A NEW MACHINE FOR MAKING EXCELSIOR.

An improved machine for making excelsior, or the curled shreds of wood used as a substitute for curled hair in mattresses, and for stuffing cushions, packing furniture, etc., has recently been perfected by the S. C. Forsaith Machine Company, of Manchester, N. H., and is shown in the accompanying illustration. The machines built by this company are in use in various parts of the country, and have an excellent record as being strongly built, without superfluous material, while being very economical machines to use, as attested by a long list of testimonials. The frame of the machine shown in the cut is of Georgia pine, 7 inches square, and is 6 feet long, 4 feet 11 inches high, and 2 feet 7 inches wide. It is a double machine, cutting two blocks at one time. There is one set of knives and spurs in each crosshead or slide, so arranged that one set of knives and spurs operate on one block when going one way and the other set on the opposite block when returning. The blocks may be 12 to 20 inches long, 2 to 6 inches thick, and any width up to 14 inches. The knife plates are steel plated, and the slides are adjustable to take up the wear. The feed screws are of Norway iron, and the boxes are of iron, babbitted. The knives are set at an angle, so as to curl the excelsior as it comes off. The holding heads or dogs are so arranged that when the block is used up as far as possible, the feed is thrown out automatically, while by moving a shipper the head is run back by power to take a new block, such block being put in without interfering with the other head, which will be feeding all the time, and can be supplied with a new block in the same way, the two heads on the machine being worked independently.

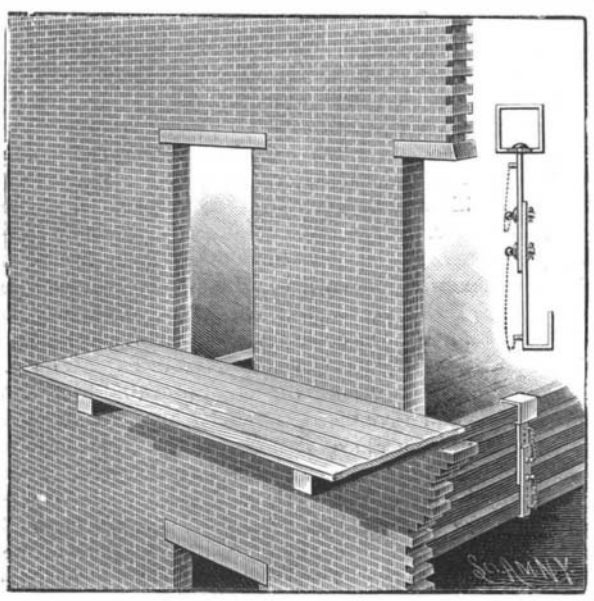
With the machine is furnished a countershaft with tight and loose pulleys, and a balance wheel with wrist pin adjustable to different lengths of stroke, counterbalanced so that it can be run at great speed. The connecting rod is made of hard wood, with heavy straps, bolts, and brass boxes, being light and strong. The machine is designed to run about 200 revolutions a minute, at which rate it will cut 1,000 to 1,200 pounds of excelsior per day of ten hours, though in some cases, with skilled operators and nice stock, they have produced 1,500 to 1,600 pounds per day; while by placing two machines facing each other, to be attended to by one man, considerable saving in labor may be effected. The excelsior made on these machines frequently commands a higher price in market, from $2 to $3 per ton, over that made on upright and other machines, it being so nicely curled. A cord of wood should make from 1,800 to 2,000 pounds of excelsior, according to the quality and condition of the wood. It is calculated that the waste wood is sufficient to furnish power if steam is used. The woods considered best for the manufacture of excelsior are the following, ranking in the order named: Poplar, white birch, yellow birch, bass, whitewood, and soft maple.

The Forsaith Machine Company also manufacture a general line of woodworking machinery, and furnish anything in the line of steam power or machine shop equipment.

THE FORSAITH IMPROVED MACHINE FOR MAKING EXCELSIOR.

