the many useful qualities of this intensifier there is one particularly deserving a few words of comment.

It is confessedly a great drawback in negative portraiture that neither the artist nor the sitter can judge exactly to what extent a portrait is successful, or pleasing—which is much the same thing—until a print has been taken. Viewed by reflected light, a properly exposed negative is a very ghastly affair, with nearly all the shadows and half tones that constitute a picture absent; and, seen by transmitted light, little else than its technical qualities can be judged of.

It often happens that the sitter will insist on seeing his or her portrait in its embryo condition; and, if the sitter be a lady, the general exclamation will be, "What a fright!" expressed in various terms, according to the habits or education of the individual; while the more timid will inquire, with the deepest anxiety visible on their countenances—"Why, what have you done with my eyes, nose, mouth," etc.? The artist, of course, explains that everything will be found in its proper place in the finished picture; but an incredulous shake of the head is often the only reply.

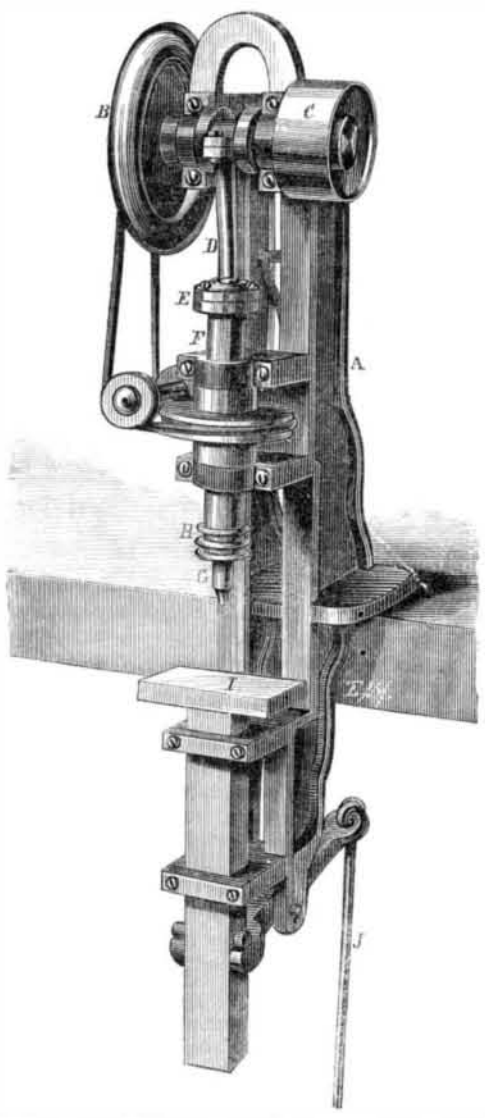
Now, by using the gold intensifier, these features can be rendered perfectly visible in the negative with the minutest details, and the most delicate half tones rendered with a distinctness equal to that in a properly exposed position.

To obtain this result, it is only necessary to watch the back of the negative, as the intensification proceeds, till the desired clearness be produced. At this point it may be stopped, if it be considered desirable to show the negative to the sitter.

In many cases, where the person is leaving the place, and a second sitting is impossible, it will be a great advantge to submit the picture for approval, and, if very favorable, a large order may be the probable result. I am certain that many of the annoyances that the poor photographer has quietly to endure may be avoided by using this process; and of this I am certain, that it needs only a fair trial to become a general favorite.—Gordon Ramsay.—*Br. Jour. Phot.*

ADT'S ROTARY RIVETING MACHINE.

The art of using the hammer is one that takes nearly if not quite as long to acquire as that of handling the file. In



"chipping" with cold chisel, striking on the anvil, and riveting at the block or vise, long practice, combined with good judgment are necessary to successful performance. In this last operation the operator with the hand hammer meets with frequent difficulties. If the rivet end is in a recess of the work much skill is required in using the riveting hammer and adjusting the work to the successive blows.

The object of the little machine represented in the annexed engraving is to provide an efficient riveting hammer worked by power and adjustable to all descriptions of jobs. It gives not only powerful blows, but the hammer is made to rotate so that without moving the work the hammer may consecutively strike every portion of the rivet end. A brief explanation will render these statements perfectly clear.

