

MACHINE FOR BEVELING ANGLE BARS, ETC.

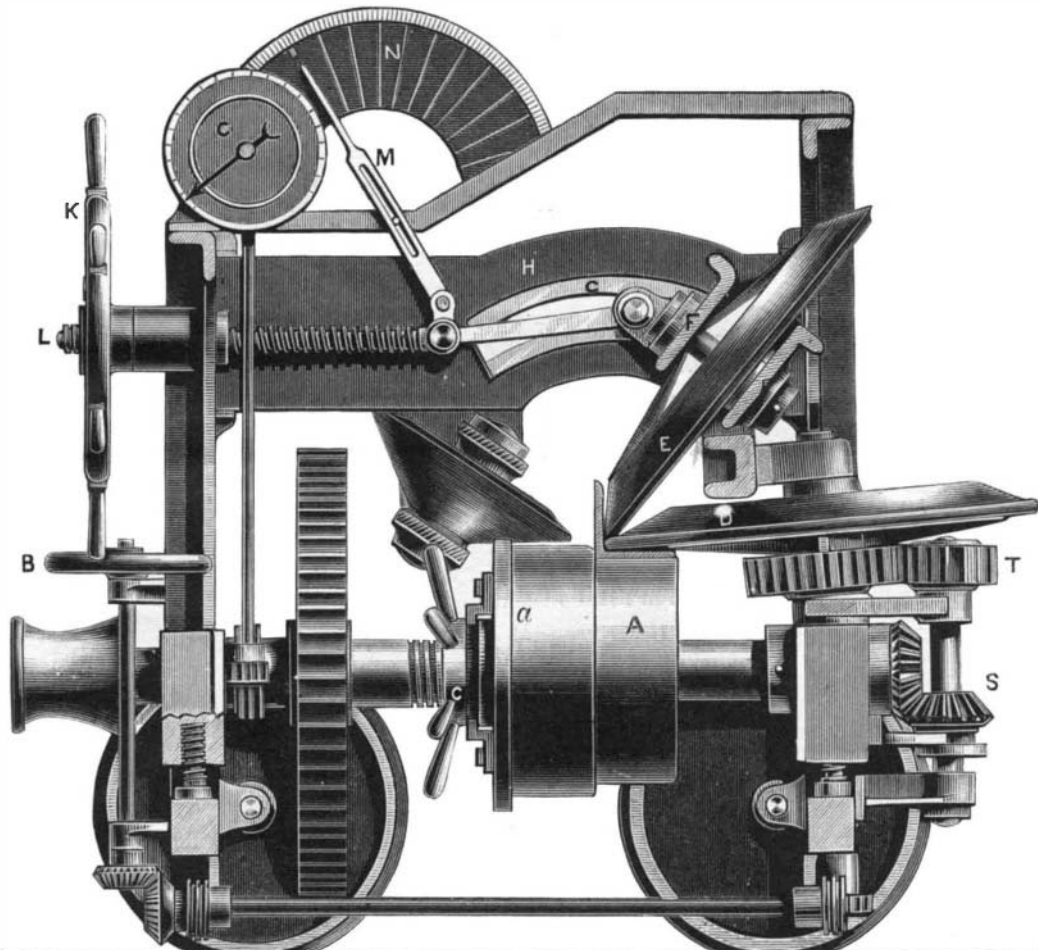
Any one practically acquainted with shipbuilding, boilermaking, etc., will be aware that up to a recent date it has been and is still generally customary to bevel bars for the frames, reverse bars, keelsons, stringers, etc., for iron or steel vessels in a very laborious manner, with the use of tools worked entirely by hand; the angle has in the first instance to be guessed at by the workmen, then altered back or forward until it conforms with the bevel obtained from the body plan of the ship. When the bevel required to be put on a bar, and the curve to which it has to be bent, is considerable, several heats are necessary, the iron in the process becoming brittle and unsatisfactory. Frequently the bar is broken and the labor at all events lost, as usually iron manufacturers only replace the material, and do not allow for the labor expended. In any case, the work when it is done by the ordinary method is far from being satisfactory, the bars becoming hollow in the flanges, thus—



instead of being perfectly flat, so that, when the work is put together, the riveters are compelled to ply the bar with quarter hammers so that it may be made to lay close; and while doing so the bars are frequently fractured, which if detected leads to them being condemned, or doubling pieces have to be fitted as compensation. Arthur's patent beveling machine overcomes these practical difficulties to good beveling, and has already been tried, approved, and adopted by several large shipbuilding firms. The patentee is a practical iron shipbuilder, being at present a foreman plater with Messrs. Ramage & Ferguson, who have adopted the machine. The need of some better means of beveling angle and other bars has often occurred to Mr. Arthur, and this machine is the result of much thought and experiment on his part.

