## 4if

E. S., of Pa.-The best way to grind a slide valve is to scrape it, which is to say that it must not be ground. The grinding scrape it, which is to say that it must not be ground. The grinding material gets in the pores of the metal and in the ports of the cylinder, and cannot be got out. In this way it soon destroys the piston packing and cylinder. Take a three square file and grind it sharp on the edges, and you will have a food scraper. To grind a poppet valve or a safety valve scrape it untll it bears mell all grind-stone, slush and cut down the high points.
L. W., of Mass.- \$24 20 recelved. We are very greatly obliged for the substantial token of your appreciation which you send us in the shape of so large a list of subscribers. For the kind words of interest and encouragement which you so well express, you have our thanks. We shall in due time.give attention to your suggestions. We do not remember any patent for the idea of revolving the wheels of a clock calendar by gravitation? But per-
haps we do not fully understand your inquiry. Do you mean a haps we do not fully understand your inquiry. D
self-operating mechanism, $i$. e, a perpetual motion?
R. C. B., of Ill.- When the atmosphere rests on all parts of the surface of any vessel or pond of water, it has no tendency to ratse any portion of the water. But if one end of a tube is placed in the water, and the air in the tube is taken out, so as to remove the pressure from that portion of the surface enclosed in the tube, thent the weight of the atmosphere resting on the surface
outside forces the water up into the tube. In the case of a pump outside forces the water up into the tube. In the case of a pump
the elr in the tube is raised from off the surface of the water by the piston. If capillary attraction is duc to atmospheric pressure, how is the pressure of the air taken from the surface of the liquid within the caplllarytube?
W. H. W., of Conn.-To procnre hydrogen gas, dilnte 3 pounds of oil of vitriol with 24 pounds of water, and dissolve in it 2 pounds of zinc. All the apparatus required is an alr-tight glass the gas. Navigating balloons will always be impracticable, for the reason that a balloon which will float an engine in the air must be too balky to be moved with any but the most moderate velocity through the air. Fire shells have long been made far more efficlent than Greek fire, or any other liquid.
H. W. S., of Ohio.-This correspondent says:-"On page 163 you have an account of a submarine boat building in En. gland for Russia. โwould ask when a vessel is sunk completely under water what means can be uscd to vary its buoyancy so min utely as to keep it at any particular distance between the surface
at the water and the bottom of the river or ocean. It seems to ot the water and the bottom of the river or ocean. It seems to would sink or float it." We answer bytaking in or expelling water. W. B. A., of N. Y.-We are very much obliged to yon for the formulx you send to obtain the lengths of belts, but does It not strike you that in practice a mechanic could find the length quite as soos has to be measured before the calculation is made, we might as well make one thing of it and find the actual length of might as well make one thing of ${ }^{\text {the beltat the same time. We shall be glad to hear from you }}$ again.
E. R. C., of N. J.-Hilton's cement will fasten the metal bottom into your porcelain cup provided you do not wish to ex pose it to action of heat. This is made by mixing with white lead ground in oil as you buy it at the paint shops, red lead white lead to make a paste like dough. It will harden in two weeks so as to make a paste fike dougn.
Use only just enough for the purpose.
C. P. R., of Ill.-Your criticism of the item " A crossed belt will drive more than a straight belt, because $i t$ hugs the pulley tighter," is perraight belt, because it laps further round the pulies, are than a the interpretation which everg intelligent mechanic would put upon the two lines in question. It Is proper to be exact in all ex pressions, but terms are synonymous вometimes, in this case par pressions,
