MECHANICAL INVENTIONS.

Mr. John G. Carnahan, of Oxford, Ind., has patented an improvement in stem-winding watches which is both simple and efficient. The invention relates to that class of stem-winding watches in which the winding and hand-setting mechanism is engaged with the gearing for winding up the mainspring and the gearing for setting the hands by the longitudinal movement of the stem. In the present invention, when it is desired to set the hands, the stem is first drawn out, which causes a collar on the inner end of it to bear on a stud in the shorter arm of a two-armed curved lever and so depress the long arm of the latter, which turns a yoke and disengages the gearing from the mainspring arbor, and connects an independent wheel with the hand-setting train to which motion is imparted by turning the stem. As soon as pulling on the stem ceases the yoke is thrown back to its place by a spring. Normally another wheel, carried by the yoke, meshes with the arbor wheel of the mainspring, and is thus always ready for winding by pressing down upon and turning the stem.

An improved cotton gin has been patented by Mr. Joseph Kopfler, of Amite City, La. In this improved gin the power is applied by band and pulley to the saw shaft, and the brush cylinder which operates in connection with the saw is driven by frictional contact of pulleys fast on the shafts of the saw and brush cylinders. To vary the pressure of these pulleys one upon the other, and to relieve them from contact when required, the bearings of the brush shaft are adjustable by means of a cam lever. This not only provides for wear of the driving surfaces of the two pulleys, but saves much wear by readily permitting of the stoppage of the brush cylinder. Combined with the brush cylinder is a picker to straighten the fibers of cotton passing through the gin. This picker, which is armed with rearwardly-projecting spikes that are swept by the brushes, is driven by band and pulley from the saw shaft, and is partially inclosed by a shield which is constructed so as to present no salient angles to interfere with the brush in its revolving movement.

Messrs. Stillman W. Robinson and Lewis C. Kiser, of Columbus, O., have patented an improved air compressor. The frame of this machine is of triangular form, containing the air receiver within it and having four cylinders arranged at the corners of it, two of which are for air and two for steam, and a single shaft located at the apex of it. This shaft is provided at its opposite ends with cranks, each of which is connected with a pair of cylinders at one end of the compressor, which cranks are arranged to secure equalization of power and resistance. Such arrangement of parts is both compact and efficient. In this arrangement, also, two connecting rods are combined with a single crank by means of a block rigidly connected to one of the rods and turning upon the crank pin, and carrying also the joint pin for the other connecting rod, whereby frictional resistance is reduced. Furthermore, the air cylinder and eduction pipes have combined with them pockets containing the induction and eduction valves and passages, which pockets are made detachable and interchangeable to facilitate repair.

Mr. Christopher Lewis, of Columbus, Ohio, has patented an improved continuous rolling mill. This invention relates to mills for rolling rails, girders, plates, etc., and its object is to permit more rapid working and to reduce the manual labor ordinarily incident thereto. The invention is an improvement in that class of rolling mills in which several pairs of rolls have their alternate pairs arranged to be run in reverse direction to those next adjacent, and in which a laterally adjustable carriage takes the rail and transfers it from one pair of rolls to the next, so that it is passed through one pair of rolls in one direction and is returned through the next pair of rolls in the reverse direction. The invention contemplates the taking of a piece of steel from the furnace in the shape of a bloom and entering it between the first pair of rolls, whence it proceeds on through the machine without handling and comes out a perfect rail; and to this end the improvement consists in combining the series of rolls whose alternate pairs have a reversed movement with a set of carriages of constantly increasing length, a set of tracks for carrying them from the line of one pair of rolls to the next, and a corresponding set of piston rods and steam cylinders grouped together at one side of the machine, which piston rods connect with the carriages to shift them at the will of the engineer in charge. The invention also comprises means for causing the ingot or unfinished rail to be fed forward to the rolls after the carriages bring them successively into line with the rolls; and also means for turning over the article being rolled to suit the different positions in which it may be required to be passed through the rolls.

