

**Preventing Noise on Railway Bridges.**

According to *La Semaine des Constructeurs*, the government administration of the new metropolitan railroad in Berlin has devoted considerable attention to the subject of diminishing the noise of trains passing over the viaducts and bridges, which, of course, form the principal portion of the road. Wherever possible, the viaducts are built of brick or stone, and the sound of light trains running over these is not very annoying; but arches of masonry cannot well be used in crossing crowded streets, and the metallic structures employed in such places rattle and reverberate in a manner which not only upsets the nerves of pedestrians, but by startling horses passing beneath is frequently the cause of accidents. In experimenting to find means for overcoming the trouble, it is found that the form of the bridge does not perceptibly affect the noise from it, a lattice truss, notwithstanding the multiplicity of joints, producing no more sound than a plate girder; but the length is a very important factor, so much so that the noise is considered by the German engineers to be directly proportioned to the span of the bridge. Where the rails rest on wooden cross ties, or on timbers running longitudinally, the sound is less than where they are secured directly to the metal, and it may be still further diminished by placing cushions of felt or rubber under the timbers before bolting them to the bridge construction.

To cover an iron bridge entirely with planking does not appreciably diminish the noise from it unless the planking is covered with gravel, a thin layer of which has a marked deadening effect, while still more improvement is obtained by thickening the layer of gravel about the track so as to bury the cross ties or longitudinal timbers on which the rails rest. Profiting by these suggestions, the Berlin engineers have adopted two different systems for diminishing the noise of trains on their viaducts. One is to bolt to the bridge structure long troughs of sheet iron, about 16 in. wide, so

**MODERN MILITARY APPLIANCES.**

In modern warfare those preparations which facilitate the rapid transportation of the army, the communication of the several sections with one another,

the army, and the latter by the use of transportable field bakeries. The separable field ovens of the "Payer system," which are used in the Austro-Hungarian army, proved, during the last great maneuvers,

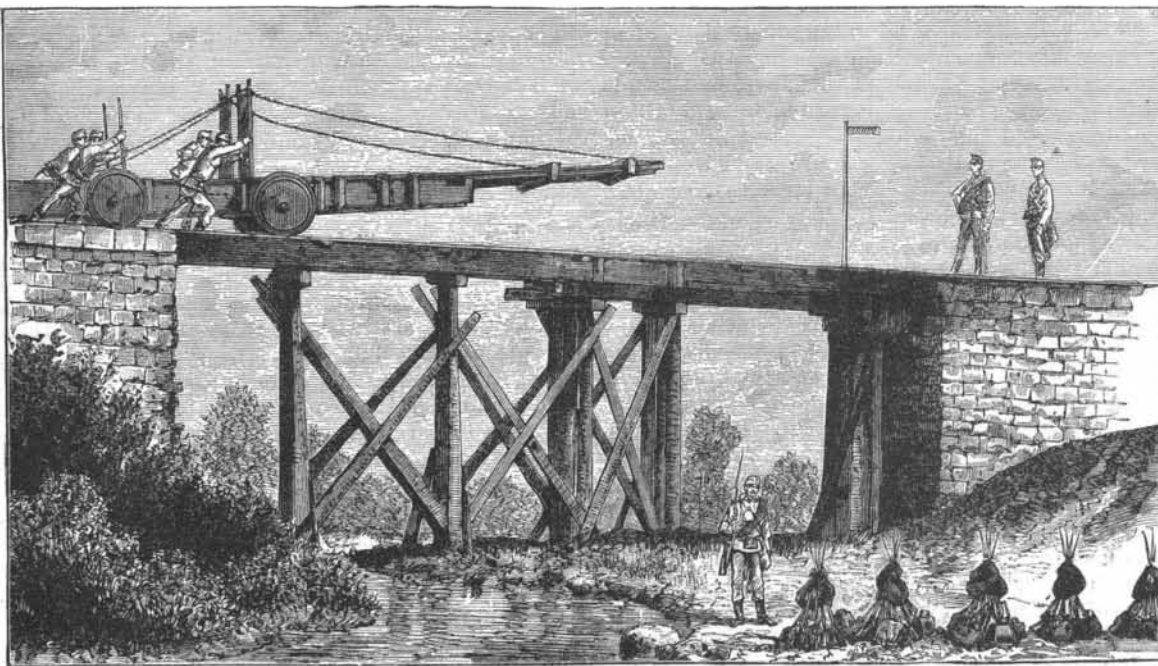


**ERECTION OF THE TELEGRAPH BY THE RAILROAD AND TELEGRAPH REGIMENT.**

and the prompt and satisfactory supply of provisions to the troops, play as important a part as the arming, equipment, and leadership of the army. For years past the Austrian war department has made a point of improving and perfecting the existing military arrange-

to be excellent. The ovens are taken apart, and they, with the other utensils belonging to the field bakeries, are placed on special wagons and carried with the troops so as to be ready in case of need. A field bakery generally consists of three sections of forty-eight ovens, each section being divided into four parts, and each of these parts containing four ovens, which latter are always set up and operated in pairs. It requires four hours to set up the ovens and tents. A field bakery of this kind can deliver 17,928 loaves of bread for nine "heats," each loaf forming two rations.