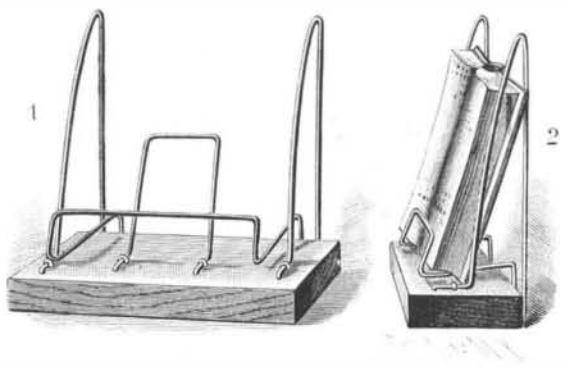
AN IMPROVED SCAFFOLD HOLDER.

A simple and easily adjusted device adapted for use in supporting scaffolds on the outside of buildings is illustrated herewith, and has been patented by Mr. William J. Blundell, of No. 152 East 129th Street, New York City. The holder is made with a skeleton frame



BLUNDELL'S SCAFFOLD HOLDER.

at its upper end, adapted to slip over the inner end of a beam which may be projected from a window to support a scaffold, while its lower end has a hook to engage with a joist of the flooring, as shown in the sectional view, so that the holder serves as a tie rod between the beam and joist. The holder is made in two sections, which overlap each other and are held in place by



HARBAUGH'S BOOK HOLDER.

pins passing through corresponding holes, whereby the holder may be adjusted as to length according to the distance from the top of the window sill to the lower edge of the joist.

AN IMPROVED BOOK HOLDER.

A simple and inexpensive device for holding books in an open position, at a suitable inclination for reading, is illustrated herewith, and has been patented by Mr. Frank P. Harbaugh, of Chambersburg, Pa. Near the ends of the base piece are wire standards, bent into an approximately V shape, and midway between the standards is secured a bent wire support for the back of the book. Between the standards and the support are arranged the arms of the bottom support, so that the leaves of a book placed on the arms may be held in open position by the horizontal part of the support, the covers resting against the standards, and the book being thus held in a light spring clamp. This holder may be attached, by simple fixtures, to chairs, lounges, etc.

Long Distance Telephoning.

Words spoken in Philadelphia can now be heard in Portland, Me., a distance of 450 miles. A member of the *Review's* staff in New York conversed with Mr. Standford, manager of the telephone exchange at Portland, Me., on October 6, and heard every word distinctly. The American Telephone and Telegraph Company, of New York, of which President Theo. N. Vail and Vice-President and General Manager Ed. J. Hall, Jr., are the energetic and far-seeing executives, is to be congratulated on the successful opening up to telephone service of this vast and wealthy territory. What was at first looked upon as a doubtful venture is now rapidly becoming recognized as one of the successful and progressive moves in recent electrical history. The large and important cities of Philadelphia, New York, Brooklyn, Albany, New Haven, Hartford, Providence, Boston, and Portland, with intermediate towns, are now in telephonic communication, covering a territory represented by seven States. By November 1 this company's lines between Buffalo and Albany will be completed, and the cities of Syracuse, Rochester, Utica, Auburn, etc., will enter the long distance telephonic system.

There are at the present time over 100 manufacturing establishments in the territory adjacent to New York that are daily patrons of this system, either by leasing lines or by contracting for so many hours per day, and these companies are all supplied with the improved long distance transmitter—the invention which, with the use of hard-drawn copper conductors, made possible this wonderful and potent advance in the telephonic industry.

The extension of this system to Cleveland, Pittsburg, Baltimore, Washington, Cincinnati, and Chicago is now only a question of time. It is known to be electrically possible, and the experience of the American Company so far leads to the belief that it will be successful from the stern standpoint of dollars and cents.—*Elect. Review.*

American Industries and the Brussels Exhibition.

