A Gigantic Flour Mill in California.

The competition of India and Russia in the western European wheat markets is causing the merchants of California to use every effort to maintain their footing, and among other devices, says *Engineering*, for lessening the cost of transport there is arising the practice of reducing the grain to flour before it is shipped, thereby effecting a saving of 20 per cent in freight. This carries with it the additional advantage of employing a large amount of local labor, and of turning the wheat to the best advantage, as by aid of new machinery and the best systems of milling a far greater and better yield can be obtained than by the more antiquated methods which still to a great extent prevail here. Messrs. Starr & Co. are now building an immense flour mill and wheat elevator on the south shore of the Straits of Carquinez, about two miles below Porta Costa, and fronting the town of Crockett, to carry out this plan, the spot they have chosen being available for the largest ocean steamships, while it is sufficiently sheltered for the river barges from the interior to approach it with safety.

At the site of the mill the shore curves inward, leaving a flat rock reef mostly bare at low water, but sloping off abruptly on the northern and western edges. Upon this reef there is being erected an eight story mill and elevator building, about 150 feet by 300 feet, reared upon a superstructure of artificial stone piers and arches. The piers, of which there will be 209, averaging from 5 feet to 8 feet square at the base, and standing 13 feet apart from center to center, are built upon the rock, and are connected by groined arches, standing some 4 feet clear above high water level, which has an open passage under them, between the piers. The artificial stone floor of the mill and elevator is laid over the arches and forms a monolithic platform of nearly 50,000 square feet area. There will be 140,000 cubic feet in the piers, arches, and floors, the greater part being already in position, and heavy wire cables are being laid transversely through and through the concrete above the arches to serve as earthquake ties. This portion of the work, which will cost $50,000, is being done by Mr. Ernest L. Ransome, who has long been occupied in California, bringing into extensive and successful use the artificial stone invented by his father, Mr. Frederick Ransome, a number of years ago.

The mill building will be 143 feet by 158 feet, with seven stories, aggregating 100 feet in height, while the elevator, 82 feet by 178 feet, is to be capable of storing 10,000 tons of wheat. The outside walls of the great building will be formed of heavy buttresses, rising over the artificial stone piers, and connected with curtain walls. The floors above the first story will be carried by clusters of five wooden pillars, 13 feet apart. The engines and boilers are in a separate structure, the power provided for milling purposes being 2,400 horse power, and for the elevator 300 horse power. The ultimate capacity of the mill will be 6,000 barrels of flour per day, but it will be started with machinery for turning out 2,500 barrels per day. Agents of the company are now in Europe inspecting all the best milling machinery and processes.

The docks, to be covered by two-story warehouses, are in two sections, having an open slip 104 feet in width between them. The eastern dock section will have an area of 115,000 square feet, and the western section one of 256,800 square feet, and both are to be traversed by railway lines in connection with the railroad system of the State.

From this account an idea will be gained of the extent of the enterprise which Messrs. Starr & Co. are inaugurating, and the magnitude of the trade in which they are engaged, and which they are making such great exertions to keep.

The New Time Standards.

The proposed new standards of time for the railways of the country, which are to be established by the General Time Convention of Railroad Managers, has received the approval of the Harvard Observatory, and its co-operation is promised. The railroads centering here acquiesced in the plan on the condition that the time given from the observatory should be correspondingly changed. The consent of Professor E. C. Pickering, the director of the observatory, being necessary, he was met in New York promptly on his arrival from Europe on Sunday by Mr. J. Rayner Edmonds, of the observatory, and his hearty approval of the scheme was readily given. Accordingly, a note has been sent to the Secretary of the Chicago Convention, W. F. Allen, to this effect, and assurance given that if the convention adopts the system the observatory will be ready to furnish telegraphic signals conforming to the minute and second of the proposed standards.

