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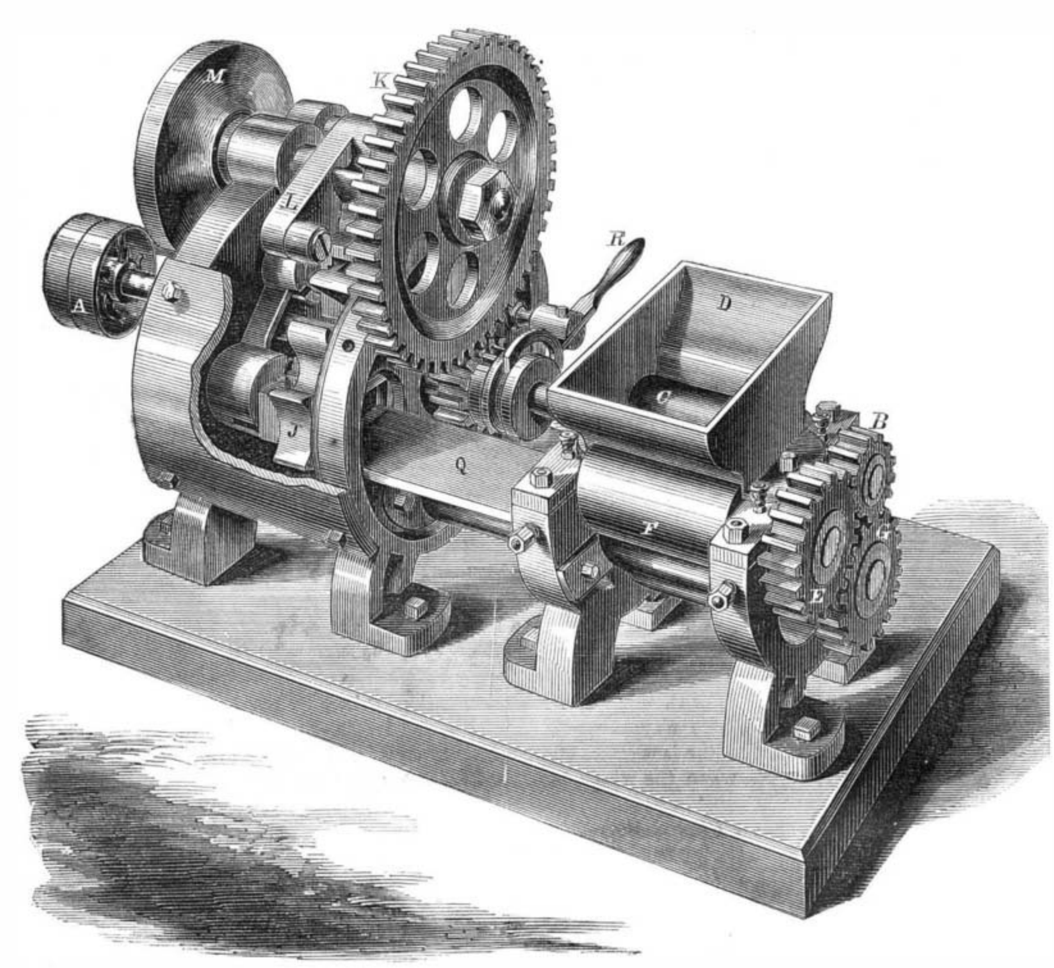
### Improvement in Molding and Pressing Bricks.

The machine represented in the accompanying engravings will arrest the attention of brick makers and other mechanics, from its compactness and its ingenious application of mechanical movements. It is direct and absolute in its action, dependent upon neither springs nor weights for correctness, and built of iron, so that there is but little wear and tear.