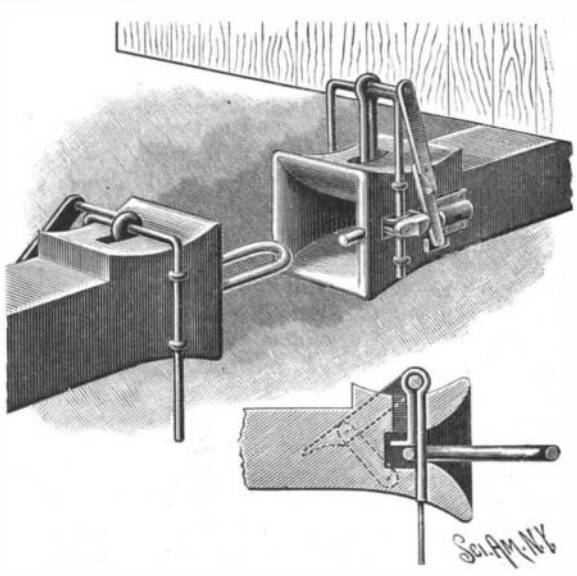
The following extract from a note to the *Evening Post*, just received from one of the jurors of the Brussels exhibition, shows that though the number of American exhibitors was not large, the reputation of American artisans for ingenuity and talent was fully sustained by those who represented them. The writer, under date of the 5th of October, says: "I have just finished the duties of juror at the exhibition, and must let you hear of the returns. In the agricultural machines, on which division I was put, we got for the United States three diplomas of honor—the highest award—and one gold medal; in other words, a diploma of honor for each exhibitor but one, and he really only deserved the gold medal. The other exhibitors fared equally well, for out of 73 *exposants*, 54 got distinctions of greater or less degree. I think we have reason to congratulate ourselves."

THE Smithsonian Institution, at Washington, has sent an expedition to Nova Scotia and secured facsimiles of the "fairy rocks," on which are curious hieroglyphic characters, evidently very old, which may throw some light on the history of the early discoveries of America. The markings are cut in upon a rock of highly polished slate, and the intaglio is about a sixteenth of an inch deep.

AN IMPROVED CAR COUPLING.

A car coupling which is simple and durable in construction and automatic in operation is illustrated herewith, and has been patented by Mr. Joseph H. Weaver, of Grange, Ga. The coupling pin has a rearwardly extending foot or arm adapted to rest on the inner end of the coupling link, to hold the latter in horizontal position, the coupling pin being held to slide vertically, and its upper outer end being supported by a U-shaped frame, having its side arms engaged by eyes secured to the sides of the drawhead, whereby the frame is perfectly guided in its up and down movement. From one side of this frame projects a pin on which is fulcrumed an arm pivotally connected to a second arm pivoted at its lower end to one side of the drawhead, the latter arm having a pin adapted to engage the lower end of the upper arm. The front edge of the lower arm is also adapted to be engaged by a dog pivoted to a bar sliding horizontally on the side and projecting beyond the front of the drawhead. With the coupling in the position shown in the left-hand figure, the link being held horizontally by the foot of the coupling pin resting upon it, the coming together of the opposing drawheads causes the dropping of the coupling pin held in the drawhead to the right, the pushing in of the horizontal bar causing the pivoted arms at the side to assume the position shown in the small sectional view.

For further information relative to this invention address the patentee, or Mr. S. W. Hamilton, Hendersonville, N. C.



WEAVER'S CAR COUPLING.

Risk in Firing Big Guns.

The blast of the discharge and the concussion produced by the modern high-powered rifle gun has introduced a new element that must be considered in designing ships to carry guns of heavy caliber. Until recent years the charge of powder usually weighed from one-sixth to one-tenth the shot, whereas in the new built-up steel guns the charge has been increased to one-half the weight of the projectile. The 110 ton guns of the British battle ship Benbow fire a shot weighing 1,800 pounds with a charge of 1,000 pounds of powder, and the 139 ton Krupp gun now building, and designed to pierce 47 inches of wrought iron, will have a still heavier charge.

