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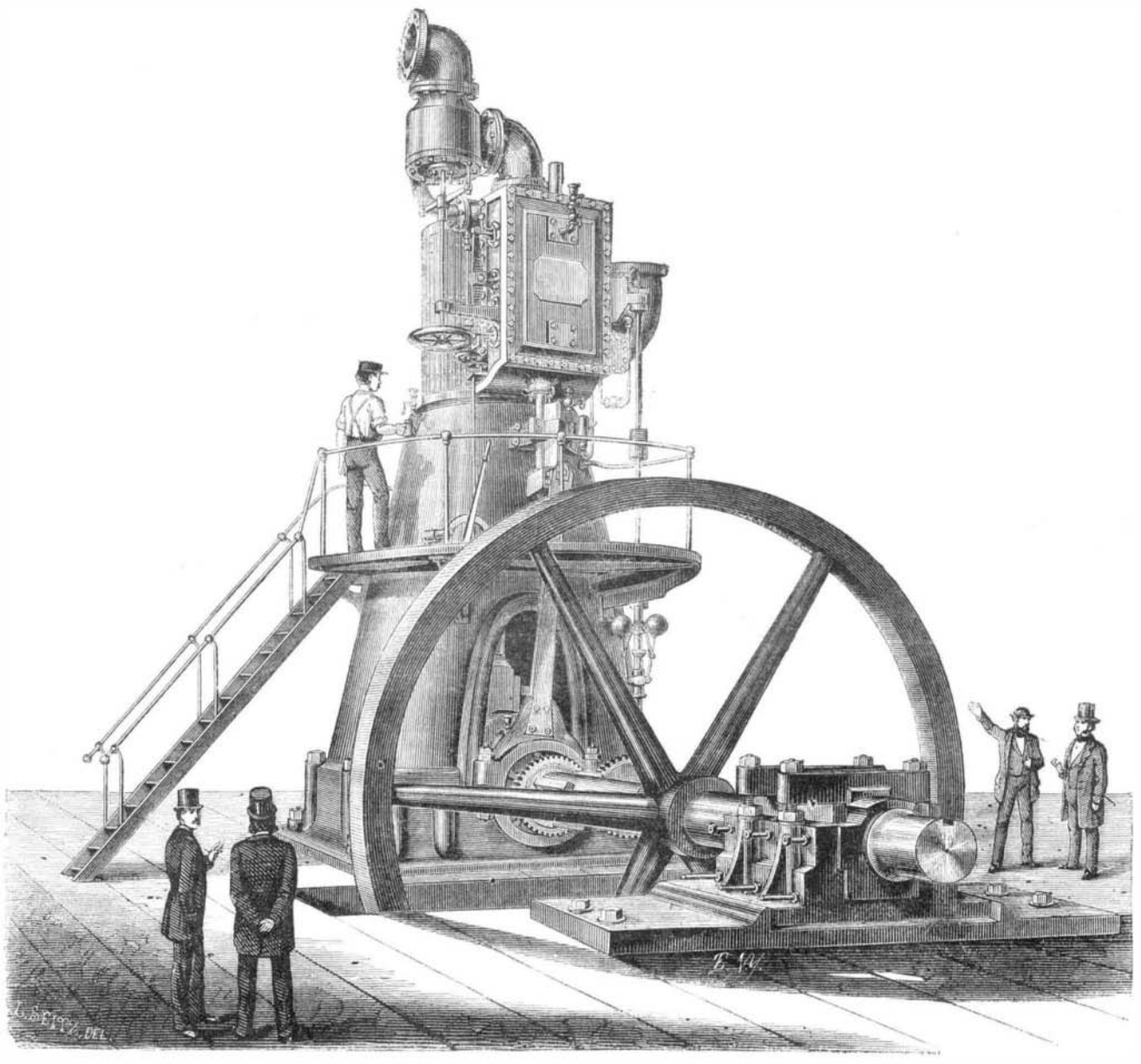
Improved Steam Engine for Rolling Mills.

The engraving is a fine perspective view of a new steam engine lately constructed at the South Brooklyn Steam Engine and Boiler Works, for the Trenton Iron Company—Cooper, Hewitt & Co.—and now being erected in their rolling mill. The machine is massive, compact, and presents a splendid appearance. We made, in company with a number of practical engineers, a critical examination of the engine on the occasion of its completion, a few weeks ago, and the opinion then expressed was unanimous that it was a remarkably fine specimen of workmanship. It is fitted with the Babcock & Wilcox cut-off valve, of which we gave a detailed description in No. 17, Vol. XVII., first page, to which we refer our readers. The valves and connections are of course somewhat modified to suit the circumstances of the case. Those who saw the engine there described at the late fair of the American Institute will readily understand the operation of this.



THE BABCOCK & WILCOX UPRIGHT STEAM ENGINE.

An immense cast iron open pedestal sustains the cylinder, steam chest, and connections, the connecting rod and crank working inside the column near the bottom. The fly-wheel and spur-wheel are secured to the shaft by three massive feathers forged on the shaft, the intervals between which and lugs cast in the interior of the hubs are filled with hard wood wedges, intended to receive and diminish the jar and concussion to which an engine employed for driving rolls must be subjected. The fly-wheel is unusually heavy, weighing 55,000 lbs., and is 22 feet in diameter. Especial attention has been given to securing durability in the working parts, they being made as hard as will allow tool finish. The forgings are made of Messrs. Cooper, Hewitt & Co.'s best gun-barrel metal, and the brasses of the best government standard composition. The crank-pin is lubricated by an automatic attachment acting through its center, and the slides by traveling roller dipping in drip-cup. For the benefit of engineers we give the principal dimensions and weights:

Cylinder, 46 inches diameter and 40 inches stroke, with steam jacket and double lower head, weighs, with steam chest, 10,910 lbs.; column connecting cylinder to bed-plate, 23,513 lbs.; cast iron bed-plate with inboard pillow blocks, 18,923 lbs.; eccentric, 32 inches diameter and 5 inches face; piston rod, 6 inches diameter with cross-head forged on; wrought iron crank, 2,130 lbs.; wrought iron shaft, 15 inches diameter, 16 feet 6 inches long, 10,807 lbs.; inboard journal brasses, 15 inches diameter and 27 inches long; outboard brasses, 15 inches diameter and 30 inches long. The total weight of the machine is 151,518 lbs.

