POOLE & HUNT'S LEFFEL TURBINE WATER WHEEL.

By Joseph W. Hall, of Buffalo, N. Y.

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ABRAHAM LINCOLN WAS NOT A MILLER.

"An old settler" writes to the Clinton Public Ledger from "the hills," in a little nook off the main roads of the state. He says that Lincoln was an old settler and lived within one mile of the place where he was born in 1819. His father was a miller, and his mother was the daughter of a miller. Lincoln was born in 1826, and he was apprenticed to his brother James in 1837. He was married in 1841, and he moved to Illinois in 1843. The mill he worked at was called Lincoln's Mill. It was situated on a stream called Lincoln Creek, near the town of Mattoon. It was a small mill, with a capacity of 100 barrels per day. It was powered by water from the creek, and it had a small store in the mill building.

"Abraham Lincoln was not a miller," he writes, "as is commonly supposed. He was an old settler and lived in the vicinity of Mattoon, Illinois, where he was born in 1819. His father was a miller, and his mother was the daughter of a miller. Lincoln was born in 1826, and he was apprenticed to his brother James in 1837. He was married in 1841, and he moved to Illinois in 1843. The mill he worked at was called Lincoln's Mill. It was situated on a stream called Lincoln Creek, near the town of Mattoon. It was a small mill, with a capacity of 100 barrels per day. It was powered by water from the creek, and it had a small store in the mill building."
THE UNITED STATES MILLER.

Tweed-Grilling Mill, James E. McCormick, New York, N. Y., with Electromagnetic Scraper, Columbus, Ohio.

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Leather, grain or smooth side to pulp, 31
Leather, flesh side to pulp, 10

Proposition of Teeth of Gear.

From pitch to top of tooth, .032
Tooth height, .020
Thickness of tooth on pitch line, .04
Profile diameter, .04
Ordinary width of tooth, .020

Take 40 links on the chain. Has 30 links on the perpendicular, and 60 for the hypothesis.

In wresting a wall or frame, measure off from the corner 6 feet on one side and 8 feet on the other the distance between the two points just ten feet just 10.

One acre of surface contains 45,450 square feet, or 45,450 feet of side. The number of cubic feet in each acre, for example 100 feet.

The pressure of water in a vessel or drum depends only upon the perpendicular height of the water above the bottom; and one square inch of the surface of the cistern, flume or pipe containing it, is exactly equal to the weight of a column of water one square foot, extending perpendicularly from a given point to the surface of the water in the cistern.

The velocity of water spouting from an orifice under the pressure of a perpendicular column of water is eight times the square root of the height of the head.

A density of 10,000 is obtained through an orifice of given size, varies as the square root of the head.

The volume of a vessel is equal to the square of the side multiplied by the height.

The revolutions of a turbine vary as the square of the velocity of the impeller, divided by the diameter of the wheel in feet.

To ascertain the cubic feet per minute that will be thrown out of a nozzle, let the number of revolutions be divided by the theoretical, the area of the opening in feet by the square root of the head, multiply the product by 100, and divide it by 30.

If the opening be on a thin metal plate with a circular opening a foot in diameter, the quantity of water discharged will be only five-eighths of the theoretical, as usually calculated.

Rule for Finding the Length of Bolt Wound.

Add the diameters of the two pulleys to the sum of the diameters of the two shafts, and subtract the lengths of the bolts by the quotient by one and four-fifths. Add the product to twice the distance between the centres of the pulleys, and you will find the length required.

Rule for Finding the Change Required in the Length of Belts when the Pulleys on which They Run are Changed for Out of Composition.

Take three times the half difference between the diameters of the pulleys, and the result will be the length of belt to cut out or put in.

To Find the Width of Belt to Transmit a Given Power.

Multiply 30,000 by the horsepower. Multiply the speed of the belt in feet per minute by the product, and divide the quotient by the number of teeth of the small wheel. Divide the product by 45. Multiply the small wheel by 3. Multiply the product by the number of teeth of the small wheel, and the result will be the width of the belt.

The length of belt (in feet) equals the sum of the diameters of the roll and eye (in inches) multiplied by the number of teeth, and this product multiplied by the decimal .0193.

