to distinguish it from the kind which is hard and flinty; these are not so subject to glaze on the face; and it is found by experience that stones of this texture will grind at one dressing three or four times as much grain mixed with garlic, as those of a hard quality.* (See Art. 111.)

CHAPTER XVII.

ARTICLE 115.

OF BOLTING REELS AND CLOTHS, WITH DIRECTIONS FOR BOLTING AND INSPECTING THE FLOUR.

THE effect we wish to produce by sifting, or bolting, is to separate the different qualities of flour from each other, and from the skin, shorts, or bran; let us now inquire which are the most proper means of attaining this end.

* It is very difficult to convey my ideas of the quality of the stones to the reader, for want of something with which to measure or compare their degrees of porosity or closeness, hardness or softness. The knowledge of these different qualities is only to be attained by practice and experience; but I may observe, that pores in the stone, larger in diameter than the length of a grain of wheat, are injurious; for how much soever they are larger, is so much loss of the face, because it is the edges that do the grinding; therefore, all large pores in stones are a disadvantage. The greater the number of pores in the stone, (so as to leave a sufficient quantity of touching surface, to reduce the flour to a sufficient degree of fineness,) the better.

Mill-stone makers ought to be acquainted with the true principles on which grinding is performed, and with the art of manufacturing grain into flour, that they may be judges of the quality of the stones suitable to the quality of the wheat, of different parts of the country; also, of the best manner of disposing of the different pieces of stone, of different qualities, in the same mill-stone, according to the office of the several parts, from the centre to the verge of the stone. (See Art. 104.)

Mill-stones are generally but very carelessly and slightly made; whereas, they should be made with the utmost care, and to the greatest nicety. The runner must be balanced exactly on its centre, and every corresponding opposite part of it should be of equal weight, or else the spindle will not keep tight in the bush; (see Art. 107.)—and if it is to be hung on a balance ryne, it should be put in at the formation of the stone, which should be nicely balanced thereon.

But, above all, the kind of stone should be most attended to, that no piece of an unsuitable quality for the rest be put in; it being known to all experienced millers, that they had better give a high price for an extraordinary good pair, than to have an indifferent pair for nothing.

Observations concerning Bolting.

1. Suppose that we try a sieve, the meshes of which are so large, as to let all the bran and meal through: it is evident that we could never thus attain the end proposed by the use thereof.

2. Suppose we try a finer sieve, that will let all the meal through, but none of the bran; by this we cannot separate the different qualities of the flour.

3. We provide as many sieves of the different degrees of fineness, as we intend to make different qualities of flour; and which, for distinction, we name—Superfine, Middlings, and Carnel.

The superfine sieve we make of meshes, so fine as to let through the superfine flour, but none of the middlings: the middlings' sieve, so fine as to let the middlings pass through, but none of the carnel: the carnel sieve, so fine as to let none of the shorts or bran pass through.

Now it is evident, that if we would continue the operation long enough, with each sieve, beginning with the superfine, that we might effect a complete separation. But if we do not continue the operation a sufficient length of time, with each sieve, the separation will not be complete; for part of the superfine will be left, and will pass through with the middlings, and part of the middlings with the carnel, and a part of the carnel with the shorts; and this would be a laborious and tedious work, if performed by hand.

Many inventions have been made to facilitate this business, amongst which the circular sieve, or bolting reel, is one of the foremost; this was, at first, turned and fed by hand; and afterwards it was so contrived as to be turned by water. But many have been the errors in the application of this machine, either from having the cloths too coarse, by which means the middlings and small pieces of bran passed through with the superfine flour, and part of the carnel with the middlings: or by having the cloths too short when they are fine enough, so that the operation could not be continued a sufficient time to

take all the superfine out, before it reach the middlings' cloth, and all the middlings before it reach the carnel cloth.

The late improvements made on bolting seem to be principally as follows; namely :—

1. The using finer cloths—but they were found to clog, or choke up, when put on small reels of 22 inches diameter.

2. The enlarging the diameter of the reels to $27\frac{1}{2}$ inches, which gives the meal greater distance to fall, and causes it to strike harder against the cloth, which keeps it open.

3. The lengthening the cloths, that the operation may be continued a sufficient length of time.

4. The bolting a much larger portion of the flour over again, than was done formerly.

The meal, as it is ground, must be hoisted to the meal-loft, where it should be spread thin, and often stirred, that it may cool and dry, to prepare it for bolting. After it is bolted, the tail flour, or that part of the superfine that falls last, and which is too full of specks of bran to pass for superfine, is to be hoisted up again and mixed with the ground meal, to be bolted over again. This hoisting, spreading, mixing, and attending the bolting hoppers, in merchant mills, creates a great deal of hard labour, if performed by hand; and is never completely done at last: but all this, and much more of the labour of mills, can now be accomplished by machinery, moved by water. (See Part III.)

Of Inspecting Flour.

The miller must attain a knowledge of the standard quality passable in the market: to examine it whilst bolting, hold a clean piece of board under the bolt, moving it from head to tail, so as to catch a proportional quantity all the way, as far as is taken for superfine; then, smoothing it well by pressing an even surface on it, will make the specks and colour more plainly appear; if it be not good enough, turn a little more of the tail to be bolted over.