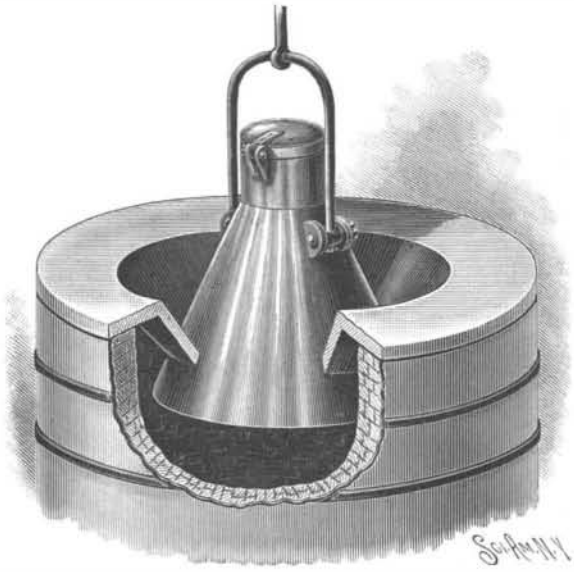


A BELL FOR BLAST FURNACES.

To prevent damage to blast furnaces by the explosions which frequently occur in the top of the stack, from the ignition of accumulated gases, the improved bell represented in the accompanying illustration has been devised and patented by George B. Berger and Martin H. Thompson, of New Castle, Pa. The bell, seated in the hopper, has a perpendicular cylindrical extension at the top of which is an outwardly opening

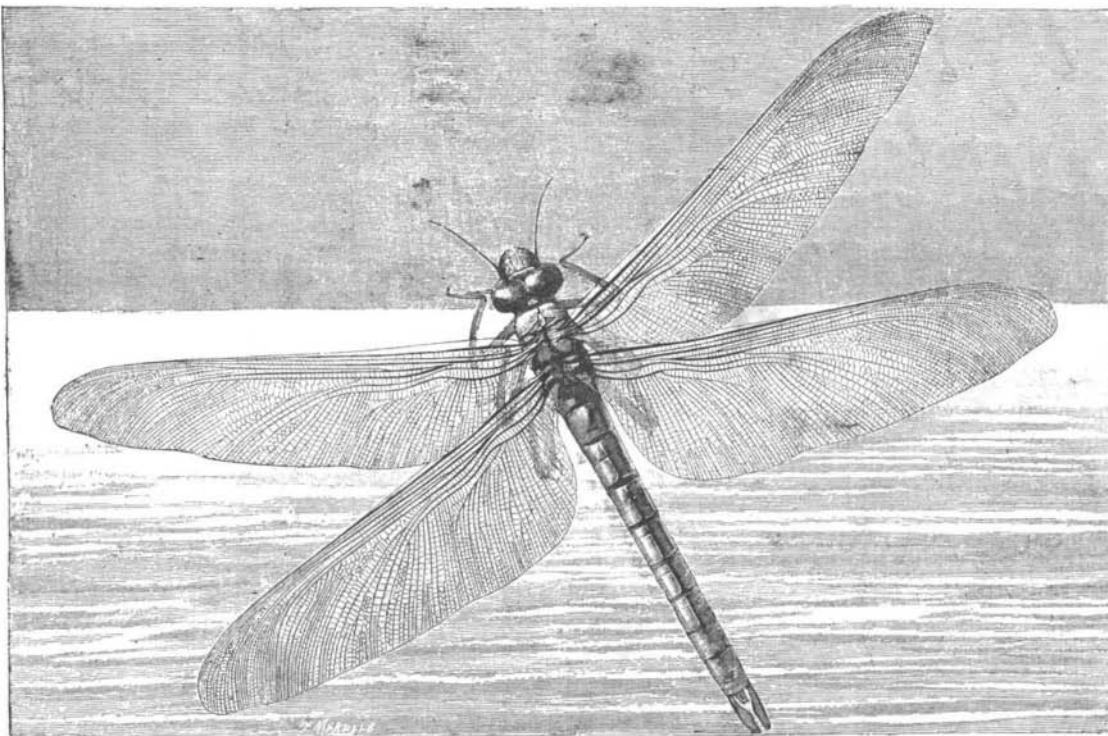
**BERGER AND THOMPSON'S BLAST FURNACE BELL.**

pivoted door or valve, which is adapted to be opened automatically by the force of accumulated gases or explosions. The bell extends approximately half its length above the top of the hopper when the bell is in closed position, and when the bell is in the lowermost position its upper cylindrical portion projects above the upper surface of the hopper, and all danger of the valve being clogged or affected by the contents of the hopper is avoided, the valve being thus free to operate at all times.

