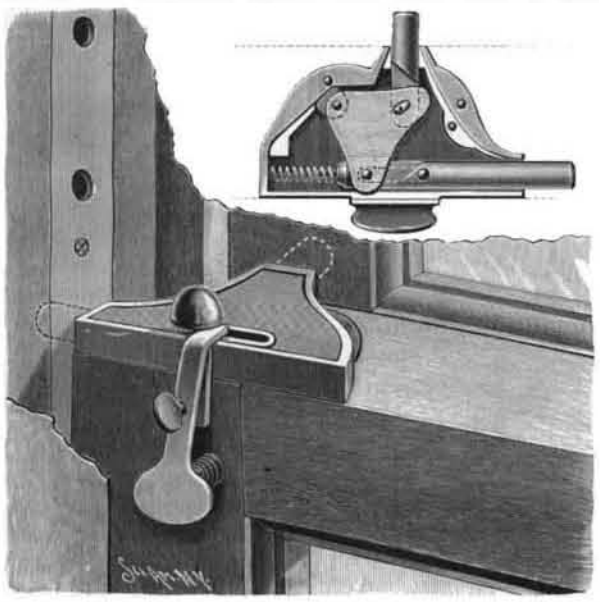
AN IMPROVED SASH FASTENER.

This is a simple and readily operated device to lock sashes in a closed or open, or partially open, position. It has been patented by Mr. Benjamin F. Rathbun, of No. 99 Winslow Avenue, Buffalo, N. Y. In a suitable casing, to be attached to the top of the lower sash at one side, are arranged two bolts at right angles to each other, one to engage an apertured keeper in the window casing and the other to engage a similar keeper in the stile of the upper sash, these keepers being simply attached metallic strips having apertures at the desired distances apart. The inner ends of the

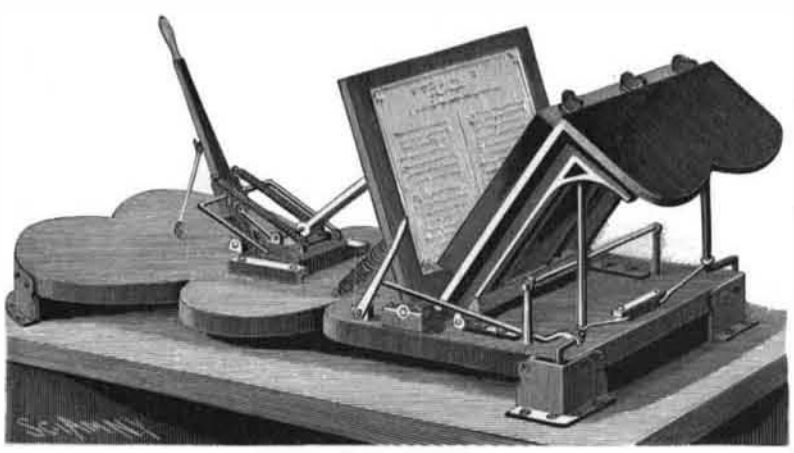


RATHBUN'S SASH FASTENER.

bolts, as may be seen in the small figure, are pivotally connected with a bell crank lever fulcrumed in the casing, the lever being connected with a knob whose shank extends through a slot in the top of the casing. In the casing is a spring pressing against the inner end of one of the bolts, thereby normally operating to move both bolts to an outermost position and lock the sash, but by the movement of the knob, actuating the bell crank lever, both bolts may be simultaneously withdrawn. To lock the knob in either of its two positions, a locking arm is mounted to turn on a bolt secured in a projection of the casing and the top of the sash, the upper end of the arm having an extension adapted to engage the shank of the knob on opposite sides, while its lower end is formed as a thumb piece, where a spring pressing against its under side normally holds the arm in the position shown, in engagement with the shank of the knob. To move the knob in either direction, the operator presses upon the thumb piece, the release of such pressure causing the locking arm to lock the knob in the position to which it has been moved, with both bolts withdrawn or in their outermost position.

