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NEW SERIES.

Improved Steam Riveting Machine.

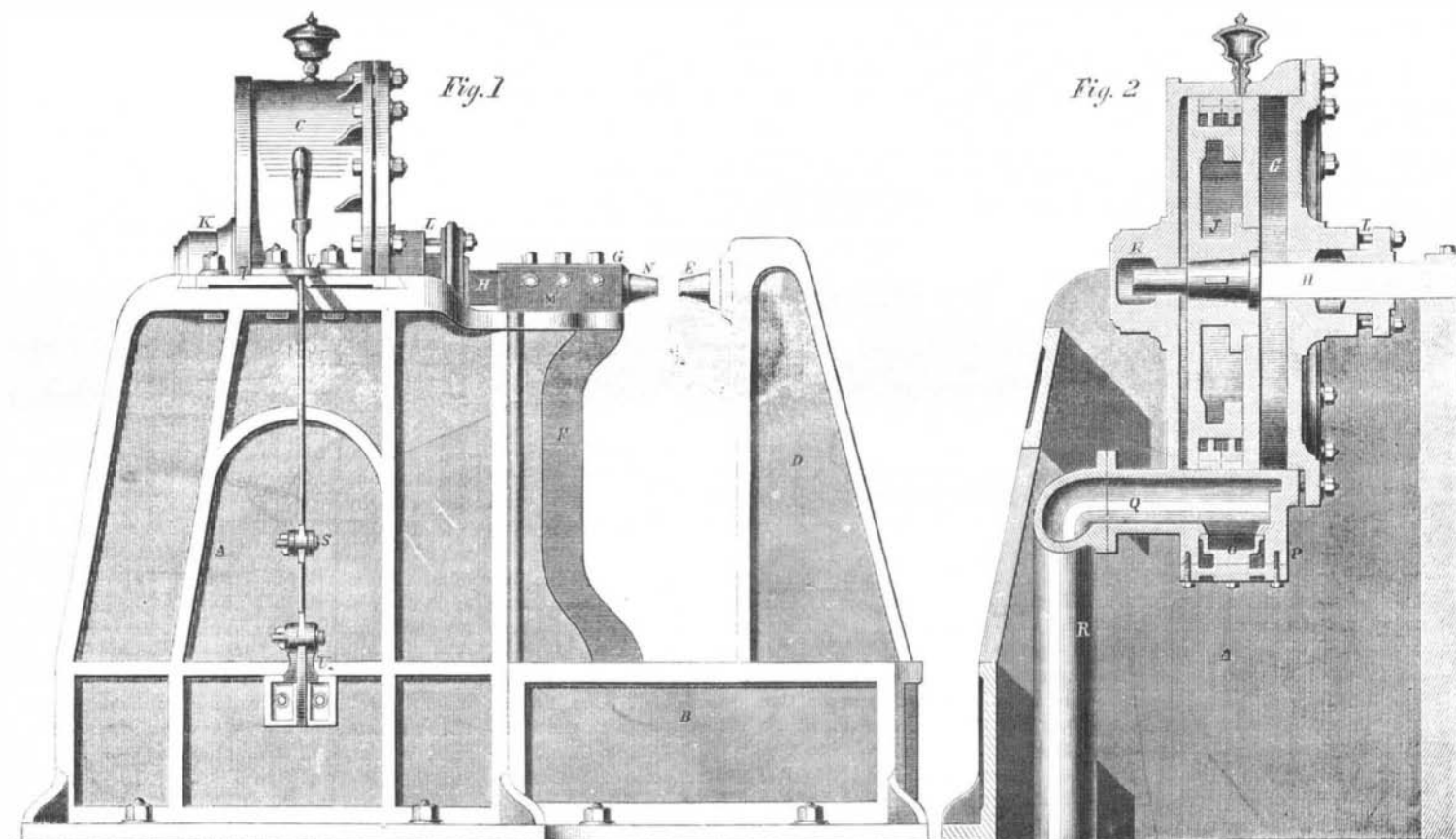
From remarks in the English mechanical papers we judge that in all the very large Steam-engine manufactories in Britain the riveting of boiler plates together is done by steam power, instead of by the hand process, which still prevails in those of our large establishments with which we happen to be acquainted. As the noise produced by hand riveting is a nuisance to the neighborhood in which it is carried on, we hope that those of our engine manufacturers whose works are located in cities will, partly from

by the formation of expanded heads at both sides, to retain the plates in position. One of the dies is stationary, whilst the steam drives home the counter-die through the simple intervention of a piston of large area, working in a very short steam cylinder.

The machine represented in our illustration is capable of striking three rivets at each blow. Fig. 1 is a side elevation; Fig. 2 is a vertical longitudinal section through the center of the steam cylinder.

