oil chamber with an opening leading to the upper end of the feed groove on the spindle. As the chamber is an integral part of the nut, it is always in the proper position, and there is no danger of wasting the lubricant, the spindle being thus oiled without requiring the removal of the wheel.

OVERDRAW CHECK BIT.—Joseph Carter, Blyth, Canada. This bit is independent of the driving bit, and is designed to stay in any position in which it may be placed, not moving up or down in the horse's mouth when the horse is checked. It has a central raised section which may be covered by a cushion, and the ends are slightly curved upward and terminate in eyes, cheek bars connected with the ends of the bit receiving near their connection the check rein, while a nose band is adjustably connected with the cheek bars, there being means for locking the nose strap in a given position.

SLEIGH BRAKE.—Adelbert Mecham, Edinburg, North Dakota. Should the team stop when the sleigh is being drawn up a hill, this brake acts automatically to prevent the sleigh from running backward, and when descending a hill, the action of the team in holding back operates to apply the brake, and thus control the descent of the sleigh. By means of locking devices the brakes are made inoperative when the sleigh is to be backed. The device is inexpensive and is applicable to any form of sleigh.

POLICE NIPPERS.—Leon Brown, Chicago, Ill. This is an improvement in chain nippers, whereby they are so made as to require but a single handle, the loose end of the chain being readily thrown over to an engagement with the handle, forming a loop, which may be contracted upon the wrist of the prisoner by the manipulation of the handle.

NOTE.—Copies of any of the above patents will be furnished by Munn & Co., for 25 cents each. Please send name of the patentee, title of invention, and date of this paper.

SCIENTIFIC AMERICAN

BUILDING EDITION.

MARCH, 1895.—(No. 113.)

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1. Elegant plate in colors showing a cottage at Mount Vernon, N. Y., three perspective elevations and floor plans. Mr. H. R. Rapelye, architect, Mount Vernon, N. Y. An attractive design.
2. "The Gables," a half timbered cottage recently completed at Glen Ridge, N. J. Perspective elevation and floor plan. Mr. Charles E. Miller, architect, New York City.
3. A cottage at Great Diamond Island, Me., recently erected for H. M. Bailey, Esq., two perspective elevations and floor plans. A unique design for an island cottage. Mr. Jno. C. Stevens, architect, Portland, Me.
4. A dwelling at Armour Villa Park, N. Y., recently erected for J. E. Kent, Esq., at a cost of $5,200 complete, two perspective elevations and floor plans. A very picturesque design.
5. A colonial cottage at New Rochelle, N. Y., recently erected for C. W. Howland, Esq., two perspective elevations and floor plans. Mr. G. K. Thompson, architect, New York City A unique example of a modern dwelling.
6. The residence of Charles N. Marvin, Esq., at Montclair, N. J. A design successfully treated in the Flemish style. Two perspective elevations and floor plans. Mr. A. V. Porter, architect, Brooklyn, N. Y.
7. A fine Colonial house at Elizabeth, N. J., recently completed for Henry A. Haines, Esq. Perspective elevation and floor plans. Architects, Messrs. Child & De Goll, New York City.
8. A residence at Flatbush, L. I., recently erected for C. H Wheeler, Esq., at a cost of $11,000 complete. Two perspective elevations and floor plans. Architect, Mr. J. G. Richardson, Flatbush, L. I. An attractive design.
9. A cottage at Plainfield, N. J., erected for Chas. H. Lyman, Esq., at a cost of $5,000 complete. Two persective elevations and floor plans. Architect, Mr. W. H. Clum, Plainfield, N. J. A picturesque design.
10. An elegant house at Scranton, Pa., erected at a cost of $15,000 complete. Two perspective elevations and floor plans. Architect, Mr. E. G. W. Dietrich, New York City.
11. Engraving showing the new building of "The Bank for Savings," recently erected on 22d Street, New York City. Mr. C. L. W. Eidlitz, architect, New York City.
12. Foundation piers of the American Surety Company's building, New York City. Four illustrations, showing the most advanced methods of caisson construction for city buildings.
13. Miscellaneous contents.—An automatic gas saving governor, illustrated.—Heating a residence with open grates, illustrated.—Arranging effective interior, illustrated.

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Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our information and not for publication.
References to former articles or answers should give date of paper and page or number of question.
Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department, each must take his turn.
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Books referred to promptly supplied on receipt of price.
Minerals sent for examination should be distinctly marked or labeled.

(6464) W. C. E. writes: In a town in this State the water supply is pumped from a lake to a reservoir situated at a distance of about 1,800 feet from the pump house, and at an elevation of about 300 feet above the town; the power used to elevate the water is two Worthington compound pumping engines, with steam cylinders 12 and 18½ inches diameter respectively, water cylinders 8½ inches in diameter, all 10 inches stroke, and are of 750,000 gallons capacity each per 24 hours. As the capacity of the pumps greatly exceeds the wants of the village at present, it is proposed to use a portion of the water from the reservoir to operate a 6 inch turbine water wheel, which it is claimed will develop 100 horse power under 300 feet head, to operate a dynamo with which to light the streets. Would this be practicable? Would it cost more or less for fuel to furnish the power for a dynamo in this manner than by an engine directly attached? A. Your pump has a capacity of 520 gallons per minute, and 100 horse power by the best impact wheel requires 1,560 gallons per minute under 300 feet head. So that the total horse power of your pumps is but one-third of the power required. It is a decided waste to pump water by steam for generating water power. Direct steam power for the dynamo is proper and practicable, and the best of all is a combined compound engine and multipolar dynamo.

