Washing-machine. One for cleaning clothes with water and soap.

The oldest fashions are the rubbing between the hands, the dashing of the clothes on the water, and the pounding of the clothes on stones in the stream.

The modern machines have several other typical forms.

The present state of the art may be said to embrace the following modes:

1. Churning. The clothes are beaten by a pounder in a tub. In some cases, wooden balls are added to increase the friction.

Fig. 7049 has a combined up-and-down circular motion.

2. The dash-wheel. The clothes are put in a barrel which is turned upon an axis, — longitudinal, transverse, or oblique. Such are used in bleacheries.

See Fig. 710, page 227.

3. Sluicing. The hot water is driven through the clothes.

See Wash-boiler for one form. See also Bucking-er, Fig.

969, page 267. In Fig. 7050, the clothes are placed in the six-sided cylinder, and the water circulated by the paddle-wheel at the other end of the suds-box. A stove beneath the metallic bottom gives means of heating. The cylinder and wheel are rotated by a winch upon the paddle-wheel shaft, and a chain connects the shafts.

4. Centrifugal. This is on the principle of the sugar-drainer, and is shown at Fig. 1214, page 514.

5. Draining. The clothes are alternately wetted and then placed in a strong cloth and wrung out.

6. Squeezing. In Fig. 7061, the clothes are rolled over and
over, and squeezed by the segmental arm against a presser-board.

Fig. 7052 has a combined squeezing and rubbing action. The tub-box has a curved bottom and a nearly vertical end, armed with transverse ribs. The ribbed dasher is pressed to a transverse shaft, sweeps over the curved surface, and presses the clothes against the end.

7. Rolling. The clothes are carried by an apron between fluted rollers (Fig. 7053). Fig. 7054 is another form, in which the upper and lower rollers are geared together and turned by a hand-crank. The clothes are passed on an endless apron between the rollers. The operating parts are attached to an inner frame, which is lifted from the tub by a treadle-lever and connecting slide-rods. The lower roller is pressed upward against the driving roller by transverse levers connected to its respective ends.

8. Rubbing. a. Between vertical surfaces. The clothes are attached to a gate, which reciprocates vertically between the corrugated surfaces of two spring-pressure bands attached to removable frames in the side-box (Fig. 7055).

b. On a curved bed. A series of concave, corrugated, and yielding fingers, each having a pin enclosed by a spiral spring, is hinged by a bolt to the yielding frame, the front edge of which is upheld by spiral springs, its rear edge resting on the tank bottom. Arms and a pin of vibrating rubber are hung to a frame, and the pressure is adjusted as required (Fig. 7056).

c. Between flat disks

In Fig. 7057, the rubber has a circular reciprocating motion, and with its driving mechanism may be vibrated vertically on a hinge to remove the rubber from the tub.

d. Between surfaces reciprocating in a direct line. The clothes are thinly spread between two rubbing surfaces, to which latter are given a quick and short alternately reciprocating motion (Fig. 7058).

9. Rocking.

a. On a flat bed (Fig. 7059).

b. In a concave (Fig. 7060).

The Oriental "washing-machine" is rather hard on clothes, and has caused some surprise to ladies who have sent colored cotton goods to the wash, and have received them with all the color beaten out of them. Fig. 7061 illustrates the operation. The clothes are wetted and slapped upon flat stones, then rinsed, and slapped again. It is said to be very effective, but sore to the buttons.

One of the ladies of the writer's family had a printcd calico dress sent house white by dye of this river-washing in Ceylon. The washing-machines of the cotton-cloth manufacturers, of bleachers, dy-
trough in the direction indicated by the arrows, passing eight
times around the bars c', d'; as these come in line with each
other, the material is
flapped against the inter-

discernible board d'. On
coming from the trough
it is carried between a
pair of press-rolls to expel
moisture. e is the supply
and / the discharge-pipe.

Another form of wash-
ing-machine is shown in
Fig. 7063. The cloth is
shown together. Above the vacuoles between the rollers are
transverse pipes, slotted be-
tween, to throw jets of water
upon the material passing
through.

Washing-shield.
A corrugated palm-shield

or armor to protect the person and form an effective
surface for rubbing, or upon which to rub the clothes.

Washing-table. (Metallurgy.) A shaking-
trough in which ore is sorted by gravity.

Fig. 7068 consists of a long rectangular trough, suspended by
hooks, and provided with stops at suitable distances apart on
the inside of the trough. These

steps consist of strips of wood extending from one side of the
trough to the other, and kept in place by posts. A vibrating
motion is imparted to the
trough by means of a cam
working against the end of
the beam. The ore, previous-
ly ground into sizes in
water, is supplied through
the aperture in the chute.

which the folded cloth is carried a number of times in succe-
sion as it winds spirally about the roller b, being at the same
time struck by a series of beaters c' (Figs. 7064, 7065). In all
these machines it is customary to tack a number of pieces of
the fabric end to end, forming one continuous length.

See also "Dictionary" (American edition), Vol. III.
page 527 et seq.

Wool-washing machines vary in their construction almost as
much as the domestic article.

In Fig. 7066, the wool is passed upon an endless apron be-
tween the lower fixed and upper spring rollers, which are all