The framing of the machine consists of two substantial castings, A B, bolted down by flanges upon a

The piston rod and die carrier, H, is oblong and rectangular in cross section, and emerges through a stuffing box, L, of a corresponding form, and immediately in front of this it passes through the guide, G. This guide, which consists simply of a horizontal groove formed in the casting, B, is fitted with side pieces which are accurately adjusted by the lateral screws, M, so as to keep the piston rod and die carrier, H, perfectly steady, without, at the same time, interfering with the freedom of its motion. A cover piece is bolted down across the guide. The end of the piston



GARFORTH'S STEAM RIVETING MACHINE.

consideration for others, as well as a regard for their own interests, be induced to supersede hand labor by the cheaper, more perfect, and silent operations of machinery. We have had engraved from the plates in "The Imperial Cyclopedia of Machinery" the accompanying illustrations of an exceedingly simple and powerful riveting machine, invented by W. J. and J. Garforth, of Dunkinfield, England.

This is an example of the application of the direct action of steam to mechanical operations, in which a rectilinear motion, combined with great pressure, is required. The machine in question is for riveting iron plates together in the construction of boilers, and other similar fabrics. In this operation, the rivet being placed in the holes punched out for it at the overlapping edges of the two plates to be riveted, the latter are brought between a pair of dies formed with concave faces, and on these dies being driven forcibly together, not only are the plates brought into perfect metallic and steam-tight contact, but the rivets are also made to perfectly fill up the holes, and,

foundation of solid masonry. The casting, A, although of great strength, is hollow, and serves to support the steam cylinder, C. The casing, B, is heavy and solid, and has cast upon it the resisting head, D, of the stationary rivet dies, E, and the support, F, of the guide, G, of the moving die holder, H, which is forged in one piece with the piston rod of the steam cylinder, C. The steam cylinder, C, is placed with its axis horizontal, and has flanges, I, cast on each side, by which it is firmly bolted down to flanges cast upon the top sides of the frame, A, the cylinder flanges being dovetailed into the frame. The steam piston, J, which is thirty-six inches in diameter, is fitted with metallic packing, and is firmly cottered on to the piston rod and die carrier, H. This piston rod projects behind the piston, and enters a recess, K, cast in the cylinder bottom, in which it takes a bearing so as to secure steadiness of action. In some instances, the constructors make the piston rod pass out through a stuffing box in the bottom of the cylinder, thereby giving it a still longer bearing.

ton rod, H, is formed with sockets to receive the three dies, N, of hard-tempered steel. These dies, N, are directly opposite to the stationary dies, E, made of the same material, and socketed into the resisting head, D. The faces of the dies are spherically concave, so as to produce spherical heads upon the rivet on both sides.

The admission of steam to the cylinder, C, is regulated by hand. The cylinder is provided with the usual ports, and the side valve, O; but in consequence of the shortness of the cylinder, the traverse of the valve is across the cylinder, being in a horizontal direction below it, and the steam passages are curved to suit this arrangement. In Fig. 2 the section is taken through the valve casing, P, valve, O, and the exit passage, Q, which communicates with the pipe, R. The steam pipe is immediately behind the pipe, R, and is therefore not seen. The slide-valve rod is connected by a link, S, to the hand lever, T, jointed at its lower extremity by a pin to a double-eyed bracket, U, bolted to the framing, whilst the

upper extremity of the lever works in a slot in a plate, V, projecting laterally from the cylinder flange, I.

In operating with this machine, the plates to be riveted are suspended by an over-head tackle, in such a manner as to bring them between the dies, N and E. Then, on the plates being accurately adjusted, the attendant draws out the lever, T, which action admits the steam behind the piston, J, causing it to drive home the die carrier, M. On returning the lever to its original position, the steam enters in front of the piston, forcing it back in readiness for another stroke.

By means of this machine the work is done with greater regularity and without the disagreeable noise which is unavoidable in hand riveting. And the immense saving in time and cost will be apparent when it is stated that whereas, by the common process of hand riveting, three men and one boy can rivet only twenty-three three-quarter-inch rivets per hour, with this machine, one man and three boys can rivet with perfect ease and in the firmest manner, at the rate of six per minute, or three hundred and sixty per hour.

M. Lemaitre, of Paris, was the first to employ an independent steam cylinder for actuating riveting dies without the intervention of rotary movements, but in his machine a system of levers is interposed between the steam piston and the die, so that the action was far from being direct and simple as in the machine of the Messrs. Garforth.