(6465) J. W. H. asks: What is the loss in friction between the transmission of 100 horse power with direct connections with engine and a bevel gear? Also loss in friction between a direct connected engine and a machine driven by belt? A. The loss of power transmitted by belting is somewhat variable, depending upon thickness, tightness and velocity. On an average the loss is about two per cent by creepage, and the loss by increased journal pressure and flexure of the belt is from ½ to 1 per cent more. A total of 3½ per cent variable. The loss by gearing of equal size and of the larger dimensions, well made and adjusted, is very small, embracing only the friction of the teeth, amounting to from ½ to 1 per cent of the transmitted power.

(6466) G. W. S. writes: I am a reader of the SCIENTIFIC AMERICAN, and would like to know whether in the manufactnre of a small experimental dynamo one would get as good results from a drum armature as a shuttle armature? And if so, ought the size and amount of wire on the armature be the same as would be used in the same dynamo on a shuttle armature? By all means use a drum armature. Make it larger; two or three times the diameter of the shuttle armature. We refer you to SUPPLEMENT, Nos. 161, 599, 600 and 844, for information on the construction of small dynamos; price 10 cents each by mail.

(6467) E. W. H. writes: 1. Kindly tell me how walls are wainscoted with tiles, that is, how the tiles are best fastened to the walls, and what backing is first laid down upon which to lay a tile floor over wooden joist, so as to insure a water tight job free from cracks. A. Portland cement freshly mixed is the best bedding for tiles for walls and floors. For floor backing put in a deafening floor two inches below the top of the beams, well fastened to prevent springing, and fill with good mortar concrete even with top of beams, and on this surface bed the tiles with Portland cement. 2. What thickness of plate glass would you specify for a residence, size of glass 3×3 feet, and how thick should the frames be for such glass? A. If polished plate is to be used, it should be ¼ inch thick. For common plate ⅛ inch or $\frac{3}{32}$ inch is the usual thickness. Frames for the ¼ inch glass should be 1⅞ inch thick, for the thinner glass 1½ inch thick. 3. Would Portland cement be preferable as a mortar to lay brick in a foundation wall, to lime mortar tempered with cement? If so, please give proportions of sand and Portland cement best adapted, and say if such mortar would be unfavorably affected by the heat if it were used in laying chimney brick. A. Portland cement is best for foundation walls in varying proportion with lime according to economy desired. Lime 3 parts, Portland cement 1 part by measure makes a strong mortar with 8 to 10 parts sharp sand. This also makes a good mortar for ordinary house chimneys. 4. What proportions of Portland cement and sand would be best adapted for plastering the inside of a brick cellar wall to make it water tight? A. Equal parts of Portland and clean sand for cellar wall plaster. 5. Is there any objection to the use of sheet lead for gutters, flashings, and flats, and how should the edges of the sheets be soldered together? A. There is no objection to the use of sheet lead for flashings. The edges should be turned up, cleaned by scraping and burned together with a hot iron without solder.

(6468) H. S. L. A. asks: What is the latest theory of electricity? We have several theories of our own make, and would like to know how far we are from the most generally accepted theory of electricity. A. Your question is a very broad one. You will find excellent articles on the subject in the SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 666, 719, 857, and 995. We can also supply any books on the subject.

(6469) L. B. asks: 1. In what way does the difference in distance between the carbon and platinum points in the Blake transmitter affect the intensity of the current? Does the current decrease according to the amount of air between the points of contact? A. The points are always in contact. The pressure constantly changing causes the variations in current effecting the transmission of sound. 2. If a thin rubber ball filled with carbonic acid gas were placed near to the mouth piece of a bell receiver while in operation, would the sound be increased? Could this sound be retransmitted? A. It would concentrate, not increase the sound. It could be retransmitted. 3. Do you think that it would be in any way possible to obtain power from the rotating of the earth? Has any one ever attempted it? A. This is among the possibilities, but has not yet been demonstrated to be practicable. 4. Have made Page's rotating armature as described in Sloane's "Electrical Toy Making," and it works well as a motor but it will not generate. Cannot surmise what the cause is. If possible suggest a remedy. A. It will generate some current if rotated rapidly enough. 5. Please refer me to some periodical or book telling of the advantages of galvano-cautery. A. For a good treatise or galvano-cautery we refer you to Bigelow's "International System of Electro-Therapeutics," 8vo, cloth, 1160 pages. Price $6 by mail post paid.

(6470) J. D. says: 1. I have constructed storage battery like one described by you some time ago. What would be proper resistance to discharge them through in forming; size of plates 10×12, 7 plates to cell, 26 cells in all? What would be number of hours they would run, and how many 16 candle power lamps would they run, and how long? A. Four ohms resistance will answer for dischargingin series. They should run ten hours and maintain about twenty 16 candle power lamps, but it would be safer to make a large deduction to allow for imperfection of construction. 2. Have motor sixteen segments to commutator, leads give one-quarter turn, brushes work on opposite sides, have three ¼ inch carbons in each brush holder, and in a few minutes' run, commutator and brush holders become so hot that you cannot touch them, and in a short while so hot that it will unsolder leads from commntator. Run with 50 volts about 10 or 12 amperes. Please give me cause for this, and remedy. A. Your field may be out of proportion to your armature, but try giving it less potential. Interpose a resistance in series with it.

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An experience of nearly fifty years, and the preparation of more than one hundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequaled facilities for procuring patents everywhere. A synopsis of the patent laws of the United States and all foreign countries may be had on application, and persons contemplating the securing of patents, either at home or abroad, are invited to write to this office for prices, which are low, in accordance with the times and our extensive facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broadway, New York.

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