Under the new system, instead of running the various systems and divisions of systems by as many local standards of time, the continent is to be divided into five broad belts, running north and south, the time for each of which will be one hour slower than that of the next division to the eastward and one hour faster than that of the next division to the westward. By this plan the minute hand of a traveler's watch will not have to be changed, however far he may have to travel or in what direction; but his watch will be just one hour slow when he crosses the imaginary line into the next division to the east, or an hour fast when he crosses the line into the next division to the west. The time now furnished by the Harvard Observatory is the mean solar time for the Boston State House. The new time will be 15 minutes 44·5 seconds—practically 15¾ minutes—slower, and will be the average time for this division, which includes the New England States, New York and Pennsylvania, and the greater part of Canada. North of Lake Erie the division extends west to Detroit, while south of Lake Erie Pittsburg is practically on the western boundary of this division. Thus in the region north of the lake the standard time will be five hours slow by Greenwich, and south of Lake Erie and west of Pittsburg it will be six hours slow by Greenwich. The new standard, if adopted, will go into effect on a Sunday noon, and from that hour all the railroads will be run by the new time.

The new time standard was adopted October 11, by 78,000 miles of railway.

IMPROVED TRICYCLE.

The guide wheel standard passes through a sleeve, and has at its upper end a short right angle bar, to the end of which is a rod reaching to the crank operated by the right hand piece. The tricycle is propelled by the feet of the rider working upon jointed pitmen, whose forward ends are pivoted to the ends of a crossbar, and whose rear ends are attached to the crank of the bent axle. The body iron is U-shaped, and is formed with sets of plates by which it is

ASBURY'S IMPROVED TRICYCLE.

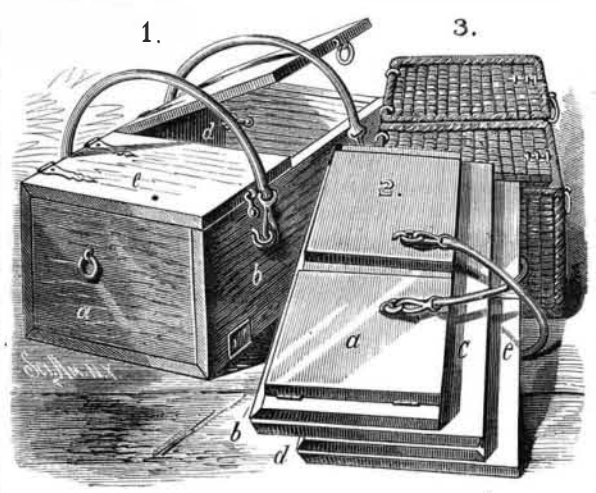
secured to the axle, the plates serving as boxes to receive the journaled blocks. To the upper ends of the body iron is secured, in a horizontal position, a second U-shaped iron, in the center of which is a third U-shaped iron vertically arranged for supporting the seat. To the forward ends of the horizontal piece are attached the hand pieces, one of which is rigid while the other may be turned, and so change the front wheel from left to right to guide the tricycle.

This invention has been patented by Mr. William Asbury, of Boston, Mass.

FOLDING BASKET.

This basket may be folded very rapidly, so as to occupy but little space, and can be erected readily for use. It may be made of either sheet metal, wood, wicker-work, or other material specially adapted for the service to which it is to be put. In the accompanying engravings, Fig. 1 represents the erected basket made of wood, Fig. 2 the same folded, and Fig. 3 shows it erected and made of wicker-work. In the first two figures like letters represent like parts. To the opposite edges of the bottom the front and back are hinged; the front being hinged so that it swings out and folds under the bottom, while the back is hinged upon the inside so that it will rest upon the bottom. The cover, which is halved, is hinged so that it folds over upon the outer surface of the back. The ends are hinged to the front side and fold down upon its inner surface.

From this it will be seen that all the parts of the basket lie flat upon each other, and take but little room. The covers are provided with hasps or loops through which hooks on the front can be passed. The sides of the ends opposite the hinges are furnished with hooks to be passed through



DAUL'S FOLDING BASKET.

eyes or rings projecting from the inner surface of the back, so as to keep these parts in place. On the inner lower edge of the ends is a sliding bolt, which enters a hole in the bottom. On the outer part of the front and back and at a short distance from the top are staples or rings, and on the two ends and under side of the cover are similar staples. When the basket is erected the handles are hooked to the back and front staples, and when folded are hooked to the end and cover staples. The basket may be made strong and light, and at small cost.

The invention has been patented by Mr. Anton Daul, of Jamaica, Long Island, N. Y.

Labor Saving Cranes.