The experience on board the Atlanta and Boston, with the 6 inch guns firing a charge of only 50 pounds, demonstrated the importance of this question, and proved that if guns are placed in echelon the crew of the foremost must be protected from the blast of the one in the rear. In these ships, owing to the comparatively small charge, there is no doubt expressed by the officers as to the possibility of interposing a movable shield or a heavy curtain that may afford sufficient protection for the guns' crews. Further experiment will solve the problem.

Some of the boats of these vessels hoisted at davits projecting from the side were shattered or had their seams opened by the force of the concussion. This fact must be carefully noted in the other ships now building to prevent a like result. The Chicago, for instance, can never fire her 8 inch guns astern without carrying away the boats that will be hoisted at the old-fashioned davits now provided for that purpose. The necessity for protecting the boats would not exist in actual battle, since their destruction will be rendered certain by the fire of the enemy's guns—particularly by the machine gun fire, which, to secure penetration, will be directed against the upper works, and the boats will be riddled by the hail of small shot. But during target practice, in time of peace, it is desirable to save a ship's boats, since the expense of repairing and replacing them at every practice would be considerable, and they are necessary to the safety of the crew in case of accidental collision or shipwreck. It has always been the custom in men-of-war to carry a number of boats at projecting davits clear of the ship's side for convenience in lowering, but this plan has been abandoned in the most recent ships, and we now find the boats stowed, as in mail steamers, on supports or cradles over the upper decks. Such will be the only solution of the question in the ships now building, and with the exception of the Roach cruisers, which were designed before this point had been discovered, all boats will be stowed inboard.

Wooden boats are so easily shattered or damaged by the vibration that it may be well to consider the advisability of constructing a man-of-war's boats of thin steel or iron plates.

As to the effect of concussion upon the hulls and fittings of vessels of war, gun trials and experiments tend to show that this question is also one that must be seriously studied. Commander William M. Folger, of the navy, anticipating this question of the blast of modern guns, made an experiment at the Naval Ordnance Proving Ground, at Annapolis, the result of which is most instructive. In order to secure end-on fire, which is an important feature in ships designed for ramming, chasing, or running away, some of the guns, and usually the heaviest ones, are mounted in projecting sponsons or in turrets on the upper deck, in which case the muzzles of such guns may be very near the ship's side, or the superstructures, when fired in line with the keel. To ascertain the probable effect of the discharge, Commander Folger built up and suitably braced a structure of iron plates representing the side of an unarmored ship, or one of her superstructures, and then fired a modern gun parallel to the plates, the muzzle being at the lateral distance likely to exist in practice. The result of the blast was to bulge in the plates and set the whole structure back somewhat, notwithstanding the security with which it was braced. The lesson of this experiment received practical confirmation in the trial of the 100 ton guns on board the Italian battle ship Lepanto, which, when fired in line with the keel, produced a destructive effect upon the ship's superstructures which took weeks to repair. These facts should be intelligently noted in their bearing upon the ironclads Maine and Texas, now building in our navy yards, since to ignore them may lead to needless disaster.

The four 10 inch guns of the Maine are designed to fire ahead and astern as well as on both sides across the decks, the two turrets being in echelon, one on each side of the ship. The superstructures that are built on the same deck as the turrets are cut away abreast the turrets to permit the guns to be fired across the deck, and are set back several feet from the ship's side to permit fore and aft fire. The conditions will, therefore, approach those in the experiments noted, and it is a matter of conjecture as to what will be the effect upon these superstructures when the 10 inch gun, with a charge of 250 pounds of powder, is fired parallel to them or across the deck through the openings left for that purpose. The vibration is very destructive of light woodwork and filigree work of all kinds, and as the admiral's cabin is within the superstructure of the Maine, it may be necessary to finish it with ornamental sheet iron rather than expensive woodwork, if it is to survive the concussion of the 10 inch gun.

