AN IMPROVED BOOK SUPPORT.

A stand for supporting dictionaries, large works of reference, etc., and holding them in either closed or open position, has been patented by Mr. James W. Coultas, of Clinton, Ill., and is illustrated herewith.

COULTAS' BOOK SUPPORT.

The standard is vertically adjusted, and has at its upper end a serrated disk fitting against and clamped to another disk carrying the book support, in such way that the inclination of the support may be changed to suit the convenience of the user. Between a plate which receives the back of the book and a frame plate are clamped the shank plates of hinges which carry the sides or leaves of the book support, the hinges being adjustable in or out to adapt the book support to receive different thicknesses of books. A spiral spring is arranged parallel and adjacent to the axial line of the two hinged plates, one end of the spring being attached to one plate and the other end of the spring to the other plate, link bars connecting loosely the opposite ends of the spring and the hinged plates, whereby the axis of the spring is thrown away from the axis of the hinge when the latter is opened and the hinge locked in open position. The book, when open, thus rests upon a solid surface, fitted to its back and sides, and is not held open by snaps or hooks.

AN IMPROVED ROCKING CHAIR.

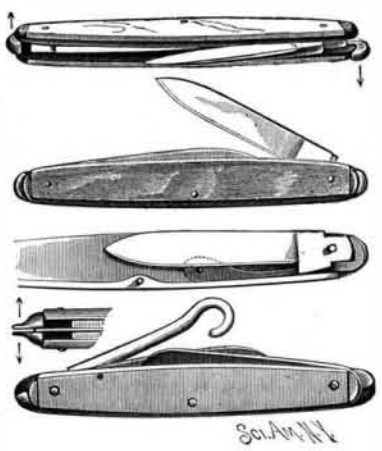
The accompanying illustration represents a rocking chair forming the subject of a patent recently issued to Mr. Lewis C. Gunn, of Seventh and Beach Streets, San Diego, Cal. The base consists of two boxes or casings connected together by cross bars, these casings providing an interior space in which is held the rockers, the several inclosing parts being so finished as to represent a solid piece of wood. The rockers are centrally pivoted on bearings in the sides of the casings, as shown in the sectional view, the shape and size of the interior space being such as to allow free movement of the rockers, the legs of which are so curved as to permit of their free movement in slots extending up through the casing near either end. The rockers are provided with a stop, in the form of a vertical projection extending upward in a central recess of the casing. This projection has a central vertical opening at the top, in which is held a brass wedge, in a groove in the top of which rests a central cushion spring, the spring moving partly through the opening below between the sides of the projections. This spring is a narrow strip of steel, so bent that the sway of the projection backward compresses one side of the spring and opens the other, and *vice versa*, when the projection moves forward.

To further aid in giving the rockers an easy and yielding movement, an elastic bearing is located beneath them, consisting of a main spring with a broad fold at each end, there being a fulcrum beneath the fold at each end of the spring, where it is made fast. The length of the spring is thus made to conform to that of the curved rocker by reduction of the fold at each end. There is a strip of rubber or leather underneath the whole length of the rocker, as a sole, preventing sound and wear of the parts in moving over the spring below. It is the design of the inventor to avoid all unnecessary weight in the manufacture of this chair, the rocker being made not to exceed three-fourths of an inch in width, of a malleable casting, with long recesses to be filled by tightly-fitting wooden strips. Each end of the rocker is solid, with a hole drilled from the top to admit of a threaded bolt by which the leg is attached, the latter being of hollow wrought iron pipe.

GUNN'S ROCKING CHAIR.

AN IMPROVED POCKET KNIFE.

A pocket knife so constructed that the blades may be moved into position to be seized by the fingers without the use of the finger nails is illustrated herewith, and forms the subject of two patents issued to Mr. Arthur Wilzin, of No. 207 Center Street, New York City. The knives are not complicated in construction, and their general appearance and the form and action of the spring are very nearly analogous to those of ordinary pocket knives, the illustrations showing both two and four bladed knives. The pivotal portion of the blade has a projection, and a receding part terminating in a point or heel, their relative positions to the pivotal point of the blade being such that the projection and the heel will bear against the blade spring in the back of the knife to hold it slightly open. To hold the blade in closed position, when pressed into the handle, a locking device is provided consisting of a pin mounted on a spring arm, the pin projecting through an opening in one of the end tips. After the blade has been slightly opened by moving the pin laterally, which is done by pressing back the tip, the blade may be seized by the fingers and pulled to fully opened position, when the pin will rest against the side of the pivotal portion of the blade.