tlcularly.
C. T., of N. Y.-You can get a small quantity of ma§ nesium wire for experiment of Professor Seely, 244 Canal street, this city, at fifty cents per foot. It may 'de set on fire with a match, when it burns rapidly with an exceodingly bright and beautiful flame. The product is or course magnesia, the oxide of mag
Wesium. J., of Pa.-In making varnish the gum is melted then hot linseed oil is poured in, and finally benzine is added Petroleum benzine is a very poor solvent of the gums used in making varnish and is apt to spparate, but the coal tar benzine i
J. McN., of C. W.-Hatfield's "American House Carpenter," published by John Wiley of this city in 1857, is a good work for you to have. We notice your remark about the Canadian patent law policy, and we sincerely hope that something may yet be done to secure such an amendment as will admit our citizens to equal protection.
W. J. C., of La.-There is no rule for finding the length of the link. It is simply an agent for connecting the two eccentric rods together, and aninch more or less makes no difference in its operation. It is made as light and as strong as possible, on ac count of the trouble of counterbalancing it.
A. T. D., of Maine.-Yonr plan of generating steam by throwing just enough water into a boiler or pipe for the capacity of the cylinder is very old. Paine's "Sprayengine" was thus operated. There is no economy in it and the heater or boiler if you choose to call it such, is destroyed quickily.
J H. H., of Mass.-There are so many good breechlozding rifles using metallic cartridges that it would be difficult to decice which one is the best. Looks over the engravings of such
devices the Screvripic Avericav, and make vour own selec tion
G. B. P., of N. Y.-We are glad you are so highly pleased with the manner in which we have executed your patent business. You can get information a
of the engine builders in your place.
T. C. B., of Conn.-An interesting illnstrated article on die-sinking and multiplying will soon be published, and we refer you to it for the information you desire respecting this art. P. M., of R. I.-Cocnlns Indicns is nsed to destroy or stupify fishes so that they can be taken with little troubie and in large quantities.
C. B. M., of N. J.-The difference between a cross-cut saw and a rip saw is that the teeth of the latter all lead one way, while those of the former are straight up and down, the first are equilateral triangles, while the latter are right-angled triangles. J. R. W., of Mass.-There is a great difference in the efficiency of levers. In a first class lever the power moves faster than the work, which is a mechanical advantage. In the thir vantage.
E. B. C., of Ohio.-We know of no journal devoted exclusively to telegraphing. The Scientific American aims to have everything new and interesting relating to the subject. We illus-
trate and describe ald valuable improvements in any of the ap
paratus. W. P. B.
W. P. B., of Wis.-Morse \& Bros., of Athol, Mass., were at one time engased in makingfurnacesforburning wet tan bark H. D. of Main. We
O. H. D., of Maine.-We shall be most happy to read your article on dry printing, and the results of
with the machinery in the treasury department.
with the machinery in the treasury department.
J. S. Cummings, of Webster, Mass., wants to know if machinery sultable for the manufacture of linen thread can be procured in this country
C. A. C., of Ind.-We are preporing a series of illustrated articles on the subject of lathe tools, which will appear in o short time.
C. M. R., of Va.-Yon can obtain galvanic batteries and all the information you desire of Messrs. Chester, 404 Center street, W. A. F.,
ton street of V.-Address M. J. Cluff, No. 288 WashingT. B
. B., of Ohio.-Knife blades can be fastened by a cethe handle is fllled with this powder, the tane heated pusbed in andleftstanding on end.

