may be rapidly carried on and the books delivered from the machine in a strong and neatly finished condition. The general plan is shown in the patent formerly granted to Mr. Blauvelt.

ATTACHMENT FOR CLEANING COTTON-GIN SAWS.—H. J. Fitzpatrick, Athens, Ga. Gin-saws must always be dry, and in ginning wet or green cotton the saws become clogged. Lint when freshly separated from seed and when slightly moist through any cause is exceedingly adhesive and clings to the saws, and renders perfect action of the gin impossible. Thus gummed or clogged with wet cotton lint, the saws can no longer separate the lint and seed, and it is necessary to stop the gin, take out the cotton, remove parts of the gin, and clean the saws by taking off the wet lint by hand. The use of the invention obviates this trouble.

Musical Devices.

SELF-PLAYING PIANO.—H. Meyer, New York, N. Y. The object of the invention is to provide a piano arranged to insure accurate playing of the keys and with the proper touch and expression and to allow the use of a single note-sheet containing a number of pieces of music, only one of which is played at the introduction of a coin, the note-sheet being automatically rewound at the end of the last piece of music to start playing the first piece on the introduction of another coin.

MUSIC-LEAF TURNER.—E. R. Eldridge, Sumter, S. C. In the operation of this improvement the folio is placed upon the support with the back thereof engaged by clasps, and the individual leaves are engaged with jaws of the turning arms, all of said arms being arranged upon the right side of the support. When it is desired to turn the leaf, the uppermost arm may be swung to the other side of the support by means of a finger-piece.

Prime Movers and Their Accessories.

ROTARY ENGINE.—A. Glidie, New York, N. Y. This invention pertains to certain improvements in rotary engines adapted to be operated by steam, compressed air, or other fluid under pressure; and the object of the inventor is to provide certain improvements in means for controlling the admission and exhaust of the motive fluid in order to gain the maximum efficiency.

PUMP.—W. Y. Cruikshank, Freeland, Pa. This invention relates to pumps, and especially to rotary lift-pumps. The object is to construct a pump of the class described having an improved arrangement of the vanes whereby the efficiency of the pump will be much increased. When a rotation is imparted to the shafts the two hollow shafts will be rotated in the same direction, while the inner shaft which extends longitudinally within the hollow shafts will be rotated in a reverse direction.

Railways and Their Accessories.

CAR-REPLACER.—W. Cook, Hoboken, N. J. In this instance the invention relates to car-replacers, such as used for replacing derailed trains upon the track. The object of the improvement is to produce a device of this kind which can be readily set in position and which will be reversible in its nature, enabling the device to replace a car moving toward it in either direction.

HAND-CAR.—J. W. Finch, Elizabeth, Miss. In operation when the rock-lever is rocked upon its bearings the parallel arms are rocked about a counter-shaft, and since the stub-shaft is rigid with the pitman and a gear-wheel is rigid with the stub-shaft, another gear-wheel which meshes with the first one is constrained to rotate and carries the counter-shaft therewith at a much higher speed than were the parallel arms secured directly to the counter-shaft and acting thereon as a crank-arm, and since one sprocket-wheel is of relatively greater diameter than the other this movement is further multiplied on the axle.

Pertaining to Recreation.

FISHING-REEL.—G. W. Blackburn, Sarasota, Fla. The principal objects in this case are to provide reels with an improved friction-drag, with an automatic stop, with means for setting the drag for any desired pull, with a locking device to prevent the nut of the reel-post from working loose, and with other advantageous features without using any screws on the face of the device to injure the hands or any washers to wear out or clog.

Designs.

DESIGN FOR A HAND-BAG, PURSE, OR SIMILAR ARTICLE.—F. D. Kahn, New York, N. Y. The design in this case shows a hand-bag or purse suspended by a ring-linked chain. The form of the bag keeps well within the usual lines, yet exactly represents a sitting "Teddy Bear." The top of the bear's head and its ears are capped by the hinged frame of the purse. The figure of the bear is pressed in strong relief on the material used and a decidedly life-like and attractive result is secured.

Note.—Copies of any of these patents will be furnished by Munn & Co. for ten cents each. Please state the name of the patentee, title of the invention, and date of this paper.

Notes and 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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(10487) W. T. H. writes: In your reply to C. B. R. of March 16, page 239 (10437), you state in your closing sentence that "some" people "habitually use the right and others the left eye at their ordinary work." This is true. But is it not also true that when both eyes are kept open the alignment is always made with the right eye? Let any one with both eyes open hold out either his right or his left hand at full length of his arm, and then range the point of his forefinger with a distant object. Let him then while holding his hand steady close his right eye, and he will find that his finger is not in line with the object. But if he closes the left eye the alignment is perfect, provided the head and hand have been held steady. If there are any exceptions to this I have never yet found them, and I have tested a goodly number. There possibly may be people who are left-eyed as there are people who are left-handed. If so, the alignment with such must be made with the left eye. At any rate, when both eyes are open the alignment is made by but one of the two. It would seem, therefore, that the sportsman who keeps both eyes open has the advantage, since the closing of the eye not used tends to close the other also. Any way, I should advise the beginner to keep both eyes open. But to those who have long accustomed themselves to the closing of one eye, it is probably best to continue. A. We are not able to agree with you that a person always sights with the right eye when he has both eyes open. We have tested many classes of students, and have seen many who found the alignment perfect when the right eye was closed, that is, they were left-eyed. We have also many times in lectures upon the eye made the test on members of miscellaneous audiences, and found left-eyed people.