WILZIN'S POCKET KNIFE.

AN IMPROVED BINDER.

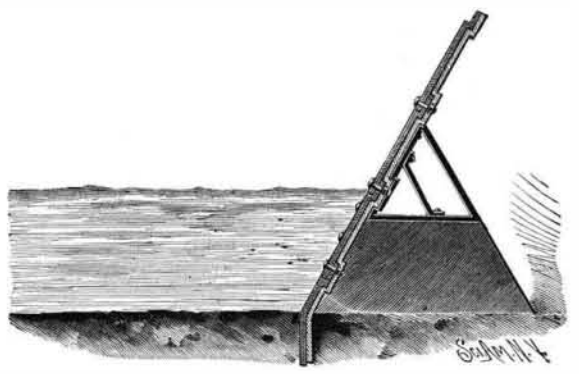
A binder or portfolio in which sheets of a newspaper, pamphlet, etc., may be conveniently bound and quickly removed when desired, and in which a sheet containing an illustration may be extended across the fold in such way that all parts will be visible, is illustrated herewith, and has been patented by Mr. Emil Wansleben. The portfolio has angled brackets attached to its inner face adapted to hold a longitudinal bar in fixed position, from which bar a series of pins is projected. A second detachable bar of equal size is provided with apertures corresponding with the pins, and upon the outer face of this bar springs are held to slide, their movement being limited by studs integral with the bar, projecting through elongated apertures in the springs. One spring is placed between each two apertures in the detachable bar, and a semicircular recess is formed in each extremity of the spring adapted to bear against the pins on the fixed bar when the device is in use. The springs are slightly bowed, and are expanded by sleeves sliding over them upon the detachable bars. The needle employed consists of a strip of wire bent upon itself to form a series of staples corresponding to the number of pins on the fixed bar.

For further information relative to this invention address Mr. Henry Rohr, St. John, Kansas.

MR. JOSEPH M. GRIGGS, general ticket agent of the Boston and Albany for about 24 years past, has resigned, and is succeeded by his son, George B. Griggs, who has been in the service for several years. The retiring general ticket agent has been in the service of the Boston and Albany and its predecessor, the Western Railroad, for 47 years, having begun in 1842. He was for a long time cashier of the road, and before that was local ticket agent.

IMPROVED PROTECTOR FOR DIKES OR LEVEES.

A removable shield or protector, which may be placed at points of danger in dikes or levees in times of high water, in order to prevent disaster, is illustrated herewith, and has been patented by Messrs. James M. McLemore and Charles D. Jones, of Coushatta, La. The shield is made in sections of cast or wrought iron, bolted together, each of the sections being formed with a rabbet, on which the overlapping section fits to make a smooth front and a water tight joint. This shield is applied to and extends below the water front of the levee, as shown in the sectional view, where four of these sections are used. The shield is backed by the front wall of the levee, but extends above the crown of the latter, where it is strengthened by braces firmly bolted or otherwise anchored. This shield can be used upon either old or new levees, and when used in new constructions allows a much smaller quantity of material to be employed than ordinarily.

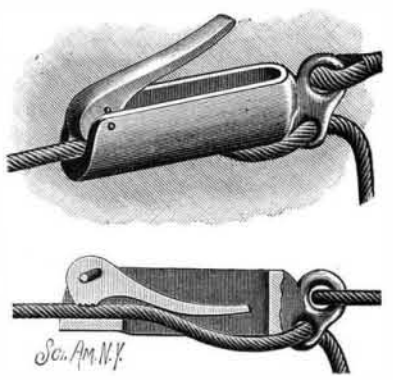


McLEMORE & JONES' LEVEE PROTECTOR.

AN IMPROVED ROPE CLAMP.

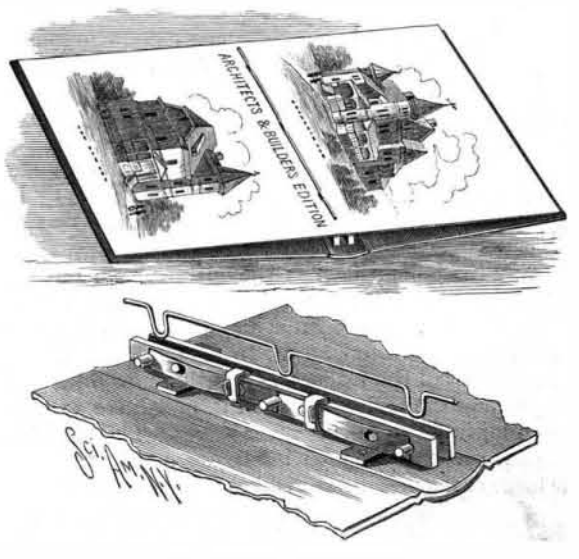
A simple form of clamp, especially adapted for use on clothes lines, tent ropes, etc., is shown herewith. It has been patented by Mr. S. William Conklin, of Yonkers, N. Y.

