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Contents:

(Illustrations are indicated by an asterisk.)

THE POLICY OF STRIKES.

In an article in the New York *Sun* the following sensible paragraph appears:—

"The most effectual method for removing the disputes between capital and labor is by removing the too prevalent notion that there is an 'irrepressible conflict' between them. When workingmen and employers are convinced of the fact that there is a natural partnership between them, in which the former find the labor and the latter the money to carry on the business, and when they fully appreciate the necessity of harmony and concord under that partnership, then strikes or lock-outs will not disturb the 'channels of trade,' or interfere with the rights of every class of our citizens."

This is the view of all sensible people. Strikes are the legacy of a barbarous age—of the days when apprentices were bound—and in no wise a remedy for the evil they pretend to reach. Many well-meaning persons and journals have confused ideas on this subject, and are continually discussing and defending the *right* of men to strike. No one disputes the *right*, but the expediency of such a step. Strikes never bettered any trade; on the contrary, most have been injured by them. Ceaseless agitation of the question of pay has resulted in neglecting the trade itself. Wages forced up for a time by combinations come down again by degrees when the combinations are inactive, so that the last end of the strikers is worse than the first.

Strikes are generally originated by envious dissatisfied men, who, finding themselves falling behind their comrades in pay, create dissatisfaction in order to rise to popularity on the topmost wave thereof. We have always deprecated strikes, and shall raise our voice against them—not because, as has been insinuated by a silly paper, we are interested in reducing the earnings of our fellow-men, but because there is no benefit in the act; on the contrary, the greatest evils ensue. We hear enough in papers interested in fomenting discord between men and their employers about the grand success of such and such a combination, but they never tell us how ephemeral it is, or of the misery and sufferings of the families who want when the father is idle, or of the loose habits and false ideas engendered which fasten on him sometimes for life.

In this country the workman of to-day is often the proprietor to-morrow, and we can look back on many in the course of our experience who once ardently espoused the policy of striking, but now oppose it because of its fallacy. It is a hopeful sign of the times that, with all the demagoguism of the false friends of the workman, there are so few trades that lend an ear to their twaddle, but pursue the even tenor of their way to prosperity and peace, never dreaming that they are abused and downtrodden.

OPENING HOT SAFES.

We find this item in a Baltimore paper:—"The late conflagration at Richmond developed a curious incident and fact which may be valuable, if remembered. Some week or ten days after the fire, the iron safe of the *Enquirer's* office was opened, when immediately on the admission of the air, the books and papers were ignited and consumed. And such was the case of all other safes which were not in brick vaults. In these the contents were uninjured. The *Enquirer's* safe, at the time it was reopened, was cold externally to the touch."

It is very doubtful if the contents would have been preserved had the safes been allowed to become perfectly cold before they were opened. The fact that the books and papers took fire on the admission of air shows that the temperature was at the burning point, but paper is charred and reduced to tinder below the temperature at which it will burn. Any one who has a kerosene lamp may readily try this experiment, for it so happens that the temperature at the top of a kerosene lamp chimney is generally hot enough to char paper, but not enough to set it on fire. It is probable that the paper in these Richmond safes was decomposed, the hydrogen, nitrogen and oxygen being driven out, and mingled with a quantity of steam from the drying of the plaster in the safe walls—the carbon remaining as tinder. On the opening of the door these hot gases were swept out, and as the oxygen of the atmosphere came in contact with the hot carbon, the two entered into that swift combination which is combustion. The same non-conducting properties of the safe walls which enabled them to resist heat for a moderate period, caused them to retain it for so long a time after their interiors had become heated; hence their very slow cooling.

Practically, it might be better to let safes become perfectly cold before opening, because in many cases the paper would not be decomposed, and even if it were, satisfactory proof might in some cases be obtained of the destruction of notes, bonds, or other valuable documents, as writing or printing sometimes remains perfectly legible on paper after it has been reduced to perfect tinder.

The most valuable lesson, however, enforced by the condition of these Richmond safes, is the same that was so impressively taught by the great Troy fire, that iron safes are not to be intrusted with valuable documents unless they are inclosed in brick vaults.

ANOTHER STEP TOWARDS FLYING.