The machine is driven by the pulley, A—horse, steam, or any other power being used—the shaft having on its further end a gear, B, and a roller, C, which latter revolves in a hopper, D. The gear on the driving shaft engages with a larger one, E, which drives a corresponding roll, F, that, of course, turns slower than the roller, C. The clay—properly moistened—put into the hopper, D, passes between the rolls, being subjected to a comminuting or pulverizing process, in consequence of the abrasive action of the two rolls, the surfaces of which travel at varying velocities. From the rolls the fine clay is carried through a horizontal cylinder under roll, C, by means of a shaft driven by the gear, G, on which shaft are a series of spiral blades, H, Fig. 2, each of which forms a section of a screw, those at the discharge end, however, forming a complete screw extending entirely around the shaft. By this means the clay is carried from the mill to one of the press boxes, seen at I, Fig. 2, which are within a cylinder or disk, J, which revolves on a fixed hub secured to one of the standards of the machine, and through which the main shaft passes loosely. The press boxes, or brick molds, are placed at equal distances apart in the cylinder, which is revolved by a shaft driven by the gear, K, that is rotated by means of a pinion on the driving shaft. A crank, L, on the upper shaft, carrying the gear, K, having a friction roller on its wrist end, gives an intermittent motion to the cylinder, J, by means of recesses in the cylinder or disk; the rotation of the disk to produce a complete revolution, being assured by two gear teeth cut in what may be considered the hub of the crank, and engaging with similar teeth on the periphery of the disk.



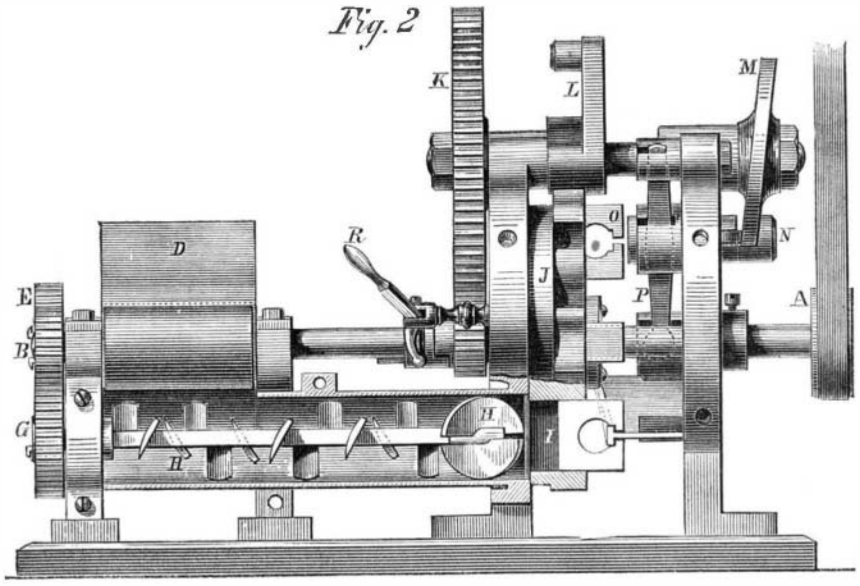
HAYDEN'S IMPROVED BRICK MACHINE.

On the outer end of the shaft carrying the gear, K, and crank, L, is a cam, M, which drives a plunger, N, Fig. 2, against the press piston, O, same figure, compressing the clay in the mold and forming the brick. At the same time, and by the operation of the same cam, a lever, P, actuates another plunger, that throws out the pressed brick upon a table, Q, Fig. 1, from which it is removed to the yard or other convenient place for drying.

The lever and clutch, R, are for disconnecting the mill and the press, so that the former can be run without operating the latter. The boss of the crank, L, after the disk containing the molds has been moved, so that the plungers and mold boxes are in line, traverses around a half of a revolution without imparting motion to the disk, thus affording time for the action of the plungers. It will be seen that at the same time that one mold box has received a charge, another is being carried to the plunger, the plunger is compressing a third, while the fourth is being discharged upon the table.

Patent pending through the Scientific American Patent Agency. Address all inquiries to the inventor, Peter Hayden, Pittsburgh, Pa.