The frame of the clamp is preferably made of malleable cast iron, in one end of which is pivoted a clamping lever, formed with an eccentric notched upon its lower surface to engage the rope. The clamping lever has an inclined slot for its pivotal pin, so that any strain upon the rope will tend to draw the lever forward and force it downward upon the rope, thus increasing its holding action. The opposite end piece is formed with a ring by which the clamp is secured to one end of a rope, and also a lower ring through which the opposite end of the rope is passed after being drawn through the open space back of the clamping lever.



CONKLIN'S ROPE CLAMP.

IN a recent lecture at the Society of Arts on the Forth Bridge, Mr. B. Baker described a practical method he had adopted for the purpose of determining the effective area of the bridge exposed to a wind pressure striking the work at different angles. A model of the bridge was made and towed in water at different angles to the stream; the area of a flat board normal to the current was then determined, which exerted the same drag as the model. This area was then taken as the effective area of the bridge for the particular angle at which it was towed.



WANSLEBEN'S BINDER.

Do Machines Hurt a Trade?

BY THEODORE L. DE VINNE.

There seems to be an uneasy feeling among compositors about type-setting machines. It is true that only three of the many recently invented are at practical work, but all of them give a promise of usefulness, if not in all fields, at least in some field of composition. It is certain that the machines have come to stay. Compositors fear that they will reduce the price of labor, and will indirectly drive them out of business.

Much of this disquietude is unnecessary. That type-setting machines may or will reduce the cost of the work on reprints and cheap books and papers is probable. That it will ever drive any large body of good workmen out of business is absurd. The machines will surely make more work for workmen. So far from decreasing the standard of workmanship, they will elevate it. This conclusion is warranted by a review of the changes in the trade made by inventions in another department—that of presswork.

Fifty years ago the advantages of machinery in presswork were recognized in this country, but they were not fairly tried. Stereotype, composition rollers, cylinder presses, and Adams presses had then been invented, but were little used. The New York *Sun* and New York *Herald* were trying to print growing editions of their then petty sheets on hand presses. Harper & Bros. and other book printers in New York were doing their presswork on hand presses. Books were cheap and editions were small; pressmen were abundant and wages were low. Journeymen piece compositors were paid an average of twenty-four cents per thousand ems, and earned seven dollars a week with difficulty. Weekly wages for time compositors were nine dollars, but this sum was earned only by the more active and expert. The average wages of piece compositors, and occasional time hands was not over seven dollars a week. Hand pressmen, paid almost entirely by the piece, had to do an amount of hard labor to earn nine dollars a week which the modern power pressmen would regard as excessive and unreasonable.

Although work was hard and wages small, there was even then a dislike to machinery—a dislike which seems to have been imported from abroad. Johnson, an eminent printer of London, had already denounced the printing machine, then in use in London, as the destroyer of the living of pressmen, and called upon Parliament to impose a tax on machine presswork, so that machines could not work for a lower price than hand presses. In 1830, and even as late as 1848, the journeymen printers of Paris destroyed printing machines in the Royal Printing Office of that city as well as in other offices, because they said that these machines were taking the bread out of their mouths. Stereotyping, invented by Ged in the last century, had been delayed more than fifty years by the opposition of hand pressmen, who secretly battered plates in the supposed interest of compositors. Master printers were afraid to use the new process. Composition rollers were opposed by pressmen, because they enabled a boy to do the work of the extra man, who wielded the old-fashioned inking balls. The first inking machine attachment was found more objectionable, because it enabled the master printer to dispense with this extra roller boy or this extra man who had been regarded as necessary to the working of the hand press. Every invention or process that increased production was regarded by working men as an evil agency.

In this country there has never been any active hostility to new machinery in the printing business. There have been no mobs or strikes against inventions, but workmen look on all new devices with suspicion and unfriendliness. They do not see that the invention which temporarily throws one man out of work ultimately makes work for two or more men.