A NOVEL PRINTING PRESS.

The illustration represents a hand press of simple and inexpensive construction which has been recently patented by Mr. Daniel Maurer, of Middle Village, N. Y. The type bed is hinged to the bed plate, the chase holding the type or form to be printed being held



MAURER'S PRINTING PRESS.

in position on the bed by set screws or other suitable locking means, while an ink table extends backward at right angles from the upper edge of the bed. As shown in the engraving, the bed is inclined backward in position to receive a form, but it is brought to a vertical position for making the impression by means of a hand lever connected with a rocking yoke, rocking levers being connected by the yoke with the rear of the type bed to move it to a vertical position or incline it rearwardly. When moved to its vertical position it is held against the pressure of printing by the inclination of the levers at its rear, these levers being then engaged by a removable tie-rod passed through brackets at either side of the base.

The platen is pivotally connected to the bed plate in front of the type, against which it is brought to bear by means of springs connecting it with the bed plate, any number of such springs being employed, and pivotally connected centrally with the back of the platen is an arm whose opposite end is pivoted in a block moving in slide ways upon the bed plate. A hand lever is pivoted in the rear of and connected by a link with the sliding block, and two springs also connect the lever with the block, the tendency of the springs being to draw the hand lever in the direction of the platen and assist the other springs to keep the platen up against the type bed. When the platen is to be held away from the type bed, the hand lever is engaged by a latch, as shown in the engraving. In operation, the form having been inked and the paper placed on the platen, the type bed being then in vertical position, the hand lever is drawn back and then released, the springs causing the platen to approach the bed with a quick movement, or the platen may, if desired, be permitted to approach the bed slowly by retaining a grasp upon the lever.

Mortality Report of New York State.

The New York State Board of Health has gathered together some very valuable figures concerning the causes of the deaths throughout the State during the calendar year 1894. The entire number of deaths reported was 118,195, and of this number 71,055, or 60 per cent, occurred in the maritime district which includes New York, Brooklyn, Long Island, Staten Island, and Westchester County. It is noteworthy that the mortality from diphtheria in the maritime district is very high and has been rising steadily during the last four years. In 1891 in this district 46·41 deaths in every thousand was caused by diphtheria; in 1892, 47·90; in 1893, 51·14; and during the past year, 71·27. The diphtheria death rate has increased, it will be seen, notwithstanding the careful precautions which have been taken in sanitation and in methods of diagnosis. It is expected, however, that the use of the serum remedy will considerably diminish this mortality. During the year nearly one-ninth of all the deaths in the State were caused by consumption. The mortality from this disease has declined since 1889 from 120 to 108½ per 1,000 for the entire State and from 123 to 110 in the maritime districts. There has been, however, an increase for the past two or three years in some of the central districts.

The death rate from typhoid fever, in the maritime district, has steadily declined since 1889. The district which includes New York and Brooklyn reported 60 per cent of the entire mortality during the year, while but 34 per cent of the deaths from typhoid fever occurred in this section. These very favorable results are thought to be due largely to the purity of the water supply of the two cities. A gradual reduction of the death rate from tuberculous diseases is expected in the next few years. The public is being gradually educated concerning sanitary precautions and the danger of infections from various sources.

Remarkable Balloon Voyage.

