IMPROVED YARN REEL AND TESTER.

The necessity for close attention to the details of cost of manufacturing, both in the matter of stock and labor, has recently received much consideration. This is especially the case in the cotton and woolen manufacture. The two engravings published herewith exhibit very important means towards greater economy in the spinning of cotton and wool, beside keeping the manufacturer informed of the actual quality of the work produced.

Fig. 1

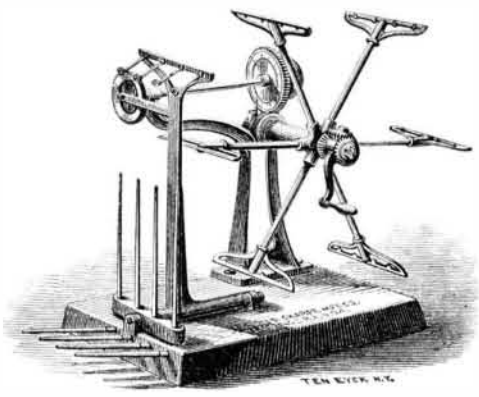


Fig. 1 shows an improved yarn reel of new design, particularly adapted for use in reeling fine cotton, linen, woolen, or worsted yarns. The reel is one and a half yards in circumference, and connects with a disk graduated into 120 parts, indicating the number of yards reeled from each spindle. An automatic feed motion lays the yarn flat upon the reel, securing accurate and uniform measurement, and consequently correct results as to stretch, strength, and numbering.

Fig. 2.

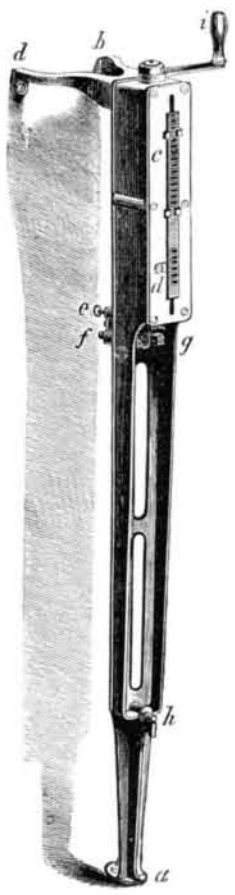
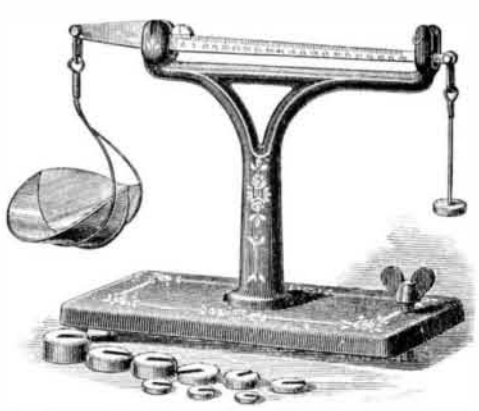


Fig. 2 exhibits a yarn tester, which is designed to test both the strength and stretch of yarns. A knot, or one seventh of a hank or skein, of yarn is first reeled and then removed from the reel and placed upon the pins, *g* and *h*. The crank, *i*, is then turned to the right until the yarn breaks. The index point, *d*, will then show the amount of stretch in inches and eighths, and the upper index, *c*, will give also the exact breaking weight in lbs. avoirdupois. The machine is adapted for a breaking weight of 100 lbs. or less, which generally includes any number of yarn above 20. If any number should exceed 100 lbs. in strength, it would be necessary to reel off only half of the amount mentioned above, which would equal 60 yards, and then multiply the weight by 2. The advantages resulting from the use of such a reel and tester will be at once appreciated by those familiar with this branch of production.

Further information can be obtained from the Brown & Sharpe Manufacturing Company, Providence, R. I., who are the inventors and makers.

SAMPLE-WEIGHING SCALE.

The sample-weighing scale illustrated herewith is designed to meet a want often felt where a large number of small articles or parts are to be computed, or large quantities are to be estimated from the weight of samples. One pound can be weighed by ten thousandths. Screws, samples



of paper, drugs, colors, etc., can be accurately weighed. It also answers for a postal scale. The finished parts are nickel plated, and the stand and base are neatly japanned and ornamented. The scoop is detached for convenience in use. Further particulars will be furnished by the Brown & Sharpe Manufacturing Company, Providence. R. I.

A SYSTEM of weather observations is now applied to the whole coast of Australia. All the stations are connected by telegraph

PATENT GAS HEATER.

The simple contrivance illustrated herewith at once explains and commends itself to those who require a ready means of heating and tempering small tools. It is intended to take the place of a forge in heating and tempering machinery and jewelers' small tools, beside being capable of use for domestic purposes, such as a nurse lamp, etc. A

piece of steel half an inch in diameter can be heated sufficiently to harden in about six minutes. It does not heat to a degree that will injure the quality of the steel, and tools heated by it will be tougher than when heated in a forge in the usual way. Darling, Brown, & Sharpe, Providence, R. I., are the makers of this article.

FISHHOOKS, JETTIES, AND MISCELLANEOUS DEVICES.

We select this week from Knight's "Mechanical Dictionary"* a number of interesting engravings relating to subjects which it is scarcely possible to classify under any one general heading. In Fig. 1 is represented a number of ingenious

FISH HOOKS.

a and *b* are two forms of spring hook in which a mousing piece engages the barb. *c* and *d* are two positions of the same hook, one set and the other sprung. *e* is intended to give the hook a square presentation, and prevent glancing of the hook in striking. *f* has a tripping hook which strikes from above, and supplements the primary hook. *g* has a spiral spring shank. *h* has a spring hook attached to the snood, which affords the means of attaching a bait or other hook. *i* has an additional hook, which is sprung, and thus supplements the primary hook. *j* has spiral vanes, so as to revolve it when drawn through the water in trolling. *k l* shows two forms—on different scales—of a spring hook whose claws are thrown down upon the fish which tampers with the bait.