Many of the Hotchkiss guns of the Maine are mounted on the top of the superstructure, and will be in advance of the muzzles of the 10 inch guns when the latter are fired ahead or astern. In the light of the experiments on board the Atlanta and Boston, it would seem probable that the crews of these guns will be deafened or stunned by the discharge of 250 pounds of powder under these conditions.

There are two distinct periods in the discharge of a great gun during which damage may result to surrounding objects. When the projectile leaves the gun, it is followed by a volume of gas at a high tension and moving like the shot at a great velocity. This gas, expanding enormously and moving at a high velocity at the same time, causes a violent blast, driving the air before it, and thus producing in its rear a partial vacuum. This blast, therefore, is the first element of destruction, and carries away everything movable in its path. The air rushing in from all sides to fill this vacuum produced by the blast causes a reaction—an object moved in one direction by the blast would be moved in the opposite direction by the rush of air. This movement of air to restore equilibrium is very violent, and doors are burst open from the inside owing to the excess of pressure on that side. For this reason it is well, when possible, to leave all superstructure doors open, that there may be a free circulation of air, otherwise locks and hinges will be torn off and doors will open themselves.

On both the Maine and Texas, boats, bridges, and superstructures, or hurricane decks, will be immediately over the muzzles of the heavy guns when they are fired across the deck. An inspection of the plans and the theoretical arcs of fire would indicate that all such parts will be destroyed if the limits of train are approached. It may be said, with reason, that in the battle there would be no attempt and no particular necessity for saving these portions of a ship, as they are certain to be destroyed by the enemy's fire, and, therefore, risks, would be taken in order to get in a successful shot, no matter what the consequence might be. Nevertheless, it will be well to reduce as far as possible the danger likely to arise in ordinary practice.

In the Texas two 6 inch guns on the same deck as the turrets and several machine guns and search lights on the hurricane deck above the turrets will be in advance of the muzzles of the 12 inch guns when they are fired in line with the keel. The charge of the 12 inch gun will be about 400 pounds of powder, possibly 500 pounds, and the blast and concussion will be terrible. In the light of present knowledge, it would seem improbable that the crews of the smaller guns can remain at their quarters when the big guns are fired fore and aft. One thing is certain, the plans of ships now in process of construction should be scanned with great care to prevent the possible necessity for expensive and radical changes in the hulls of such vessels and in the disposition of their guns.—*New York Times.*

Collegians vs. Apprentices.

The question is often asked why educated young men do not succeed as well in obtaining employment as do boys who have grown up in trade, and received their education and experience along with the hard knocks commonly called "getting the eye teeth cut." That the fact, as thus stated, is true cannot be denied. The precise reason would, perhaps, be hard to find, but there are many things which the mind recurs to at once as having a bearing on the subject.

First, college-bred young men are without experience on the practical side of life. The pushing, alert business man is not particularly impressed with the value of a college degree in forecasting the market or determining the value of "job lots," because he knows business is not a theory all, but a hard fact. Then, too, collegians often give themselves superior airs, which do not go down with their associates, the majority of whom have received honorable scars in their fight with circumstances, and have little tenderness for carpet knights. Moreover, the impressionable and formative period of life having been spent in the school room, they have not acquired that alertness, that power to grasp a business situation or problem and instantly solve it. Nothing in their school books taught them the shrewd, watchful readiness competition makes necessary. Their refined mental discipline is almost useless, and at once upon entering the field of trade they find they have a great deal to unlearn. It is not to be denied that a three dollar clerkship and the slow, painful climb to business manhood must seem insulting to a young fellow who can toss off Greek hexameters on call, or deliver an oration on Ciceronian Latin. We are far from denying the value of academic training to the professional man, but the tradesman's requirements are different.