In putting on a new belt or taking up an old one, great care should be taken to have the ends perfectly square, and the loose end laid down on the floor, with as much care as to the material in contact, with smaller pulley. Divide the first product by the second. The quotient will be the number of teeth of the large wheel, and the number of teeth of the small wheel.

Divide the square inches of belt contact with each roll by the quotient by the velocity of belt in feet per minute and divide by 30,000.

To Find the Number of Teeth in a Pinion when the Number of Teeth on the Driver is Given.

To ascertain the number of teeth in the pinion, multiply the number of teeth the driver by the number of teeth on the pinion, and divide the product by the number of teeth on the driver, and the quotient will be the number of teeth of the pinion.

To Find the Number of Revolutions of a Driver when the Number of Revolutions of a Pinion is Given.

Multiply the number of teeth of the pinion by the number of teeth of the driver, and divide the product by the number of teeth of the pinion, and the quotient will be the number of revolutions of the driver.

To find the number of revolutions of the last Wheel at the end of a Train of Spur Wheels, all of which are in a line and mesh into smaller Wheels, divide the number of teeth of the first Wheel by the number of teeth of all the following Wheels, and the product will be the number of revolutions of the last Wheel.

To find the number of teeth in each Wheel for a Train of Spur Wheels, each to have a given Velocity.

Multiply the number of teeth of the driving wheel by the number of teeth of the driven wheel, and divide the product by the number of revolutions of the driving wheel, and the quotient will be the number of teeth of the driven wheel, or the number of teeth required for each.

To Compute the Number of Revolutions of the last Wheel in a Train of Spur Wheels, with or without Pinions, when the Revolutions of the first or Driver, and the Diameter, or Pitch Circumference, of the first, or Driver, are given.

Multiply the diameter, or circumference, of the last wheel by the number of revolutions of the last wheel, and divide this product by the continuous product of the diameters, or circumference, of the whole set of wheels, and the quotient will be the number of revolutions of the last wheel.

Example:—If this diameter, or circumference, of the first, or driver, is 10, and the diameters, or circumferences, of the last wheels are 8, 8, 10, 12, and 6, and the diameters, circumferences, or number of teeth of these last wheels are respectively 120, 120, 100, 120, and 100, the revolutions of the last wheels will be 100, 100, 75, 60, and 50.

Multiply all the drivers together and then by 10 revolutions, and you will have 8 by 10 equal to 800, and 800 divided by the amount of the product of the figures for pinions, 4 by 5 by 5 by 6=600, and the result will be 800 divided by 600, or 1.3333, which is the number of revolutions of last wheel.

This rule is equally applicable to a train of pulleys, the given products being the diameter of each and the circumference.

To find the Horse-power that a Tooth of a Wheel will Perform.

Multiply the square of the pitch in inches, by the velocity of the pitch in feet per second, divide the product by 12, and divide the result by the breadth of teeth in inches, and divide by 10.

To determine the Diameter of a Pair of Wheels in contact with each other, Diameter of their Centers apart being given.

Divide the greatest velocity by the least; subtract the ratio from one, and this quotient must bear to each other. Hence divide the distance between the centres by the ratio, when the radius of the smaller will be of the quotient, and of the smaller wheel—and subtract the radius thus obtained from the distance between the centres, and the remainder equals the radius of the other.

ENGINES AS HELPERS FOR WATER-WHEELS.

"How not to do it" might well be written in capital letters and set in large type in every book of instructions for the making of fixtures, gauges, shafting, and pillow-blocks, by which engines are sometimes connected with water-wheels. The experience of many years of study and practice has given me the view of helping them, but with really the effect of piling upon the joint effort of the engine as an additional burden, unless the load above the limit which need have been increased. In other words, we should never add to the engine, and with high boiler— though this would be possible when the boiler is large enough, and with which to build a strong foundation, or, if need be, a slender-braced pier, it is an answer to this objection to say that they should rise, or to add to a declining water-power, or upon a high-priced coal supply, the burden due to the use at high speed of the complex trains which have sometimes become necessary on water-mills.

It is very hard to believe that they were designed for the purpose of a real helping from a single large engine, and that the wheels to which are placed at considerable distances from each other and run at different speeds, and further, that the water-power should be separated from the combination.

