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H. 8., of Pa .-There is no formula by which an inventor can regulate the sale of rights under his patent so as to secure equa and exact justice to all purchasers. We can suggest no fixed rule est of the bargain.
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E. M., of Mo.-Your method of bleaching wax, so far as we know, is new and patentable. There are no eatablishmentsin this vicinlty, with which we are
T. H. M., of Pa.-Alcohol is a solvent of castor oil and with it forms a clear solution, but with olive oll it forms a milky so lution. Tibealchare carlor, bat wit
S. N.. of Ill.-A correspondent whose letter is published on page 182, Vol. VI. (new series) of the Scientific american states that the nitro-muriate of platinum is employed to form
dead black on brass, such as the eye pieces of telescopes.
A. B., of Mass.-Any good treatise on photography will give you information respecting the strength of solutions for deS. C. C., Jr., of Mass. and J. A. M., of Pa.-Your commu nicalions on aerostallon have been received.
S. B. L., of R. I.-Corliss \& Co., of Providence, R. I., will nodoubt construct an air wh
operated withan air pump.
W. H. F., of Iowa.-We recommend you to get a good millwright to select theengineand boiler foryourgrist mill. Any respectable engineering estabilshment will build you a bol
H. W., of Pa.-The cement for stopping sand-holes in iro castings ls made by mixing one part of flowers of sulphur and two tarnings. Sumfient water is used to make this compound into a thlck paste; it is used as soon as it is made and the boles are plugred ught with it. This cement ultimately becomes as hard as the metal itself.
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rails and chairs for rail wa ss: Plate XIII.; Rule and Practical Data:











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 Continuation. of the Study of Shadocs: Plate XXVIII. Tuean Order
Plate XXIX. RResernd Practial Daaca. Pumps. Hydrostancic principles

 of water through rectangular orifices of narrow edges, Calculationg of
ibe discharge of water through overrbot outets. To determine ho
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OBLIROE Proserions.-Aplication of rules tothe delineation of an
oscillating cyinder: Plate XLI.

 Len of the mill, Representation of the minl in perspective, Notes
recent improments in lour mills, Schiele's mill, Mullinn rering
millstone. Barnett's millstone, Hastie's arrangement for driving millstone," Barnetl's millstone, Hastie's arrangement for driving
mills, Curite impovements in millstones; Rupand
Work performed by varlous machnes, Flour mills, Saw millis, Veneer ExapLEs or FINIBAED DRAFINGs or MAcAiNERY.-Plate A, ba
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## Improved Patent Governor.

All our readers are so familiar with the uses to which the invention herewith illustrated is applied, that we forbear any comments upon this branch of the subject and proceed at once to describe the apparatus, which in its arrangement and design is both novel and praiseworthy. The column, A, has the hollow spherical head, B, attached to a tube running through the center of the column connected at the bottom with the crown gear, C. This case contains a rod which has a shoulder on it in which the ends of the levers, $D$, work. The clutch, $E$, is secured to
are two stationary inuts, $J$, which can be set a any desired point. The pulley, K , transmits power from the engine to the whole apparatus through the bevel gear, L. These are the principal details of the apparatus. The operation of them will be under stood by referring to the annexed description :-
When the balls are revolved they maintain a position whose distance from the column is proportioned to the speed at which they travel ; as they rise or fall by an increase or decrease in the number of the revolutions, the clutch is thrown into communication with the upper or lower gear and thus rotates the


## HOWELL'S PATENT GOVERNOR.

the rod just mentioned by set-screws. In either end of the clutch there is a V-shaped groove which is accurately fitted to corresponding projections on the gear, C and F, (see Fig. 2).


Below the two standard plates on which the machinery is placed mas be seen a spur wheel connect. ing with a pinion; this wheel is keyed on to the same rod that carries the clutch and operates, through the pinion just mentioned, the screw shaft. G. The lever, $H$, is jointed to the upright, and the forked end of it connects with a nut working on the screw shaft. At either end of the screw shaft
gear connecting with the screw shaft. As the screw shaft moves in obedience to the machinery, the nut in the lever runs up and depresses the opposite end of the same, which is in connection with the steam or throttle valve. The whole duty of the balls is exerted on the friction clutch; the motion is very slight, as the distance between the clutch and the gears it drives is only one-sixteenth of an inch. The gears placed at the side of the machine are intended to accelerate the speed of the screw shaft as may be desirable. This is a necessary feature and it strikes us that if the screw shaft itself had a quicker pitch on it the apparatus would be still more eflectual. As it is, when properly made, it must be a sensitive governor, and we are assured that it gives great satisfaction in the navy gard at Portsmouth, N. H., where it is now used. This governor was patented on Dec. 23, 1862, by John S. Howell, of Portsmouth, N. H., and further information can be had by addressing him at that place.

## Electro-metallurgy.

This term is applied to the art of depositing metals upon one another, or upon non-metallic bodies-an important invention, which dates from about the year 1840. At the present time numerous persons are engaged in this business in Sheffield, Birming ham, and London. The simplest mode of operating is to employ in one cell Smee's or Daniel's battery, for the purpose of generating the electric force ; then to have a second vessel, of a size sufficient to hold the article to be coated with metal. If it be intended to coat the object with copper, then this vessel must be flled with a saturated solution of sulphate of copper, and a sheet of copper placed into it. This is connected by a wire to the copper of the battery, unother wire is made to connect the sinc of the bat-
tery with the object to be coated. The battery being set in action with weak sulphuric acid and water, the deposit of metal takes place without further trouble. If the article is to be coated with silver, then a solution of cyanide of silver is used, and a silver plate, instead of the copper-salt and plate mentioned. Every metal can be thus deposited from its solution when the proper salt of the metal is employed. If the object to be coated is metal, nothing but absolute cleanliness is necessary; but if the object be wax, plaster-cast, wood, \&c., then it must be brushed over with fine black lead, in order to make the electric fluid travel, all objects except metals being non-conductors. Beginners should commence with small objects, as a little experience is necessary to lead to satisfactory results.-Septimus Piesse.


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