The engine is calculated to make 75 revolutions per minute at a steam pressure of 80 lbs., and is, although so compact, of 1,200 estimated horse power; which must be acknowledged as a remarkably good result when the dimensions of the machine are taken into consideration.

From the above, and the view of the engine given in the engraving, a tolerably correct idea may be formed of its massiveness, compactness and solidity.

REPORT OF THE ACTING COMMISSIONER OF AGRICULTURE.

The following selections from this public document will be found to be of general interest:

PROGRESS IN AGRICULTURE.

It is gratifying to note the evidences that are apparent even to the superficial observer of the increasing interest of our people in the advancement of agricultural science—of the quickened mental activities of farmers, as shown by the widening demand for agricultural books, newspapers, and the reports of this department—of the disposition to experiment, test alleged improvements, and adopt labor-saving expedients—of the growing inclination to employ in agriculture money, business energy and active enterprise, which are so successfully employed in other departments of business.

In nothing is this intellectual activity shown to be so manifestly beneficient to the agriculture of the present era, as in the improvement of agricultural implements. In 1847, the number of agricultural patents granted was but 43; in 1863, it had increased to 390; in 1864, to 563; in 1865, to 642; while in 1866, the wonderful increase to 1,778 was made; and during ten months of the present year, the patent-office has issued no less than 1,777. Thus the number of agricultural inventions perfected yearly is now more than forty-fold greater than twenty years ago. Already has this nation surpassed all others in the excellence and variety of its agricultural machinery. Partially represented as was our agriculture in the recent world's exposition of industry, at Paris, and almost ignored officially in the national recognition of that great exhibition, our honors plucked from the field of European competition were almost exclusively industrial, and largely agricultural. So successful have been our farming implements in repeated contests on European soil, that their rapid introduction into foreign markets is only impeded by the greatly increasing demand at home. These improvements are rapidly revolutionizing the agriculture of the West, and reducing to the lowest minimum ever attained, the proportion of manual labor employed in its operations. As an instance, the reaper, first doing the labor of a half dozen, then a half a score of men, is supplemented with a self-raker, which does the work of others still; and now further to facilitate and economize the harvest work, the same machine is furnished with apparatus for instantaneous binding of the sheaves. And the further this labor-saving progresses, the higher the wages of harvest workers, the broader become the harvest fields, the greater are the profits of the farmer, and the more extensive become the garners of the world.

While adverting to these evidences of progress in American agriculture, it is proper to drop a word of dissatisfaction, and even utter a note of warning, in view of the improvidence and reckless waste which is stripping the fairest fields of their wealth of fertility, exposing them to the constant action of the elements, and subjecting them to an annual drain of the same constituents, none of which are ever returned to the soil. The department estimate of the average production of wheat in Ohio, last year, was about four bushels per acre; the State statistics, so far as returned, made the yield scarcely three bushels. None will doubt that it is more owing to bad culture and want of drainage than to the severity of the season that the product did not average twenty bushels Every new Western State is remarkable for sounding reports of great crops of wheat, and the same States, in a very few years, are equally remarkable for reduction in yield of wheat, increase of insects, and prevalence of disease.

The freshest areas in this culture, east of California, will scarcely yield an average of twelve bushels per acre the present year. A systematic rotation, some attention to fertilization, greater care in the selection of seeds, better tillage, and more thorough culture, will alone prevent deterioration in products and real values of farm property.

This stigma upon American agriculture may be attributed in part to the cheapness of Western lands, the original price of which bears so insignificant proportion to their intrinsic value, that the owner erroneously deems it cheaper to remove to new lands than to sustain and increase the productive capacity of his present farm. One result of this fatal error, is the removal westward, year by year, of the center of wheat production, thus adding transportation and other charges to its ultimate cost, threatening to make difficult the future supply of our population, and to render export impossible.

The railroad interest has secured among other favors and franchises of the government, grants of public land, amounting to 184,000,000 acres, in aid of lines extending in all directions, to the borders of civilization, under the plea of furnishing facilities for travel and the transportation of the fruits of agriculture and the products of mines; and the results have been seen in extended settlement, and expanding cultivation: yet growing stronger, disregarding the general welfare, these monopolies have combined in their tariff of rates to discriminate unfairly against farm products, and to require much the larger portion of the value of the crops for their transportation to market. So onerous is this burden, that the cost of transportation of wheat from Chicago, and other Western centers, to the Atlantic cities, is greater than from San Francisco, via Cape Horn, to the same points. It is hoped that the attention of rural voters to this subject may ultimately correct this evil which proves so serious a drawback to their industry; but it can only be accomplished by untiring vigilance over State legislation, and by securing the enactment of laws that shall restrain these corporations from the absorption of the entire products of the farm, instead of allowing them to control the legislation of the country against the best interests of the people, and especially to the detriment of the consumer, who is made to pay tribute to this combination which breaks down a fair competition incidental to all other classes and associations in the business of life

In this connection I desire to express the hope that Congress may devise and perfect some plan for facilitating the early construction of a ship canal for the transportation of