The real test of skill and good judgment in making engines, is to avoid a concatenation of parts which will thus be quite easily separated, and not by the rigidity of parts which are connected for the combination, and not by the rigidity of joints which are connected for the purpose of erecting combinations of the engine. The use of two or three engines, as in one case instead of one larger, central engine, is due to a greater less from friction in the engine, and to water-power, and to use the steam, but any probable sum of any of these losses, if the arrangement be skillfully contrived, always is less than that due to the combination of gearing for which some of the designs of such figuring to have been indispensable and altogether anaccountable.

Many of these men, who would seem to believe the wheel to be a machine which could as easily be made worthless by dams. Mr. Sutherland has in his hands seventy cases of the kind, arising from the Appleton, Mansfield, and Montello dams, and he says that the only way to get them in their concern the amount of damage which can be done is to make a cure on the margin of an angle.

The fan case may be taken out and used as a help to get water towards the head of the machine, if desired. See that the machine is driven fully to the top of the fall.

Keep the slipp on the sieve always stretched.

The speed at which the millings flow down the cloth may be varied by changing the pressure of the roller. It is best to keep the roller in the shaker frame, a rapid flow being obtained by setting them out of perpendicular toward the cloth, and then back again.

As a rule no more pitch should be given closer lanes than the required to flow the cloth.

Never use air enough to bubble the stock on the cloth, but make the currents as strong as possible without causing this air, and without carrying good stock to the dressed side.

Always load a machine as heavily as it is possible without making the tappings too rich. The width of the cloth should be just enough to allow itself to sufficiently accomplish this end.

Cut off and return a few inches from the head of the cloth, unless, as is sometimes done, added to theast room should be at least three times the size of the spout leading to the head of the machine.

The NEMASHA, W.I., MILL DAM CASE DECISION.

The Supreme Court of the United States has at last rendered a decision in the celebrated case of the owners of the Nemasha, the county surrounding the raising of a farm by reason of the water in the lake being raised by the Nemasha dam, and the case brings the people of Montana and the people of Montana, on Thursday, April 16, 1875, and was entitled, Frank J. Jones, the owner of the estate of George J. Pum-

The Nemasha, W.I., Mill Dam Case Decision.
DO YOU MAKE BUCKWHEAT FLOUR?

CRANSON'S
SILVER CREEK BOLIER BUCKWHEAT SHUCKER

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IMPROVE YOUR QUALITY,
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From 1 to 50 foot diameter, of any desired size or pitch needed, by our own special machinery. Shipped in parts, in case, and sent to hand.

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Best Quality French Burr Millstones.


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The American Turbine, as recently improved, is unequalled in the power obtained from a given quantity of water, and is demanded by every Wheel ever known. It has been almost entirely made.

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Built under their original patents until their expiration, improvements since added: "TOP MOUNT ON REGULATOR," prevents engine from furnishing away; "SELF-PACKING VALVE STEMS" (two patents), dispense with steam stuffing boxes; "RECESSSED VALVE SEATS" prevent the wearing of shoulders on seats, and remedying a troublesome defect in other Corliss Engines; "HARRITT & HARRIS' PISTON PACKING" (three patents). "TOP COLLECTING DEVICES" (one patent). Also in "General Construction" and "Superior Workmanship." The HARRITT AND MORT WACKERMAN type of the Corliss Engine is the standard, substantially built, of the best materials, and in both Corliss and Non-Corliss forms. The Corliss Engine, from 2 hp. to 150 hp. of steam, at or above, is a labor-saving in the power and other its more fuel. Small parts are made in quantities, and interchangeable, and kept in stock, for the convenience of repair and in each. No others esquire is authorized to state that he has furnished this engine. All others where this engine can be had, WM. A. HARRIS, No. 1, without part being licensed.

M. W. HARRIS, Proprietor.
The United States Miller

Improved Rapid Method of Copying Drawings

The common method of copying drawings by contact with the blue process or sensitive paper is thought to have no future. Instead, the sun of from fifteen minutes to half an hour, seems likely to be superseeded to some extent by the newer and more rapid process of improved gelatine bromide of silver paper.

Gelatin sensitive paper has been difficult to make. Most of the efforts to make it have been made with special materials that are now being used for this purpose. As a result, the material is now used more and more in the process of making gelatin bromide of silver paper.

