, shirking hard work, frivolous reading, lack of manhood in the battle of pense. 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 hold," " 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 he has just learned the business he concludes to go into dry goods. By failing to choose that first he has thrown away seven years' experience. Probably, after learning the dry goods business, he will conclude to become a watchmaker, and at last become a " jackat-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 he does not understand.

Another cause of failure is the disposition to escape hard work, and get rich in haste-" desiring the success another man has, without being willing to work as that man does, and begin, as he did, at the foot of the ladder." How many who were in haste to get ricb, to reap without patient industry in sowing, have learned the truth of the old proverb: "Tbe more haste, the worse speed "!

#### 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, 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 placed in each seat, and are so formed as to fit against 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. The



BROWN'S INSERTIBLE SAW TOOTH.

rear edges are straight and at right angles to the length 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 receive the tracer spur, F, Fig. 4. These spurs are made of hardened steel wire, a gauge or two tbicker than the saw plate, and are slightly tapered upon the outer sides to prevent binding. They fit into grooves in the straight edges of the teeth, are a little longer than the teeth, and their outer ends are notched in line 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 that they will operate upon the wood in the same manner and at about the same angle as the iron of the ordinary hand 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 hole, 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-

## IMPROVED OAR.

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



## Tempered Glass.

It is not very long since the discovery of M. Alfred de la Bastie filled all our newspapers with paragraphs, 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, however, to many defects in its present state.

The process of tempering glass, as is well known, consists in heating a piece of glass, say a window pane, to such a degree as to approach malleability, but not hot enough to lose its shape; the glass in this state is instantly plunged into a batb composed of fatty and resinous matter, which is heated and maintained liquid at a temperature ranging from 300° to 600°, according to the quality of the glass The difference of temperature between the malleable state, about 1,400°, 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. This 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, until the whole mass is thoroughly cooled. This peculiar form and state of glass is known as Prince Rupert's drops. Though a hard blow may be struck upon the thick part of these drops, it has no perceptible effect, but if the thin tail end is ruptured the whole mass instantly flies to pieces. The glass appears to be under a great state of tension, and the least rupture of the equilibrium, such as the breaking of the slender thread terminating the drop, is sufficient to destroy the mass.

Until the discovery of tempered glass by M. De la Bastie, it had always been considered that unless a lamp chimney or any other piece of glass was perfectly annealed, differences of temperature brought on suddenly would invariably cause a breakage. The Bastie glass would seem to prove this view to be erroneous, as the tempered glass can sustain sudden and extreme changes of temperature witbout breaking. Molten lead has been poured into a glass bowl or tumbler without producing a fracture. A piece of plate glass tempered by the Bastie process, having been heated among coals, was suddenly plunged into cold water without producing any effect. This experiment, repeated five times in succession, did not seem to impair the qualities of the glass, for on dropping it from a fifth story window it did not break. It may be said, however, that if in the heating the temperature should reach the point at which it would be annealed, the temper would be destroyed. This action does not seem to take place when the period of reheating is not continued too long. A plate of glass 61/4 x43/4 inches and three-sixteenths inch thick could only be broken under the shock of a weight of 7 ounces falling 13 feet, while an ordinary piece of glass of the same dimensions would break under half of that weight falling about sixteen inches.

M. Siemens, of Dresden, says that the strength of glass is increased fifty times by being tempered. A bent plate of glass laid upon the floor with the convex side upward is capable of resisting the weight of an ordinary sized man without breaking. The glass while subjected to the weight will flatten out, but as soon as the pressure is removed it will spring back at once to its original shape. Hardened glass seems to be less dense than ordinary glass; it is harder, however, and is more difficult to cut by the diamond and tempered tools; it also possesses a much superior elasticity over the ordinary glass.

Since tempered glass, however, cannot be cut with the diamond without flying to pieces, its use must necessarily be limited to definite sizes not requiring to be modified; this is quite a drawback to its use. It would seem, however, that some of the defects have already been overcome, for at 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 chemical glassware, mortars, pestles, beakers, covered bowls, funnels; also a variety of plain and cut glass tumblers, 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 hazardous, as many of them are apt to fly to pieces either in the making or cutting.-Glassware Reporter.

### Photographic Printing in Colors.

In this process it is necessary to use colored negatives--that is, ordinary negatives which have been hand 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.

of tin, and expose to weak light until the silver chloride is the same plane throughout, or it can be constructed to form a reduced to subchloride, and the paper assumes a uniform gray color.

3. Float the paper in a mixed solution of chromate of potash and sulphate of copper, and dry in the dark.

The paper is now sensitive to all the colors of the spectrum, and by printing on it with a colored negative the colors of the negative will be reproduced. After printing, wash with cold water, and dry.-J. Sherlock, St. Helen's Photo. Assoc.

STANTON'S IMPROVED OAR.

### Medical Photography.

Dr. A. L. Cory says: "As to the use of photographic outfits in medicine, I would say I find mine a great benefit. I have used it in cases of skin diseases, small pox, spina be-

2. Place the washed paper in a solution of protochloride rivets, as shown in Fig. 2. The blade can be made flat and in fida, etc., and can see now where I should have kept photos of many cases if I had possessed it before. While in charge spoon oar, or its side edges can be rounded to form a paddle of Lake health department I took frequent copies of small pox cases. It is so little trouble to keep the plate holder for a canoe. An oar constructed after this plan possesses filled and the camera in one corner of the consultation room. many excellent features: the metal blade is more durable than a wooden one, it will not warp nor split, springs easily, A photo of any case can be had at a minute's notice, the and the upper end of the blade and the lower end of the plate to be developed when convenient. I frequently take socket can be made very slender, so as to cause very little mine in the buggy when called to a case I think may be inback water. teresting, and use it if opportunity offers. Nothing that I know of offers us so easy and accurate a method of record-

This invention has been patented by Mr. George B. Stanton, of Long Lake, N. Y.

ing interesting cases."