Mr. James A. Bonsack, of Bonsack's, Va., has patented an improved cigarette machine. This invention is an improvement upon a previously patented machine by the same party, and which comprised a combination of a concave with suitably covered rollers, and also a reciprocating belt for distributing and spreading the tobacco for a uniform and homogeneous feed, also a peculiar tapering tube having an endless belt passing through it for receiving the tobacco and causing it to be curled up longitudinally to form a filler, likewise a second endless belt, that carried the filler and a strip of paper through another tube that wrapped the paper around the filler and held it while being pasted. The present invention consists in a combination with a toothed distributing roller and a double concave, of a toothed roller at the entering side of the concave, for co-operation with the latter, to feed the stock to the distributing roller and prevent it from piling up on the outside. It also comprises a brush at the delivery end of the spreading belt and its reciprocating frame, for preventing the adhesion of tobacco to said belt; likewise a toothed belt operating in combination with toothed and plain rollers, to prevent piling; also a pressing roller for forcing the tobacco down between the teeth of the belt before passing beneath the concave; and a trough-like device for forming a continuous filler, composed of three endless belts and a pressing contrivance, backing strips applied to said belts, and pulleys for distending the latter. The invention also includes a holder for the cigarette and means for projecting said holder and the cigarette during the operation of cutting the latter.

Mr. John H. Munson, of New York city, has patented an improvement in button-hole sewing machines. The object of this invention is twofold, namely, first, to avoid the inconvenience and expense of the breaking of the friction spring which bears on the carrier plate of a button-hole sewing machine, to hold said plate steady during the movement of it, which breakage has been due to the gradually increasing pressure as the work advances; and, secondly, to apply the requisite friction to the carrier plate before the sewing commences, and thereby avoid that unsteadiness of the carrier plate and irregularity of the sewing at the commencement of the button-hole, which takes place when the friction spring is fitted so that it does not touch the carrier plate till after the sewing has commenced. To these ends the invention consists in a friction arm pivoted to the bed plate, and bearing at its free end on the sliding carrier plate, by the action of a spiral spring contained in a socket that is fixed on the bed plate. This arm is so arranged that it bears on the carrier plate in a direction at right angles to the first or straight movement of said plate, so that the spring acts before the sewing commences. Said spring is arranged around a pin pivoted to the under side of the friction arm, and is held between a flange on the pin and the bottom of the hole in the socket. By this construction the required pressure can be obtained without risk of breakage, and the proper working of the machine is facilitated.

Live Millers.

The title chosen for this article is an American phrase, but not the less expressive on that account. We have certainly no desire to aid in the Americanizing of our institutions or our language, but we should be very happy if, to any extent, we could be instrumental in infusing into the minds of the millers of the United Kingdom some portion, and the more the better, of that energy which the Americans inherit from ourselves, and which, greatly to their credit, they have improved upon. The phrase is used by our brethren across the Atlantic not as expressive of vitality in the ordinary physical sense, but as indicative of the possession of a keen sensitiveness to all the influences which affect the trade with which they are identified, and a lively appreciation of the varied circumstances which, at any and all times, go to the promotion of its interests, or which may militate against them. That all the American millers are "live" in the specific sense referred to cannot, we suspect, be affirmed, for "Sleepy Hollows" still exist in that favored region of the world, just as they did when poor, simple, henpecked, ne'er-do-wellish RipVan Winkle took that memorable "nap" of his. There are, however, a very large and constantly increasing number of millers in the United States who are "live" in the strictest sense of the term as the Americans use it.

To how many of those in the United Kingdom can it be applied in a sense equally strict? We are happy to think that their number is large, and that within the last few years their liveliness has been getting more robust, while their numbers have been gradually increasing. There are indeed few millers in the country who are not "live" in the sense of looking after what they conceive to be their true interests. They strive to get the best price they can for their flour, and to obtain the raw material of their manufacture in the cheapest possible markets. They entertain thoroughly orthodox views on forward sales and long credits, although, after the manner of human nature generally, their practice in these particulars occasionally gets the better of their theoretical principles, much to their loss. They have a virtuous horror at anything savoring of laxity in the due return of sacks, and in commercial matters they have the fullest assurance that they know how many beans make five.

To be a thoroughly "live" miller in the present day, when forces have to be contended with which up to within a few years were, if not actually non-existent, so quiescent as not to disturb the steady current of the trade, requires the possession of other and higher attainments than those necessary to shield the members of the trade from the pitfalls of forward sales, long credits, and sack keepers. To be thoroughly "live," a miller at the present time must have the fullest appreciation of the changes which have taken place in the circumstances and conditions of the trade, not merely in his own country, but in every country where milling ranks as a chief industry. The history of our cotton manufactures shows how fortunes were made, and the wealth of the country increased by the skill of our manufacturers and operatives in utilizing the raw material of the Southern States of America, and selling the manufactured products to Americans and other nations. It is *not at all likely* that our millers will attempt to do with wheat what our Lancashire millowners did so successfully with cotton; but it need not be said that it is necessary that they should keep themselves thoroughly *au courant* with reference not only to the price of wheat in the various wheat-growing regions of the world, but with the conditions under which it is cultivated, the natural enemies with which it has to contend during its growth, the average surplus of the material which the different countries have at their disposal for export, the facilities which exist for its transportation to our markets, and the rates at which transport can be effected.

