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NEW YORK, SATURDAY, OCTOBER 19, 1867.

Contents:

(Illustrated articles are marked with an asterisk.)

THE LESSON OF THE SHOEYBURYNESS EXPERIMENTS. HOW LITTLE ENGLAND HAS PROFITED BY IT.

That England has profited less than her maritime rivals from the millions of pounds she has so liberally expended in experimenting with artillery, rifling, projectiles, and armored targets of almost every possible description, is a very remarkable fact. This fact—as curious as it is true—does not speak very highly with respect to the engineering talent and judgment which have directed the fabrication of her heavy ordnance and her iron-clad navy.

After the experiment with the 13-inch smooth bore at Shoeyburyness, Sept. 13th, 1862—five years ago—against the *Warrior's* section of 4½-inch plates, 18 inches of teak, and an inner skin of iron, to suppose that a target similar to that one with the exception that it had 3½ inches more iron, could resist the 15-inch gun, seems to us to betray a remarkable misapprehension of the important national problem committed to the English naval constructors and gunmakers for solution.

The complete penetration of the 8-inch "*Warrior* target," backing, and inner skin, by the 15-inch gun on Sept. 26th, as stated by the Atlantic cable, points out to every one who can read, that the iron-clad fleet of England is as vulnerable to the guns likely to be brought against it as the old wooden vessels were to the guns cast to attack them with. That the plans on which the English artillery have been built will not give to large calibers the strength necessary to attack first-class iron-clads, appears to be established by a retrospective view of the experiments of the past five or six years. Commencing in 1862 with 10½-inch wrought iron rifles, increasing shortly afterward to 13½-inch, we now see (and 1868 is close at hand) a puny weapon, the 9-inch rifle, the best gun in the English artillery parks, while on the other hand the maritime nations in the north of Europe—Russia and Sweden—knowing from the publicity of the English experiments, what not to make, are casting, as fast as they can melt the iron, duplicates of the very gun John Bull has just proved to the world can send its big round shot through any iron-clad he has built or is building.

Thus England, by the foolishness of her gunsmiths and constructors, has been materially assisted into such a position that her influence in European politics is nearly if not quite, wiped out.

With respect to the last exploit of the Shoeyburyness artillerists and "select committee men" in bursting their target and their reputation at the same time with the 15-inch gun, we do not believe they would have imported that weapon if they had any idea of its capabilities. Already had the highest authority on ordnance in England, Captain Noble, demonstrated, in an elaborate official report, that the maximum force of the 15-inch shot was only 8,658,760 foot-pounds (while he has himself proved by late experiments that it is 17,000,000 foot-pounds!) Again, neither is it likely that this officer and the "select committee" would have permitted the big smooth bore to demonstrate its power by the use of full charges against the target had it not been for the criticisms on his calculations and trials, by an American engineer, which were republished in several of the English journals. As it is, the extraordinary tests to which Noble has put the gun, failing, as was no doubt the desire, to burst it, exhibit its power in a stronger light than would otherwise have been the case. On the first trial against the target on July 26th, it will be remembered that after the first two rounds with cast iron shot, a steel shot weighing 498 pounds and no less than 14·945 inches in diameter (see *London Times*) was used, or in other words the windage was only $\frac{55}{1000}$ of an inch; in fact, this shot fitted as tight as a steam engine piston—it was as close a fit as could be got in the bore. The gun was not injured, and the next step was to raise it to an elevation of 32°, imbed it in timber, so that proper recoil was prevented, and blaze away with 100-pound charges, or 40 pounds more than they had used against the target. The gun also stood this trial without injury, and as several of the prominent British journals wanted to know why 100 pounds was not used against the target, there was nothing left but to accede to this very proper request. The trial was made (we believe with cast iron shot), and the target, nearly twice as strong as any British iron-clad afloat, was penetrated (according to the American system of penetration), and smashed. A comparison between the hole made by the 15-inch and the sort of gimlet penetration effected by the 9-inch, will show the difference between the British "awl hole" system and the American penetrating system. But a pretty correct idea of the appearance of the hole made by the 15-inch can be had by a photograph in our possession of the 4½-inch *Warrior* target after it had been penetrated by the 13-inch smooth bore in 1862. We trust, however, that Brother Bull will not omit to have a photograph taken of this last hole.