*Fig. 2*



### MIND AND CHARCOAL.

Doctor Hall, in his *Journal of Health* for June, has the following instructive article which we hope every one will read notwithstanding its length:—

The diamond, the most valuable thing in Nature, so sparkling, so beautiful and bright, whose luster does not pale a particle in the lapse of ages, is but another condition of carbon, or charcoal, which you cannot touch without soiling your fingers; beautifully shadowing to us that greater change which shall come over the frail tenement of man, when it shall be raised "a spiritual body," fit for the heavenly mansions, and destined to a beatific existence when time shall be no more. But the human mind cannot act without the agency of carbon, and by this same agency do the trees grow, and the flowers bloom, and the connection between these is called "The Correlation of Mental and Physical Force," which phrase we were afraid to put at the head of this article, lest the reader should be frightened by its apparent abstruseness and skip it over; for all like the kind of reading best which requires the least thinking; the newspapers, civil, religious, and mongrel, have found this out, and load their columns with all sorts of impossible fabrications, as weak as water and as wishy-washy as cold soup; but publishers know that "there is money in it," the thoughtless public are pleased, and down we are going, at railroad speed *"ad infernum."*

Carbon represents heat; vegetation grows by absorbing carbon; and the hotter the climate, the faster does vegetation grow. At the poles there is no carbon, and there is no vegetation. When a tree is growing, it absorbs as much carbon as it will give out, when it is cut down and burned; if a pound of carbon, or wood, is burned and applied to water, so as to make steam, that steam, if economized, will raise a man to the top of Mount Washington. But if a man wants to go to the top of Mount Washington, he can raise himself up there by the force of his will, acting on his feet; but in order to do this, the brain must act upon the muscles of the body, and to do that, carbon must be supplied to it; this carbon is obtained from the food we eat; and unless we eat food which contains carbon, we will soon die, as the body gets cold; in a sense, freezes. Thus we see that carbon, acting on water, will raise a man sky-high; this is called "physical force;" carbon feeding the brain, enables a man to will him self to the same altitude, and away he goes, as fast as his legs will carry him; this is the result of "mental force," and now the reader sees the connection between physical and mental force, that they accomplish the same result, and by the use of the same agency, heat, obtained from carbon, or charcoal. That is to say, the vital force of the body and of the vegetable, is generated by carbon. It would be useless to bother the reader with this long rigmarole, unless we could derive from it some practical lesson, by which we can be made better or happier. The largest specimens of vegetation and animals, grew in the earlier ages, in parts where the atmosphere was a furnace; and as the crust of the earth cools, both grow more slowly, and the time for dying comes before they reach as great a stature as of old; and so it must be with man, the more carbon he absorbs, the more food he can eat and appropriate healthfully to the bodily uses, the larger or stronger will he be, according to whether the greater amount of carbon is absorbed by the brain or muscles; it is the stomach which is to prepare the food for the elimination of the carbon contained in it; this process is called "digestion," hence, the more perfect, the more vigorous; the more healthful a man's digestion is, the more vigorous will he be in mind or body, if not both; so whatever we do to weaken, to disease the stomach, we do that much toward impairing mind and body; toward depraving the race; degrading it toward the mere animal and the idiot. If we eat just enough, both mind and body are invigorated; if we eat too little, both become weak and faint; the body trembles, the mind is inefficient; if we eat too much, the stomach cannot eliminate the material which is to give out a pure carbon, and it then gives out an impure article, and mind and body are oppressed; the former loses its activity, the latter its vigor. Farming or any other active out-door life tends to perfect digestion; city life, with its inactions and its intemperances impairs the digestion, then follows the startling truth, and known to be truth, the world over, that families in cities, whole family names, die out in two or three generations; it has been stated that it rarely happens that a grandchild reaches maturity in Paris; scarcely a dozen of the same prominent family names are found in the New York City Directories of 1868, which were in the directory of 1802—just two generations ago; and but for the replenishment of lads from the country, the progeny of hard out-door workers vigorous of stomachs, eliminating carbon largely, so as to give power to produce children of robust health, New York would be almost depopulated in a comparatively short time. These are serious truths, and to antagonize such results, let every child born in New York, and whose father and grandfather were born in New York, be sent to the country during the first month of its life, to be brought up to out-door labor, so as to renew the constitution. The intelligent reader will feel a very deep interest in these statements, and will regard them as general truths, to be modified by antagonizing circumstances, but not the less true and practical for all that. Let us recapitulate. As much heat or carbon is absorbed by a tree during its growth, as it will give out when it is burned, so as much bodily and nervous energy will be given out by a man, as the carbon contained in the food which he eats will supply.

