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: "Unholy 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 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 "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 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 rich, to reap without patient industry in sowing, have learned the truth of the old proverb: "The more haste, the worse speed"!

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.

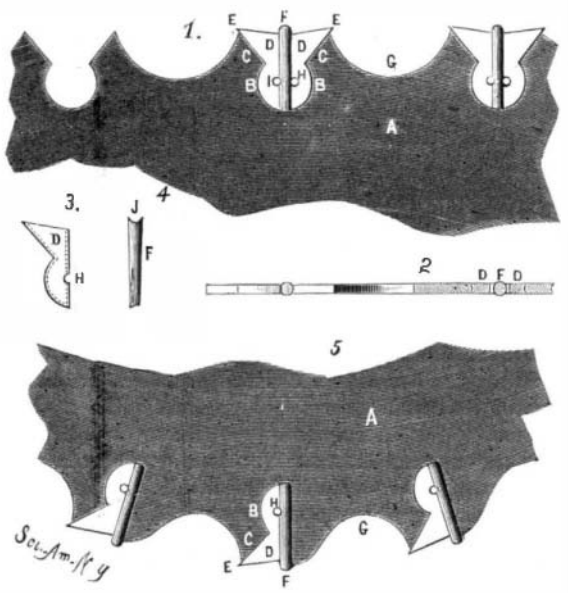
2. Place the washed paper in a solution of protochloride of tin, and expose to weak light until the silver chloride is reduced to subchloride, and the paper assumes a uniform gray color.

3. Float the paper in a mixed solution of chromate 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.*

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 teeth are 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 thicker 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 out 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 expense.

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

STANTON'S IMPROVED OAR.

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 the socket can be made very slender, so as to cause very little back water.

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

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 bath 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 without 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 6¼x4¾ 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.*

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 befida, etc., and can see now where I should have kept photos of many cases if I had possessed it before. While in charge of Lake health department I took frequent copies of small pox cases. It is so little trouble to keep the plate holder filled and the camera in one corner of the consultation room. A photo of any case can be had 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 method of recording interesting cases."