It is not unlikely that the 15-inch gun or the big smooth system is too plain a subject for the highly scientific writers on artillery and armor in English journals. They seem to be completely bewildered by the "hifalutin" talk (as the *London Army and Navy Gazette* has it) of their gun makers and ordnance officers. Our readers are no doubt aware that it is the habit of English officers, both of the army and navy, as well as scientific men in civil life, when a new idea strikes them, to rush into the amphitheater of one of their "Institutions," and either deliver a "lecture," read a "paper," or have a "conversation." These efforts are published with proper ceremony, and are called the "proceedings" of "Institution" so and so.

We remember very well the "papers" of such men as Armstrong, Coles, Halstead, Tyler, and many others, read and published during the progress of our rebellion; they often proved very entertaining to their audiences, as in many cases they proved, beyond the shadow of a doubt, that things which we Americans had already accomplished could not be. For example, that monitors could not possibly go to sea! By the use of a hydrostatic press, it might be possible to squeeze the "papers," "lectures," "conversations," and "pamphlets" of the naval, military, and civil *savans* of John Bull's land, on the subjects of guns and iron-clads alone, into the office—which is not very small—in which we are writing.

No antiquarian library on mechanical subjects can be complete without a set of these valuable documents.

These persons have been in the habit, as soon as an innovation in the naval or engineering line is broached, to grab it at once, shuttle-cock it about, until it is so befogged that the originator of the project himself would not recognize what they are talking about. So many irrelevant side issues are started by these ingenious investigators, that both writers, readers, lecturers, and listeners, were very often so confused and entangled, that they forget what it was that "light" was to be thrown on. The chief of artillery of the London *Times*, the scientific reporter of the Pall Mall *Gazette*, and the ordnance officer of the *Engineer*, appear to have wallowed in "papers," "reports" (Noble's in particular), and "discussions," until their minds are in quite a mixed up state. Here are some extracts from their last disquisitions on the big smooth bore. The chief of artillery of the *Times*, after stating that on the trial "for range," (*i. e.*, the trial to see if they could burst the gun,) the 15-inch, at 32° elevation, with 100 lbs. "American" powder—we call it "mammoth grain"—projected its shot with an initial velocity of 1,538 feet per second, and to a distance of 7,680 yards, 4¼ miles, says: "The gun is probably too short to burn all the powder before the shot leaves the muzzle, and a further increase of charge could not give proportionate velocity." As they proved on their trials, "60 lbs. give 1,170 feet per second (to a 453 lb. ball), and 100 lbs. *only* increase it to 1,538 feet."

Now, if a pound of powder in a given gun always performed the same amount of work, irrespective of the weight of charge, the *vis viva* would vary directly as the weight of the charge; and, consequently, the velocity of the shot as the square roots of the charges. Hence, as 60 lbs. give 1,170 feet to a 453 lbs. ball, a 100 lbs—if each lb. was of same efficacy as first charge—would give 1,511 feet per second; but this charge actually gave "1,538 feet" to the same weight of ball. The remarkable fact is thus shown that the work done per pound (notwithstanding the magnitude of the charge) increased with a charge nearly double the first one. Yet, in the face of this demonstration, which took place right under his nose, the chief of artillery of the *Times* says, "the gun is too short to burn all the powder," and "a farther increase of charge would not give proportionate velocity."

And in order to exhibit still further the strange ignorance of the first principles of gunnery which characterize the writings of this artillery *savant*, it will only be necessary to say that the proportionate space occupied by even a 50 lbs. charge in the bore of their 9-inch pop-gun, is so much *more* than 100 lbs. taken up in the 15-inch, that it shows he has no accurate knowledge of the subject on which he discourses to the whole of Europe through the columns of its "leading journal."

The change in the tone of his last article in the *Times* of September 10, from the gorilla-like shriek of his former one in *Times* of July 27, to use a comparison started by himself, is as different as the terrible roar of the 15-inch is from the tiny tinkle of the 7-pounder rifle fired on the same occasion. We are, by the by, quite anxious to read his account of the penetration of the target on September 26.