In making the hooks, straight wires of the proper size and length are flattened at one end, and the barb formed by a single blow with a chisel. The point having been sharpened, the proper curve or twist is given to the hook; the soft iron is then case-hardened, to give it the stiffness and elasticity of steel, by immersion in hot animal charcoal. The hooks

Fig. 1.

Fish-Hooks.

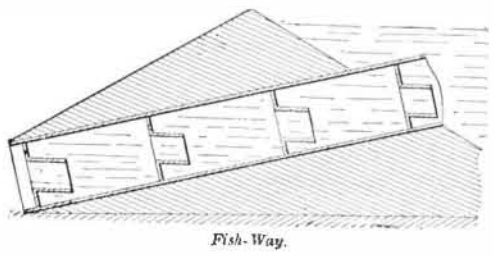
are subsequently brightened by friction, and tempered. In the hook-making machine, the wire is run from a reel into the machine, and on the other side the fish hook drops out completed, with the exception that it must be tempered and colored. After the wire reaches a certain point, the requisite length is clipped off. The next operation barbs it; the other end is flattened. It passes around the revolving dies, whose teeth, formed like the notched spikes of a wheel, catch it, and bear it from one operation to the next until it is smoothed and filed, when it passes between rollers that give it the prescribed twist and turn, and it drops into the receiver awaiting it.

*Published in numbers by Messrs. Hurd & Houghton, New York city.

THE FISH WAY,

shown in Fig. 2, is a device to enable fish to ascend a fall.

Fig. 2.



Fish-Way.

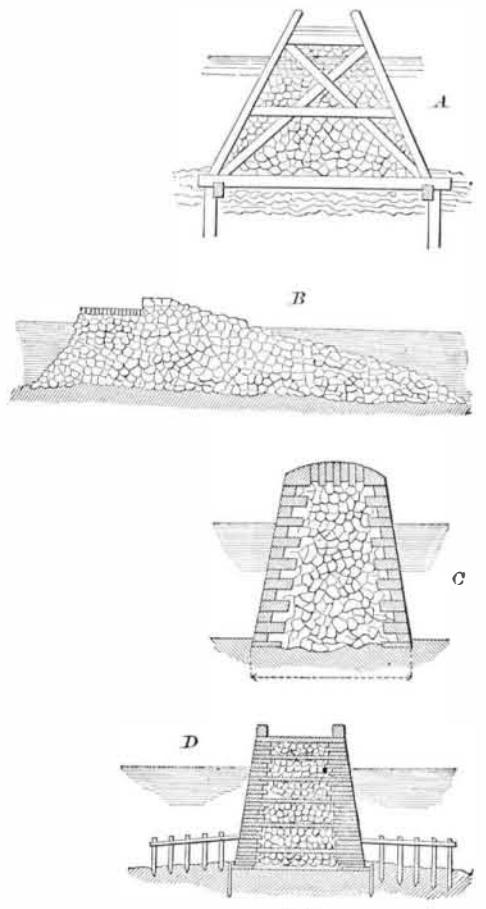
It may consist of a series of steps over which the water descends, turning a fall into a cascade, and sometimes known as a fish ladder; or it may consist of a chute with a sinuous track for diminishing the velocity and assisting the passage of the fish to the level above the dam. In the example, it is an inclined chute having a series of chambers containing comparatively still water, the current being confined to a relatively smaller space.

The success with which Captain Eads is meeting with his construction of willow jetties, at the delta of the Mississippi river, will render interesting the various other forms of

JETTIES

presented in Fig. 3. Although limited to no particular form, a very common construction of jetty is a timber framing, A,

Fig 3.



Jetties.

secured by piles or loaded with rubble. It is often built in the manner of a sea wall having a double row of sheeting piles, the interval filled in with rubble or *béton*. The latter is excellent. The term jetty is also applied to expensive and solid erections of masonry, and to hards or landing places for boats.

Telford's jetty, B, at the eastern arm of Kingstown harbor, Ireland, is an example of a jetty made of rubble, with a track and parapet of coursed masonry. The foreshore, in most works of this kind, is faced with patched stones, that is, an outer layer in which the undressed stones are not laid at random, but deposited end on, beginning at the lower edge, and so caused to bind and become mutually sustaining

Jetties of masonry, C, have usually ashlar facings and heartings of rubble or concrete. The walls filled in with *béton* will be nearly equal to a solid mass; in fact, *béton* it self makes a wall of such tenacity that its strength is equal to a homogeneous block. When the ashlar masonry is filled in with earth, it requires a bond; when this is masonry, the counterforts take the form of division walls, which thus reduce the jetty to a series of compartments. The stones of these horizontal bonding courses should be cramped and joggled together, and the top carefully paved to prevent infiltration.

The southern jetty, D, of the port of Havre is exposed to violent storms and a powerful littoral current. It exemplifies the ashlar facing, horizontal bonding walls, rubble filling, paving, parapets, aprons of piles and *pierre-perdue* to protect the foundations from the repercussion of the waves, all executed in a style which has provoked the admiration of those who have understandingly examined it.

FELTING.

The mechanical features of the operation of felting are derived from the jagged character of the edges of some animal fibers which enables them to pass in one direction, that is, root first, but opposes their withdrawal. When the fibers are pressed together by suitable means, the projections interlock, and a compact fabric is produced.