The "live" miller must be a diligent reader, in order that his mind may be stored with facts bearing upon his trade in all its departments. Reading is, in a very special sense, the bread which sustains his vitality in a trade aspect, and if it is not systematic and sustained, but by fits and starts, to fill up an unoccupied hour or pass an evening which hangs heavy on his hands, his vitality will suffer.

In order fairly to appreciate the changes which have been effected on the circumstances and conditions of his trade, the miller to be really "live" must have recourse to reading, because, as a rule, he cannot devote the time which would be necessary to acquire the requisite knowledge at first hand. Even supposing this could be done, he would require to be constantly on the move to keep his information abreast of the progress which is now going on with such rapid strides that the novelty of this year stands a great chance of being obsolete next. Books, and more especially the journals devoted to histrade, which photograph every step of the progressive march, are his towers of observation, from which, without leaving the precincts of his study, and incurring the expense, the fatigue, and the dangers incident to long and frequently repeated journeys, he can scan the entire field of milling practice and ascertain how and in what respects that of his foreign rivals differs from his own. Possessed of this knowledge, the "live" miller feels his vitality quickened, and as he studies the means used by his rivals for the purpose of securing the results they severally desiderate, he becomes conscious of an accession of energy which enables him to adopt measures of combating their rivalry with, at all events, a fair certainty of success.

The motto of "live" millers is "Never say die." They feel that what is possible for others can always, at the very least, be attempted by themselves. If they become convinced that they have been pursuing a wrong course, they console themselves with the comforting proverb, "It is never too late to mend." If wrong, they had, up to the other day, the entire trade for company, and being readers, they know at what precise point they discovered that a new path had been opened up, which was declared to be the only right and safe one, and they have sufficient data to enable them to decide, with some approximation to correctness, what degree of truth there is in the allegation. It is the "live" miller only who has the wisdom to know when he is wrong and the courage to take the requisite steps to put himself right, if he possibly can.

Although "it is never too late to mend," he does not defer the reformative effort a moment after he is convinced that amendment is indispensable. He may—for is he not human?—have a lingering affection for the path he has traveled in so long, and with much comfort and profit to himself, just as one has an affection for the old suit of clothes, which has almost become part of one's self, rather than for brand-new garments, which suggest no higher or more tender ideas than the tailor and the tailor's bill; but he screws his "courage to the sticking place," and discards the well-worn paths, just as he lays aside—perhaps with the sentimental tribute of a sigh—the well-worn garments. He cannot afford to gratify prepossessions which tug at his heart to the detriment of his purse, and although the music of the mill stones may be sweet to his ears, he throws them aside the moment his commercial sense is convinced that rollers or dismembrators are means for the production of flour for which there will be a larger demand and a higher price than for that produced by mill-stones.

"Live millers," so far as trade matters are concerned, obey the dictates of science rather than those of sentiment. For them the age of faith is no longer existent, and however positive may be the dogma and venerable the dogmatist, they insist on the subjection of both to the crucial test of investigation. They object to nothing merely because it is new, and they discard nothing because it is old. "What can it do?" is their question to anything recommended for their acceptance, and if the answer is demonstrably satisfactory, acceptance is the result. They are pre-eminently anti-rule-of-thumb men, but they are equally impatient of scientific theories until they have been proved to harmonize with sound and profitable practice. They have no objection to spend money in trying experiments if these give *prima facie* promise of success, but they have a very decided exception to "leaps in the dark," which in most cases result in loss of time and loss of cash, a double waste for which there is no recompense. "Live millers," in fact, are men of sense as well as men of science, who take a pride in their trade, not only as it is the method of making, if not in all cases fortunes for them, but fair competences; they also take a pride in it as a means of bringing the higher powers of their mind into that healthy play which yields the highest form of enjoyment which reasonable men can desire. They no doubt regard their mills as money-making shops, but they also contemplate them in another aspect, viz., as establishments in which processes are carried forward related to the manufacture of a material which constitutes the most important factor in the alimentation of civilized mankind.—*London Miller.*