With the very extensive fronts of the large armies of the present day, it is not always possible to communicate by telegraph, specially when two divisions are separated by marshy ground. In such cases the field signaling apparatus can be used to advantage. This is an optical telegraph which consists essentially of a triangular and a hexagonal piece of linen, which can be so arranged in different positions in relation to each other that full dispatches can be transmitted very quickly. As, however, an apparatus of this sort cannot be employed in foggy weather, numerous electric telegraphs must take its place. The construction of the latter (particularly the laying of the cables) is attended to by the railroad and telegraph regiment which has been formed in Austro-Hungary during the past few years. This is a corps similar to the pioneer corps, and is, like the latter, armed with the pioneer sword and also with the extra corps gun; and the uniform is of the same gray with steel-green trimmings, bearing the winged wheel as a special mark. All of the officers of the telegraph regiment, as well as those of the pioneer regiment, are mounted. In placing the telegraph wires they are allowed to run off a drum which is mounted on two-wheeled cart, and then secured to the light, transportable telegraph poles which are supplied with insulators. Furthermore, the construction of short connecting railroads for the transportation of troops, ammunition, and provisions forms a part of the



**THE RESTORATION OF A PORTION OF A ROAD BY THE RAILROAD AND TELEGRAPH REGIMENT.**

arranged that a rail will come in the center of each. The troughs are then filled with gravel, in the middle of which is buried the longitudinal timber carrying the rail, and the space between the troughs is covered with iron plates on which is spread a thin layer of gravel. The second method, which is found to be more efficient than the other, consists in placing a continuous series of shallow iron troughs, about 5 ft. square, along the line of the tracks. These are filled with gravel, on which the ties and rails are laid.

[In New York it is noticed that a heavy fall of snow renders the elevated railways almost noiseless.]

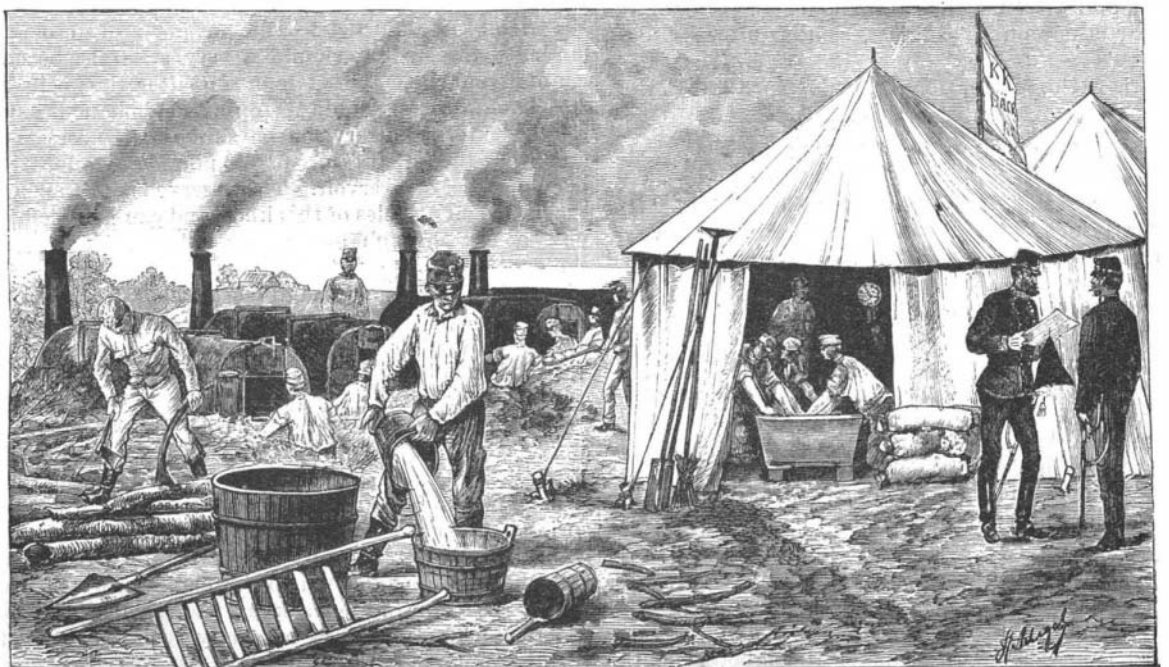
**Horse, Steam, or Electricity.**

Mr. Ransom, writing on the comparative cost of steam, horse, cable, or electricity, takes a sample road, six miles long, with twenty-four cars, a speed of six miles an hour, and running twenty hours out of twenty-four. This would require forty-eight horses on the lines and 192 in the stables, costing, with harness, initially about \$38,400. The initial cost for electrical plant he estimates at \$26,500, for cable plant \$35,000, and for comparison these figures may be put:

A motor plant of horses costs \$38,400; of electricity, \$26,500; of cable apparatus, \$35,000. With regard to the road, the estimate is for horse road single track per mile, \$9,000; electric varies, according to system, from \$10,000 to \$23,500; cable roads from \$30,000 to \$110,000; steam, \$9,000. If old roads have to be adapted to the new traction, the cost of adaptation is given for a six mile road: For cable, \$265,200; for electricity, \$70,500; for steam, \$40,000. In conclusion, Mr. Ransom says: "In original cost, expense of operating, cost of maintenance, outlay in applying to old roads, steam distances every other mechanical system."

ments, and has lately made many innovations in this direction.

It is very important for the welfare of the troops that they should always be provided with fresh meat and bread. The former is obtained by driving cattle after



**FIELD BAKERY.**

**MODERN MILITARY APPLIANCES.**

duty of the railroad and telegraph regiment, while another important duty consists in replacing parts of roads destroyed by the enemy. This regiment, like the pioneer corps, has a special train for carrying the building material, the necessary tools, blasting materials, etc.—*Illustrirte Zeitung*.

**Sugar from Coal Tar.**

The wonderful coal tar sugar story, which has been published in nearly every newspaper within a year, is again revived, and from a recent article in the *German Sugar Manufacturers' Journal* it appears that a factory for the production of that wonderful product known as saccharine is now completed, and will be fully equipped for work in a few weeks. It is located in Westerhausen, near the old historic city of Magdeburg. This coal tar sugar, having a sweetening power 300 times greater than cane sugar, it is said, will be used for mixing with glucose, and it is presumed will, in a large measure, displace the product of the cane for the same purpose. The journal from which we gather the above facts also states that one pound of the new saccharine mixed with 500 parts of glucose gives a compound as good as the best sugar used on the Continent, while it can be supplied at a much lower price.

**A SIMPLE AND POWERFUL STUMP PULLER.**

A stump pulling machine in which the power is applied on the screw principle, through a worm wheel working horizontally, in connection with a chain wheel, and by which the most difficult jobs can be readily and economically performed, has been patented in the United States and Canada by Mr. John Cornelius, and is represented in the accompanying illustration. The framing of the machine is preferably of iron, to give greater strength and durability, and in the frame are journaled horizontal and vertical shafts, the latter having an upward extension to receive the sweep to which the team is hitched. The vertical shaft is stepped in a socket block, with washers, to save wear, and is provided with a worm which meshes with a worm wheel on the horizontal shaft. This vertical shaft is so con-

structed that it can be thrown in and out of gear—thrown in when operating, and thrown out to draw the chain out its full length for the next pull, to avoid the moving of the lever.

be made to clear from one to two acres of ground without moving it, the machine adjusting itself, as each stump is loosened, toward the next strongest stump, and so on as the operation proceeds, until all the stumps are extracted. The services of two men and one boy are all that are required to work the machine successfully, and when in operation from one to five or more stumps at a time can be seen yielding to its great power. It is also well adapted for the pulling of standing timber of the post oak variety and for moving buildings and other heavy bodies.

For further particulars with reference to this invention, or machines made under it, address Mr. John Cornelius, Buffalo, N. Y., where the machine is now on exhibition.

**Sick Headache.**

Dr. S. F. Landrey says in *Popular Science News* that the headache of indigestion, accompanied by scotoma, or scintillations and dazzlings of light before the eyes, is always due to acidity and evolution of gases in

the stomach. When not accompanied by aphasia or by a want of co-ordination, it is easily cured by common saleratus or supercarbonate of soda. Let the patient take one-fourth of a teaspoonful in much water—say, four to six tablespoonfuls, or more—wait a few minutes, and if not relieved repeat the dose. The glimmering soon ceases, and the pain forgets to follow. Hot water can be used if the stomach is very weak, and Bondault's pepsin will sometimes relieve it without the soda.