But it does not follow that the more a man eats the more carbon will he absorb, and, consequently, the larger, stronger, and more intellectual will he become; these depend on the healthful vigor of his digestion, because it is this which prepares the food for the separation of the carbon in it, previous to its absorption into the system; and as an active out-door life is the best means known for securing a perfectly healthful digestion, the inference is fair, logical, and legitimate, and observation will prove its truthfulness, that out-door activities, for the first thirty years of life, at least, are very certain to be followed by high health, bodily power, intellectual ability, and long life; this intellectual activity being greater or less, according to the greater or less size of the brain proper, which is that portion which lies in the front and upper region of the head.

The mind acts on the body through the brain, making the brain in the nature of a machine, whose working involves waste, and the necessity of repair or renewal, as oil to the wheels of vehicles of locomotion; this renewal is made from the food we eat; the faster a physical machine runs, the faster will it wear out, and there is no help for it; but the human machine had Divinity for its architect, and it does not follow that the faster or more vigorously it works, the more intense the thoughts and sensations, the sooner will it decay; but it only follows that the harder a man works, or thinks, or the more intense are his sensations, the more nourishment must be given to the muscles which work, and to the brain, through which comes our sensations; that is, the more carbon must be supplied to the system; and as was before noticed, that the greater the amount of carbon supplied, the larger was the tree, the greater the animal, the more vigorous the action of the brain—the mental work, it therefore follows that the human machine increases its physical and mental capabilities by the very increase of its activities; that the more a man works, the more and better he can work; the more he thinks, the more and better he can think; hence, the busiest men live the longest, whether it be physical or mental industry; thus, Newton, and others of the greatest intellects in physics, in theology, and in ethics, have lived to a good old age.

But it is a beautiful thought, and suggestive, too, that man expends his carbon in two directions; through the muscles, enabling him to work a great deal; and through the brain, enabling him to think a great deal; if expended equally in these two directions, a man becomes a good worker and a good thinker; but if he would become the best worker, the excess of carbon must be expended through the muscles; if, on the other hand, he desires to excel in the world of thought, he must expend the greater share of his carbon through the brain.

But another beautiful thought must not be omitted. A good digestion takes the carbon out of the food eaten and throws it into the circulation, the blood; but throwing coal into a furnace will not warm the house, the fire must be kindled; the coal must burn, and its burning gives out heat; this is called combustion; the body is the furnace, the carbon put into it by eating, is its coal or fuel, but it must be kindled, must be set on fire by having oxygen introduced: we know that a fire will not burn unless the air can get to it and supply it with its oxygen; so, also, will not the carbon in the blood kindle into warmth and heat, unless a plenty of good air is introduced into it, which is done by breathing it into the lungs, where all the blood goes, and so, being brought into contact there, the oxygen of the air and the carbon of the blood join, and combustion is the result, giving out heat, fire, warmth; and as the out-door air is the purest, freshest, and best, the more we are out of doors, the more oxygen we get, the more perfectly the carbon is burned, and the greater the amount of healthful heat is there in the system.