What would have been the state of the trade if we had no stereotype or electrotype, no composition rollers, and no printing machines? The daily newspaper, as we now have it, would be an impossibility. An edition of two thousand or twenty-five hundred copies of a small sheet would be the highest performance of the hand press, and what severe work this paltry performance would impose on the wretched hand pressman who had to print this edition in a hurry! The illustrated magazine of large edition and low price, filled with fine wood cuts, could not exist at all in days of hand presses. One could go on and show how hand presses would curtail the production not only of the popular but of the artistic forms of typography.

Processes and machines that were once dreaded are now used by every printer, and they are welcomed as much by the journeymen as the master. No one will pretend that they have reduced the number of workmen. Where there was one printer fifty years ago, there are at least twenty printers now. Instead of driving hand pressmen out of the trade, the printing machines have really brought more pressmen in it, and have enabled an employer to pay them better wages. The machines have not even driven good hand pressmen out. In all our large cities the expert hand pressman is in active demand. He does but one-half the labor of his predecessor, yet he is paid twice as much and has steadier work. For some forms of printing the hand press is more economical than any machine, and if there were more men who could use them skillfully, they would be more generally employed. They are not used because it is difficult for an employer to get a boy to learn this branch of press-work. He objects, because the work is hard. Not even for double or treble the old pay will a pressman in 1889 undertake to do on a hand press the work done by all pressmen in 1840.

The journeyman book compositor of New York, who works by the piece, now earns an advance of seventy-five per cent on the rates of fifty years ago. The time hand gets twice as much. Expert machine pressmen in the larger New York book offices are paid $20 and $22 a week—an advance of more than one hundred per cent. If they are specially skillful or active, they are cheerfully paid a good deal more. They have steady employment and comparatively easy work. It should be noted that the highest wages are always paid in those offices that have the most and best machinery. Low wages are the rule almost without exception in all offices that have little or no machinery. Instead of throwing men out of work, machinery has made a demand for more work. Instead of lowering the price of labor, machinery has raised it.

It will be noticed that the prices of composition have not increased as much as those of presswork. The compositor's advance is seventy-five per cent or less; the pressman's is one hundred per cent or more. The reason is plain. Composition has not as yet received any appreciable benefit from type-setting machinery. Nearly all of our composition is done by hand, as it was done fifty years ago, but the piece compositor who works in an office that has many printing machines earns more than he does in an office that has few machines. Indirectly he obtains advantages from machinery, which he personally does not manage.

As a rule, the average piece compositor is a better educated man than the average pressman. Under equal conditions he should and would earn higher wages, but his superior intelligence and education do not increase his production. This production is limited by the slowness of his hands, which is now as it was fifty years ago. If the compositor was employed on a type-setting machine, he would get some of the benefits of the increased production. With more machines there would necessarily be more composition; there would be more compositors, and they would be better paid.

One reason why the modern pressman is better paid than the old pressman is because he is a better workman. The machine is more complex than the hand press, and it compels the pressman to exercise more forethought and intelligence. He has to keep it in order and to get a fixed quantity of work from it within a limited time. To accomplish this he does not have the hard stretching of the muscles that was called for by the hand press, but he does have to do twice as much work with his brains. It is this work of the brains more than that of the hands that earns him higher wages, but it is the machine that spurs him up to this increased mental activity.

As a rule, the mechanics who most bitterly decry machines are those who have been found incompetent to handle them. The men who refuse to learn the theory or the practice of new processes—who are content to do work as it was done when they were boys—who "don't want to be bothered" by the study of new problems in handicraft—who evade or shirk responsibilities—are the very men that employers don't want to employ upon their machines. That they may and probably will suffer for their persistent refusal to adapt themselves to changed conditions is much to be regretted; but are they blameless? Is it the fault of the master, or the machine, or the workman himself?

It is probable that many employers will at first try to get composition done on machines with the cheapest labor. Many of them will employ poor workmen, inexpert boys and girls. They will sophisticate themselves with the notion that a cheaply paid helper will soon be taught to do as much as an expert workman. This is the error that was made when power presses were first introduced. There were employers who reasoned, "It is the machine and not the man that does the work. The machine is the first consideration and the man the second, a cheap man can be made to do as much work as a high priced man." This fallacy is no longer believed. Every master printer who does good presswork, or even tries to do a large amount of of presswork in a given time, regardless of quality, knows that an expert workman at high wages is always more economical than the cheap workman. He takes better care of the machine, he gets more work out of it. The same conclusion will be reached after a long trial of type-setting machines. The expert man who thoroughly understands his business will always be in demand. He never need to fear the competition of boys, or girls, or amateurs.