A GIANT OF FORMER AGES.

It is well known that everything on this earth is judged relatively. It is difficult to believe that turtles were once as large as elephants and that crocodiles walked on their hind legs and were 65 feet tall, although there are still turtles that are one and one-half yards long and crocodiles 22 feet long; and we are even more surprised to learn that certain dragon flies that lived in former ages measured 27 inches from tip to tip of the wings, because those of the present day are scarcely one-tenth as large. However, such insects really did exist when the coal was still green and soft, and the explorer Charles Brongniart has described fossils of them found in the mines of Commentry, in the Department of Allier, France. These, of course, were not exactly like the dragon flies of the present day, but were similar to them. Brongniart has called them protodonta, and those of our time are named odonta. He has found such fine specimens that the whole insect has been reconstructed.

Brongniart has found specimens of two different species, the large one already referred to, which he has named *Meganeura monyi*, for Mr. Mony, director general of the mine at Commentry; and one only about half as large, which he called *selysii*, for the Baron Selys Longchamps, of Luttich, the best authority on living dragon flies in Europe. The *Meganeura monyi* had a thick head, and colossally

**A GIANT DRAGON FLY.**

developed jaws that were provided with strong teeth; the eyes, like those of the present species, were large and round; the first of the three rings, the prothorax, was narrow, but the second and third rings, the mesothorax and metathorax, to which the two sets of wings were attached, were more fully developed; the legs were powerful and quite long, the hind legs being longer than the two other pairs; and the wings were very long, almost five times as long as wide.

It would seem that the dragon flies of ancient times did not differ materially from those known to us, but, being so much larger and voracious, we can assume that the insects and fish which served as food for them, both in the larval state, under water, and as flies, must have been either very large or very numerous.—Illustrirte Zeitung.

AN IMPROVEMENT ON THE STONE BOAT OR DRAG.

A machine designed to overcome the difficulty of lifting and loading stone, and facilitate its carriage, taking the place of the old-fashioned stone boat or drag, is represented in the accompanying illustration. It has been brought out by the S. C. Forsaith Machine Company, of Manchester, N. H., and is made in sizes suitable for one, two or four horses, capable of carrying two, four or eight tons. It consists of a strong four-wheeled truck with heavy axles and an improved arched reach, to which is attached a powerful and simple lifting mechanism and chains—a double hitch just in front of the rear axle, where the most weight naturally comes, and a single hitch back of the forward axle. The lifting appliances are independent of each other, and each is operated by one man by a lever with ratchet and pawl, holding the load securely at any point. The stone may be lifted and drawn over the boat until it is filled, and then it, with its load, may be lifted and drawn away. The machine may also be used as a stump puller, and as a hoist for loading long timber or logs.

An Experiment with Condensed Army Rations.

The federal government has been experimenting at its various military posts with condensed army rations, so called, with a view to using that style of regimen if it were found practicable. Whatever may have been the experience at the other military posts, that of Fort Logan has been of a kind to preclude the use of condensed army rations unless some decided, but scarcely anticipated, improvement is effected in that kind of food; the experiment was given a thorough trial, but it only resulted in incapacitating one-half of the men experimented upon from military duty, making them ill for several days.

Condensed army rations have been used by the European armies for some years, and, with a view to benefiting by them, the American military attachés at the European capitals were instructed to make inquiries concerning the rations, and to send the information obtained, including samples of condensed rations, to Washington. Then, after organizing a special board to have direction, the War Department entered upon the experiments which have been the source of woe to many.