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gents the Railroad Curve is less than one-quarter of its Radius.
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## Improved Washing Machine.

The inventor of this machine claims that it accomplishes its work very perfectly, and that in its construction and general features it is a very convenient apparatus. It is easily worked, simple in its details, and in other respects desirable. It can be operated when seated or standing, and does not tear, rust the clothes, or strip the buttons off. Large numbers of them have been sold, and those now using them are entirely satisfied with their operation. A cover accompanies the machine (not shown in the engraving) which closes the top entirely and prevents the steam of the hot suds from diffusing itself over the house. The machine itself consists of a water-tight case, A, set on legs. This case has a raised edge, B, in which

## The Laird Rams.

Sincethe purchase of these famous ships by the British Government, they have been handed over to the builder to be finished. Oneof them, El Tousson, re-named the Scorpion, made a trial trip on the 30 th of August. She is thus described by the Liverpool Courier :-
"A recapitulation of some of the principal features of her construction will be of interest at the present time. The ordinary hull is of iron of extra strength; over this is a coating of ten inches of teak, and armor plates four and a halt inches thick, nearly the whole length of the side, but tapering in thickness, of course, at bow and stern. The bulwarks are novel. The topgallant rail is of wood, and removable


## DOTY'S "PARAGON" WASHING MACHINE.

the bearings of the frame, C, work. The wash-board, D , is in form a common footstool turned upside down, this is attached to a pair of levers, E , in such a way that the action is very easy. The clothes are placed in the case, and by moving the levers up and down, as in pumping water, they are thoroughly rubbed, squeezed and lifted at each stroke, so that they are rinsed, shaken and as well worked over as the hand of a skillful wash-woman could do it. If at any time portions of the clothes, such as the seams of wristbands, require rubbing in spots by the hand, the wash-board can be made stationary by the hook and staple, F , and the rubbing can be done as well as in an ordinary tub. The action of the levers is aided by an elastic band, G, which, on the return or up-up-stroke, when less power is exerted, draws the board over. Any kind of wringer can be attached to this machine, and in its general features the inventor is confident of his ability to compete with any in the market.
The invention was patented through the Scientific American Patent Agency, on the 12th of July, 1864, by Wm. M. Doty, of New York city. For further information address him at 19 Beekman street, New York, or E. P. Doty, Janesville, Wis.

The London Times says the costly British ironclads are built on obsolute patterns and are failures.
at pleasure, the bulwarks proper being of iron, hinged on the deck level, and falling outwardly against the ship's side, thus 'literally clearing for action,' and giving the guns in the turrets an uninterrupted sweep almost any way except directly fore and aft. The muzzle of the guns are only a little above the deck level, and the tops of the cupolas are only five feet high, so that they do not present a very conspicuous mark. But the turrets extend some depth below, and have thus the protection of the ship's sides. What is exposed above deck has five and a half inch plating, doubled near the muzzles of the guns, and fourteen inch teak backing. The turrets are eighteen-sided in the surface presented to shot, Captain Cowper Coles preferring these angles to the curve of a rounded surface.
"There are two turrets, each to carry two twelvetun guns, ranged side by side, and throwing a 156pound spherical shot, or a 300 -pound bolt, if the weapons are rifled, as most probably they will be. The tower rests on a turn table, running on wheels, the motion being obtained by four crab winches, acting on a toothed rim fixed to the kelson that supports the tower. The tower is prevented from shifting by an immensely strong wrought iron central spindle, bolted into the framework and bed of the vessel. Outside the towers are twenty-four feet in diameter; inside, nineteen feot. The charge and projectile will
be handed up to the gun by means of a very simple tackle, these turret guns being positively easier to work than ordinary broadside guns, while the men are all under cover of the armor plating. Aim is taken from the outside of the turret. For this purpose there are three little holes in the roof for the master gunner to pop his head through, there being iron bonnets fitted to glance off rifle bullets. The gunner, in fact, brings the port holes of his turret to bear upon the object. This is not so dangerous an office as would at first appear. Supposing the vessel to open fire at one thousand yards range, a man's head, with the protecting bonnet to shield it, would not be a very conspicuous object, while, in the smoke of a close action, he might take a sight with impunity. One of the turrets was shown in action yesterday, and the facility with which it was worked was admirable, even with an untrained crew.
"The dimensions of the Scorpion (and Wyvern) are:-Length on water line, 224 feet; beam, 42 feet 6 inches; depth, 20 feet; measurement, about 1,890 tuns. Their great beam gives these vessels wonderful stability as floating batteries. The screw propeller we should state is fourteen feet in diameter, and has three blades, yet the rapidity with which the Scor pion answers her helm is remarkable."
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## FOR 1864!

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