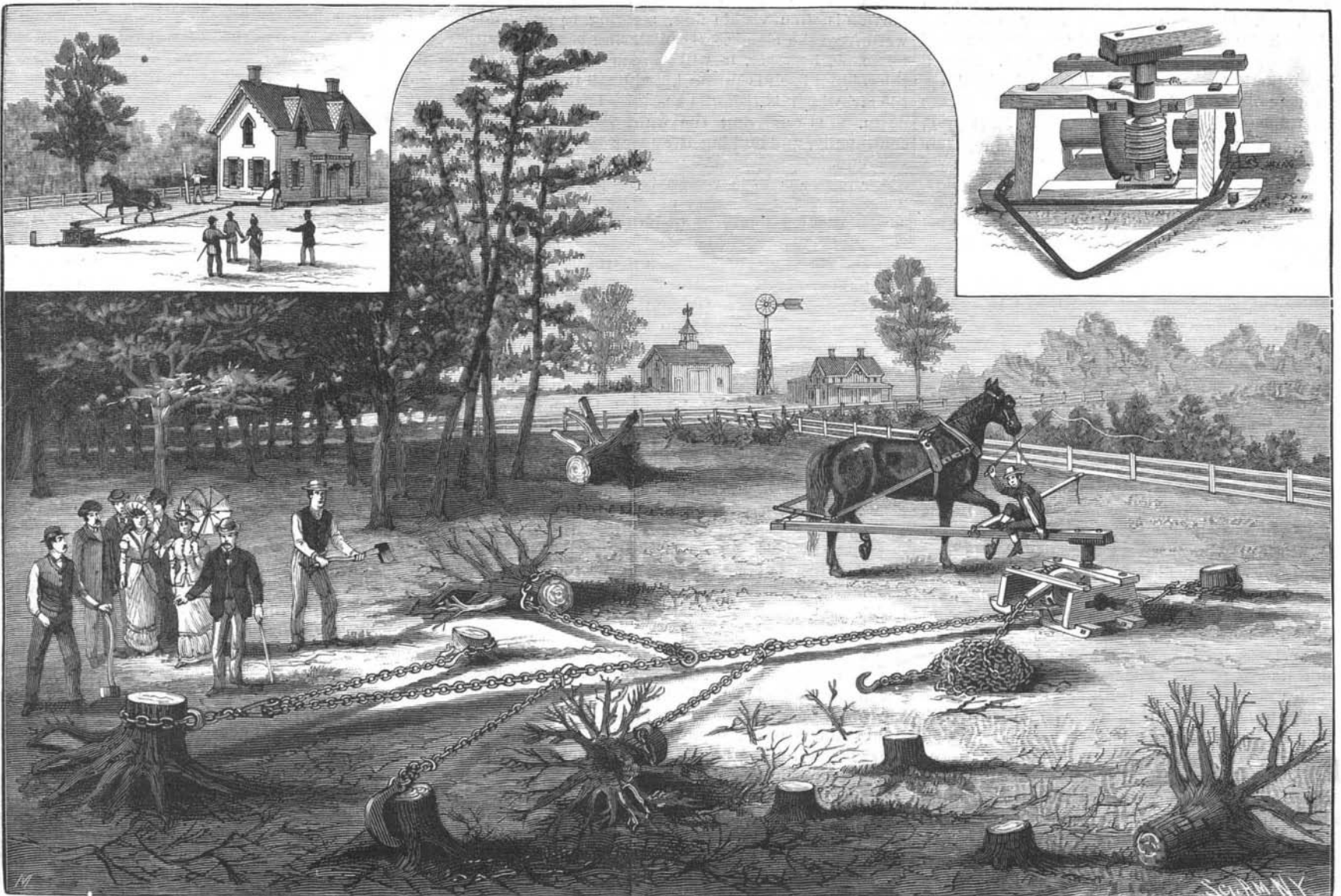
**Human Bite.**

Physicians agree that the poison conveyed by human teeth is one of the most annoying that they have to deal with. One of them writes to the *Medical Register*: "I have under my attention severe and most complicated cases of blood poisoning, in which the patient had but slightly abraded the hand in the course of a fight by striking the knuckles against the teeth of his opponent. I have known hands thus poisoned only saved from amputation by the application of all the resources of science."



MODERN MILITARY APPLIANCES—FIELD SIGNAL STATION.

There is rigidly fixed on the horizontal shaft, in connection with the worm wheel, a chain wheel, on which the chain is wound in operating or unwound by throwing vertical shaft out of gear. The chain wheel is formed with a radial circumferential groove adapted to receive the size of chain to be used, there being three different sizes made of the machines, which vary only in the use of a lighter or heavier screw wheel, and in the different chain wheel required for the stronger or lighter chains best adapted for various classes of work. Guides, in the form of tubes or throats, are fitted for the passage of the chain through them to and from the chain wheel, the machine being adapted to pull with either direction of movement. The machine may be anchored to the ground or to a central stump, and under strain will assume position with the receiving guide in the direction of the greatest strain, the machine conforming to the variations in strain. A principal point claimed for this machine over others is that, while the latter are carried or drawn from one stump to another, this machine, being anchored to a central stump, can



THE JOHN CORNELIUS GRUB AND STUMP PULLER.