

## MATERIAL AND FORM OF DAMS.

The weirs or dams thrown across the beds of rivers have been constructed in a great variety of shapes and of different materials, some of them too costly for general use in a country where small mills are chiefly needed. In cases where the supply of water is large and a high fall is not demanded, a temporary dam composed of boulder stones is sometimes thrown across the stream in a diagonal breadth. The water is thus partly forced into the conduit or race above the dam, and the remainder passes over the surface of the dam in a shallow sheet. Being hastily and cheaply built, a dam of this kind may be repaired without much outlay, but the inconvenience of doing this after every heavy raise of the stream is a material drawback on its value.

In contrast with this comparatively rude species of dam are those of more solid structure, substantially built of stone, and stretched across the river in the form of a bow, the curve being against the current—the middle of the dam, in other words being higher up the stream than the two ends. A dam of this sort, if provided with massive stone abutments, present a firm resistance to the onset of a flood, and will stand any test ordinarily experienced. It may be made with a gentle slope from the crest both up and down the stream; or with a steep descent on each side, making its walls almost perpendicular; or again with either a steep or sloping front on the upper side and on the lower a curved apron, the wall rounding downward from the top like the lower half of the letter C, by which arrangement the fall is made gradual and its force abated.

In a stream of moderate size, a form of weir has sometimes been adopted resembling the letter V, with the apex or point directed up stream. If built upon piles, with a frame of timber forming an inclined plane upon the face of the dam, and filled up with gravel surmounted by a mass of bolder stones well packed in, the dam will be nearly impenetrable by water. The position of the two arms of the V distributes the force of the water in passing over, and as the currents descending from either side tend toward the centre of the stream, the banks are less liable to be washed away. If timber is abundant, the frame instead of having a uniform slope downward on the face of the dam, may be made in a series of steps like a wide stairway, breaking the water into cascades. The piles for such a dam may be placed at right angles, with the current, stayed and covered with plank, and made watertight with sheet piling supported with foot piles. Constructed in other respects like the one last described, a dam of this kind will possess great durability and admit of no leakage.

An undue accumulation of water above the dam may be remedied by a channel and sluice gate in one of the side walls, by which the surplus water may be drawn off before reaching the crest of the dam. A self adjusting dam of heavy planks strongly framed together is sometimes stretched across the stream, connected by hinges to the crest of the permanent dam, and held in an upright position by weights passing over wheels on the abutments. In case of a flood the weights give way partially to the increased pressure and the auxiliary dam is let down toward a horizontal position, allowing the water to pass unobstructed. In place of an appendage of this kind, movable flash boards are often used, being held in place by pins and other supports along the brink of the dam, and tightly fitted to each other. In time of low water, the flash boards are of important service in obtaining sufficient head. When the stream rises, the boards are removed (though the supports may often remain) and the crest of the main dam being below high water mark, the surplus water escapes freely.—*Lefell's Construction of Mill Dams.*

## THE GROWTH OF LONDON

Some remarkable facts about the growth of London during the last thirty years are contained in the opening address of the President of the Surveyors' Institution. The president has set down in tabular form the number of building operations, including new buildings and alterations to old buildings since 1856