The machine which we saw at work was mounted on rails in front of the furnace, and when in use is brought up opposite the furnace mouth. It draws the bar out of the furnace (a saving of manual labor), and the beveling process goes on simultaneously while the bar is still at its best heat, no time being lost as in the ordinary method by having first to secure the bars on the blocks. It bevels straight out from the heel, and smooths down the rough edges of the rivet holes, so that the rivet head gets close up to the neck and the work lays close. The beveling is done correctly and at once, so that the result is smooth, clean, and accurate work; and the operation being done by rollers when the bar is hot, the edges are fair and free from local

free from kinks. It is claimed by the patentee that the work is done with a saving in labor alone equal to about 50 per cent, and there is no doubt that there is a very great saving in the labor expended in beveling. The machine is very compact, lightly but strongly constructed, and so simple that any workman can use it.



MACHINE FOR BEVELING ANGLE BARS, ETC.

The machine we saw in operation was being used to bevel 6 in. by 4 in. frame bars, and the frame turner using it was doing so for the first time, and had found practically no difficulty in understanding how to manipulate it, and expressed himself thoroughly satisfied that it did much better work than can be done by the old, crude method; and seeing the patentee was a perfect stranger to him, and he has no interest whatever in the machine, such an expression of opinion speaks for itself.

We append an illustration showing a sectional view of the machine, with part of the gearing and guide rollers removed, and with a bar in the position for open-beveling; when it is required to shut-bevel, the bar is fed through the machine with the horizontal flange in the opposite direction to that shown in the drawing, so that the edge will lie toward the collar, *a*, of the roller, *A*, and this roller is then adjusted horizontally to bear up on the edge of the bar. The most important parts of the machine are the conical rollers, *D* and *E*, of which the roller, *D*, holds one flange or wing of the angle bar horizontal, while the other roller, *E*, regulates the angle of the other wing of the bar. The angle is determined beforehand, and indicated by the pointer, *M*, on the sector, *N*, which is provided with a scale. The position of the roller, *A*, is adjusted by the hand wheel, *B*, and the screw collar, *C*, according to the thickness of the bar. By means of the collar, *C*, the roller, *A*, can be moved toward or from the conical roller, *D*; and by means of the hand wheel, *B*, the roller, *A*, can be adjusted vertically.

To regulate the angle of the bar, the screw, *L*, is turned, thus moving the summit of the cone, *E*, in the slot, *G*, formed in the cross-bar, *H*. The pointer, *M*, is connected at one end to the screw, *L*, and, as stated above, indicates on the sector, *N*, the angle formed by the two wings of the bar. This angle can be varied in different parts of the bar; and in this case the angles are taken on the plan of the ship at equal intervals in the length of the bar to be shaped. A disk, *O*, provided with a pointer indicates the course taken by the bar in passing through the machine. Note is taken in advance of the angles which correspond to each point of the bar, each of these points being designated by a number, and these numbers are placed on the disk, *O*. When the machine is to be operated, a bar is placed between the rollers, *D* and *A*, which revolve, and thus draw said bar into the machine. As the points which have been marked occur at regular intervals, it can easily be seen on the disk, *O*, when one of these points arrives at the rollers, at which moment the operator regulates

the position of the roller, *E*, so that the pointer, *M*, will indicate on the sector, *N*, the angle corresponding to the desired angle of the bar at said point.

The machine draws the bar from the furnace when it has reached the desired temperature, and for this purpose guide rollers are provided, which are not shown in the cut.