M. Lemaitre's machine embodies an arrangement for holding the plates together during the riveting action; this consisting of a tubular presser, which descends in advance of the rivet die inside it. The object of this is, to prevent the metal of the rivet from spreading between the plates, and thereby rendering their contact imperfect; this defect has not, however, shown itself in the action of Messrs. Garforth's machine, which recommends itself both for its extreme simplicity and accurate action, and the consequent non-liability to get out of order.

NOTES ON MILITARY AND NAVAL AFFAIRS.

AN AVALANCHE OF GOOD NEWS.

As we go to press we are overwhelmed with the most cheering news from every direction. The vigorous preparations of the government seem to be at last completed, and we have begun to smite this rebellion with the whole power of the nation. We hear of the successful attack of the great naval expedition upon the forts at the entrance of Port Royal and the passage of a number of the vessels up to the town of Beaufort. In Eastern Kentucky a victory has been won by the Union forces under Gen. Nelson the most brilliant that we have obtained since the commencement of the war. The Union men of Eastern Tennessee are making war on the secessionists by breaking up the railroad and telegraph communications, burning the bridges, cutting the wires, &c. We also have reports, not yet fully confirmed, that General Price has been driven entirely out of Missouri into Arkansas, and that the privateer *Sumter* has been at last really captured.

THE NAVAL EXPEDITION.

Beaufort, which has been selected as the point of attack of the great naval expedition, is situated on the coast of South Carolina, about midway between the cities of Charleston and Savannah which are 104 miles apart. A low swampy tract of land borders the sea at this point, and a network of bayous extending inland from the ocean, divides the land into a number of islands, upon the largest of which, Port Royal Island, the town of Beaufort is situated. The town is on Beaufort river, some ten miles inland from the coast, and the heads on both sides of the inlet had been fortified by the secessionists to prevent the entrance of our fleet.

The account derived from the Charleston *Mercury* is that the fleet made its appearance off the entrance on Thursday, Nov. 7, and while some of the ships engaged the batteries at the entrance, others pushed on up to Beaufort, and preparations were being made to land the troops. The attack of our vessels was completely successful, soon silencing most of the guns in the batteries. One of our vessels was burned, forming a magnificent spectacle. The guns were successively discharged as the fire reached them, sending their shells ashore. The crew escaped through a hot

fire from the enemy. A vessel has arrived at Fortress Monroe direct from the fleet fully confirming the news of the success of the expedition.

THE VICTORY IN KENTUCKY.

The following is the brief telegraphic account of this brilliant affair:

CINCINNATI, Nov. 12, 1861.

General Nelson met the rebels under General Williams at Pikeville, Pike county, Ky., on Friday last, and gained a glorious victory. Colonel Luke Moore attacked the rebels in the rear with 3,800 men, while Colonel Harris, of the Second Ohio Regiment, with 600 men, attacked them in the front, Colonel Harris falling back and Colonel Moore pressing forward, until the enemy were brought into the midst of General Nelson's brigade, when our forces pressed them on all sides, killing 400 of them and taking 2,000 prisoners. The balance scattered in all directions. The Union loss is small. Generals Williams and Hawes are among the prisoners.

Pike county is the most easterly county in Kentucky, about in the middle of the border running north and south.

THE DESTRUCTION OF GUYANDOTTE.

We have the following horrible account by telegraph from Cincinnati, dated Nov. 12th:—

The defeat of the Union forces at Guyandotte was accomplished by trickery on the part of the inhabitants. It seems that a force of rebel cavalry, variously estimated at 500 to 1,000, had concentrated in the country back of the town. These proposed, with the assistance of the rebel inhabitants of Guyandotte, to annihilate the Union forces in the town. This force consisted of 250 Virginians belonging to a Virginia regiment, and a few of Colonel Zeigler's Fifth Virginia Volunteers.

It was arranged between the rebel cavalry and the rebel citizens to massacre our troops in cold blood. Accordingly, the rebel citizens were very kind to our troops last Sunday evening, and invited them to their houses on various pretexts, and all who were off duty accepted the invitation. While they were being entertained, at about half-past eight o'clock, the rebel cavalry dashed into the town. Signals were displayed from every house where the Union troops were, and into these the rebels rushed, murdering the unarmed soldiers in cold blood. The rebel citizens—men, women and children—rushed to arms, and aided the cavalry in the slaughter. The Union troops in camp prepared as soon as possible for defence, but were overpowered, and had to break. Very few men were killed in the engagement with the cavalry, nearly all being murdered in the houses.

When Colonel Zeigler arrived, and on learning the particulars of the affair, he ordered the destruction of the town. The buildings were immediately fired, and the whole town is now reduced to ashes.

MISCELLANEOUS.

