

cut into small pieces; and in exactly six minutes from the time of starting the whole ten head of oxen were cut! Now, this was all done with two saws and six men, who fed them and took off the pieces as they were cut. At this rate these two saws and six men could cut up one thousand head in ten hours. This shows the capacity of the improvement when fully tested. But with ordinary running, the two saws and six men can more easily cut five hundred beeves per day than could fifteen men two hundred per day by the old hand saw process.

Here then is a saving of more than one-half the labor and about two-thirds of the time usually employed, and also a great improvement in the manner of cutting. When offering mess for sale the inspectors are particular in seeing that the pieces are cut square and smooth. If they are not they are rejected and branded inferior. This damages the sale, and the owner incurs a loss thereby. By the application of these saws every piece is cut alike—there are no ragged pieces, no ragged edges—every piece is cut smooth and clean and square. In this respect alone not to speak of the labor saved—the invention is a highly valuable one, and cannot fail to be greatly prized by the trade.

But Messrs. A. E. Kent & Co. have made other improvements in the beef packing department. Instead of killing the steers with a hammer, by knocking them on the head, they are shot in the head from a breech-loading rifle. Besides being less cruel, this is a much quicker mode, and the animals die instantly. Then as soon as they fall and are bled, a chain-drag is attached to the horns, and by turning a lever, steam power is applied, by which the carcass is immediately dragged from the slaughter pen into the dressing room. This is a great improvement on the old appliance of ropes, with block and tackle. Another improvement has also been introduced, which consists of a railway conductor, by which one man can convey an entire beeve from the dressing room to the hanging room. This has often been introduced into the pork packing establishments, but has never been used in hanging beeves.—*Chicago Tribune.*

THE MILITARY RAILROAD SYSTEM OF THE UNITED STATES.

Mr. Benjamin C. Truman writes the following interesting letter to the *New York Times*:—

Few persons, even of those in the highest military stations, are acquainted with the gigantic efforts which have been called into requisition to sustain our armies occupying this portion of the South-West.

It will be remembered that Nashville was first occupied by National troops in February, 1862. The Confederate forces, before retiring from the city, destroyed everything in the shape of machinery for manufacturing purposes, stores, etc.; but most particularly did the retreating enemies employ themselves in making complete their work of destruction in the shops and manufactories attached to the Nashville and Chattanooga, and the Tennessee and Alabama railroads, which had been of the most vital importance to the railroad system of this section, and eminently so in assisting the progress of the rebellion. Everything in the shape of locomotives and rolling stock was, of course, removed.

There are now about fifteen hundred miles of road, employing eighteen thousand men, as mechanics, engineers, blacksmiths, conductors, brakemen, laborers, etc. The rolling stock consists of two hundred and seventy-one engines and three thousand cars, while the buildings erected within the past year, and occupied by this particular branch, extend for several miles—a detailed description of which I shall give below. I will add, however, that these buildings are built upon the most improved plan of wooden structures, all of which are guarded, day and night, and protected against fire by a multiplicity of rotary engines, steam fire-pumps, cisterns, etc.

All this is, in a great measure, owing to the sagacity and zeal of Gen. McCullum, Col. J. C. Crane and Mr. Anderson, to whom the country at large is greatly indebted. To Col. Crane must the highest honors belong, for the existence of this stupendous transformation. His is the executive eye, and to him almost entirely belongs the credit of bringing about this great change. Great credit, however, is also due to Gen. McCullum, Mr. A. Anderson, and

the Commander-in-Chief of the Military Division of the Mississippi, who, together with Col. Crane, have shown to the world a new feature in the art of war, namely, building a railroad which shall keep pace with an advancing army, and each evening deliver its necessary supplies for the coming day.

The expenses incident to the running of the military railroads in the Division of the Mississippi, including the purchases of material and the payment of employees, reaches the astonishing sum of \$2,200,000 per month.

Below I give a detailed description of Col. Crane's department, the result of a visit which I made on Tuesday last.

LOCOMOTIVE AND MACHINE DEPARTMENT.

This is by far the immensest establishment of the kind in the country—perhaps in the world. I shall endeavor to give you a fair view of its exterior and interior, realizing the fact, however, that no picture can urge the imagination to a proper conception of its vast proportions.

The locomotive and machine department is under the efficient superintendence of Mr. E. P. Benjamin, and employs three thousand men. The main building is two hundred feet long and eighty wide, and is in process of extension, its projected extreme length to be four hundred and fifty feet. The upper part of this building is used for rebuilding and repairing locomotives and tenders, and is called the erecting floor. This capacious room will accommodate thirty-four engines at a time. Really, the shop has not yet built a new locomotive; but every piece of machinery necessary in the construction of an engine or locomotive, with the exception of the wheel tire, has been turned out. Captured and crippled locomotives find their way into this shop, and in a few weeks steam out as good as new. The foreman of the locomotive shop pointed out to me a magnificent looking engine which had been elevated from a worn-out boiler. Everything about the structure had been manufactured in this shop, except the boiler and driving wheels. While I think of it here, nothing is manufactured by the government, the foreman informed me, which involves a loss, except a steam whistle. These can be bought cheaper than they can be manufactured, and the manufacture of them in whole has been discontinued in consequence.