There is another point which it may be well for both the chief of artillery of the *Times*, the scientific reporter of the Pall Mall *Gazette*, and the ordnance officer of the *Engineer*, to make note of, and that is that the *vis viva* of their 9-inch "punching" bolt, compared with the atmospheric resistance it encounters, is only about 7 per cent. more than that of the 15-inch sphere.

The scientific reporter of the *Gazette*, in his issue of the 10th inst. says: "The rifled gun (9-inch) can be used in broadside, the smooth bore (15-inch) only in turrets." Is it possible that he does not know that we have a carriage which can handle a 15 or 20-inch whenever a platform can be found strong enough to carry it, broadside or any where else.

It is true we prefer to put them in monitor turrets, where they can be protected by say from 15 to 20-inches of wrought iron, instead of the English system of mounting their 7 and 9-inch guns behind a thin veneering of the same metal.

The ordnance officer of the *Engineer* has made the brilliant discovery that 34° is "the angle at which projectiles are thrown to the greatest distance." The same officer, in order to conceal his chagrin that the 15-inch did not burst after being fired two rounds with 100 lbs. charges at that angle, goes off on a long rigmarole about powder in his issue of 13th inst., leaving the *vis viva* of the shot out of the question! To restate what we have already partially alluded to, we will briefly observe that the big monitor smooth bore, the identical gun installed in our turrets over five years ago, at the commencement of the rebellion, has shown that it can put its shot through any iron-clad in the British navy.

Even if in future trials the Shoeyburyness artillerists succeed in bursting the American gun, it will not materially help their case, as the important fact of the great power of large round shot against armor plates has been fairly established, and there is no difficulty in building a smooth bore gun of 15 inches caliber, to use, say, 150 lbs. charges.

AN IMPORTANT QUESTION.

Is marking patented things with the patent stamp of nearly identical but inferior articles actionable under the act of 1842?

Frequently patentees suppose in cases where their inventions are infringed under color of right by reason of the infringer making use of the date of another and somewhat similar invention, that they have a remedy for the mischief under the 5th sections of the Patent act of 1842. The first clause of that section provides that a person shall not (under a certain penalty) affix upon an article not patented by him, the name of another who has obtained a patent upon such article, without the consent of such patentee; the second clause, that a person shall not affix the word "patent," or "letters patent," or "patentee," or any word or words of like import, with intent of imitating a patentee's device on any unpatented article, or in other words, on an article not covered by any patent whatever, for the purpose of deceiving the public. The first clause is the one enacted for the protection of a patentee under certain circumstances; the second for the protection of the public generally.

The case referred to above does not come within either of these clauses without it can be shown in an action brought that the infringer is wrongfully using the date of the second or similar patented article, as it may be made to appear that he has a license from the second patentee; or is using such mark upon an article unpatented by any person whatever, for the purpose of imposing upon the public, or in other words, deceiving the public by making it think it is getting a patented article when such is not the fact.

The case would be different and clearly within the statute, were the infringer using the name of the patentee who prosecutes in the action, or date of his patent, without his consent, or using his date of patent upon an article not patented by any person, with intent to deceive the public, as before explained. The only way of reaching such fraud so far given by our legislators is by proceeding as in cases of common infringement.

INDUSTRIAL EDUCATION---WHAT A LIBERAL MANAGER HAS ACCOMPLISHED.

The education of the families of skilled artizans is a subject which philanthropists and political economists never tire of writing about—in fact, we know of no subject in the educational line about which more has been said and less accomplished than this. This is almost, if not wholly due to the narrow-mindedness, illiberality, and, we may add, not a little to the stinginess of employers. What can be accomplished in this direction, by the energy and liberal-mindedness of a single individual, is very strikingly shown by the success which has attended the efforts of M. Schneider, manager, and we believe, the proprietor, also, of the immense iron works at Creusot (department of Saone et Loire), France.

These works are of great magnitude, as will be seen by the following description, taken from the Pall Mall *Gazette:*

Creusot may be said to form a kind of model manufacturing community, all placed under the direction of a single individual or firm, and consisting of 24,000 inhabitants.