At a recent meeting of the American Society of Civil Engineers, in this city, a paper by Mr. C. J. Appleby, on the subject of cranes as labor saving machines, was read by the author, who remarked that a well constructed crane or other similar power machine requiring only one man to drive it would do as much work as could be done by the manual power of ten men, but in one-tenth of the time they would require. It seems singular that railroad and waterside depots and workshops should so rarely be laid out with reference to the employment of such labor saving machines. The most economical working result is obtained from machines so arranged that when they take hold of the load, it is not released until final deposit. The author considered the following systems for transmitting or applying power:

1. The well known hydraulic system, with pressure pumps, accumulator, and distributing pipes.
2. Compressed air distributed through pipes.
3. Steam distributed as above.
4. High speed rope or "endless cotton cord," which runs at a speed of 5,000 to 6,000 feet per minute.
5. Low speed rope running 1,500 to 2,000 feet per minute.
6. Square shaft supported on tumbler bearings.
7. Steam from a boiler delivered on the top of a piston with multiplying chains similar to the hydraulic system.
8. Boiler and engine fixed on the crane, and driving gear for the several motions required.

The first, second, and third can only be applied to cranes fixed or moving over very limited areas. The fourth, fifth, and sixth will transmit power over large areas, which, however, should be nearly rectangular. The other two can be used generally wherever there is a railway track. The hydraulic system possesses great advantages over compressed air or steam, but experience tends to the conclusion that its common use will be attended with considerable inconvenience where the winters are cold. The use of compressed air has not been applied with great success in many cases.

Steam is largely used, and frequently carried through 1,000 feet of pipe without much inconvenience. The high speed cotton cord runs at a speed of 5,000 to 6,000 feet per minute. The cord works in grooved pulleys, is carried on rollers or other supports at intervals of ten to twenty-five feet, and is kept in tension by a weighted pulley. Low speed rope transmission is generally effected by a hemp rope running from 1,500 to 2,000 feet per minute. The square shaft has been used for many years, the only special difficulty experienced being that of supporting the long main line of driving shaft. The author exhibited recent designs whereby this difficulty has been very successfully overcome. The relative advantage of rope or shaft transmission is largely influenced by local circumstances. As a general rule the rope system costs less and is better where the distance for transmitting exceeds 200 feet. Below that distance the shaft is probably the best and cheapest. But the rope possesses advantages when machinery has to be on different levels, or at an angle with the point from which the power is transmitted.

The steam crane, employed under many differing conditions, perhaps performs more functions than any other mechanical arrangement for lifting and placing loads. All such cranes should lift and turn around by steam power. One, specially illustrated, has additional motions for altering the radius of the jib for hauling materials, so as to bring them within the reach of the machine, and also for moving empty or loaded cars. Fixed cranes are often seen so placed that one-third or even one-half of the number erected at a particular point are idle. It would, therefore, seem that for the same outlay, the best duty will be obtained from movable cranes. Where two or more railroad tracks are parallel with the water front, it will often be desirable to make the crane span the two lines of tracks, allowing head room for the vehicles to pass under it. Cranes fixed on floating vessels were also illustrated up to 60 tons power. Locomotive cranes up to 25 tons were described, and also cranes specially adapted to terminal freight stations. One of these has lifted 80 tons per hour a height of 20 to 30 feet, and deposited the loads of 1½ to 2 tons each 60 feet from the point where taken up. A similar crane commonly delivers 240 barrels of oil per hour the same height of lift and length of deposit.

The cost, per day, is one driver's wages and the necessary fuel, oil, etc. Five per cent. per annum is ample allowance for depreciation. The cost of this system of working is easily ascertained, but a great gain also arises from the increased speed of passing large quantities of merchandise.

The paper was discussed by Messrs. Cartwright, Cooper, Emery, Farney, Geo. S. Greene, Jr., Hamilton, R. L. Harris, James Platt, and the author.

A Shower of Grasshoppers.

According to a local paper, a shower of grasshoppers fell in Louisville during the evening of September 30. They made their appearance about nine o'clock, and soon scattered over the streets, filling every place to which they could gain access. Many gathered about the lights, but the cold had so benumbed them that they displayed little activity. They were of all sizes, but the large ones outnumbered the little ones. It is supposed they were blown to the city by a strong breeze which prevailed during the afternoon, but that theory will hardly account for their great numbers, for they were thicker than is generally the case on their native heath.