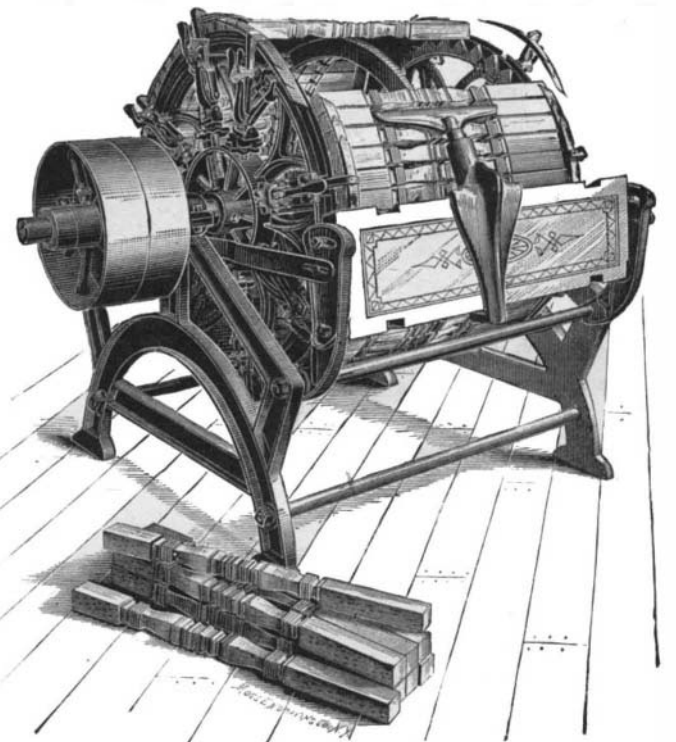
THE SLEEPER'S GUARD.

One, two, or three horizontal slats are attached to two upright bars, which are intended to be placed between the edges of the mattress and the side pieces of the bedstead or berth. Two folding arms are hinged to these uprights at points considerably above their lower ends, and when in use are arranged to be placed between the two mattresses of the bed, or when only one mattress is used, between the mattress and the springs or slats. The guard is shown in our illustration as adjusted to an ordinary bedstead. When not in use, the arms may be folded against the uprights, as shown, and the guard is readily portable or may be disposed of during the day by putting it under the mattress. The invention has quite a wide application. It is intended for use with ordinary beds, or with the berths of sleeping cars and steamers, to prevent the occupant, and particularly children, from falling out and being injured or crippled. It is a very simple device, and when adjusted to the bed or berth, the sleeping persons are perfectly secure without recourse to pillows, chairs, or other uncertain contrivances. The guard has been patented by Mr. John C.

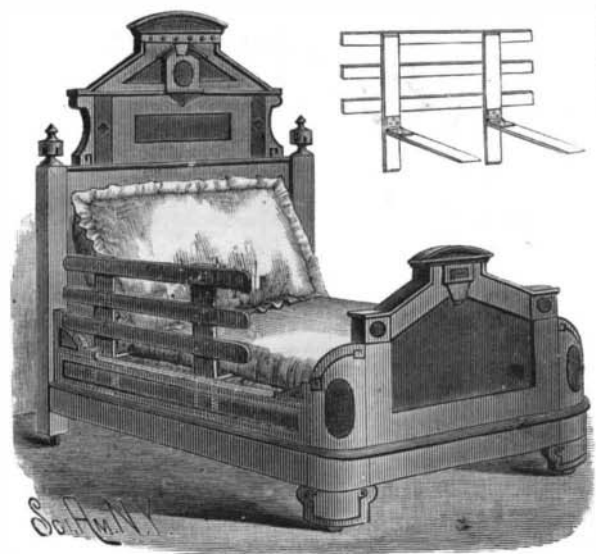
McMurray, and is manufactured by the Sleeper's Guard Co., 277 Pearl St., New York.

AN IMPROVED TURNING LATHE.

This lathe, shown in the engraving, is designed to turn work square or polygonal in shape instead of round. The machine consists of two wheels adjustably secured upon a central shaft. The materials to be turned are placed upon the wheels, thereby forming a cylinder. The wheels being revolved, one side of the pieces are cut to the desired shape. They are then turned over, and the other sides cut in like manner. The pieces are held on the wheels by a series of clamps or shoes, which are adjustable radially to enable them to clamp materials of different thickness. Each clamp is worked by a lever, which is quick and powerful in operation. A single movement of the lever will throw the clamp back out of the way, as shown in the engraving, leaving a section of the machine free of all im-



SMITH'S IMPROVED TURNING LATHE.