Take the young fellow who left school as soon as he had mastered the rule of three, and entered upon the struggle for existence. His mind was open to all impressions—he learned business without knowing he was learning, as a child learns to talk. He has formed business habits unconsciously. His mind was moulded to alertness, rapidity of thought, promptitude of action, the requirements of business character. Let us illustrate. Take a little fellow of eight or nine years, brought up in a well-regulated home, and place him beside the street Arab, bootblack, or newsboy. On the score of mental activity and practical knowledge and shrewdness, the latter will run him to cover in two minutes. Does not some such difference exist between the educated young man and the one to whom business has been a matter of daily life since early youth, which makes employers prefer the latter? Is there not some way of combining an intellectual with a practical business training which will inure to the benefit of all concerned? We have no desire to discourage intellectual ambition, but the majority of mankind must work for their living, and the time to receive the necessary training for that work must, to accomplish the best results, be commenced in youth.—*Baldwin's Textile Designer.*

The Nerves and the Moods.

Nothing in nature is more marvelous than the network of nerves constituting what we sometimes carelessly call our nervous system. Each nerve is a telegraphic cord in itself. Each is a part of the whole complex and inimitable system of telegraphy by which messages from the headquarters in the brain are sent to the minute stations in the extremities. If this telegraphic system of nerves were erected on diminutive poles outside of our bodies, it would be a most peculiar exhibit.

Happily for us, our nervous systems are, as it were, a harmonious arrangement of underground wires, carefully buried within us, and deftly concealed from outside observation. We cannot see them, nor know whether they are too slack or too tightly strained We can tell when they are disturbed, for neuralgic agony shoots along their course from station to station. When we are glum, and dismal, and low-spirited, the telegraphic apparatus is out of order, and the nerve forces are demoralized. When nerves work wrong, it is as when telegraphic poles are shaky, or wires tangled or crossed, or currents irregular, or batteries confused.

According to the irregularity of our nerves, so are our irregular moods. If all is right, we are happy and cheery and sunshiny. But let the batteries blunder, or the currents cross, or the wires become entangled, and we are irritable, sulky, ill-tempered, or angry, as the case may be. In some of our distressful moods we pout and sulk, and misinterpret, and misunderstand. We take offense where no offense is intended, and we impute to others motives which are never conceived by them.

At times when the moods are out of sort, we think the whole world is persecuting us, and we, the afflicted objects of persecution, are above all other human creatures singled out for martyrdom. There are circumstances under which most of us can, without insuperable difficulty, rise from the moodiness which is brought about by letting the nerves have their own way. Mental and physical diet has much to do with it. Brooding over real sorrows and imaginary miseries will make the best of us moody and wretched. Nursing grief and affronts and telling the sad story of our woes has as depressing an effect as narcotic drugs.

Sleeping in unventilated rooms often produces chronic wretchedness, even if these rooms be furnished with the appliances of wealth and refinement. Association with grim persons is depressing and dispiriting. Good health, mental, spiritual, and bodily, is worth working for. It casts out the malaria of moodiness and lifts us into the sunlight of joy. Good health is more easily attained than most folks suppose.—*The Christian at Work.*

The Power of Words.

The effect an advertisement has upon the reader is very well illustrated by the following, as related in the *Mechanical News:*

A wealthy man who owns a country residence recently became dissatisfied with it, and determined to have another. So he instructed a real estate agent famous for his descriptive powers to advertise it in the papers for private sale, but to conceal the location, telling purchasers to apply at his office. In a few days the gentleman happened to see the advertisement, was pleased with the account of the place, showed it to his wife, and the two concluded that it was just what they wanted, and that they would secure it at once. So he went to the office of the agent and told him that the place he had advertised was such a one as he desired and he would purchase it. The agent burst into a laugh, and told him that was a description of his own house where he was then living. He read the advertisement again, cogitated over the "grassy slopes," "beautiful vistas," "smooth lawns," etc., and broke out, "Is it possible? Well, make out my bill for advertising and expenses, for, by George! I wouldn't sell the place now for three times what it cost me."