It is really amusing to reflect on the cheerful short-sighted stupidity of the earnest trade union men, who so violently opposed all improvements in typography. Really meaning to benefit the trade, they were actually doing their best to destroy it. If they had carried their point, if they had suppressed all labor-saving devices, if they had kept the trade in the same narrow rut it was in fifty years ago—what would be the present condition of most of the men who are now earning fair wages in pleasant situations in our trade? It is plain that if these improvements had been prevented, they would not be in the trade at all. There would be no place for them. The limited amount of work that could be done on hand presses would have kept them out. They would have been obliged to find employment in other fields. Most of them would have had to do hard manual labor, or accept inferior situations in which they could with difficulty earn nine dollars a week. In view of the enormous blunder then made by sincere men, a thinking compositor may now well question the wisdom of the policy that oppresses type-setting machines. — *National Publisher and Printer.*

New Barometer Scale.

BY JAMES ASHER.

Instead of saying the air supports a certain height of mercury, I state the ratio of given pressure to standard. I say pressure is 1,000 thousandths of normal in place of saying it sustains a thread of mercury 760 mm. high. The point 760 in barometers will be marked 1,000; divisions 0·76, usual length.

ADVANTAGES.

1. Scale tells fraction of normal pressure in decimals.
2. Divisions are shorter, hence greater accuracy with integers.
3. Using it with my milligrade thermometer scale (see SCIENTIFIC AMERICAN, Nov. 26, 1887), we can correct bulks of gas to normal pressure and temperature with elegant simplicity. In correcting to standard temperature, 1.000 is numerator and temperature denominator; and to standard pressure, 1,000 is denominator and pressure numerator: 1,000 cancels. Hence the brief

RULE.—Multiply by pressure and divide by temperature.

Ex.—Barometer shows 983 thousandths, thermometer 1,065° milligrade; what will 648 c. c. of gas be at normal?

Solution: $\frac{983 \times 648}{1065} = 598{\cdot}1$ c. c.

4. With equal ease we find weight of bulk, given pressure, and temperature.

Ex.—A gramme of H at standard fills 11·19 liters; what will 43 liters weigh, barometer 1,013, thermometer 954° M?

Solution: $\frac{1013 \times 43}{954 \times 11{\cdot}19} = 4{\cdot}08$ grammes.

Problems need a third of usual time.

5. Aneroid and sympiesometer in graduations will be independent of mercurial barometer.

[The above is an excellent suggestion and well in line with the milligrade thermometer scale. The present barometric scale is so awkward that Prof. Bunsen, in his gas analysis calculations, reduces all volumes in his formulæ to a pressure of 1,000 millimeters.—ED.]

Remarkable Runs by the Strong Locomotive.

In our issue of January 12 of the present year, we gave an illustrated description of the Strong locomotive A. G. Darwin. At that time the engine was doing express service on a New England road, which was not a fit place for the development of the locomotive's capacities. In order to test these to the uttermost, two trial runs were made upon the New York, Lake Erie, and Western Railroad, between this city and Buffalo. On April 1, at 9:24 A. M., the engine left Jersey City with six cars. Other cars were picked up *en route*, so that at one time nine cars were attached. Over part of the route a speed of 65 miles an hour was maintained with this heavy load. Several delays occurred, one near Callicoon, where a derailed train was in the way, and another of equal duration at Hornellsville. These delays the engine made up without difficulty. Between Hornellsville and Buffalo snow was encountered. At 10:27 P. M., three minutes ahead of schedule time, the engine reached Buffalo, an unbroken run of 423 miles. This made one of the most remarkable runs on record, eclipsed as to length by the famous Jarrett & Palmer train, which, in 1878, was taken to Pittsburg, 444 miles, by a single engine. This train, however, only consisted of three cars.

A special party accompanied the Darwin, including representatives of various railroad interests, and the inventor, Mr. George F. Strong. It was driven by Mr. George McRae, an engineer of the Strong Co. Erie R.R. engineers accompanied him as pilots. It now remained to show that this remarkable run was made without undue effort; accordingly, in a snow storm, on the morning of April 2, the same engine started from Buffalo on the return trip. With a load varying from nine to eleven cars, the return was made on exact schedule time, the train reaching Jersey City at 10:55 P. M. A special interest attaches to these runs, in view of the fact that the road traversed is of about the same length as the famous London-Edinburgh roads on which the fast running occurred last summer.