of a violin depend upon the kind of wood which it is made of? A. The quality of a violin is dependent upon the wood and upon the workmanship with which it is made. It improves as it grows old, and therefore its age is an important factor when its quality is considered. 2. If so, what kind of wood is best? A. Pine wood is used for the front and curly maple for the back. 3. Is there any work published in regard to the construction of the violin? A. We are not acquainted with any special book descriptive of the manufacture of the violin, but you will find a good deal of information contained in the various cyclopedias.

for soda water? A. Either of the following can be used with advantage: 1. To each gallon of sirup, add from 2 to 4 oz. of gum arabic dissolved in its own weight of water. 2. Quillaya bark, 4 oz.; alcohol, 4 oz.; glycerine, 4 oz.; water, 8 oz. Exhaust by percolation, so as to make 1 pint of tincture. From 2 to 5 drachms of this tincture to every gallon of sirup will be found sufficient to give every glass of soda water that creamy appearance so universally liked.

(38) E. D. F. asks how high a bicycle track should be banked on the outer edge of a 20 ft. i inclose the same area in a square, its sides must be broad track on the circle, the radius of circle being 120 ft., the rate of speed of wheelman to be 1 mile in 3 minutes? A. Under the speed named man and wheel will make an angle of 121/2° to counteract centrifugal force on a 120 ft. radius. The radial grade of the track should incline 1 ft. in 5. But as this is for extreme velocities we recommend only one-half this grade, or 1 ft. rise to 10 ft., or 2 ft. for your 20 ft. track. There will be no difference in the angle of inclination for differences of height in weight of man or vehicle

(39) C. F. C. asks: 1. How many candle power is a German study lamp? A. About 20. 2. Candle power of an ordinary 4 ft. gas jet? A. About 12. 3. How large a single incandescent lamp the dynamo in SUPPLEMENT 161 will run? A. Five or 6 candle power of low resistance. 4. Candynamo run an arc light? A. A very small one. 5. How can I construct a simple motor to be run by water in a large reservoir for driving the above dynamo? A. Make a small turbine water

(40) J. L. S asks: What the mixtures of varnishes are, that is, how to make the different kinds. 1. Whitevarnish? A. A white hard spiritvarnish can be made as follows: gum sandarac, 1 lb.; clear turpentine, 6 oz.; rectified spirits (65 over proof), 3 pints; dissolve. 2. Black varnish? A. Black varnish can be made by putting 48 lb, foreign asphaltum into an iron pot and boiling for 4 hours; during the first 2 hours introduce 7 lb. of red lead, 7 lb. litharge, 3 lb. dried copperas, and 10 gal of boiled oil; add one 8 lb. run of dark gum with 2 gal. of hot oil. After pouring the oil and gum continue the boiling 2 hours, or until it will roll into hard pills like japan. When cool, thin it off with 30 gal. of turpentine or until it is of proper consistence. This varnish is specially adapted for iron work. 3. Common brown? A. A brown hard spirit varnish consists of sandarac, 4 oz.; pale seed lac, 2 oz.; elemi, 1 oz.; alcohol, I qt.; digest with agitation till dissolved, then add Venice turpentine, 2 oz.

(41) J. R. D. desires to know some pre paration that will cause tender skin to become hard and callous? A. Almost any astringent substance will accomplish this purpose, and therefore various solutions, such as vinegar, dilute sulphuric acid, lemon juice, or alum water, may be employed. Rub the parts to which the liquid is applied, and slap them well.

(42) F. W. B. asks: 1. Why is the N. Y., C. & St. L. Railroad called the Nickel Plate? A. We believe it was a nickname given because its founders represented it to be superior to any other road, so the story was that they were not satisfied with steel rails, but must have them nickel plated. 2. What is the best fillings between brick walls for a fireproof safe? A. Bricks are very good; a mixture of plaster of Paris and alum is much used. Fine sand offers a very good protection against fire. 3. Can an iron body be suspended by a magnet, or held in the air, without being in contact with that is, is it possible to balance the action of gravity on the weight by the attraction of the magnet so nicely as to keep them a given distance, say one-half inch, apart? A. You can accomplish this by means of an axial

(43) F. B. W. asks: 1. How to smoke glass slides for magic lanterns, so the black won't come off? A. You can smoke glass over a small gas flame or over a candle. You can cause it to adhere by subjecting it to steam of alcohol. 2. The way to paint on slides for same purpose? A. For information on lantern transparencies consult Supplements 423, 173, 424 3. How to get pictures from newspapers transferred to slides, so that they will be transparent? A. Coat the glass with mastic varnish, allow the varnish to become sticky, place the print face down upon the varnish surface and burnish it well, so that all parts of the paper will be brought into contact with the varnish, and when the varnish has become thoroughly dry, moisten the paper and rub it over with the fingers until it is all removed, leaving the print in the varnish. Finally brush the print over lightly and quickly with a very thin coat of varnish.