The number of workmen employed is 9,950; the steam power is equal to that of 9,750 horses. There are coal mines, which produce 250,000 tuns annually. There are iron mines, which produce 250,000 tuns of minerals per annum; and the annual production of cast iron is 130,000 tuns. But it is not in the mere production of raw material that this company expends its skill. It converts its cast iron into all the forms of wrought iron employed in the manufacture of machinery, or in the construction of large engineering works. In the course of the year it turns out 100 locomotives, or about two a week. Although situated far inland, with no direct temptation to undertake naval engineering, it exhibits numerous examples of marine steam engines (one of 950 horse power nominal—upward of 5,000 actual) for the iron-clad ships of the French navy.

It seems, that, from their earliest childhood, the children,

boys and girls, of the workmen at this immense establishment, are educated and trained in schools organized by M. Schneider. So far from the education which they receive putting the workman above his work, the contrary is the case; it enables him to do it more to the satisfaction of his employer, and to his own honor, and better for his own personal advancement.

The system of the instruction given at the Creusot schools is fully detailed in tables hanging on the walls of the Great Exhibition; drawings of the habitations of the workmen, their churches, their hospitals, and their schools, are also exhibited.

"Statistical tables illustrate the progress and changes of the population; these are divided into two parts—the one showing the progress of their material welfare, their accumulation of property, and their consumption of food and luxuries; the other showing the amount of attendance at schools, the relative statistics of individual success in these schools, and the subsequent rank attained by each pupil in the manufactories. From these we gather that the progress of education has always been followed by improved moral character and advanced social being; that the pupils who have most successfully availed themselves of the technical schools are those who have afterward risen to the highest ranks as foremen, clerks, superintendents, overseers and engineers, in the works themselves."

These tables also show "the organization of the schools, the programme of subjects taught, distribution of pupils' time, samples of their mechanical and mathematical drawings, samples of their hand and eye sketches, examples of writing and French composition, lists of their studies in religion, sacred history, French history and geography; studies in arithmetic, algebra, elementary geometry, and descriptive geometry; specimens of ornamental writing and map drawing. These are for the boys. But the girls also are well educated, with the difference that for plain drawing and geometry are substituted needle-work and dress-making. They are also taught book-keeping." It was remarked this education—fully equal to that taught in most of our high schools—does not put the workman above his work; and the magnificent display in almost any branch of heavy iron and steel manufacture placed by the Creusot works in the Exhibition, is as finely finished, both as regards accuracy and beauty of finish, as it is possible to make iron and steel. Fully equal to that of the most ignorant and dextrous of the English workmen.

It has been intimated on more than one occasion, by a prominent political economist of this country, that it would not harmonize with the "American idea" for employers to manifest any interest in the welfare and advancement of their employes. We believe this to be ridiculous fallacy.

No doubt American mechanics will strongly object to be ostentatiously *patronized* by that spirit of vanity which is so often illustrated in founding educational and theological establishments, so as to afford a prominent place to display the name of the founder. But an employer who cannot manifest an interest in the welfare of those employed by him, and those depending on them, without offending that proper pride which belongs to any man who is good for anything, by ostentatiously patting them on the back, and doing good with a loud blowing of horns, shows at once that he is a mean fellow—even more stingy, in reality, than one who makes no pretensions.

The moment a man becomes an employer he assumes duties which it is wicked to shrink from; duties scarcely less sacred than those due from parents to children. It is quite unnecessary to enlarge on these obligations, any one who cannot hide behind a three cent piece will appreciate them just as thoroughly as though they were placed before him in the largest type.

Where you find a man with a keen scent for gratitude, it is a pretty safe rule to set him down as "small potatoes, and few in a hill." To do good, to advance the welfare of others, to add to their happiness, is all the reward a noble nature cares for; and this seems to be the spirit which moves the manager of the Creusot Works.

If one cannot attempt to add to the means of enjoyment of others, without the accompanyment of a brass band, he had better, a good deal, not make the attempt at all.

THE TWENTY-EIGHTH STREET BOILER EXPLOSION.

This catastrophe which occurred Sept. 9th was so remarkable that it has attracted the attention of engineers and practical men throughout the country. The public, generally, have also read the details with great interest. The statements, however, which have appeared in some of the news journals have been so inaccurate and confused that we deem it well to publish the facts as they could be ascertained by personal inspection. This boiler, which was eight feet diameter at the bottom, six feet at the top, and fourteen feet and six inches high, and weighing five tuns, exploded about 4 P. M. on the 9th of September, at 258 West 28th street, ascending into the air nearly vertically, with a slight westerly inclination, described by those who saw it as appearing about the size of a nail keg, and falling into the rear part of the dwelling house 308 West 28th street, a distance horizontally of about 450 feet. Two persons were killed where the explosion occurred—the engineer and fireman; and two children of Mr. Houseman, by its descent through his dwelling, and several others were injured.