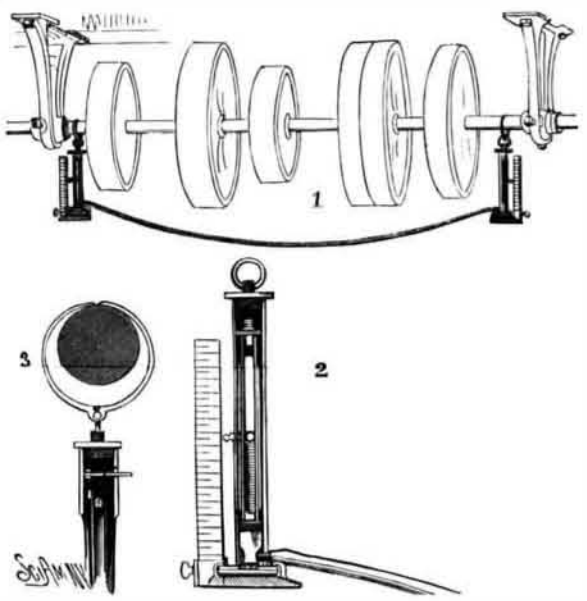
A remarkable balloon voyage was made in Germany a few weeks ago by Dr. A. Benson, during which the balloon reached a height of 31,496 feet, or nearly six miles. The balloon was equipped with various instruments for making observations, and much of interest was observed concerning atmospheric physics. Dr. Benson retained consciousness throughout the entire voyage by breathing artificial oxygen prepared for the purpose and carried in bags, and his observations are unusually complete and interesting.

It is noteworthy that up to a height of 1,500 meters the temperature rose steadily. At this elevation the thermometer indicated 5 degrees Centigrade above zero. The air meanwhile was foggy and thick clouds frequently hid the earth from view. At an elevation of 5,000 meters the temperature sank to 18 degrees below zero. The atmosphere at this height was very dry, and the sun's rays very weak. The artificial respiration was commenced at an altitude of 6,750 meters, the temperature at this height being 29 degrees below zero. When Dr. Benson found himself at 8,000 meters he tried for a moment to breathe the natural rarefied air, but found it would be impossible to retain consciousness at such a height in this way. His voice at this height sounded strangely muffled. The temperature meanwhile had sunk to 42 degrees below zero. At 9,000 meters he passed up through the thin stratum of high cirrus clouds and found the stratum consisted of small well formed snowflakes. The extreme height of 31,496 feet was reached two and a half hours after the start, and the thermometer at this point stood at 47·9 degrees below zero. In this extreme cold Dr. Benson suffered considerably, although he was clothed in heavy furs. Two of his fingers were frozen during the voyage.

Dr. Benson calls attention to several interesting facts which have been established by his voyage. He found humidity in the highest regions and observed fine mist in the sky to the astonishing height of more than 10,000 meters. It was also noted that the cirrus clouds at a height of 9,000 meters were formed of snowflakes, and that to a height of 15,000 meters there is a change of temperature mornings and evenings, but not above this level, and much more of more technical scientific interest. The voyage is considered to be one of the most satisfactory ascensions on record.

A DISTANCE LEVEL INDICATOR.

A leveling device for use in machine shops, and by bridge builders and others, and which is arranged to conveniently level in places considerable distances apart without the use of straight edges or other tools, is shown in the accompanying illustration. It has been patented by Mr. James Darragh, No. 5 Prince Street, New York City. In Fig. 1 it is shown in use for leveling shafting, Fig. 2 being an enlarged sectional side view of one of the indicators, and Fig. 3 representing a transverse section at the top of the indicator. It has two similar liquid indicators, connected with each other by a flexible tube, and secured to the base of each is a metallic tube with open sides, the metallic tubes holding each a glass tube connected at its lower end with one end of the flexible tube. The two glass tubes are normally filled about half their height with liquid, which fills also the flexible tube, so that on raising one of the indicators its liquid will fall and that in the other indicator will correspondingly rise. The upper end of each glass tube is adapted to be closed by a lever valve, and in it is also arranged a self-closing check valve to prevent loss of the liquid, while a



DARRAGH'S LEVELING DEVICE.

float in each of the tubes plainly indicates the rise and fall of the liquid, there being also a pointer vertically adjustable on the metallic tube to mark the original height of the liquid when the two indicators stand on a level. For conveniently suspending the indicators in practice, each indicator has at its upper end a ring engaged by a suspensory device resembling calipers whose curved jaws are adapted to embrace a shaft. A suitable spirit level is arranged on each indicator base to indicate its proper horizontal position, and at one side is a vertically adjustable graduated rod. Instead of supporting the indicators by the calipers, they may be set with their bases on different articles which it is desired to level.