McMURRAY'S SLEEPER'S GUARD.

strains, which are always put on bars beveled by the old fashioned way, the beveling occupying just about the same time as in the ordinary method is taken in merely drawing the bar out of the furnace.

The bar when it has left the machine is sufficiently hot to be turned without reheating, and is easily wound or turned fair to the set, so that it is therefore

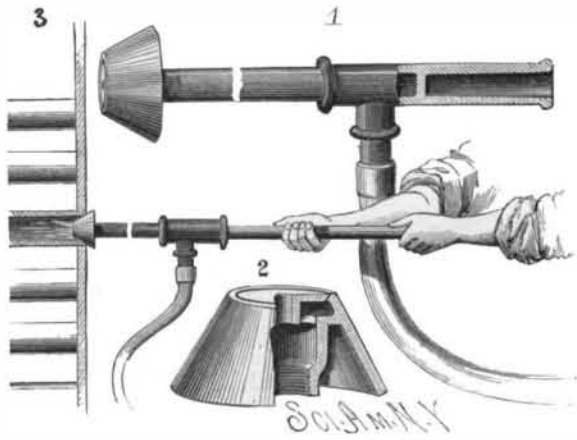
pediments, enabling the operator to place materials thereon or turn them over very rapidly; and when in place, a single movement of the lever will securely clamp them to the machine and lock the clamp so that it cannot be thrown back. The machine has an adjustable middle support for the pieces, upon which they are firmly held, preventing all vibration and per-

mitting of the finest work. The wheels are provided with adjustable seats, by means of which the pieces may be turned octagon or any other number of sides. The machine is so designed as to be easily and rapidly operated, and will finish smooth, with clean, sharp edges, from one hundred and fifty to six hundred pieces in ten hours.

This invention has been patented, and the machines are now manufactured by Messrs. D. C. & S. E. Smith, 227 West 5th Street, St. Paul, Minn.

BOILER FLUE CLEANER.

In the flue cleaner which we illustrate, the inventor has taken advantage of the cleansing power of a jet of dry steam, and has produced an instrument which is both effective and rapid in its operation. A truncated cone of cast iron, having the diameter of its base



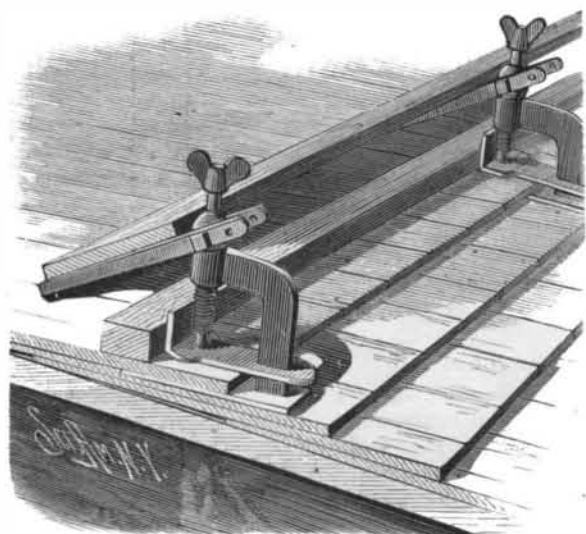
FERGUSON'S BOILER FLUE CLEANER.

somewhat greater than that of the flues to be cleaned, is screwed on the end of a section of tubing, which has a socket on its other end for the reception of a handle, and a right-angled neck for connection with a flexible steam pipe. This construction is shown in the first figure on a larger scale, and in the third figure as in actual operation. In the second figure, a portion of the truncated cone has been broken away, in order to disclose the internal arrangement. The neck of the conical nozzle is screw-threaded to make a tight joint with the tube section, and, by means of suitable braces, supports a disk at its face, provided with an annular opening and a central aperture for the discharge of the steam blast. The nozzle closes the mouth of the flue, excluding all air, and, by means of the openings in its disk, discharges a current of steam against the sides of the flue, sweeping out all obstructions and preventing the formation of scale. Where the cleaner is intended for use with an upright boiler, the handle may be arranged at right angles to the tube.

The device has been patented by Mr. J. M. Ferguson, 99 Camp Street, New Orleans, La., who will furnish further particulars.

CLAMP FOR ROOF SCAFFOLDS, ETC.