This boiler was new, having been in use less than two months and a half, was built by Densmore & Black, of this city, and was of the style known as the Densmore boiler, which has an excellent reputation in different parts of the country. It was illustrated and described on the first page of No. 23, Vol. XVI. Scientific American. It was tested by hydrostatic pressure to 115 pounds to the square inch. The iron is pronounced of good quality by all practical iron men. The man who has since bought it and cut it up, says it is the best iron he ever found in a boiler. All agree that the boiler was well made. These boilers, of the same size as this, have been tested both by the Metropolitan police inspectors and the steamboat inspectors, to 120 pounds to the square inch, and received their certificate to carry 80 pounds pressure of steam, and have carried that pressure for years. Many of them are now running, carrying 90 and 100 pounds to the square inch.

It was intended to carry 60 pounds pressure to the square inch on this boiler, and the safety valve was supposed to be set to blow off freely at that pressure. It had two steam gages—one in the fire room and one in the engine room. It did its work very easily, running all the time with the damper nearly closed and much of the time with the fire door open. On the afternoon of the explosion it was not doing more than about half its ordinary work. The engine was running at the time of the explosion and had not been stopped. The boiler had never been known to foam any after the first two days, and it was working to the delight and admiration of the owner and scores of practical steam men who visited it.

The lower portion of the boiler stood in a vault, the arch over the vault coming up a little below midway of the boiler, there being about two inches space between the boiler and arch all around. The fire room was below the arch, and the engine room was above and at one end of it, and the gage cocks and water glass gage were above the arch on the back side of the boiler where the fireman could not see them when at his duties, it being intended that the engineer should have sole charge of the water. This was an arrangement of the engineer himself. It should be borne in mind that the same engineer and fireman had run there, for about four years, three horizontal boilers placed in this vault—the fireman having charge of the fire and water, and the engineer charge of the engine and the machinery generally through the establishment. The boiler stood upon cast-iron legs that raised the bottom of it sixteen inches from the fire-room floor, which space was open on the front side half way around the boiler and stopped up on the rear side with a four inch brick wall laid up under the edge of the boiler. The fire grates were about 20 inches above the floor of the fire room, and the fire-box in the boiler was about 7 feet 4 inches high above the grate and contained about 180 square feet of heating surface of the most effective kind, the heat acting with nearly equal force upon every part of it. From the top of the fire-box the heat was conducted down to the bottom of the boiler through 135 tubes, 6 feet long and 2½ inches outside diameter, and was conducted directly from the bottom of the boiler to the chimney, and the outside of the boiler was covered with hair felt all over to the very bottom.

The cylinder containing the tubes was 4 feet diameter and 6 feet long, hence would contain, without any tubes, 90 cubic feet of water,. The tubes would displace 27½ cubic feet, leaving the water contents of the tube cylinder 62½ cubic feet, or more than two thirds as much as it would be if it had no tubes in it. The water spaces between the tubes and the shell would average about six inches thick. The water spaces around the fire-box were nowhere less than four inches thick, and would average full six inches and a half thick. The gage cocks were set to carry from fifteen to twenty inches depth of water on the crown sheet. In regular working order it carried over 1,300 gallons of water, or about 21 hogsheads, about one cubic foot to every four feet and a half of heating surface. The ordinary run of stationary tubular boilers carry one cubic foot of water to from five and a half to seven square feet of heating surface; railroad locomotive boilers, a cubic foot of water to from eight to eleven feet of heating surface; and steam fire engines a cubic foot of water to from thirty to thirty-two feet of heating surface.

The evaporating power of this boiler, as near as we can arrive at it, was about 470 gallons per hour. The quantity of water on the crown sheet about 315 gallons, as designed to be worked, hence it would take forty minutes to uncover the crown sheet, and about twenty minutes more to get the water down to the upper tube head, which would have to occur before the tubes could heat.

