

**New Inventions.**

**New Cloth Measuring Machine.**

At a recent meeting of the English Institution of Civil Engineers, Mr. Joseph Whitworth, of Manchester, exhibited a new measuring machine, for determining minute differences of length. The accuracy of the machine was demonstrated by placing in it a standard yard measure made of a bar of steel, about three-quarters of an inch square, having both the ends rendered perfectly true. One end of the bar was then placed in contact with the face of the machine, and at the other end, between it and the other face of the machine, was interposed a small flat piece of steel, termed by the experimenter "the contact piece," whose sides were also rendered perfectly true and parallel. Each division on the micrometer represented the one-millionth part of an inch, and each time the micrometer was moved only one division forward, the experimenter raised the contact piece, allowing it to descend across the end of the bar by its own gravity only. This was repeated until the closer approximation of the surfaces prevented the contact piece from descending, when the measure was completed, and the number on the micrometer represented the dead length of the standard bar to one-millionth part of an inch. Eight repetitions of the experiment in a quarter of an hour produced identical results, there not being in any case a variation of one millionth of an inch.

**Ship Measurer.**

Mr. Abijah S. Hosley, of this city, has invented and taken measures to secure a patent for a most beautiful instrument to be used in taking the dimensions of the models of ships and other vessels, and which is termed a "ship model measurer," and which must be of great service to our nautical modellers and naval architects. By means of this instrument, by measuring the model, the proportions which it bears to those of the vessel it represents, are ascertained precisely, also the dimensions of the ship to be built from the model are set forth in its various parts, so that the ship builder obtains those necessary measurements which will enable him to construct a vessel in a much shorter space of time than can now be done by any means in use for that purpose. This is a very useful and beautiful invention indeed, and one which cannot fail to come into general use in a very short time.

**Improvement in Apple Mill.**

Mr. Samuel Amspoker, of Eldersville, Washington Co., Pa., has made an improvement in cider mills which is equally applicable to other mills when animal power is employed, and for which he has taken measures to secure a patent. The nature of this invention consists in causing the mill and its several parts to revolve on a vertical centre or shaft, while the crushing cylinder or roller (one or more) receives a separate motion on its axis by means of a friction roller, which rolls on the raceway on the ground, and which is attached to the driving shaft, so that in addition to its own rotary motion as well as that of the mill carried round by the horse or other animal, the driving power of the mill is governed at all times without alteration of the pace of the horse, by additional pressure or weight to the axis of the pressure roller.

**New Railway Torch for Signals.**

In England it is well known that great attention is paid to signals, and as the trains on our railroads become more numerous, so will we have to adopt the same system. The following is the account of a new torch recently introduced upon one of the English railroads:—The torch consists of a small oil fountain containing about half a gill of oil, with a tube, burner, and wick attached, which slide horizontally inside of a case, completely protected from the wind by a slide valve and small dome in which the light burns, ventilation being supplied to the burner by two air tubes below, so disposed that the stronger the wind blows the better the torch burns; the flame is only sufficient to light the burners in the signal lamps, and will burn full four hours. The valve, which is inseparable from the torch, is

hinged and loaded; after the outer cover is removed the point of the torch is passed into the lamp at the same time raising the valve inside, and when withdrawn the valve shuts, preventing admission of the wind.

