

IMPROVED RAILWAY SYSTEM.

The object of this invention is to overcome the disadvantages attending the present mode of supporting railway rails on ties placed at intervals, by providing for them continuous and equalized bearing surfaces, which are yet of a sufficiently elastic nature to relieve the rolling stock of undue wear and tear. To enumerate the objectionable features of the present system would only be to repeat what we have said in former articles, so we will at once proceed to show how it is now proposed to meet them.

Mr. Connelly, the inventor, has devised, with the above end in view, two plans of construction; one consisting mainly in a system of longitudinal wooden sleepers, and the other in a semi-elastic concrete bed. We will first explain the former, which is shown at the lower side of Fig. 1, and, in detail cross section, at A, Fig. 2.

The sleepers are 10 by 12 inches in cross section. The crossties used are of either cast or wrought iron, and are formed with ribs on the under side and end ribs on the upper sides, while their ends are turned down to correspond with the beveled edges of the sleepers. A portion of one of the ties is shown at B, Fig. 3, from which its construction will be seen. The upper rib serves to support the outer edge of the rail clamp, C, and the lower ribs supply an anchorage for the bolts by which the clamp is fastened.

The ties for joints are eight inches in width and the others two inches and a half; and the clamps are made to correspond. Two of the wide and four of the narrow clamps are used for each length of rail (thirty feet), and the joints of the rails on each side of the track are laid on the broad ties alternately; which arrangement is seen in Fig. 1. The wide clamps are made sufficiently high to take the place of a fish bar, as shown in Fig. 3, and the outer one may, at the rail joints, be made heavier and extended up level with the tread of the rail, so as to take the bearing of passing wheels when the ends of the rails are separated by contraction, and, thereby, prevent their being battered down. The sleepers are mortised to receive the ties, which may be spiked to them through the beveled ends if necessary; and between the tie and the clamps and rail, at D, is placed thin wood, gum, or other elastic material. A substantial road bed between the rails, and extending two feet outside, is made of ballast thoroughly tamped with gravel. The entire construction, as described, will readily be understood on inspection of Fig. 2, at A.

The concrete system is represented in the upper portion of Fig. 1, and at E, Fig. 2. A longitudinal bed of concrete, 14 inches square, is laid down, and is covered with what the inventor calls an "elastic boulevard," one inch thick. Coal tar enters into the composition of this covering and gives it the requisite elasticity. This is capped with a wrought or cast iron plate, which has its edges flanged down in such a manner as to secure the boulevard and itself upon the concrete bearing. The road bed is made as in the previous case, and the ties and clamps used are the same as in that. Oak plank is laid under the rail and clamps, and the cap, crosstie, plank, and clamps are bolted together, as shown at E, Fig. 2.

It is claimed that in this invention the chance of broken rails is reduced to a minimum, while an absolutely smooth and durable road is secured, and the rolling stock preserved from injury.

The inventor states, further, that in the system of longitudinal sleepers a 48 pound rail is fully equivalent, in all respects, to the 67 pound rail now used with the ordinary ties; and he estimates, thereby, to effect a saving in metal of over \$1,000 per mile with iron rails, or of over \$1,500 per mile when steel is used. The first cost of the concrete system is estimated to be the same as that of the present track, but the economy in its maintenance would, he thinks, give it a great advantage over the latter.

The proprietors of the patents on this invention, which were dated May 14 and June 18, 1872, are J. C. Tilton & Co., of Pittsburgh, Pa., who are desirous that the improvements

should go into immediate use, and who will correspond with railroad officials, manufacturers of materials, capitalists, and others who may wish to become interested.

OZONE.—In the *Journal* of the Scottish Meteorological Society for January and April 1872, in addition to the usual records of temperature, pressure, rain, etc., is a report on ozone observations, which appears to be of considerable value. The following conclusions are interesting: "When the air had a pleasant sharpness to the feelings, exercising a stimulating influence on the spirits, the largest quantities of

and cartridge extractor, which is connected by a link with a pivoted breech block, a lever which is moved by the action of the lever. The gun is also provided with a cartridge gage, by means of which a stop behind the carrier is set so as to accommodate cartridges of various lengths.