In that year the works were 14,654 in number, and they gradually increased until 1868, when they reached 91,915. About this time there seems to have been a glut in the building trade, for building operations commenced to fall off, and decreased steadily until 1873, when they numbered 17,354. After this dull season the builders commenced to be busy again, the number of works increasing by hundreds and thousands yearly, until in 1881 it reached its height with 29,271. Another dull season seems to have set in for the builders, for though the last figures only apply to 1883, and these show a decrease of nearly 3,000, it is understood that the building trade has not yet recovered from the congestion of 1881-82. We note that while in the earlier years the number of new buildings exceeded that of additions and alterations, the balance has recently swung round the other way. During the seven years 1876-83 the number of new buildings constructed in London was 80,657, and of additions and alterations to buildings 80,399. But while the proportions in 1877 were 10,052 new buildings to 8,930 alterations, in 1883 they were 8,750 new buildings to 11,100 alterations. The main building construction is that of houses for artisans and people of small incomes in the suburbs. Land about Clapham Common has been augmented in value from about £1,000 to £3,000 an acre. In the outlying parts of Battersea it is £3,500. In North London the increase in the value of building land is even more marked, and the health-giving slopes of many a green retreat are marked for future streets. The president of the Surveyors' Institution thinks the growth of this class of habitation means more comfort and better health for workpeople. We hope that may be so; but if builders continue to throw up houses as they do just now, running them up from start to finish, without sufficient inspection, in less than a fortnight, those who inhabit them may, after all, gain neither in comfort nor sanitation.—*Timber*

## THE OUTLOOK FOR 1886.

The old saying, "Tip one brick and it tips all the rest," has been fully verified during the past three years. But, "Raise up one brick and it encourages or sets all the rest to raising," is the phrase now most interesting. In the industrial world each industry is dependent upon the rest, and all must be successful if one would be. The farmer and producer of raw material buys more when he sells more, and sells more when he buys more, gets better prices, and like the old fable of the clock when each hand and wheel and pendulum began to move, the whole started and was prosperous. One cannot move without the rest. There is no healthy circulation when even a hand is paralyzed. No special industry can force itself into the highest permanent prosperity except as it assists and makes possible the highest permanent prosperity of all. The raw material must move, the railroads must move, and all unitedly. It is fortunate that a necessity always exists in all highly intelligent communities for every possible species of product of farm, mine or mill, and this necessity must at all times compel the movement of the wheels of industry, if not arbitrarily enjoined. When the United States imported more than it exported, and were continually shipping gold and bonds to meet the balance of trade and indebtedness, and were oversupplying the markets with foreign products, depressing prices, reducing freights, and destroying manufactures and their ability to afford employment, there was a cause for disaster, and the wheels must stop until the over-stuff was worked off. The patient was very bilious.

Now, after nearly three years of a better, although a very rigid economy in importing, the wheels are again beginning to move. On all sides we hear that the stocks are reduced, and that something to wear is needed as well as something to eat. The old plough and the old coat have been mended and patched until there must be new ones. To make the plough, the furnace and foundry must blow, one miner must dig the ore and another coal, the railroad must haul them, the lumberman must prepare the timber, and the mechanic must put all together. To make the coat the sheep is shorn, the woollen

mill and the clothier, the sewing girl, the button-maker and the trimming maker find employment. In the same way the wheels of the industrial enterprises are now steadily beginning to show increased activity. Some articles of home manufacture are reported scarce and advancing in price, and this for the first time since the latter part of 1882. There are no more people or no more capital in the States than can find profitable employment, if we will only stop employing from outside, and develop our own resources. The imports of goods from other nations this year are less than our exports, while stocks have been reduced and must be replenished from some source. The cost of manufacture is, also, so far lessened that goods cannot at present be imported in competition, and large part of what is now consumed here is being produced here, and the nation is convalescing, but slowly. If the sick man's appetite does not so far overact as to cause a relapse there are good hopes for a new prosperity to all the varied industries of the nation.

In various quarters of the West and Northwest there are a number of new railroads projected, and a better demand is springing up, and better prices are obtained. Steel makers are at work more generally, producing tool steel and rails, and a variety of other kinds. But, as intimated above, the iron interest must wait the readiness of many other industries for its genuine prosperity. The hum of the cotton and woollen spindles, and the confidence the activity imparts is necessary to the starting of the iron manufacture, and these are beginning to respond to a better call for goods, and in many quarters we learn of considerable activity. As merchant after merchant calls for new supplies of merchandise, it begets hope and confidence that the dawn is at hand—the dawn of better and brighter days.—*Chicago Lumber Trade Journal.*