Modernizing of an Ancient Bridge.

It has taken two years to partly rebuild a bridge at Rome which, it is stated, dates from the time of the Emperor Adrian, an assertion which is in strict consonance with many other remarkable features distinguishing the Eternal City. It does not appear that the necessity for the partial reconstruction arose from any absolute want of repair in the ancient structure itself, but was due to the new conditions to which the bridge was subjected in consequence of the works undertaken in connection with the improvement of the river Tiber. These included the better regulation of the course of the river, a widening of the channel and a raising of both banks. The result was that at one end the approach to the bridge was below the level of the newly raised bank. Originally the structure consisted of three principal arches of 56 feet span each, and three smaller ones of 12 feet. The latter were for the purpose of allowing for the passage of floods, and have now been replaced by a pair of arches of the same span as that of those first built, which brings the roadway of the bridge almost on a level. The structure as it now stands has five elegant and symmetrical arches of equal span. In fact, if it were not for the difference in tint of the old and new masonry, it would be almost impossible to distinguish the handiwork of to-day from that of nearly eighteen hundred years ago.

Completion of the Jeddo Tunnel.

The Jeddo Tunnel, five miles long, driven for the purpose of draining coal mine workings near Hazleton, Pa., has just been finished. These mines, says the Railroad Gazette, were flooded by the breaking through of surface streams, and have been abandoned for seven years. The working did not extend more than 450 feet below the top of the mountains upon which they were located. This made the tunnel a possibility, the plan being to drive in from Butler Valley, five miles off. Two shafts were sunk and boring was done in five sections. Work was begun in the spring of 1891. The progress was slow, the rock being very hard. Red, green, and gray sandstone, conglomerate, fine grain, large pebble, and black sandstone were met during the boring. Ingersoll-Sargent rock drills were used and the blasting was done with forcite, a refined form of dynamite, less powerful, but giving out but little fumes and smoke. Of this 350 pounds were used. As originally planned the tunnel was 8 feet by 8 feet, but this was changed to 7 feet by 9 feet. Many streams of water were met with, which was pumped from the different sections. The bore hole from the flooded workings was cut with a jump drill and rope. For 250 feet a 12 inch hole was worked. Then the bore was changed to 6 inches for 170 feet, and from here to the tunnel, 20 feet, was reduced to 4 inches. Iron pipes surrounding the drill keep the water out of the tunnel. The 4 inch hole is now stopped with a hickory plug. When the iron casing and plug are removed, about 8,000 gallons per minute will empty into the tunnel. About two months will suffice to empty the 500,000,000 gallons now in the workings. Not a man was killed during the progress of the work, and only four were injured.

Comparison of the Navies of the World.

Some interesting statistics have been compiled recently by Secretary Herbert concerning the number and the types of the war vessels of the leading navies of the world. The tables show that England has, at the present time, some 43 battle ships, 12 coast defenders, and 18 armored cruisers, and 10 battle ships building. The French navy contains 43 armored vessels built and 20 authorized and building. Russia has 40 such vessels, Germany 32 and Italy 18. These navies have, in addition, many unarmored vessels. The number of war vessels in the service of England, including protected cruisers, ordinary cruisers, gunboats and torpedo vessels, exclusive of torpedo boats, is 238, and some 48 additional ones authorized and building. The French navy contains in all 147 vessels, with 24 building. Germany has altogether 39, Russia 32, and Italy 72. Torpedo boats have come to take a very important part in naval warfare. France has 217 torpedo boats in service and 42 authorized and building; England has 165 and 64 respectively; Italy 178 and 11; Russia 163 and 14, and Germany 119. The comparison between the United States and foreign navies afforded by this table is very significant. At present the United States has 3 torpedo boats and 3 building. Such a comparison needs no comment. It is to be hoped that the United States navy may be more adequately provided in the future.

