NEW INVENTIONS.

Great Improvement in the Construction of Chains.

There are some things which appear to escape general observation, as it respects the necessity of improvement; this has been the case with the one before us, for no man can question the value of it after it is made, although we believe few, if any but the inventor, ever thought it was required. The improvement is on the simple link of a chain, whereby its strength is doubled; and whoever thought this could be done, or does not wonder that it was not discovered long ago, as chains have been made from time immemorial, and in every nation on the globe. The inventor is Mr. Ledyard Colburn, of Birmingham, New Haven Co., Conn., who has taken measures to secure a patent for the same. The invention consists in simply uniting the two ends of each link together, by doubling them over one another, the same as if we should hook, "mason fashion," the two little fingers into one another. The old unwelded links, on no chain, were ever made with their ends hooked into one another, but simply brought together and formed (the most common way) like an 8. Now what are the advantages of this improvement? They are great. We have tried the old link and the new one, in a *Jack*; they were both made of iron rods of the same diameter, and we found that the new link stood more than double the power applied to the old link, before it gave way; in short, it is as strong as the welded link.

When we consider the usefulness and extensive application of iron chains to so many processes and operations, the value of this invention cannot be estimated; for the link can be made as fast and as cheap as the old unwelded link, while it has all the advantages of being as strong as the welded one.

Pencil Case Improvement.

Mr. J. H. Rauch, of this city, has taken measures to secure a patentfor a very excellent improvement in Pencil and Pen Cases, which cannot fail to come into general use. In all the pencil cases constructed at present, for the use of a pencil and a gold pen, it is well known that the pen has to be taken out and slid into its receptacle backwards, when we wish to use the pencil, and vice versa: this is both troublesome and inconvenient. The old-fashioned gold cases for pen and pencil required no such manœuvring, for the pen had one slide and the pencil another, and the one was made to slide past the other in the case, thus making use of both pen and pencil very convenient; this kind of case, however, was not so neat as the ones now made, for a ferrule was employed for each slide; the improved case has no ferrules like the old kind; it is as neat as the new kind, and has all the advantuges of the old convenient cases.

Improvement in Cast-Iron Car Wheels.

Messrs. John Canard and John McDonough of the city of Pittsburg, Pa., have taken measures to secure a patent for an improvement in Cast-iron Car Wheels, which consists in having the wheels cast with circular and eliptical braces, having central openings in them, which unite the rim and hub together. It is stated that the improvement allows of wheels being cast so as to make every allowance for contraction in the cooling of the metal, without employing cooling flues or ovens for that purpose.

Improvement in the Coiling Roving Machine.

Mr. M. R. Lemman, of Jackson, Miss., has taken measures to secure a patent for a very valuable improvement in the Coiling Machines to pack the cotton roving in the cans as it comes from the drawing-frame. The improvement consists in constructing the "Coiler and Packer" with a false head, which is not only made to revolve, but to fall and rise within the can, and which packs the sliver in an easy and regular coil in the can, without the assistance of the usual feeding rollers, to feed the sliver into the said can.

Improvement in Endless Chains for Horse-Powers.

Mr. P. H. Kells, of Hudson, Columbia Co., N. Y. has taken measures to secure a patent for an improvement on endless chains for horse-power machines, which consists in forming the joints of the several links with an offsett in each, which causes the links of the chain, when fitted, to lie in a straight line, and thereby allow the chain to impart a more steady motion.

Iron Stone---Terra Cotta.

Mr. Edward Selby, of this city, has made a most beautiful discovery in the manufacture of stone ware, by which, out of very common and cheap materials, abounding in many parts of our country, he makes a ware resembling free stone in appearance, but is much harder and more durable. The ware is of a rich brown color, and can be varied to any intensity of shade. It may be employed for capitals, cornices, mouldings, and all ornaments of brown stone buildings.

ERRICSSON'S CALORIC ENGINE.

Figure 1.

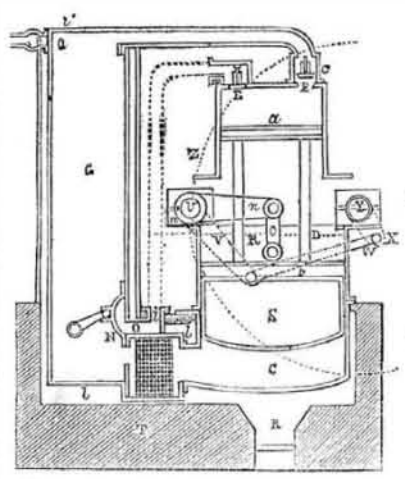
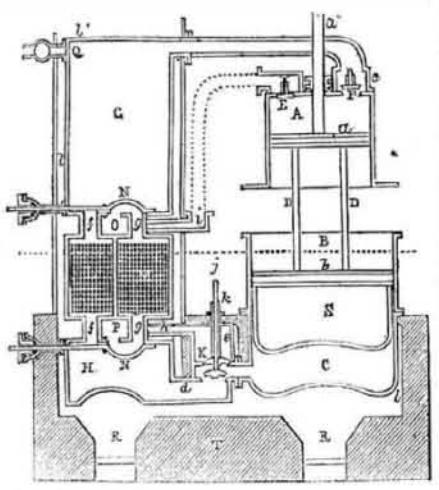