(10488) J. J. G. writes: Referring to query No. 10426, issue of March 16, second question: A claims that in foggy weather, when smoke descends to the ground, the atmosphere is light and will not support the smoke. B claims that it is heavy, and will not permit the smoke to ascend. Which is correct? You answer by saying: "When smoke falls toward the ground the air is light, so that the hot smoke is heavier than the air. In fine weather the air is heavier, and smoke rises." Now, if I am not presuming, I wish to differ with you, and to state my reasons: Moist air is lighter than dry air, but even so, it is difficult for me to reason that "hot smoke" would be heavier than moist air. It does not seem that hot smoke could descend till its loss of temperature permitted it to contract to the density of its neighboring strata. Then if the smoke remained drier than its neighboring strata, it would sink very, very slowly. But while the process of conduction is lowering its temperature, likewise the percentage of humidity is rising, and I believe it would soon adjust itself and become in equilibrium with its neighboring air before any lowering could be perceptible. However, it is a fact that smoke does descend in damp or foggy moderately tranquil atmosphere, and I attribute the cause to be due to the rapid coalescing of the water particles of the atmosphere on the dust particles of the smoke. These nuclei, which are the smoke, descend from the increasing weight of coalescing water particles upon them. A. There was no emphasis upon the *"hot smoke"* in the answer to query 10426, nor do we know why we used the word *hot*. It seems to us unnecessary, since smoke is always hot as it emerges into the air. Nor does the theory of the condensation of water upon the particles of carbon in the gases from the chimney seem to us to greatly help the matter, since it is a matter of common observation that the smoke does not first ascend in stormy weather while hot and then after cooling and taking on a load of water drop again. The fact is that smoke comes down instantly from the chimney top. Many a time the smoke of a train of cars at full speed gets down fast enough to fill the cars and be very uncomfortable when no wind is blowing. In the country we have seen the smoke of the chimney drop from the housetop into the yard close beside the house without any visible rise from the chimney. We still think the smoke rises in fine weather because it is lighter than the air at the time, and falls in stormy weather because it is heavier than the air at the time, without taking time to cool and take on water drops by condensation. Nor can the cooling of the smoke be by conduction as stated above, but by radiation into the air, since neither air nor carbon is a conductor of heat.

(10489) C. E. B. asks: 1. Is it theoretically possible to get as much work out of a permanent magnet as it takes to magnetize it? For instance, suppose a certain magnet takes 100 foot-pounds of work to magnetize it, and suppose further that the work done by this magnet at one lift is 1-10 foot-pound. Will it be possible to make the magnet do one thousand lifts, removing the armature each time by outside power? Magnet and armature to be laminated to prevent as much loss in currents as possible. A. The work done in magnetizing a steel magnet and the work which can be done with the magnet in lifting weights have no relation to each other. A magnet does not lose strength by lifting. It tends to gain strength rather. Pulling the weight off a magnet tends to magnetize it to a higher degree rather than to take away the magnetism. After a magnet has made one thousand lifts it should be in just as good condition as at first. Magnetism is a molecular condition of steel, and not an effect of work done upon steel. 2. If the magnet in No. 1 lasts for the thousand lifts, has it really done 100 foot-pounds of work? Is it possible that it uses up its total active power in the first lift, and that this power is restored to it (when the armature is pulled away) at the expense of the temporary magnetism of the armature and the outside power applied to move armature? A. If a magnet will hold up a pound, it may be used to lift a pound to any height desired, and it should not let the weight drop. When the weight has been raised 1,000 feet, the man who has lifted the weight has done 1,000 foot-pounds of work. The magnet has not done the work of lifting the weight. It has simply held the weight, and to hold a weight is not doing work. 3. What quantity of electrical energy in watts is necessary to magnetize a suitable hardened steel bar weighing 1 pound? A. We do not know the watts necessary to magnetize a bar of steel.

(10490) F. A. McD. writes: Referring to your answer to query No. 10428, for a process for electro-plating with aluminium, in your issue of March 16, I beg to refer you to Prof. Richards's book on "Aluminium," the last edition of which contains several formulas for this deposition, and is, I believe, a more reliable volume in this connection than the one you mention, Watt's "Electrodeposition." A. So many formulas for plating aluminium have proved unreliable that we should look with distrust upon any positive claim upon this subject. We give the above letter for our readers' benefit and can furnish the book for $6. We hope that reliable modes both for plating with aluminium and for soldering the metal will be found.

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