The upper ends of the tubes and all the upper portion of the fire box showed unmistakable evidence of having been over-heated. The lower tube head blew out taking the tubes with it, the head and most of the tubes remaining where the boiler stood, the tubes first coming out of the upper head. There were 135 two-and-a-half-inch tubes equally distributed over a fifty-two-inch head well expanded with good projections on each end outside of the heads, and if not over-heated would not have yielded at three times the pressure that other portions of the boiler was able to withstand.

THE MACHINIST'S APPRENTICE.

Several communications asking information in regard to the trade of the machinist have been received. If we reply to one the answer will comprehend the inquiries of the others.

A correspondent from Iowa wishes to enter as an apprentice, a shop where locomotive and other engines, and machinist's tools are manufactured, or, at least, where engines are built, and desires replies to the following questions: "Can you recommend some such establishment where I could get in or you think I could? What is the period and what the terms of an apprenticeship? I wish a situation where the best of work is done and an opportunity is afforded the apprentice of becoming a thorough workman."

The time was—twenty-five or thirty years ago—when the position of apprentice to the machinist trade was easily obtainable and the remuneration was sufficient to support the apprentice. It is not so now. To enter a good shop as an apprentice requires in most cases influence and the position is granted as a favor. The amount paid is rarely more than enough to liquidate board bills, if it is even so much, and the time required from three to five years. There are adequate reasons for this change. The apprentice must be furnished with good and valuable tools and his work is of as high a character as his increasing capabilities will warrant, not only for the purpose of advancing his interests but for the benefit of his employer. It is not surprising, therefore, that the first year or so of his apprenticeship proves, from breaking of tools and spoiling of jobs, unprofitable to the proprietor.

Again, there is no adequate means to compel an apprentice to fulfill his contract with his employer. He may, soon as he deems himself competent to do work which brings higher pay, leave his shop and go elsewhere. Consequently, master machinists prefer to employ ordinary laborers for their rougher work and journeymen for the better quality. Under these circumstances we do not know how to advise you.

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING OCTOBER 1, 1867.

Reported Officially for the Scientific American

PATENTS ARE GRANTED FOR SEVENTEEN YEARS the following being a schedule of fees:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

☞ *Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to Inventors, may be had gratis by addressing MUNN & CO., Publishers of the Scientific American, New York.*

69,298.—Foot Rest.—Calvin Adams, Pittsburgh, Pa.

I claim constructing a foot rest with the base, A, of suitable diameter for its support, and the rest, B, of convenient shape to form a rest for the foot, connected by one or more columns, C C, substantially as shown and described.

69,299.—Fence.—G. W. Adams, Rochester, N. Y.

I claim the arrangement of the metallic stakes, P, double bracing wire, f, in connection with the bed plate, C, and the rails, R, of the fence, substantially in the manner herein shown and described and for the purposes set forth.

69,300.—Broom Head.—E. A. Alexander and H. C. Kellogg, Independence, Iowa.

I claim the employment of slotted bar, b, when arranged in combination with hooks, d d, loop, c, and handle or screw rod, a, in the manner and for the purpose set forth.

69,301.—Corn Planter.—Thomas Allen, Arrow Rock, Mo., assignor to himself, Joseph Nicholson, Arrow Rock, and A. B. Garrison, St. Louis, Mo.

I claim the arrangement of the furrow plow, B, coverers, k k1, side boards, O O1, rolling wheel, D, slide valve, d, worked with a lever, E, or automatically, the adjustable cams or pins, p, on the rolling wheel, all in combination, when constructed and arranged substantially as shown and specified.

69,302.—Clothes Dryer.—Israel B. Arnold (assignor to C. P. Dunham), Providence, R. I.

I claim the improved folding clotheshorse, as composed of a central post, A, the series of posts, B B B B, their several connection bars, C C C, the catch plates, D, and screws, e, arranged and applied together substantially in manner and so as to operate asset forth.

69,303.—Machine for Making Socketed Reed Plates.—Chas. Austin, Concord, N. H.

I claim the combination as well as the arrangement of the guides, D1 D1, the endless carrier, B, the presser, I, the rotary cutter, F, the vibratory frame G, and the adjustable cam, H, as described, the said cutter, F, carrier, B, and cam, H, being provided with mechanism for operating them, substantially as described.