## INTERNAL SCREWS IN STOP VALVES.

A very faulty detail in the construction of steam and water stop valves is the internal screw and nut on the valve spindle. It may give the valve a neater and simpler appearance, and it is a cheaper job than the external pillars and crossbridge type of construction, but otherwise we fail to observe anything commendable in it. The condition of the thread cannot be ascertained without taking off the covers, and this, in case of boiler stop valves can only be done when the boiler is laid off. A writer says:—"We have recently been troubled with our boiler feed valve, which is constructed with the internal screws. We are blessed with dirty and gritty feed-water, which plays sad havoc with the valve threads. The valves are always sticking and will not shut tight, and when taken out and examined the threads are invariably found to be badly burred, and require to be filed and made an easy fit before being replaced. Not long ago one of the attendants was about to shut off one boiler in a range when to his surprise he found the valve spindle thread stripped. This was very awkward, as he wanted to blow off the boiler, and to shut the other boilers meant, of course, stopping the engine. Now, supposing an accident had happened to this boiler, which required its being quickly shut off from the rest of the range, the quickest way we could have done it would have been to shut every junction valve, and what might not have happened in that time? If the valve had had an external thread its condition could at any time be seen, and if failing, renewed or remedied, but being inside the box its condition could only be ascertained periodically." Apart from the serious drawback of the screw being always in contact with any impure or corrosive matter that may be passing through the valve, the internal nut is a fallacy, and it is pleasing to record the fact that it is fast disappearing.—*Boston Journal of Commerce.*

## WOOD-WORKING PATENTS.

The following list of patents relating to the wood-working interests, granted by the United States Patent Office, December 1st, 1885, is specially reported by Franklyn H. Hough, solicitor of American and Foreign patents, 925 F. Street, N. W., Washington, D. C.

331,633.—Chuck, lathe—G. A. Barnes, New Haven, Conn.

331,590.—Saw feed, gang—J. H. Watson & C. H. Hubbell, East Tawas, Mich.  
331,619.—Saw mill dog—A. Delaney & J. M. Bond, Richmond, Va.  
331,653.—Saw mill, portable—J. N. Richey Wayneborough, Pa.

## PATENTS ISSUED DEC. 8.

331,790.—Cutter head—A. Hoppins, Kingston, Ontario, Canada.  
332,124.—Hoop planing machine—A. F. Ward, Detroit, Mich.  
332,065.—Lathe boring tool—D. Evans, Sharpsburg, Pa.  
332,066.—Lathe tool holder—B. B. Keyes, Chelsea, Mass.  
332,213.—Lumber elevator—H. T. Runyan, Chicago, Ill.  
332,161.—Saw mill—J. S. Millar & E. Lapham, Cadillac, Mich.  
331,887.—Saw set—R. F. Gibbs, San Francisco, Cal.  
332,184.—Saws, device for holding circular—J. Prickett, Marinette, Wis.  
331,839.—Shingle slicing machine—O. H. & J. B. Spencer, Niantic, Conn.

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THE POST OFFICE,  
AND  
THE CUSTOMS & INLAND  
REVENUE OFFICES

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Plans and specifications can be seen at the Department of Public Works, Ottawa, and at the office of J. E. Belcher, Architect, Peterborough, on and after FRIDAY, the 18th day of December next. Persons tendering are notified that tenders will not be considered unless made on the printed forms supplied and signed with their actual signatures. Tender for each building to be separate, and forms will be supplied for each. Each tender must be accompanied by accepted bank cheque, made payable to the order of the Honourable the Minister of Public Works, equal to five per cent of the amount of the tender, which will be forfeited if the party declines to enter into a contract when called upon to do so, or if he fails to complete the work contracted for. If the tender be not accepted the cheque will be returned.

The Department does not bind itself to accept the lowest or any tender.

By order,  
A. GOBIEL,  
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Ottawa, 7th December, 1885.

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