The frame, A, is of cast iron securely bolted to a bench. At the top is a horizontal shaft carrying at one end a fly wheel, B, and at the other end a driven pulley, C. In the center, between the bearings, is a crank of short stroke, to which is attached a pitman, D, connecting at its lower end by a ball and socket joint in the gland, E, with a vertical reciprocating tube, F. Inside this tube is a rod, the lower end seen projecting at G, which is the hammer proper. Between its upper end and the closed top of the tube is a stiff spiral spring, and at its lower end a similar spring, but weaker, which bears at one of its ends on a shoulder on the hammer rod and at the other on the nut, H, which confines the rod inside the tube. This rod at its lower end is either squared or flattened to fit to a corresponding opening in the tube, F, that it may turn with the tube. Surrounding the tube, F, between its bearings, is a sleeve carrying a grooved pulley. This sleeve has a longitudinal, vertical slot on its inner surface or bore, in which plays a feather belonging to the tube, F. A belt leads from the grooved pulley over guiding pulleys to a small grooved pulley on the horizontal shaft carrying the two wheels, B and C. It is evident that as this shaft is rotated the tube, F, will rise and fall, and at the same time, through the medium of the pulleys, belt, and the sleeve, the tube and hammer rod will be rotated, so that each repeated blow of the hammer will strike in a different position relative to the work.

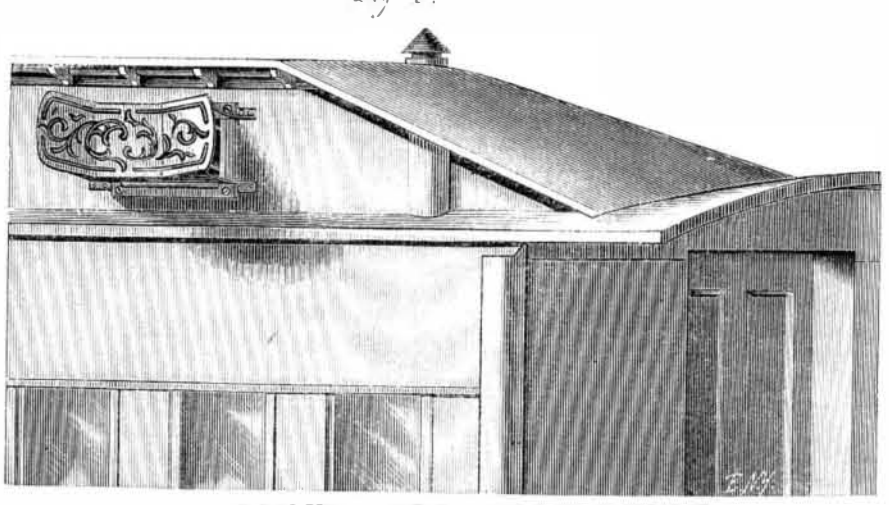
The table, I, moves in guides attached to that portion of the frame extending below the level of the bench and is elevated or depressed by means of a treadle connected to the rod, J. On this table—which may be of any form to suit the work—the job to be riveted is placed, and the power applied to the pulley, C, when the foot guides the table, I, by means of the treadle, and the blow is thus graduated. The springs inside the tube govern the action of the hammer and produce a springing blow, while the hammer slowly rotates around the point to be riveted. This device can easily be adaptad to be used horizontally as may be readily seen by the practical workman.

For this device letters patent were issued through the Scientific American Patent Agency May 22, 1866, to John Adt. Inquiries relative to the invention may be made of J. Adt and Karrman Machine Company, Wolcottville, Conn.

Apparatus for Ventilating Railway Carriages.

Among the annoyances—if not belonging to the dangers—of railway travel, is the inefficient or rather the improper ventilation of the carriages. The plan represented in the accompanying engravings may be said to be partly automatic in its action and partly arbitrary. It can be easily regulated and is entirely under control. Fig. 1 shows the side of a car of the "monitor" or raised roof style, with the ventilator attached to the side of the raised portion. Fig. 2 is an exterior enlarged view of the ventilator with the guard, seen in Fig. 1. removed. Fig. 3 is a view of the ventilator, taken from

Fig 1.



HARDY'S PATENT CAR VENTILATOR.

the inside of the car, showing the register, the two leaves of which are opened or closed at will by a handle.

The guard or outer case is of such a form as to present to the atmosphere, in whichever direction the car may be moving, a wide and somewhat funnel-shaped mouth, through

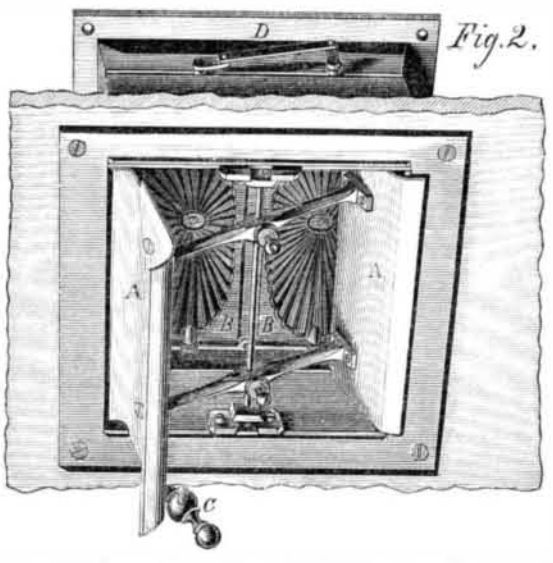


Fig.2.