We all know that the harder we work, the sooner we get tired and the more hungry we become; and students at school, and academy, and college, know very well that they grow weak by hard study; and that their appetites become so imperative and exacting sometimes, late at night, that remorseless contributions have been made on neighbors' corn cribs, dairies, orchards, melon patches, and henneries. Who does not now feel that we have made "the correlation of the mental with the physical forces" as plain as a pike-staff, and very interesting, too; that shows our genius. Reader, don't you feel that it is a plain matter, after all? Any body can make an egg stand on end, after a Columbus has shown him once how to do it!! But O, how little of the immeasurable world of truth does any man know, do all men know! Balloons for ordinary traveling purposes may yet be contrived; some may think that a man may, sometime, travel as fast as a telegram, and who knows but that the science of "mind and charcoal" may be so systematized, that a man may prepare himself for a specified amount of labor by eating a specific food of a specific quantity, may graduate the intensity of his sensations by the measure of his meat; and when conscience reproves him for the meanness of marrying that pretty girl for her money, he may excite a pure and disinterested and raging love, by the articles ordered from Professor Blot!!

## POMADES AND OILS.

According to ancient writers, unguent, pomatum, ointment are synonymous terms for medicated and perfumed greases. Among Biblical interpreters, the significant word is mostly rendered "ointment;" thus we have in Prov. 27:9, "Ointment and perfume rejoice the heart;" in Eccles. 9:8, "Let thy head lack no ointment." "The sons of the priests made the ointments of the spices" (1 Chron. 9:30); "Hezekiah was glad, and showed them his treasures, his spices, and the precious ointment" (Isa. 39:2).

Oiling and greasing the hair is a custom pretty nearly universal among the people of all civilized nations. There are oil-glands on the scalp, but their power of secretion is very slight, except in a few rare instances; in these cases the hair is said to be naturally moist and soft. The general rule is, that the hair grows harsh and "dry" for the lack of natural oily secretion, hence the instinctive application of an artificial oil, a practice hallowed by its ancient custom, and sanctioned as "necessary," from the court beauty of St. James's to the belle of equatorial Africa. M. Du Chaillu, speaking of the use of njavi oil by the natives of Goumbi, says:

"They mix the njavi oil with a kind of odoriferous powder called *yombo*, and this mixture is then applied in great quantities upon their wool (*i. e.*, hair). They think it gives out a pleasant fragrance, but I differ from them."

Now, oiling the hair, besides making it glossy and soft, has the infinite benefit of rendering it "uninhabitable;" a consideration too often neglected in schools, and similar institutions.

The name of pomatum is derived from *pomum*, an apple, because it was originally made by macerating over-ripe apples in grease.

If an apple be stuck all over with spice, such as cloves, then exposed to the air for a few days, and afterwards macerated in purified melted lard, or any other fatty matter, the grease will become perfumed. Repeating the operation with the same grease several times produces real "pomatum."

According to a recipe published more than a century ago, the form given is:

"Kid's grease, an orange sliced, pippins, a glass of rose water, and half a glass of white wine, boiled and strained, and at last sprinkled with oil of sweet almonds."

The author, Dr. Quincy, observes, that "the apple is of no significance at all in the recipe," and, like many authors of the present day, concludes that the reader is as well acquainted with the subject as the writer, and therefore considers that the weights or bulk of the materials in his recipe are likewise of no significance.

Perfumers, acting by experience or Dr. Quincy's advice, pay no regard to the apples in the preparation of pomatum, but make it by perfuming lard or suet, or a mixture of wax, spermaceti, and oil, or some of them or all blended, to produce a particular result, according to the name that it bears.

The most important thing to consider in the manufacture of pomatum, &c., is to start off with a perfectly inodorous grease, whatever that grease may be.

Inodorous lard is obtained thus:

Take, say, 28 lbs. of perfectly fresh lard, place it in a well glazed vessel, that can be submitted to the heat of a boiling salt water bath, or by steam under a slight pressure; when the lard is melted, add to it one ounce of powdered alum and two ounces of table salt; maintain the heat for some time, in fact, till a scum rises, consisting in a great measure of coagulated proteine compounds, membrane, etc., which must be skimmed off; when the liquid grease appears of a uniform nature, it is allowed to grow cold.