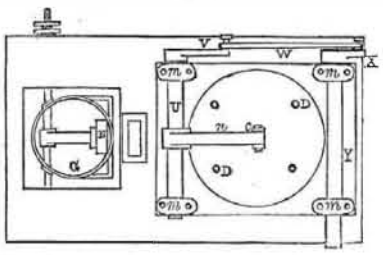
Figure 2.



The accompanying engravings illustrate a patent recently secured in England, in the name of Mr. Edward Dunn, of this city for an invention of Mr. Ericsson, the well-known inventor.

"Description.—Figs. 1 and 2 are longitudinal sections of two arrangements of this engine which are alike in all essential points, but differ in some details. Fig. 3 is a horizontal section of fig. 2. A B, figure 1 are two cylinders of unequal diameter, but nearly alike in all points; *a*, and *b*, are their pistons; A is the supply, and B the working cylinder; *a'* is the piston rod; C is a cylinder with a spherical bottom, called the expansion heater, and is affixed to the working cylinder. D D are braces which connect the pistons, *a b*. E is a self-acting valve opening inwards to the supply cylinder. F is a similar valve, opening outwards from the said cylinder and contained within the valve box, *c*, which is connected by a pipe with a cylindrical vessel, G. H is a

Fig. 3.



cylindrical vessel with an inverted spherical bottom, called the heater. J is a conical valve supported by the valve stem, *j*, and working in a valve chamber, which forms a communication between the expansion heater, C, and heater H, by the passage, *d*. K is another conical valve, supported by the hollow stem, *k*, and contained within the chamber, *e*. L and M are two vessels of cubical form filled to their utmost capacity (excepting small spaces at the top and bottom), with discs of wire net or straight wires, closely packed, or with other small metallic or mineral substances, such as asbestos, so arranged as to have minute channels running up and down; the vessels L and M are named regenerators.

f f g g are pipes, forming a direct communication between the receiver, G, and the heater, H, through the regenerators; N N are two ordinary slide-valves, arranged to establish alternate communications between the pipes *f f*, and *g g*, and the exhaust-chambers, O, and P; *h* is a pipe, communicating between the valve-chamber, *e*, and exhaust-chamber, P; *i* is an outlet-pipe, leading from exhaust-chamber, O; Q is a pipe leading into the receiver, G, provided with a stop-cock; R R are fire-places for heating the vessels, H and C; and *l l* are flues, leading from said fire-places and terminating at *l'*. S is a cylindrical vessel, attached to the working piston, *b*, having a spherical bottom, corresponding to the expansion-vessel, C; this vessel, which is called the heat intercepting vessel, is to be filled with fire-clay at the bottom, and ashes, charcoal, or other non-conducting substances towards the top,—the object being to prevent any intense or injurious heat from reaching the working piston and cylinder. T T represent brickwork, or other fire-proof material, surrounding the fire-places and heaters.

In figs. 2 and 3, the same letters of reference are used for similar parts; which are marked as follows:—U is a rocking-shaft, supported, at both ends, by appropriate pillar-blocks or bearings, *m*; *n* is a crank, projecting from the centre of such shaft, and connected, by a link, O, with the working piston, *b*; V, is another crank, on the extreme end of the rocking-shaft, connected by a rod, W, with a crank, X, on the shaft, Y; and Z, represents the circumference of a fly-wheel, paddle-wheel, propeller, or other rotary instrument to be worked by the engine. Before describing the operation of the improved engine, it should be observed, that the piston-rod, *a'*, only receives and transmits the differential force of the piston, *b*, viz., the excess of its acting force over the re-acting force of the piston, *a*; and this differential force may be communicated to machinery by any of the ordinary means, such as links, connecting rods, and cranks; or it may be transmitted directly for such purposes as pumping or blowing. The conical valves K, and J, (fig. 1) may be worked by any of the ordinary means, such as eccentrics or cams, provided the means adopted be so arranged that the valve, K, will begin to open the instant the piston, *b*, completes the up-stroke, and be closed again the instant the piston completes the down-stroke; whilst the valve, J, is made to open at the same moment, and to close shortly before, or at the completion of the up-stroke. In like-manner the slide-valve, N', fig. 2, is to open and close as the piston, *b*, arrives, respectively, at the termination of its up and down-stroke, similar to the slide valve of an ordinary high-pressure engine. It will be seen, that the link, *o*, like the piston rod, *a'*, only transmits the differential or useful force of the piston, *b*.