I also claim the combination as well as the arrangement of the hopper, E, the guides, D1 D1, the endless carrier, B, the presser, I, the rotary cutter, F, the vibratory frame, G, and the adjustable cam, H, as described, they being provided with mechanism for operating the carrier, the cutter, and the cam, as explained.

I also claim the adjustable cam, H, made substantially as described.

I also claim the combination as well as the arrangement of two or any other suitable number of edge cutters, L L, and one or more pressers, I K, with the endless carrier, B, the guides, D1 D1, the rotary cutter, F, the vibrator frame, G, and the adjustable cam, H, or the same and the hopper, E, the whole being to operate together, and provided with mechanism for actuating the carrier, the cutter, and the cam, substantially as herein before explained.

I also claim the combination as well as the arrangement of the two endless carriers, B M, one or more side trimmers or plane irons, U, the guides, D1 D1 R R, the reverser, S, the cutter, F, the vibratory frame, G, and the adjustable cam, H, the carriers, cutter, and cam being provided with operative mechanism, substantially as described.

I also claim the combination as well as the arrangement of one or more smoothers, V, one or more finishers, W, the plane iron, U, the reverser, S, the endless carriers, B M, the guides, D1 D1, R R, the cutter, F, the vibratory frame, G, and the adjustable cam, H, the whole being provided with mechanism for operating the carriers, the cutter, and cam, substansially as described.

I also claim the combination as well as the arrangement of the hopper, E, the guides, D1 D1, the carrier, B, one or more pressers, I K, the rotary cutter F, the vibratory frame, G, the edge cutters, L L, the reverser, S, the guides, R R, the carrier, M, the face cutter, U, or the latter and the presser, I, also, their combination as well as their arrangement with one or more smoothers, V, or one or more finishers, W, the camers and cam and rotary cutter being provided with mechanism for operating them, substantially as hereinbefore specified.

69,304. — Wardrobe Bedstead. — William R. Bagnall, Chelsea, Mass.

I claim a hinged oblong bed-frame arranged to swing laterally from a case, as and for the purpose described.

I claim a swinging bed frame, combined with a surmounted wardrobe or bureau, or both, substantially as described.

I claim a wardrobe or bureau, or both combined with a swinging bed frame having head and foot pieces swinging inwards, as and for the purpose described.

69,305. — Carriage-shaft Coupling. — Jesse P. Barrick, Massillon, Ohio.

I claim the pivoted or hinged stop, J, and spring, I, arranged in relation to the coupling, in the manner and for the purpose substantially as set forth.

69,306.—Carriage Button.—W. P. Bateman (assignor to himself and N. F. Mathewson), Barrington, R. I.

I claim a carriage button, as constructed, with the head eccentric to the body, and with a journal to project from the head, and with a screw and a prismatic base to its body, as described.

I also claim the carriage button, as not only made with the head eccentric to the body, and applied thereto by means of a journal so as to be capable of being revolved relatively to it as specified, but as having a prismatic base, and a screw to project therefrom, as explained.

69,307.—Machine for Making Wagon Wheels.—Alonzo Beswick, Paris Richardson, Jr., and John W. Brown, Kelley, Ill.

We claim the combination and arrangement of the cross bar, C, and movable bar, E, with the guide bars, H H, operating in the manner and for the purposes set forth.

We also claim the auger frame, W, in combination with the screw, M, and guide bar, H, operating substantially as described and for the purposes stated.

69,308.—Brick Machine.—Peter E. Bland, St. Louis, Mo.

1st, I claim the combination of movable plattens or followers, b, in a mold-bearing cylinder, B, revolving about a fixed central shaft, H, with one or more fixed cams, k, upon said shaft, all substantially in the manner and for the purpose herein set forth.

2d, The combination of compressing plates, or plungers, G, with a revolving mold-bearing cylinder, B, when said compressing plungers have the within-described reciprocating movements, and operate in unison with an intermittent movement of said cylinder, substantially as and for the purpose herein set forth.

3d, The combination of pistons, g, or their equivalents, with a revolving mold-bearing cylinder, B, and radial cam-actuated followers, b, in the molds thereof, when said pistons, g, have substantially the within-described reciprocating movements, for the purpose herein specified.