CHARACTERISTIC RAILWAY STATION IN SOUTHERN CALIFORNIA.

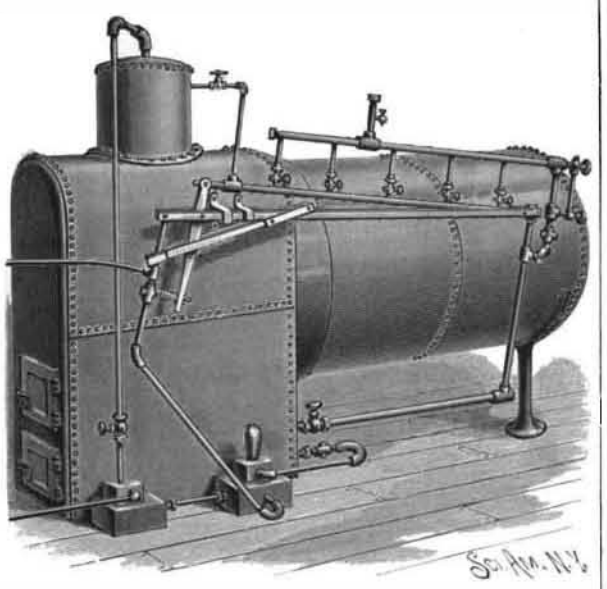
That railway corporations as well as railway men are not altogether devoid of sentiment is attested by the construction of a station at Capistrano, on the Southern California road, a good illustration of which is shown herewith. This station in its exterior is a reproduction of the old Spanish mission located at that point, the site for which was selected on the first of November, 1776. The new station, which is built closely adjacent to the site of the old mission building, follows it not only in form, but is built largely of the material taken from its ruins, while the timbers in the roof and a large portion of the flooring were brought from the Todos Santos mission at a cost fully equal to that of new timber, so that the new building will possess a historic value much beyond that of an ordinary station.

This station was opened to the public on October 22, 1894. There were present on the occasion General Manager Wade and several other of the officials of the road, together with many prominent citizens of Los Angeles and San Diego. The enterprise of the management of the road in thus preserving the ancient landmarks is to be commended and cannot fail of bringing them closely in touch with the inhabitants of the country.—Railway Review.

CAPISTRANO STATION, SOUTHERN CALIFORNIA RAILROAD.

AN IMPROVED FEEDWATER REGULATOR.

This improvement is designed to insure uniformity in the feeding of water to boilers, the regulator working without the jerks and jars frequently characteristic of feedwater regulators. It has been patented by Messrs. Charles A. and Henry F. Straub, Rouseville, Pa. An expansion pipe is arranged outside the boiler, its lower end below low water mark and its upper end above high water mark, and its lower end being connected by a vertical and a horizontal valved pipe with the water space of the boiler, while its upper



STRAUBS' FEEDWATER REGULATOR.

end is connected by a small valved pipe with the steam dome. The lower end of the expansion pipe is bolted to the end of a nearly parallel iron strap extending forward through brackets, and near the forward end of the strap is fulcrumed a lever pivotally connected with the upper end of the expansion pipe, the lower end of the lever being pivotally connected with the stem of a valve in the water supply pipe. The steam pump is in this case directly connected with the boiler, and the water supply to the pump is regulated, but instead of this arrangement the pivoted lever actuated by the expansion pipe may be connected with a valve in the steam pipe to regulate the supply of steam for working the pump. Above the expansion pipe, and connected with it by vertical pipes each having a pet cock, is a condenser pipe provided with a glass water gage, by means of which the expansion pipe may be relieved of steam, and kept constantly charged with steam directly from the boiler, whereby it will be heated more uniformly, according to the temperature of the steam and water in the boiler.