In Fig. 1, at A, is shown the opening through which the cartridges are inserted to charge the magazine. It has a spring covering, which yields readily to admit the cartridge and afterwards closes immediately by the recoil. In Fig. 2, at B, is the cartridge gage, which consists of a plate that slides in a shallow groove, and is connected with the stop before alluded to. In using the gage, the cartridge is laid with its point at an engraved line on the mounting, shown in the figure, and with its heel in the groove; the plate is slid forward until it touches the heel, and is then fixed in that position by the screw in its center. Only the length of cartridge gaged can be used unless the gage be altered.

On one side of the front end of the pivoted breech block is a projecting pin, by which the same is lifted up; and it will be observed, on inspecting Figs. 1 and 2, that this can only be done while the hammer is raised so as to clear the projecting tongue on the end of the block. It will further be noticed that by this construction the hammer cannot reach the firing bolt (which is situated under the tongue) while the breech block is raised, and thus all danger of premature discharge is avoided. Still another effect of the construction is that the breech block and all its appendages are securely locked by the hammer when firing. By raising and lowering the breech block, the operations of extracting the discharged shell and loading with a new cartridge, are effected. Upon raising it, the extractor is drawn back and the empty shell withdrawn from the barrel; and upon its attaining its highest point of elevation, its tongue strikes the lever before mentioned, by which the carrier block is raised and made to eject the shell and elevate a full cartridge on line with the barrel. The position thus arrived at is shown in the enlarged view, Fig. 3. Upon swinging down the breech block, the new cartridge is pushed home into the barrel, and the carrier is made to descend in line with the magazine to receive another.

In Fig. 4 are shown various samples of projectiles, full size, to the use of which the gun can be adjusted. It will be seen therefrom that the arm is adapted for cartridges of unusual length, and it is claimed that its range and penetration are increased accordingly. Its caliber is $\frac{4}{10}$ in., and loads of this size varying in length from $1\frac{1}{4}$ to $1\frac{1}{2}$ in. can be used.

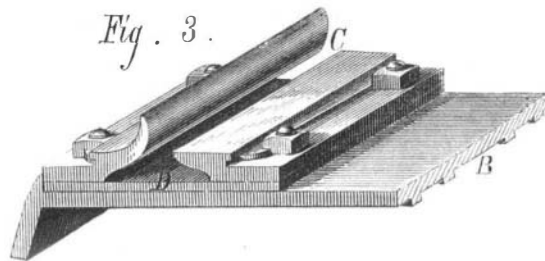
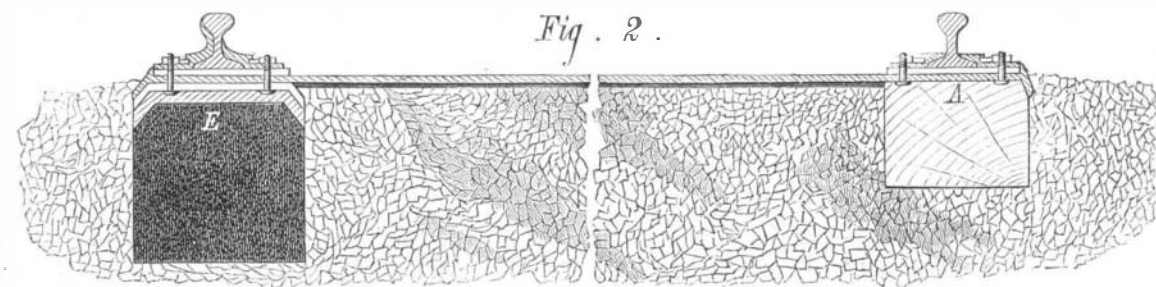
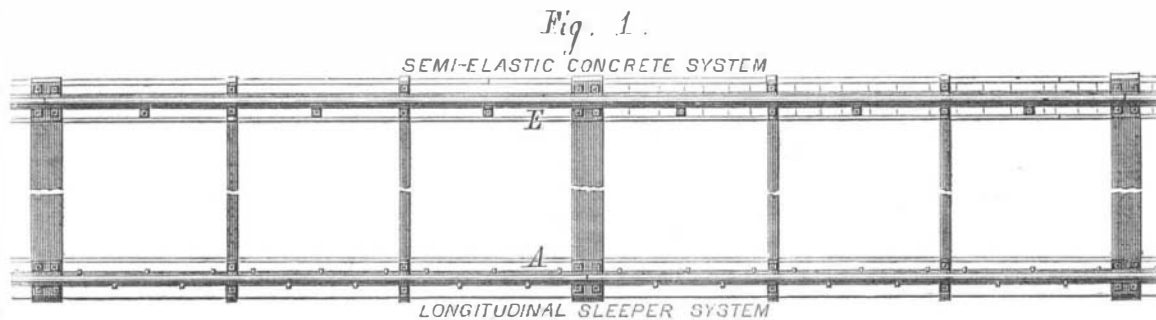
We may remark that the barrel of this rifle may be separated from the stock by simply removing a pin. The weight of the weapon as manufactured is from 7 to 9 pounds, and its length from 42 to 47 inches—the barrel being from 24 to 28 inches; and it carries from six to eight shots.

