About seven years has been claimed for an entire change in the material of the human body. 2. Would it do to use sheet iron instead of plastering in a dwelling house? Our idea would be to cover it with two or three thicknesses of paper. A. Sheet iron will make a poor finish for the interior of a house. We cannot recommend it. 3. What power would be required to lift 160 pounds, using an 8 inch and a 4 inch drum on the same shaft, so that the rope winds up on the large drum while it inwinds from the small? I am an invalid and am trying to invent an apparatus to lift me. A. It requires 80 pounds at periphery of the larger drum. 4. How many pounds will a ¼ inch, also a ½ inch rope lift without breaking? A. The breaking strain of a rope ¼ inch diameter is very uncertain, from the value of material, and make ¼ inch from 75 to 100 pounds, ½ incl from 300 to 400 pounds.

(4405) N. W. asks: 1. What use is made of old steel rails? Can they be reroled into good new rails? I asked this question about three months ago, but no reply. A. There is a good market for old steel rails for rerolling and for forgings for heavy machinery. 2. Is there any good coking coal or anthracite coal in sufficient quantity for extensive mining purposes in the United States west of the Mississippi River? If so, where located? A. Good coking coal is found in Missouri, Kansas, Indian Territory, Colorado, New Mexico, Montana, and Washington. The coke manufacture is fast increasing in those States. There are small beds of anthracite in Colorado and Arkansas.

(4406) C. W. N. writes: Tell F. W. S. No. 4337 that if he will take an ordinary three-cornered file and grind it to a point, keeping the edges sharp a little way back of the point, he can bore a hole in plate glass with it by simply turning it with a brace and lubricating it with turpentine. Operate as though about to bore a hole in a bit of wood. I have a single gas burner that reaches out into the room from the wall and have made a queer discovery while playing with it. When turning off the gas very slowly the other evening, and when the flame had almost disappeared, only a thin line of blue remaining, it commenced to buzz like a big fly. What was the cause of the noise? Ask your readers the significance of the peculiar shape of the prow of the gondola. A. The gas burner produced what is known as the musical flame. The sound is due to a series of explosions occurring regularly.

(4407) O. S. J. asks: Are there any cheap substances which might be used for bleaching bagging, which do not require to be washed out afterward? Permanganate of potassium is said to be used, and the color of the manganese oxide discharged by means of sulphurous acid. A. Gaseous chlorine largely diluted with air might do the bleaching. It should be followed by treatment with gaseous sulphurous oxide. 2. Are there any cheap preparations besides rubber and gutta-percha which when applied to bagging would make it waterproof and at the same time flexible? A. To make it really waterproof under the conditions stated, India rubber is about the only effectual application. 3. I should also like to know of a substance like the above, but white. A. Palmitate of aluminum has been recommended for waterproofing, but seems to have met but limited application.

(4408) E. R. J. asks: By what formula may I find quantitative analysis of a silver 25 cent piece, knowing the qualitative contents of the alloy, without the slightest injury, or altering of, by cutting or scratching the silver piece? I worked out a very simple specific gravity and algebraic formula, but lost it years ago. A. If only two constituents and of known specific gravity are in the coin, proceed as follows: Weigh the coin in air and then in water.

Let a= weight in air in grammes.
b= " water "
c= specific gravity of silver.
d= " " copper.
x= weight of silver in coin.

Then we have $x=\frac{dca-dcb-ac}{d-c}$

(4409) E. E. L. asks: What can I add to crude coal tar naphtha that will effectually disguise its odor or will deodorize it, and will not be expensive? A. Deodorization will be difficult. One method is to distill, rejecting the first and last portions of the distillate. Another is to treat it with a mixture of oil of vitriol and potassium bichromate, decant, wash and distill if necessary.