In order to make gelatin sensitive paper, the first step is to prepare a solution of gelatin in water. This solution is then heated to a temperature of about 70°C, and the gelatin is allowed to dissolve completely. The solution is then cooled to room temperature and then poured into a mold. The gelatin is allowed to set and harden, and then the gelatin sensitive paper is dried and prepared for use.

The second step in making gelatin sensitive paper is to expose the gelatin to light. This is done by placing the gelatin sensitive paper in a darkroom and exposing it to a light source. The light source is usually a lamp or a light bulb, and the duration of exposure can be controlled by the length of time the gelatin is exposed to light.

The third step in making gelatin sensitive paper is to develop the gelatin. This is done by placing the gelatin sensitive paper in a developer, which is a chemical solution that reacts with the exposed gelatin to produce a latent image. The developer is usually a solution of sodium thiosulfate, and the duration of exposure can be controlled by the length of time the gelatin is exposed to the developer.

The fourth and final step in making gelatin sensitive paper is to fix the gelatin. This is done by placing the gelatin sensitive paper in a fixer, which is a chemical solution that reacts with the developed gelatin to remove any remaining silver ions from the gelatin. The fixer is usually a solution of sodium thiosulfate, and the duration of exposure can be controlled by the length of time the gelatin is exposed to the fixer.

The gelatin sensitive paper is then washed and dried, and the process is complete. The resulting gelatin sensitive paper is then used to make copies of drawings by placing the gelatin sensitive paper against the original drawing and exposing it to light. The resulting image is then developed and fixed, and the process is complete.

The process of making gelatin sensitive paper is a complex and technical process, and it requires a great deal of skill and experience to be able to produce high-quality gelatin sensitive paper. However, with the development of new materials and techniques, the process of making gelatin sensitive paper is becoming more and more efficient and effective, and it is likely to continue to improve in the future.
The MILLS OF MINNEAPOLIS

The present milling capacity of Minneapo-
lis is shown in the appended table:

<table>
<thead>
<tr>
<th>Name of mill</th>
<th>Barrels per day</th>
</tr>
</thead>
</table>
| **Barnard & Barnard** | 13000 |}

**Wheatstone's** FRINGED IRON MILL.

**Grayson's** BARLOW & STANLEY MILL.

**Barnard & Barnard**'s **Stonewall Mill.**

**Minnesota Milling Co.,** 20,000 barrels per day.

**Backman & Hultin Mill.**

The *Mill-owners and Farmers' Journal* reports that the new mill in St. Paul has been completed and put in operation.

**Backman & Hultin Mill.**

The new mill is said to be of the latest design and is equipped with the most modern machinery.

**Grayson's** BARLOW & STANLEY MILL. This mill has been equipped with the latest improvements in milling machinery, and is said to be one of the most efficient mills in the United States.

**Minnesota Milling Co.** This mill has been in operation for some time and is said to be one of the largest in the country.

**Backman & Hultin Mill.** This mill has been in operation for some time and is said to be one of the most efficient mills in the United States.

**Grayson's** BARLOW & STANLEY MILL. This mill has been equipped with the latest improvements in milling machinery, and is said to be one of the most efficient mills in the United States.

**Barnard & Barnard**'s **Stonewall Mill.**

The new mill in St. Paul has been completed and put in operation.

**Wheatstone's** FRINGED IRON MILL.

**Backman & Hultin Mill.**

**Barnard & Barnard**

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DUSTLESS GRAIN SEPARATORS!

Our aim has been to construct a machine that would do superior work, clean fast, run easy, and to remove all dust and foul stuff without wasting any grain or seed; also in making it strong and durable in every respect.

For these machines we make the following claims:

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**Trumb.** Their Large Cleaning Capacity: In constructing these machines the capacity has been greatly increased, so that they will clean much faster than any single machine of equal size.

**Fryz.** The Effectiveness of Removing Dust and Chaff: By combing the Dustless Fan with these machines all dust and chaff can be taken out and carried through spouts to outside of building, or into a dust-box, thereby obviating the great objection and nuisance of having the house filled with dust, and the discomfort and annoyance caused on men working therein.

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With Adjustable Shaking Shoe and Changable Cockle Screens, whereby all Cockle can be extracted from the Wheat. Will do thorough work, both as a Scourer and Separator.

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