Important changes are officially announced in two of the military departments. Major-General Henry W. Halleck is appointed to command the department recently under Gen. Fremont. It consists of Missouri, Iowa, Minnesota, Illinois, Arkansas and that portion of Kentucky west of Cumberland river. Gen. Halleck is considered one of the ablest officers in the army. General Don Carlos Buell is appointed over Ohio, Michigan, and that portion of Kentucky east of the Cumberland river, and the State of Tennessee. Gen. Hunter is appointed to command the department of Kansas, to include the State of Kansas, the Indian territory west of Arkansas and the Territories of Nebraska, Colorado and Dakota. The Department of New Mexico, to consist of the Territory of New Mexico, is to be commanded by Colonel E. R. S. Canby, United States Army.

Advices from the Kanawha state the secessionists, who had been shelling the camp at Tompkins from Cotton Hill, had retired upon the approach of a force under Col. De Villiers. Nine of the enemy's pickets were killed; but no loss on our side. Col. De Villiers has taken possession of the hill.

The people of Maryland, at their recent election for State and judicial officers, have shown their devotion to the Union in a most unmistakable manner, by giving immense majorities for the Union candidates. At the last accounts Maryland had organized already, or was in process of completing, twelve regiments; a result really gratifying to think of after the desperate efforts made on all sides to cause her to abandon the Union.

Casper D. Schubarth, of Providence, R. I., has been awarded a contract for the manufacture of 20,000 Springfield rifles, at an aggregate cost of \$400,000.

A factory is being fitted up in Providence for their manufacture. Our readers will find an engraving of Schubarth's breech-loading rifle on page 136 of the present volume.

Quartermaster-General Meigs has come to the manufacturing districts to contract in person for army cloths. A very large amount of red tape will be cut in pieces by this arrangement. The presence of this faithful and capable officer will prove of equal advantage to the manufacturers and to the government, and will simplify and improve the arrangements for supplying the army. Gen. Meigs is unquestionably one of the ablest and best men in the government service. He knows his business without advice from others, and faithfully performs it. Gen. Meigs is a thorough military man, and had he been in command of the western department instead of Fremont we should not have had the disgraceful exhibit that now stares us in the face from that department.

We understand that Gen. McClellan approves the proposition for an exchange of prisoners. This has been his sentiment from the start, and declares that "the principle of an exchange of prisoners is demanded by the highest considerations of policy and humanity." This is sound logic, and would be carried out with a recognized government at war with us. If the government consents to an exchange of prisoners the Confederacy is thus far recognized, and would place us in a position toward the rebellious States similar to that occupied by England and France, against which several of our sensation daily papers protested in severe language, thereby injuring the course of our government very materially. We, however, favor some system of exchange.

The allowance of clothing to our soldiers is much greater than to soldiers in European armies. Our troops get one uniform coat and two sack coats a year, and a pair of trousers every five months. In the French army the allowance for three years is only one tunic and three pairs of trousers, while a shell-jacket is given every two years. In the Sardinian and Belgian armies, the great coat is expected to last eight years. But the great durability of the clothing of European armies is easily accounted for when we consider the care which is taken to insure good materials. Every yard of cloth is subjected to very minute and distinct examinations by boards of officers, assisted by experts who weigh it, shrink it and examine it inch by inch, against a strong light. They also apply chemical tests to detect the quality of the dye, and the manufactories are at all times open to inspectors, who watch the fabrication at every stage.

Shortly before his retirement, Lieut. Gen. Scott obtained positive information that his entire estate, all of which is situated in Virginia, had been seized and sequestered for the benefit of the so-called Confederate government. The current monthly pay, subsistence and allowance of Lieut. Gen. Scott, were, and by order of the President continue to be, while he is upon the retired list, as follows:—pay, per month, \$270; rations, per month, \$360; allowance for servants, per month, \$90; allowance for horses, per month, \$50. Total monthly pay, \$770—which makes an annual income of \$9,240.

It is understood that the necessary documents were taken out in the Naval Expedition to form, in the places occupied by the Federal troops, Territorial governments, to be in force until the authority of the United States is restored over an entire State, when the old State form will be reestablished.

The Norfolk (Va.) *Day Book* is now printed on brown wrapping paper, and the character of its editorials seems to have suffered corresponding degradation. Its last stroke of wit is this: that it has seen some candles made from the tallow and fat of dead Yankees, and that they are as bad as candles as the New Englanders are as men.

There are between two and three thousand people on that part of Mattaras banks extending for forty-five miles north of the Inlet. These are true to the Union. Many have come to our forts, and taken the oath of allegiance. By the action of the rebel forces they have been deprived of their means of subsistence, and are suffering great privations. A great public meeting was held in this city on the 7th inst to give aid and comfort to these devoted people. George Bancroft, the eminent historian, presided. Any one disposed to aid them can remit to J. M. Morrison, President of the Manhattan Bank, New York.