Attached to a plate which can be inserted under one of the shingles, as shown in the engraving, is an arm carrying a clamping screw having a bearing plate attached to its lower end. The bearing plate is slotted to receive the arm, and when borne down by the screw it serves to securely clamp the shingle between it and the lower plate. The upper end of the bearing plate is formed with a toe or upright, against which and



BARLOW'S CLAMP FOR ROOF SCAFFOLDS, ETC.

the corresponding toe of an adjacent clamp a "straight edge" may be placed when shingling the roof, to provide for laying the shingles perfectly true without the aid of a chalk line or any other guide. On each screw above the arm is a ball, to which is pivoted a support for the plank. This support consists of a bar slotted at one end where pivoted to the ball, and provided on the under side of its opposite end with any number of small pointed projections to stick

into the roof to assist in holding the clamp in place. The clamps may be quickly and easily shifted from time to time to adjust them to different positions on the roof as the work progresses. It is claimed that one man by the aid of this device can lay 5,000 shingles a day, and that its use will result in a great saving of time and money. It can be used in laying tin or slate roofs, and by painters or tanners, and by farmers or others in repairing roofs. It does away with lumber for scaffolding and the labor of nailing the same. The clamp can be used in all kinds of weather, and would prove useful in case of fire in ascending the roof.

This invention has been patented by Mr. A. T. Barlow, of Marshfield, Oregon; further information can be obtained from Messrs. Crawford & Lockhart, of same address.

Crushing Limit of Columns.

In preparing a plan for an electric lighthouse, M. Bourdais, the architect of the Palace of the Trocadero, investigated the height to which a column of different materials could be raised without crushing under its own weight. The weight of a pyramid with a square base may be expressed by the equation:

$$P = D^2 \frac{h}{3} \delta$$

in which D represents the side of the base of the pyramid, h the height, and δ the density.

The resistance is: $R = \frac{P}{D^2}$

Hence $R = \frac{1}{3} h \delta$

$$h = \frac{3R}{\delta}$$

If we take for the limiting value of R one-sixth of the load, which produces crushing in iron, and one-twentieth for different varieties of stone, we may deduce the following table:

MATERIAL.	R.	δ.	H.
Porphyry.....	2,470,000	2,870	2,550 meters.
Iron.....	6,000,000	7,800	2,280 "
Granite.....	800,000	2,700	900 "

Such are the practical limits to which a pyramid might be raised in the respective materials. It is evident that the Egyptians, in the great pyramid of Cheops, stopped far below the limit. If the prismatic form were adopted, the height could be only one-third as great.—*Lumiere Electrique.*

Decay of Neglected Bridges.

The rapid decay experienced by iron bridges which are neglected has recently been exemplified in Callowhill Street Bridge in Philadelphia. When lately the painters were set to work on this structure, their preliminary exertions in cleaning off the rust brought off flakes of oxide from one-fourth inch to three-eighths inch in thickness. This at once revealed the extent to which the injury had already gone, and called attention to the necessity of an immediate survey. The fact that the weakening process had already proceeded to a dangerous extent was shown by the vibration, which was so violent that the men had to hold on when a heavy load passed over, to avoid being shaken from the swinging stages. On examination, it was found that not only had rust invaded the material of the girders, but that the whole bridge, which is built on a rising grade, had moved down hill so far as to tear out the top courses of the upper abutment, and to buckle the struts of the intermediate supports, while the movements of the roadway had cracked the asphalt and forced out the paving blocks between the tram rails. The bridge crosses a railway, and provides for the street traffic above it; it includes one span of 340 feet. The structure was only completed in 1875, and thus ten years of neglect have sufficed to bring it to the verge of destruction.

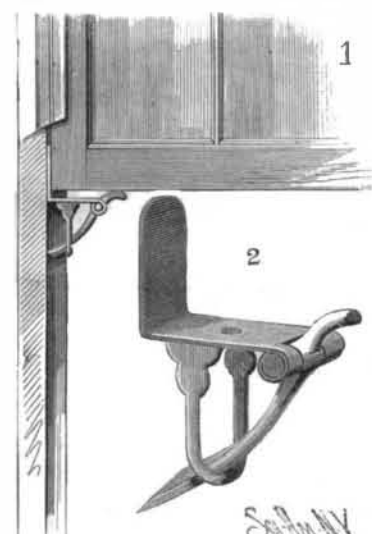
Brick Walls.