MACHINE SHOP.

Adjoining this huge building is the machine shop, which is over 200 feet long, filled with the most improved machinery of the age, up stairs and down. There are some very fine machines down stairs, including a marine lathe, for turning heavy shafting; a lathe for truck axles; compound planer, for all kinds of light planing; two heavy planers; drill press, for doing all sorts of light and heavy drilling; heavy drill press; large lathe, for turning locomotive driving wheels; slotting machine, used for horizontal planing; and two boring mills. In the upper machine shop are five bolt-cutting machines, capable of doing the heaviest of work; cotter and key-seating machine, self-feeding; several gear-cutting machines; six drilling machines; large boring and turning mill; large hydrostatic press, for putting car wheels on axles; two large driving-wheel lathes; seven planing machines; two milling machines, and twenty lathes, of all sizes and descriptions. The entire machinery is new, and of the most improved pattern, and is chiefly from the well-known establishments of William Sellers, Philadelphia; Bement & Dougherty, Industrial Works, Philadelphia; Putnam Machine Co., Fitchburg, Mass.; Lowell Machine Co., Lowell, Mass.; John Paishley, New Haven, Conn., and others.

The machinery of the whole establishment is run by two horizontal engines of 300 horse power. These engines were formerly in the Memphis Navy-Yard. After the breaking out of the rebellion they were removed from Memphis and placed in the gun-factory erected in this city by the enemies of the country, for the manufacture of small arms. The engine and fire-room is a perfect parlor, over which towers a chimney 130 feet in height, the brick used in its construction having been taken from old houses which were torn down for that purpose.

BLACKSMITH SHOP

One of the most perfect and completely-arranged blacksmith shops is connected with the locomotive and machine department. The foreman of the shop

Mr. Duncan Livingstone, pronounces it the completest workshop of the kind in the country. It is about 200 feet in length, and eighty in width, and employs nearly two hundred of the best blacksmiths that could be found, all of whom receive from \$3 50 to \$10 a day. There are forty forges which are blown by steam. By an invention of one of the employees of this shop the ashes and coal-dust is carried off by the same blast which blows the fire, making the forge present a clean appearance at all times. Every variety of heavy work as well as light is turned out here.

Connected with this department is a foundry, in which all kinds of work are turned out. There are also carpenter and pattern shops, in which the wood-work for the locomotives and tenders are manufactured.

A "round house," which is to be the largest in the country, is in process of erection, which, when completed, will have sixty stalls, and will be so constructed that 100 locomotives may be accommodated at a time.

THE CAR DEPARTMENT.

The main building of the car department is 202 feet long and 80 wide, and is solely used for the manufacturing and repairing of cars. At present Mr. Herrick is having a headquarters car built for Gen. Thomas, which, for convenience and elegance, is the finest affair I have ever seen. With the exception of the ornamental work, this model combination of house and carriage is complete. It is an iron-plated vehicle, 50 feet in length and of the usual width, containing a kitchen, dining saloon, sleeping apartment, wash-room, water-closet and office. Nothing could be more complete, while the upholstery and ornamental work is *recherche*.

The cars are all ventilated by an invention of the manufacturer, and when empty present an incomprehensible mass of network, composed of iron and india-rubber. Each car will accommodate 36 badly wounded. The hospital train always follows the passenger train, and the utmost care is taken to guard against accidents, and I will state here, that since the commencement of running these improved hospital carriages, no soldier has sustained the slightest injury. There are attached to the Car Department a blacksmith's shop, brass and iron foundries, and paint, glass and upholstery shops, besides a spacious storehouse. The blacksmith shop is upon the same order as the one in the locomotive and machine department, except that it does not employ so many hands. This shop, in connection with the iron foundry, manufactures all the iron work and castings used about a baggage or passenger car and engines. The brass foundry turns out all the articles of this metal required about cars and engines, all of which are handsome specimens of excellent workmanship. Every ounce of dust and dirt is saved, and all the sweepings of the foundry, and washed out like gold dust. The paint, glass and upholstery shops employ about a hundred hands, who are kept constantly at work at their various trades. The employees in the car department are as amply accommodated with lodgings as those at the locomotive and machine shops.

COL. CRANE.

I cannot close without saying a few words more in relation to Col. John C. Crane, the efficient and accommodating Quartermaster who is at the head and front of this immense railroad fabric. Col. Crane is one of those extraordinary young men who, despite the great responsibilities of his office, the continuous annoyance that must necessarily exist where so many employees are congregated, bears all with seeming ease. His office is at all hours besieged with a crowd of men, each of whom brings his story of grievances, or request for favors, to all of which he listens with kind attention, tendering such advice as his judgment suggests as most likely to subserve their interests and the welfare of the Government. Every spike, every nail, every foot of timber, every pound of metal used in the shops and on the roads, must be properly accounted for, as well as every dime of the \$2,200,000 which is monthly expended. Col. Crane entered the service as a private soldier in the First Missouri Cavalry, but he was shortly after selected for a more prominent position—one more fitting his ability. By his devotion to duty, etc., he has fairly won his present rank.