which the air rushes with a force commensurate with the velocity with which the car is moving. But such a draft, if allowed to rush into the interior of the car, would speedily in a cool day, make the vicinity of the ventilator unhearable. But the ventor or deflector seen in Fig. 2 throws the current of external air against the outside of the case or guard on the side opposite to the incoming air. If then the register leaves are turned to open a passage to the interior of the car, the draft will speedily discharge the vitiated air in the car and keep it pure. A, Fig. 2 are the vanes of the deflector, and B, same figure, the leaves of the register on the inside of the car. The register is governed in the usual manner by the handle, C. Similar letters refer to corresponding parts in Fig. 3. The cranks and connecting bar between the two leaves of the register are seen at D in Fig. 2. The vanes of the deflector are balanced and so arranged that when either mouth of the guard may be presented to the wind coming from the direc-

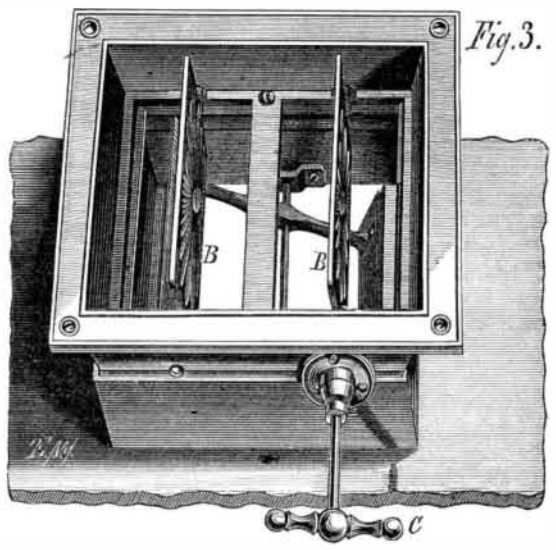


Fig.3.

tion in which the car is moving, the current will close one of the vanes and thus force the other out into the guard. They will thus be held in position, and so long as the car is moving in one direction, induce a current from the interior of the car in the other direction. If no ventilation is desired the register may be kept closed.

For sleeping cars such a ventilator is very desirable, as it provides for purity of atmosphere in the car while all incoming drafts are prevented. For this device letters patent were granted May 20, 1866, to George Hardy, 43 Turnpike street, of South Lawrence, Mass., who may be addressed relative thereto by those interested in building or running cars, whether steam railway or street railway.

Electric-Distance Meter.

The collection of articles sent to the Paris Exhibition by the Austrian War Office contains an ingenious apparatus, invented by M. C. Cocziczka, captain in the corps of engineers, for measuring the distances and indicating the movements of distant objects. This apparatus requires two points of observation placed at a certain measured distance from each other, and connected by a telegraph wire. At each of these stations a telescope is used for observing the object in view, and below the telescope a small table is placed in one of the stations, representing the map of the space in front of the observer. At one fixed point upon the table exactly below the axis of the telescope there is a long thin needle balanced upon a point, and connected to the telescope, so as to follow all movements of the latter and to be always parallel to its line of sight.

Beside this, a second needle, which turns round a point which represents the second point of observation upon the small map, is placed upon the table, and this second needle is connected with the telescope of the other station by an electric arrangement. The movement of the distant telescope is made to cause this needle to turn to an equal angle with itself, in a somewhat similar manner to the magnetic needles of the electric telegraph. The distance between the centers of the two needles on the paper being made to scale, so as to represent the measured distance of the two places of observation, it follows that the position of the two needles will indicate the two lines of sight of the two telescopes both fixed upon the same distant object, and the point where the two needles cross each other (one of the needles being slightly below the other) will correspond to the exact position of the distant object. If the latter is in motion, and the two observers follow its movements so as to keep it constantly in sight, the two needles will constantly change their position, and their point of intersection will make the same movements upon the map, on a small scale, as the distant object makes in reality; the movements of the object and those of the point of intersection of the two needles being simultaneous. For purposes of warfare there are several applications of this instrument, which will readily suggest themselves; but similar instruments may be used with advantage for purposes of general surveys of land, and for similar operations where they are not unlikely to effect some considerable saving of time, if properly employed.—*Engineering.*

A German writer estimates that an acre of good buckwheat will yield fourteen pounds of honey daily.