

Fig. 2221.

the weight to be raised, connected at the top by a pin, but spreading extensively at the feet; these are raised by means of ropes made fast to the top, and when raised are kept steady; to the top is fixed a block, by some called *rechamus*, in which two sheaves turn on axles." — VITRUVIUS, Cap. II., lib. 10.

Richardson's gin *c* consists of a framework supporting a fivefold tackle with blocks ten inches in diameter, and a roller seven inches in diameter, turned by iron levers. In the illustration, it is shown in its application to raising surface stone for removal out of the way of the plow.

2. A pump operated by windmill.
3. A coal-hoisting machine. See WHIN.
4. A snare for birds or animals.
5. A spirit distilled from grain and flavored with juniper berries.
6. A machine for separating cotton-fiber from the seeds.

Eli Whitney's cotton-gin, invented in 1793, revolutionized the culture and manufacture of the fiber by providing a mode of putting it into merchantable order at a reasonable price.

When done by hand, a man can clean but one pound per day. The *roller-gin* of India and China cleans from 40 to 65 pounds in a day. It has two rollers, which catch the fiber between them and carry it away, while the seed is detained by a comb.

The combing instrument used in the Spanish colonies for removing the seed from the cotton-fiber is called *almarraes*. The syllable *al* indicates the Saracenic origin of the tool and its uses.

In Whitney's saw-gin (*A*) the cotton is placed in a long and narrow hopper, one side of which is formed by a grating of strong parallel wires $\frac{1}{2}$ inch apart. Close to the hopper is a roller with circular saws $1\frac{1}{2}$ inches apart. These, as they revolve, pass within the grating to a certain depth, and seize the fibers of cotton, dragging them between the wires which detain the seeds. The cotton is swept from the saws by a revolving cylindrical brush.

In the lower view (*B*) is a more modern form of the same invention. The feeding-chamber is mounted above the gin, serving the double purpose of picking open and thoroughly separating all lumps and matted seed-cotton, and feeding it steadily and uniformly the whole width of the gin in small pellets or masses to the chamber below, in which is a roll-supporter, which presents the cotton regularly to the saws, and is itself driven by the action of the saws upon the under side of the roll. The brush cylinder removes the lint from the saws and delivers it into a chamber, which has for its bottom a revolving gauze cylinder, through which the air escapes while

Gin. 1. A portable hoisting-machine *a* whose frame is a tripod, one leg being movable so as to vary its angle of elevation, and thus determine the height of the apex; the other two legs preserve their relative distance, and form standards for the drum, around which the rope is wound by power applied to the hand-spikes. For heavy weights a fall and tackle is used; and for hoisting a bucket from a well or mine, simply a couple of pulleys to change the direction of motion of the rope. One pulley is suspended from the apex, and the other attached between the two permanent legs, so as to change the rope to a horizontal position, for the attachment of draft horse.

The gin *b* with fall and tackle is used for loading heavy objects, mounting ordnance, moving heavy castings in foundries. It is the most convenient form of portable hoisting-machine in places where traveling cranes and elevators cannot be had. The *shears* has two legs and the *derrick* one; the latter two require guys. See CRANE; DERRICK; WHIN; CAPSTAN; WINDLASS; WINGH; ELEVATOR.

In the United States military service gins are divided into three classes, — *field*, *garrison*, and *casemate*. Each is comprised of the same pieces, differing only in size and minor details of construction. The parts are the *legs*, the *pry-pole*, which is in fact the third leg, the *braces*, the *clevis*, and the *block* and *fall*.