Except upon sites where stone can be quarried in the immediate neighborhood, we are all familiar with the economical advantages possessed by brick over stone as a material for walls. A two-brick wall is equivalent in strength to one in solid masonry 2 ft. in thickness, and here is a saving of 6 in. in space on every average external wall—no mean consideration on a town site where the ground is valuable. That bricks absorb more moisture than most kinds of stone is admitted, but they do not retain it for so long a period, and it is consequently less liable to find its way through brick walls. But apart from this, there are methods of protecting brick walls from damp, which we should shrink from applying to stone. If we were to affix ornamental hanging tiles to the surface of a stone wall, such concealment of a fine natural material would be regarded as a piece of vandalism in art almost equal to the application of cement. Hanging tiles form one

of the most picturesque of coverings for external walls, and greatly conduce to the appearance of home-like comfort which the exterior of a dwelling can be made to suggest; while, if glazed, they will not absorb moisture.—*Brick and Tile Gaz.*

PORTABLE SASH SECURER.

The form of this improved window sash fastener, which can also be used with advantage as a sash lock, is clearly shown in Fig. 2, while the manner of applying it to the window to hold the sash is shown in Fig. 1. In the outer end of a steel plate bent at right angles is pivoted a lever, one arm of which extends above the plate and is curved as shown; the other arm



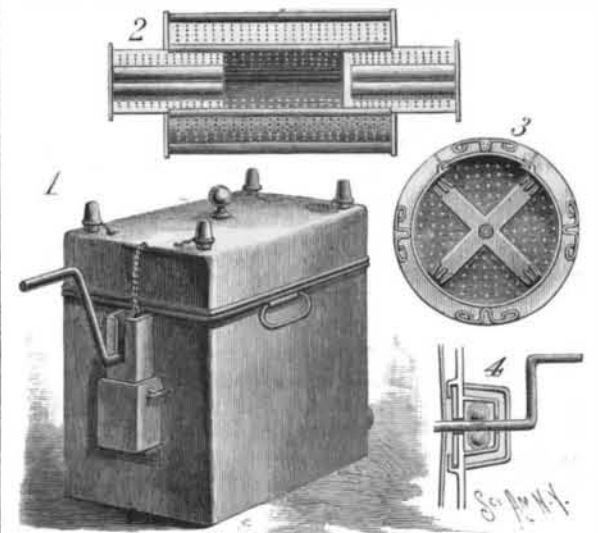
BETTERMANN'S PORTABLE SASH SECURER.

extends downward, and is made wider at its lower end and sharpened at the edge, so as to engage the guide rail of the sash when the device is placed in position for use. A U-shaped frame, riveted to the under side of the plate, prevents the long arm of the lever from dropping too far. To use the fastener, the sash is lifted and the upwardly bent portion of the plate inserted between the sash frame and the guide rail. The sash is then lowered so as to rest upon the short curved arm of the lever, when its weight throws the sharp lower edge of the lever against the rail, so as to bite into the same and thereby support the sash. To lower the sash, it is first lifted to permit the removal of the fastener. When used as a sash lock, the fastener is placed in an inverted position at one of the upper corners of the sash, when the latter cannot be opened from the outside.

This invention has been patented by Mr. R. Bettermann, of Cambria, Penn.

AN EASILY OPERATED WASHING MACHINE.

The illustrations herewith show a washing machine in which a perforated drum, holding the clothes, is placed in a boiler or reservoir containing soap and water, and the whole placed upon a stove and heated, when the clothes are washed by revolving the drum with a crank handle. Fig. 1 is a perspective view of the apparatus, Fig. 2 a plan representing the end covers partly drawn out, and Fig. 3 a transverse sectional elevation, Fig. 4 showing the working of the crank. The cover has an escape tube for the steam, with a cap to regulate its pressure, and there are ribs



ROGERS' IMPROVED WASHING MACHINE.

within the cylinder, which, as it revolves, raise the clothes and let them fall, and also cause the water to fall on them as the drum revolves; there are, besides, water elevators, formed by bent plates of galvanized metal, which take up the water and suds as the drum revolves, and cause it to pass through the perforations, so as to fall upon the clothes. This invention has been patented by Mr. Henry B. Rogers; particulars can be had from Messrs. Potter & Son, of Marshall, Mo.