Among other advantages claimed for it are its beauty of form, strength, safety and superiority of balance consequent on

the perfect proportion of all its parts, and the fact that all its working parts are closed in and protected from injury.

The gun was patented through the Scientific American Patent Agency, April 23, 1872, by Mr. Orvill M. Robinson, a previous invention of whose in the same direction we illustrated at page 127, Vol. XXV. It is manufactured by the Adirondack Fire Arms Co., Plattsburg, N. Y., of whom further information may be obtained.

THE "HEATHEN CHINEE."—The *San Francisco Bulletin* says: A manufacturer of bird cages and other ware in the city, a short time since, thought to enlarge this revenue by substituting Chinese cheap labor for the white workmen he had in his employ. The Mongols did well enough, at \$1 a day, for a short time, until they mastered the business, and are now "bearing" the bird cage market at a fearful rate. The author of this enlargement of their sphere of enterprise is prone to believe that "we are ruined by Chinese cheap labor."

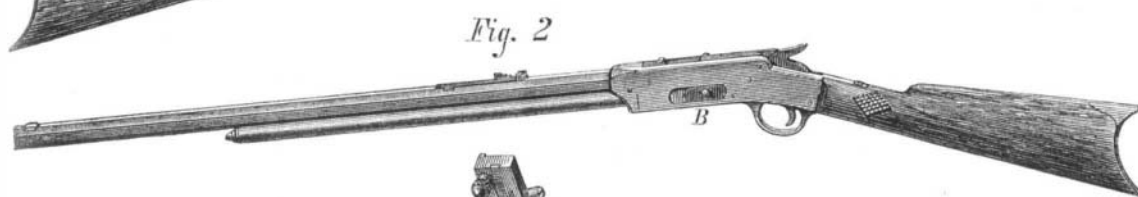
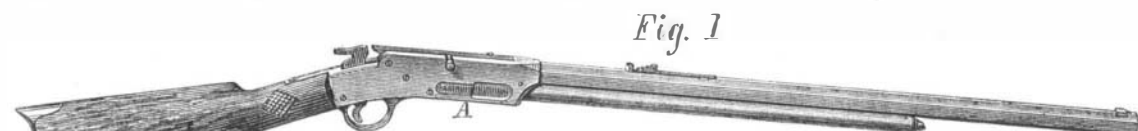


CONNELLY'S RAILWAY SYSTEM.

ozone were obtained. On the other hand, when the air was close and seemed to exercise a slightly depressing influence, little, if any, ozone was detected."

IMPROVED REPEATING RIFLE.

In the improved rifle we now illustrate, the skill of the inventor has furnished an example of simplicity, neatness and



ROBINSON'S MAGAZINE REPEATING RIFLE.

effectiveness rarely excelled. The piece is a magazine breech loader, and in it the intricacies of construction of such arms have been reduced to so low a point that a long detailed description of its working parts is rendered unnecessary. We may briefly say these parts consist of a sliding breech