(4410) J. P. says: Please let me know what is the velocity of light and the velocity of electricity? Which travels faster, as I would like to know on account of a dispute which arose on that subject? Could you let me know how it is proved, and by whose theory? A. Light has a velocity of about 187,000 miles per second. Electricity is supposed to be a phase of ether disturbance and its velocity as a current is the same as that of light. It however takes some time for a current to attain full strength at the end of a length of conductor, and hence arise the different estimates of its so-called velocity. See Ganot's "Physics," $5 mailed, for experiments and theory.

(4411) W. D. H. asks how draughtsmen make white letters on black ground. A. Take flake white and mix with water to the thickness of ink. Use with a pen.

(4412) A. L. W. asks: Which will bear the most weight, a hollow bar of round iron or a solid bar, each of the same size in diameter? If the hollow iron is the strongest, why is such the fact? A. The solid bar of iron is the strongest and will bear the greatest load. Pipe is only strongest for equal weights. The additional size required for equal weight gives a pipe greater stiffness and stability for almost any use.

(4413) I. L. W. says: I desire to obtain a rule which is simple and practical, without recourse to trigonometry, for the measurement of the pitch of a propeller wheel of the screw pattern. I am unable to find two rules alike, or two persons who use like rules, or who obtain exactly the same results in similar cases. A. To measure the pitch of a propeller screw approximately and near enough for all practicable purposes for small boats, take a carpenter's rule and lay one leg on the outer edge of the propeller blade and move the other leg parallel with the shaft and with this angle strike off two lines which shall represent the angle of the blade. Then multiply the diameter of the screw by 3·1416, which will be the circumference of the revolving blades. With this distance, measure at right angles to the line representing the shaft, to meet the angular line representing the track of the blade. The distance from this line along the line of the axis to the angular intersection first drawn is the pitch of the screw.

(4414) W. L. K. asks: Is there a way to print in bronze, or gold gilt direct, without having to use a brush or bronzing pad? I see a great deal of such work which looks as though it had been printed direct from type or rule. What puzzles me the most is to know how to print badges and do a nice job. A. We know of no way to print in bronze or gold gilt without using the bronzing pad. Most badges are printed in gold leaf on a bookbinder's press. You can make a fair-looking job by printing with a good quality of gold ink.

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Sash cord fastener, A. Wilson ... 475,956
Sash fastener, J. P. H. Gastrell ... 475,765
Sash fastener, W. H. King ... 476,050
Sash fastener, W. M. Morton ... 475,966
Sash machine, E. B. Hayes ... 476,202
Saw set, J. McIntosh ... 476,235
Scale, balance, R. E. McClelland ... 475,792
Scraper, earth, T. O. O. Sitlington ... 475,818
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Shaft, vehicle, J. Atkins ... 475,916
Sheet metal trimmer and cutter, P. Rohan ... 476,075
Shutter fastener, B. Bernstein ... 475,921
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Silver sulphides, refining, W. G. Waring ... 475,907
Sink and washtub, combined, F. H. Hawkins ... 475,941
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Skate, roller, T. W. Bryant ... 475,927
Sleeve and cuff holder, L. H. Taylor ... 475,905
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Snap hook, F. White ... 475,971
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Soap boiling apparatus, J. W. Martin ... 475,784
Soap holder, C. S. Higgins ... 476,014
Soda fountain, J. Ramsey ... 475,890
Sounding board vocal, C. C. Carroll ... 475,928
Spark arrester, Strouse & Griffin ... 476,176
Speculum, W. E. Clough ... 475,975
Spinning mule doffing attachment, G. D. Secor ... 475,808
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Stampholder, postmarking, H. T. Keith ... 476,049
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Steam boiler, A. M. Dimmick ... 475,850
Steam boiler, J. MacCormack ... 476,053
Steam boiler, cross water tube, F. R. McMillan ... 475,947
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Sulky, W. J. Wayne ... 475,991
Swimmer's use, leg attachment for, P. Curran ... 476,040
Swimming attachment, R. P., Jr., & W. N. Cafferty ... 476,000
Swimming equipment, P. Curran ... 476,039
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