**New Patent for Rising and Descending Inclinations in Railways.**

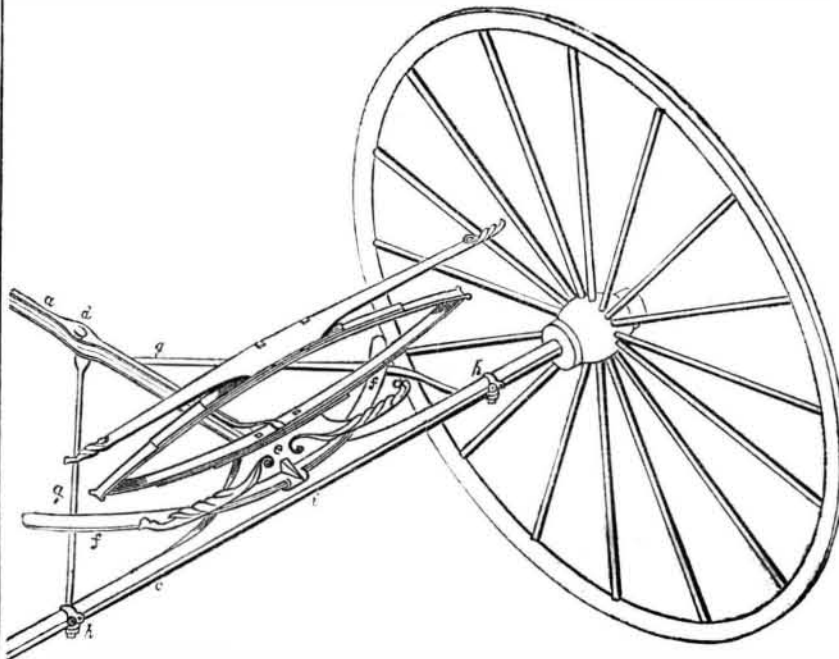
Wm. F. Carr, of Wayland, Steuben county, New York, the Post says, has filed his caveat for the patent of an invention for ascending and descending any grade upon railroads. He claims that it is a great improvement on the

methods now in use. It has, he affirms, enabled him, in the experiments he has made, to surmount an ascent of eight hundred and forty-five feet to the mile. Its principle is said to be simple and easily supplied in practice.

A third rail furnished with cogs, is laid by the side of the outside rails and cogs are put on the flanges of the driving wheels.

All that we can say about it is that if Mr. Carr had consulted us, he might have saved his money. His invention is at least six or ten years old. Mr. Hoyt of Indiana has a patent or such an invention.

**EVERETTS' CARRIAGE COUPLING.—Figure 1.**



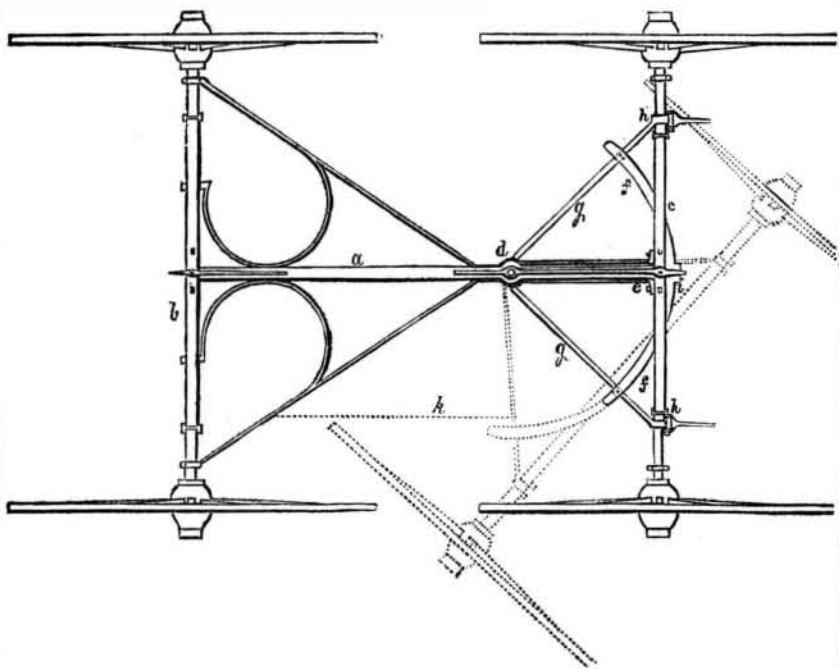
This is an improvement in carriage coupling by Messrs. Edward and Charles Everett, patentees, Washington, D. C. These figures are taken from a carriage lately constructed.

Figure 1 is a perspective view of the fore part of the running-gear, and fig. 2 a plan of the entire running-gear, with the position of the fore wheels in the act of turning shown in dotted lines. *a* is the perch; *b* the hind axle; *c* the fore axle, which is coupled to the perch by the bolt, *d*, placed some distance in the rear of the fore axle. The head block, *e*, and fore spring slide on a segment, *f*, which is attached to the fore axle, *c*, by bolts, and also by the two arms, *g*, radiating from the perch bolt, *d*, to the shaft clips, *h*, on the fore axle.

At the front of the sole plate of the head block, *e*, is a projection, *i*, which bends round the front edge of the segment, *f*, and serves as a stop to prevent the wheel from striking the body, when turned to either extreme, by coming in contact with one of the radial arms, *g*; *k* shows the line of the side of the body.