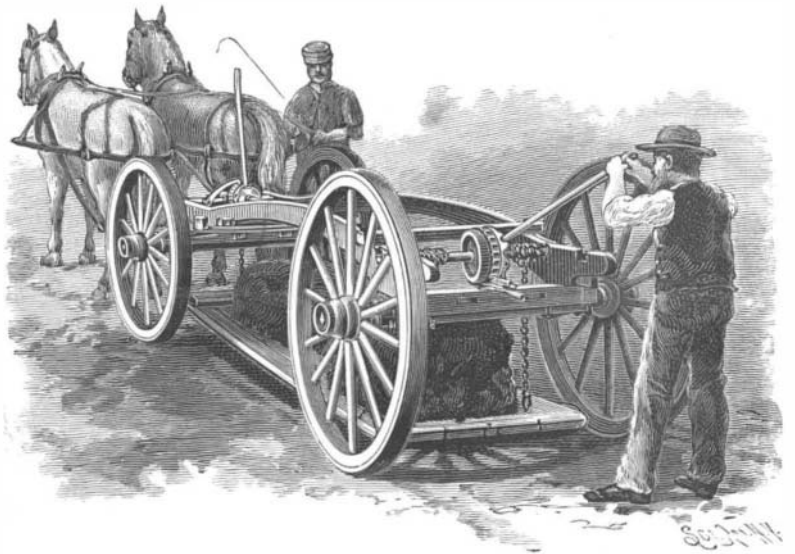
The theory of condensed rations is, not that they shall serve the army as permanent food, but rather as provision to be taken along in an emergency. The condensed rations have less weight and bulk than the regular rations, but the prime desideratum was that the food should be serviceable in emergency cases, for expeditions of about four days' duration.

From the samples the attachés sent to Washington, as learned here, the stomachs of the European soldiery must be either indifferent as to what is put into them, or compulsion exacts submission to what is nothing short of barbaric cruelty. For instance, a sausage of bread and meat received from Germany quickly emptied a large room full of people because of its odor.

In September the experiment with condensed rations was tried at Fort Logan. A period of fair weather was chosen, and an expedition into the neighboring country of four days with fifteen mile marches was ordered for a company of the Seventh Infantry. The rations issued consisted of coffee, bean soup, bread and bacon. The coffee and soup were condensed into small tablets; the bread was crushed into a flat cake of the weight and hardness of a stone. The bacon was solidly packed in a tin can. The rations were the best obtainable, bought from reliable firms. The bacon came from Chicago, the coffee from a well known house in Detroit, the soup from San Francisco and the bread from Denver.

A tablet of soup and a can of bacon were supposed to last two meals, a cake of bread one meal. The tablet of coffee made a pint of that beverage. To make the coffee and soup, all that was necessary was to add the tablet to the required amount of boiled water. The bacon had to be fried, and the bread soaked in warm water and eaten as one would oatmeal, with some sort of dressing if obtainable.

The soldiers marched and ate as ordered, but their

**THE BUTTERFIELD STONE LIFT.**

marching and eating were brought to an abrupt end by more than half falling sick before one-half the allotted time expired. With the first meal, men began to be taken ill with an aggravated stomach complaint; before the end of the second day more than thirty men were in the hospital, in the number being included most of the officers. The marches were abandoned, and a detail of those still unaffected was sent to the fort for dry tack—anything but the new food—and a surgeon. Some of the soldiers after reaching the fort did not recover for some days.

The report sent to the War Department at Washington is wholly against the experiment.—N. Y. Evening Post.

Wrought Iron Pipe Lines in the West.

The wrought iron riveted pipe line has for many years been in successful use in the West, more particularly in the hydraulic mining districts. Its toughness and elasticity and the thoroughly reliable nature of the material make wrought iron piping specially adapted to carrying water, at exceptionally high pressure, through the rough, mountainous mining districts of the West. Of late, moreover, it has completely ousted cast piping in the work of carrying city water supply from distant sources.

One of the latest instances of this is the line constructed from Alvarado to Oakland, California, a distance of 22 miles. The pipe, 30 inches in diameter, is made of the best American iron. It is double riveted, chipped, calked, and coated within and without with asphaltum. It was tested to 150 pounds pressure. The total time occupied in the manufacture and laying of the 22 miles of pipe was only seven months; and as an evidence of the excellent quality of the work, we are told that there was not a leak discovered in the whole length of the pipe when in position. The work was done by Francis Smith & Company, of 150 Beale Street, San Francisco.