(44) W. K.-For elastic moulds, rubber is probably the most durable material. The composition of printers' rollers is 8 pounds glue dissolved to a jelly by water, then add 7 pounds molasses. With the amount of water in the smallest proportion to give it elasticity, a very elastic mould may be made. Another composition used for the hektograph, and also for printers' rollers, is made with 11/2 pounds good white glue soaked in water until soft, the water poured off and 6 pounds glycerine added, and the whole melted and boiled until the right consistency is obtained by cooling a small quantity for trial. The object to be moulded must be greased to prevent sticking.

(45) A. A.—The brass coated zinc plaques are electro-plated. For the brass bath: 4 % gallons pure water, bisulphate of soda 2416 ounces, cyanide of potassium 35 ounces. Dissolve, then add the following solution: Water 9 pints, acetate of copper and protochloride of zinc each 121/2 ounces, aqua ammonia 14 ounces. Or in proportion of all the above for a smaller bath. Filter the bath; it will then become

(36) H. B. S. asks: 1. Does the quality colorless, and gives under the action of a battery a bras deposit of a very fine shade, using an anode of bras By slightly changing the proportions of acetate of cop per and protochloride of zinc, the tints may be varie from reddish yellow to greenish yellow. A little ex perience will be required to adjust the strength of the batteries-a weak battery producing a red deposit, strong battery producing a gray deposit.

(46) O. O.—We do not know that the limit of speed in wheels has ever been reached. The limit is entirely controlled by friction of the mechanica parts and the medium in which the revolving motion takes place. About 10,000 revolutions per minute has been obtained in machinery practice. We do not know why 50,000 or 100,000 may not be obtained in vacuo.

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v	colorless, and gives under the action of a battery a brass		Ha
8	deposit of a very fine shade, using an anode of brass. By slightly changing the proportions of acetate of cop-		Ha Ha
8	per and protochloride of zinc, the tints may be varied from reddish yellow to greenish yellow. A little ex-	lengths on, E. R. Knorr	
e !.	perience will be required to adjust the strength of the		
8	batteries—a weak battery producing a red deposit, a strong battery producing a gray deposit.	Churn, J. A. McRae	Ha Ha
n	(46) O. O.—We do not know that the		Ha Ha
,	limit of speed in wheels has ever been reached. The limit is entirely controlled by friction of the mechanical	den	Ha Ha
1	parts and the medium in which the revolving motion takes place. About 10,000 revolutions per minute has	Clipping machine, hair, J. K. Priest	
1	been obtained in machinery practice. We do not know why 50,000 or 100,000 may not be obtained in vacuo.	Magee. 317,837 Clock movement frame, W. C. Walter. 317,898	Ha He
5	(47) C. M. asks: If a perfect circle is	Clover huller, J. M. Thompson 317,595 Coal scuttle, G. W. Hodesty 317,786	He He
f -	made with a very fine silver wire, and then, by means of four rims, the wire transformed into a perfect square,	Cocks of gas, etc., extensible service box for the stop, S. A. Brown	He
g :	what is the difference in the result of this process and	Coffee and tea box, F. Schombel 317,678 Collapsible can, F. R. Grout 317,641	Hir
t :	that of squaring the circle? A. The area of a circle is greater than that of any square whose sides only equal	Concrete light for buildings, areas, etc., T. Hyatt. 317,945 Conducting cords, flexible tip for, G. K. Thomp-	Ho Ho
	circumference of the circle. For instance, a circle 8 inches in diameter has an area of 50 2656 inches, and	son	Ho
	the circumference of such circle is 25 1328 inches. To inclose the same area in a square, its sides must be	Corset and garment support, combined, A.L. Zor- kowski. 317,958	Ho
9	70898 inches each, or 28'3592 for the four sides.	Corset stay, A. J. Worrall	Ho
1		Corset steel fastening, L. Hill (r). 10,596 Cotton gin, I. F. Brown. 317,921	Ho
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. :	AND EACH BEARING THAT DATE.	Cut-offvalve, steam. G. W. Anderson	Ind
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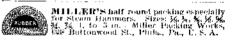


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