As will be seen, the lengthening or shortening of the expansion pipe, by the changing conditions in the boiler, causes a swinging of the lever to close or open the valve to admit more or less steam or more or less water to the pump, or to shut off the steam or water completely.

A Tubular Frame House.

M. Caron, of Chamounix, has just built a most peculiar house, for which he claims, first, a constant temperature and incidentally strength, durability, comfort, and beauty. The change of temperature in the valleys of this mountainous region is frequent and severe, and the building of such a house was prompted by the severity and instability of the climate. Mr. Caron first put up a frame of steel water tubing, allowing continuous circulation to a stream of water. Around this frame he put up his house in the ordinary way, the entire structure being a very pretty specimen of the early Italian Renaissance. The peculiarity is that all floors and ceilings are likewise crossed and recrossed by the water pipes. The water, after passing through the horizontal tubes first, that is under the floors and ceilings, passes through the vertical tubes until all have been gone through. In summer, spring water, fresh as is only the water of the snow-capped Alps, circulates under pressure through the network of tubes, cools off the walls, and, after having run its course, flows off considerably warmer than when it entered. But in its course it has absorbed much heat, which it carries away. During the long and severe winter the water, entering through the basement, is first heated to nearly 100 degrees, and then forced through the tubing. Of course, much of the heat is left all over the house, and at the outlet the temperature of the water is about 40 degrees. The speed of the circulation of water can be regulated so as to allow the fixing of a certain temperature for the house, which is equal throughout. The house has been put to a practical test through the last eight months, and has stood the trial well. The builder claims for it cheapness, solidity, and elasticity, giving it immunity against earthquakes. The house measures about 6,000 cubic yards and weighs 120 tons, or 36 pounds per cubic yard inclosed. It is fireproof, having running water in every room, and fire can be drowned out in a remarkably short time.—La Nature.

A Frenchman's Views of American Manufactories.

M. Pierre Arbel, of the Saint-Etienne Chamber of Commerce, was sent to this country, with a number of fellow experts, to examine, among other things, our factory methods. His report, recently published, shows that three principal factors condition the superiority of the American manufactory. The first is the more intelligent equipment of the plant and the greater facilities for transporting material; the second is the use of the most perfect apparatus obtainable; and finally, the labor is more efficiently organized in the workrooms.

In a very cool, judicial and matter-of-fact way M. Arbel estimates that under like conditions American factories produce two and even three times as much as the French. The latter are trying to wage industrial warfare with weapons of the stone age. The successful French manufacturer, in lieu of enlarging and strengthening his plant, straightway invests his surplus in government bonds or railway stock.

And even when the need of improved apparatus and machinery is driven home by competition, and the plant is suitably equipped, the main endeavor of the European manufacturer seems to be the preservation of the costly acquisition. A radical mistake. The American machine must work more rapidly as well as more efficiently, and it is utilized to the very utmost, without concern for its duration. Ere the old machine is discarded, a better will have been invented, and the profit on the old will more than pay for the new. An American can hardly conceive of the vast mass of rubbish retained in European shops on sentimental grounds, and handed down religiously from father to son.

The American organizes his labor in a more efficient manner. Paying his help better wages, he seeks, as far as possible, to make of each workman an intelligent operator of the machinery provided. Steam power and electricity are used in every possible way—for machines, lighting, hauling, welding, etc. Subdivision of labor is carried to its extremest limits and the output astonishingly increased. Messengers and errand boys are in constant attendance, removing all pretext for leaving one's post, and economizing valuable time to the utmost.

Thus it is manifest that the great development of American manufacture is not due solely to courage and capital: its secret is the maximum use of all available resources—the employment of the good machine at the right time, working it for all it is worth, and then pitilessly discarding it for a better.

THE first Bible printed in the point alphabet for the blind has just been issued in Louisville, Ky. It contains 1,839 pages.