The carriage above represented will describe a circle, in turning entirely round, of six and a half feet diameter, while one of the same proportions, but with the perch bolt through the fore axle, will not describe a less circle than twenty feet diameter. The facilities for getting in and out are great, as the fore wheel turns entirely out of the way, and there is ample room for steps. It is stronger than the old

**Figure 2.**



plan, as the fore axle is not weakened by a hole through its centre, and the strain of the draught is borne by the two radial arms; and as the wheels are never prevented from turning the risk of breakage is much lessened, and the disagreeable scraping of locked wheels altogether avoided.

This improvement permits the use of large fore wheels, with all the advantages derived from them in saving friction and surmounting

obstacles with facility, and at the same time obviating the disadvantages which have hitherto attended their employment, and with this improvement a carriage can be turned in a small space as those which have small fore wheels will run under the body; and besides, the wheels never touch the body, and the parts are so arranged as to give a greater degree of strength than the old method of coupling.

This plan is applicable to all vehicles where

it is desirable to use large fore wheels, and it may be applied to those already constructed with little trouble and expense. More information may be obtained by letter addressed to Messrs. Everett.

**For the Scientific American.  
Theory of the Rifle.**

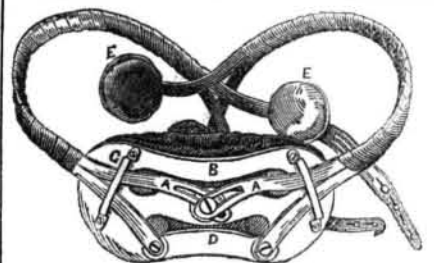
The theory and fact of the superiority of the rifle-barrel gun over the smooth bore, is as follows: in the smooth bore the ball, when discharged from the muzzle, acquires a rotary motion by friction against one or the other of its sides, the axis of which motion is always at right angles with the line of its flight, but may be with respect to the earth, either vertical, horizontal, or inclined. It is obvious that, as the axis of rotary motion is at right angles to the line of flight, therefore one side of the forward half of the bullet revolves in the direction of its progressive motion, and the other half the reverse. Such being the case, the ball meets with much more resistance from the air on the side revolving forward than on the side revolving backward, and is, in consequence, deflected from a right line to the right or left, upward or downward, according to the direction of its axis of rotation.

To obviate the irregularity in the flight of the bullet, caused as above stated, the rifled barrel was invented, and effects the desired object with great certainty. The twisted grooves formed in the bore of the rifle—which, in the most approved rifles, make about one turn in the length of the barrel—cause the ball to rotate about an axis which lies in the same direction as the line of flight; hence its forward half meets on all sides an equal resistance from the atmosphere, and is not deflected from a right line otherwise than by the force of gravity.

H. W. H.

Claremont, N. H.

**Knapp's Self-Arresting Abdominal Supporter.**



The instrument represented in the accompanying engraving is the invention of Mr. Moses L. Knapp, of Painesville, Ohio, and was secured to him by patent on the 28th of last January. A A are the front springs, having four branches, but united into one branch on each side, extending round to the back pads, E E, of which there are four; B D is a polished front wood frame, with a movable cushion inside, and with ventilation openings in it. There is a clamp, C, for each spring in front, and at A A there is a slot in each spring, to adjust the said springs by expansion or contraction by the central set screw, to suit any size or form of the wearer—an improvement long desired. It can be adjusted to the exact degree of comfortable wearing, it has a polished concave wooden surface, with ventilations and a movable cushion, also four back pads suspended by elastic steel springs, affording gentleness of pressure and freedom of motion to that important part, the spine—each part being at once beautifully and happily combined.

From the testimony of medical men and others, Mr. Knapp is confident that his invention is perfectly adapted to attain the desired end in the relief of those for whom it is intended. We believe this to be a most excellent and durable instrument, and a meritorious invention. More information may be obtained by letter addressed to Mr. Knapp.

**Improvement in Carriage Springs.**

Mr. Benjamin J. Barber, of Saratoga Springs, N. Y., has taken measures to secure a patent for an improvement in springs for carriages, which is stated to combine greater strength and elasticity than any of the springs in common use. The improvement consists in combining a C and elliptic spring; a C is attached to each end of a "semi-elliptic spring."