In the proceedings of the Polytechnic Association, published in our last number, was a description by Mr. Barbour of his carbonic acid engine, and he stated that he obtained one and a half horse power from an engine which weighed with all its auxiliary apparatus 450 lbs. This was the power obtained by following the piston with the full pressure only three-fourths of an inch in a stroke of twelve inches. There was also surplus weight in the engine, no effort having been made to reduce the weight to a minimum; the main reservoir was sufficiently thick to bear 5,000 lbs. to the inch, while the maximum pressure used was only 1,100 lbs.; and the reservoir was large enough to run the engine an hour and twenty minutes.

Now if an engine of the same form were made of aluminum, the weight would be reduced to about one-third, say 150 lbs., and then by following full pressure 3 inches instead of ¾ of an inch, the power would be materially increased, though, of course, the same supply of carbonic acid would not last as long. But if an engine could be driven for half an hour, this would be sufficient to travel thirty miles, going at the rate of sixty miles an hour. It would seem, therefore, that it is in the present power of the arts to construct an engine of 2½ or 3-horse power that will not weigh more than 150 pounds. Will these conditions enable us to fly?

A sand hill crane weighs 40 pounds, and it does not seem possible that three sand hill cranes can have the muscular power of one horse; at the first view, therefore, there would appear to be sufficient encouragement for a further examination of the question.

If we allow 180 lbs. for the weight of a man, the whole weight of a machine and its burden will be 330 lbs. If with this weight we have a machine of two-horse power, and if one-half the power be expended in moving the air and the other half in raising the machine, it will rise vertically 100 feet per minute. When sufficient altitude is attained the machine may be inclined, and a portion of the power previously expended in rising may be employed in horizontal propulsion.

Notwithstanding all that has been said to the contrary by our correspondents, a revolving spiral fan would probably be the proper form for the wings, especially as this would be the easiest way in which to obtain the high velocity requisite. It is generally stated that the resistence of the air to a body passing through it increases with the square of the velocity, but Morin says that for very high velocities the formula must contain an element increasing with the cube of the velocity. Calculating, however, an increase only in proportion to the square of the velocity, from the data furnished by Rouse's experiments, a surface 1 foot square moving with a velocity of 146 feet per second, will experience a pressure of 49 lbs. With 6 revolutions per second—360 per minute—to obtain a velocity of 146 feet per second, the fans must be 8 feet in diameter—each arm 4 feet long. As but half the pressure would be available for raising the machine, we should require a total pressure on the air of, say 700 lbs., and this, at 50 lbs. to the foot, would require an area of 14 feet. As there would be two fans with two arms each, this would give an area of 3½ feet to each arm—less than 2½ feet long and 18 inches wide. It will be seen that all the dimensions and velocities are within practicable limits.

The only plan for navigating the air that has any hopes of success is that of flying—beating the air with wings driven by mechanical force; and certainly no machine heretofore proposed comes so near possessing the requisite power in proportion to its weight as a carbonic acid engine constructed of aluminum.

TRAINING UP MECHANICS.

Many years ago a system of apprenticeship prevailed in this country by which youths were bound for a term of years to a master, who agreed to provide instruction in his trade, board, clothes and tuition in return for their services, and, for a portion of the time, pecuniary reward.

We have never heard of any legislation on the subject, but for reasons which are quite apparent the system exists no longer, and youths, instead of being bound, make a verbal agreement to serve out the stipulated period, whatever that may be. To the credit of our young men, but few instances occur where they forfeit their word. The old plan was open to many objections, so many that the evil wrought its own cure, and our shops are purged of it forever. In many cases hard masters starved their apprentices, half clothed them, gave them no schooling, and educated them only in such branches of the trade as they chose, lest in the future they might become rivals and so spoil the business by too great competition.

It was not in human nature to be so treated and not rebel, and if any reader is curious in these matters let him turn back to files of papers, published twenty years ago, and he will find small cuts of a man with a bundle slung over his shoulder on a stick, and an advertisement reading—"One cent reward! ran away from the subscriber an indentured apprentice." What wonder that they ran away? The world does not stand still; and so flagrant were the wrongs alluded to, that, by common consent, the system has been abolished. The times were out of joint. "The Idle Apprentice" is the subject of a series of the most celebrated cartoons of Hogarth, and the idle apprentice of that time was the indentured apprentice, who received blows instead of food, and curses in lieu of instruction. There were few inventions in those days; not because mankind were more degenerate, but because there was no incentive to exertion, and it was much harder then than it now is to introduce any labor-saving machine.