The operation of the engine shown at fig. 1, is as follows:—Before starting, fuel is put into the fire-places, R R, heaters and lower parts of the regenerators are brought to a temperature of about 500° by means of a hand-pump, or other similar means; and air is then to be forced into the receiver, G, through the pipe, V, until there is an internal pressure of eight or ten pounds to the square inch. The valve, J, is then to be opened; when the pressure of the air that enters beneath the piston, *b*, will cause the same to move upwards; and the air contained in the cylinder, A, will be forced, by the piston, *a*, through the valve, F, into the receiver. The slide valves, N N, being previously so placed that the passages, *f f*, are open, the air from the receiver will pass through the wires in L, into the heater, H, and further into the expansion heater, C,—the temperature of the air augmenting, and its volume increasing, as it passes through the heated wires and heaters; the smaller volume, forced from the cylinder, A, will, in consequence thereof, suffice to fill the larger space in the cylinder C. Before the piston arrives at the top stroke, the valve, J, will be closed; and, at the termination of the stroke, the valve, K, will be opened. The pressure from below being thus removed, the piston will descend, and the heated air in the cylinder, C, will pass through, *e h* P and *g*, into the regenerator, M; and, in its passage through the numerous spaces or cells formed between the wires, it will part with the caloric gradually,—falling in temperature until it passes off at *i*, nearly deprived of all its caloric. The commencement of the descent of the piston, *a*, will cause the valve, F, to close and the valve, E, to open; and thereby a fresh charge of atmospheric air is admitted into the cylinder, A. At the end of the down-stroke, the valve, K, is closed, and the valve, J, again opened; and thus a continual reciprocating motion is kept up. It will be evident that, after a certain number of strokes, the temperature of the wires, or other matter contained in the regenerator, will change: that of M, will become gradually greater, and that of I, diminish. The position of the slide-valves, N N, should, therefore, be reversed at the termination of every fifty strokes of the engine, more or less; and then the heated air, passing off from, C, will pass through the partially-cooled wires in L; whilst the cold air from the receiver will pass through the heated wires of M, and, on entering H, will have attained nearly the desired working temperature. In this manner the regenerators will alternately take up and give out caloric; whereby the circulating medium will principally become heated independently of any combustion after the engine shall have been once put in motion.

The operation of the engine represented at figs. 2 and 3, is like that just described;—excepting that the regenerator is arranged in a single vessel, and that the metallic substances therein take up the caloric from the air that leaves the working cylinder or vessel, C, and return the same to the air that enters the working cylinder at each stroke, instead of transmitting and re-transferring the caloric at at intervals, as in the other figure."

The nature of this invention is to use heated air as a propelling agent, and to save the heat of this air by the devices, substances, and arrangement of machinery described, upon which are based five claims, all of which, however, are worthless, if the principles upon which the engine is built are not correct, and that they are not correct we have not the least doubt.

If a person were to say, "how absurd it is to let the steam of an engine escape into the atmosphere after it has driven the piston to the end of a cylinder, why not let it act upon a wheel confined in a non-conducting case, and thereby let the steam drive the wheel in one direction forever," he would appear to reason as plausibly, as any person, yea, and more so, who attempts to impart a certain amount of propelling power to machinery continually, without continual expense of the impelling agent, and this is what the above invention sets out to do. It is well known that the economy of our steam engines depends upon a perfect vacuum, the above is constructed upon the very opposite principle; therefore the effective power must be always on the decrease from the first to the fiftieth stroke spoken of, for although the cold regenerator, M, may act like a vacuum at the commencement, it is continually losing this character, hence it becomes in a short time not the absorber—the regenerator, but the generator, and to us it appears that the maximum between the effect and resistance, will just depend, like all other caloric engines, upon the amount of fuel used continually. We cannot see how it can be otherwise. It would also be easy to show chemically, that heated air is decidedly objectionable as a propelling agent, and that the non-conducting substances in S to molify its injurious effects upon the piston, packing, &c., must themselves give out continually the very amount of heat which they absorb, to a colder body, or if they don't absorb heat from a hotter body, they do no good whatever. Sterling's hot air engine, is said to be a good one (but we don't believe it) yet he never pretended to get up a perpetual motion, as is done in the above specification.