A similar contrivance to the gin is mentioned by Vitruvius (about 40 B. C.):—

“Three pieces of timber are prepared, suitable to

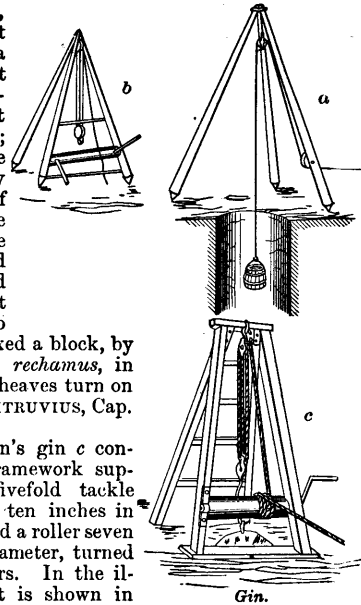
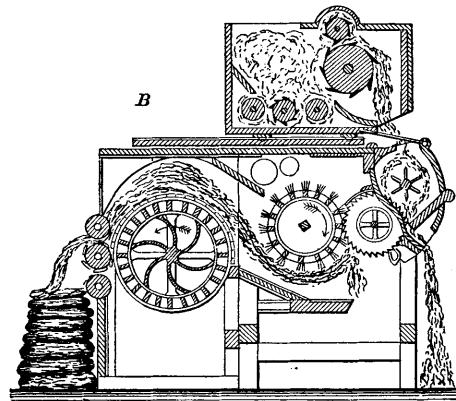
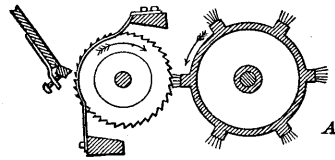


Fig. 2222.

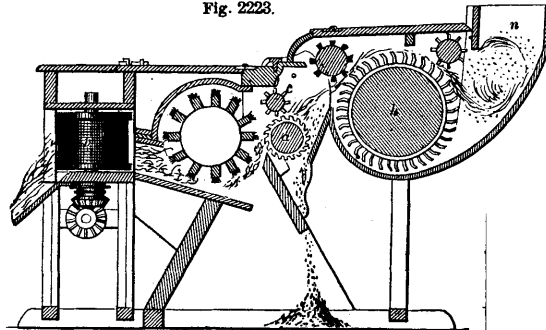


Cotton-Gin.

the lint is arrested and gathers upon the surface of the cylinder in a continuous bat, and is discharged by doffing-rollers ready for the press.

Fig. 2223 shows a form in which the cotton is taken by a toothed feeding-cylinder *h* from the hopper *n*; a stripper keeping superfluous cotton in the hopper; a brush-cylinder delivers the cotton from the feeding-cylinder *h* to the ginning-cylinder *a*. *c* is the brush-cylinder, and *v* one of a pair of wire-cloth covered condensing rolls, which press the cot-

Fig. 2223.



Cotton-Gin.

ton into a sliver and at the same time conduct away the dust and notes.

Other gins operate by means of rollers and knives and pinching devices which grasp the lint and tear it from the seeds, as in the roller-gin of India, already mentioned. In one case, as the combs alternately move up and down, they act upon the cotton, which is drawn in by the continuously revolving rolls, and comb back the seeds by working against the upper and lower edges of the bar.

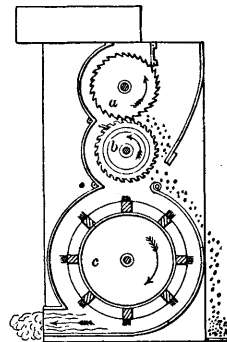
In another, the fiber is grasped by positive devices close by the seed, and is so held while another part pushes the seed away from the fiber. The holders work intermittingly, or two sets alternately, one set

holding the fiber or drawing it away, while the other set pushes the seeds away.

Another has a roller-knife acting in combination with a gin-roller, and *doctor* or pressing-knife, the roller-knife having fixed thereon a series of circular plates or disks, the edges of which come nearly in contact with the edge of the doctor or pressing-knife, and also with the surface of the gin-roller, in such a manner as to cause the seed and refuse to be beaten off, and at the same time to cause the fibers and seeds to be moved to and fro along the edge of the doctor.

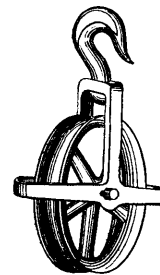
Calvert's toothed-roller gin has a guard-toothed roller *b*, which acts in conjunction with a guard-roller *a* to remove the lint from the hopper and keep back the seeds. The brush-roller *c* removes the lint from the roller *b* and conducts it to the exit.

Fig. 2224.



Calvert's Gin.

Fig. 2225.



Gin-Block.

Gin-block. A tackle-block with a hook to swing from the gib of a crane or

from the sheer of a gin.