The lard is now to be washed. This is done in small portions at a time, and is a work of much labor, which, however, is amply repaid by the result. About a pound of the grease is now placed on a slate slab, a little on the incline, a supply of good water being set to trickle over it; the surface of the grease is then constantly renewed by an operative working a muller over it, precisely as a color maker grinds paints in oil. In this way the water removes any traces of alum or salt, also the last traces of nitrogenous matter. Finally, the grease, when the whole is washed in this way, is remelted, the heat being maintained enough to drive off any adhering water. When cold it is finished.

Although purifying grease in this way is troublesome, and takes a good deal of time, yet, unless done so, it is totally unfit for perfuming with flowers, because a bad grease will cost more in perfume to cover its *mal odeur* than the expense of thus deodorizing it. Moreover, if lard be used that "smells of the pig," it is next to impossible to impart to it any delicate odor; and if strongly perfumed by the addition of ottos, the unpurified grease will not keep, but quickly become rancid. Under any circumstances, therefore, grease that is not perfectly inodorous is a very expensive material to use in the manufacture of pomades.

In the South and flower-growing countries, where the fine pomades are made by enfleurage, or by maceration, the purification of grease for the purpose of these manufactures is of sufficient importance to become a separate trade.

The purification of beef and mutton suet is in a great measure the same as that for lard; the greater solidity of suets requires a mechanical arrangement for washing them of a more powerful nature than can be applied by hand labor. Mr. Ewen, of Garlick Hill, who is an extensive lard and fat purifier in London, employs a stone roller rotating upon a circular slab; motion is given to the roller by an axle which passes through the center of the slab, or rather stone bed, upon which the suet is placed; being higher in the center than at the sides, the stream of water flows away after it has once passed over the suet; in other respects the treatment is the same as for lard. These greases used by perfumers have a general title of "body," tantamount to the French nomenclature of *corps*; thus we have pomades of hard corps (suet), pomades of soft corps (lard). When drawing *extraits* from the enfleuraged grease, such as *extraite de violette*, jasmin, the pomades of hard corps are to be preferred; but when scented pomade is to be used in the fabrication of unguents for the hair, pomades of the soft corps are the most useful.

The following process of purifying grease prior to enfleurage has been expressly written for this work by M. Auguste Bermond, of Nice:

"Take one hunredweight of perfectly fresh grease, either of lard or beef suet; cut the grease into small pieces, and pound it well in a mortar; when it is well crushed, wash it with water repeatedly, so long, in fact, until the water is as clear after withdrawing the grease as before it was put in. The grease has now to be melted over a slow fire, adding thereto about three ounces of crystallized alum in powder, and a handful of sea salt (common salt); now let the grease boil, but allow it to bubble for a few seconds only; then strain the grease through fine linen, into a deep pan, and allow it to stand, to clear itself from all impurities, for about two hours. The clear grease is then again to be put into the pan, over a bright fire, adding thereto about three or four quarts of rose water, and about five ounces of powdered gum benzoin; it is allowed to boil gently, and all scum that rises is to be removed, until it ceases to be produced; finally the grease is put into deep pans, and when cold taken carefully off the sedimentary water; it is then fit for use, and may be kept for an indefinite period, without change or turning rancid."

It will be observed that the principal feature in this process is the use of benzoin.

Dr Redwood has recently directed the attention of chemists to the fact that certain ointments, particularly zinc ointment, will not become rancid, if a little gum benzoin, or benzoic acid, is added to it when made; that such is the case there is little doubt, for it has been remarked that the prepared fat used by the flower farmers in the process of enfleurage will remain sweet for some years, provided that it be digested for a time over gum benzoin, in the process of its purification,—a practice that has been generally worked for this century at Grasse, Cannes, and Nice. It therefore only becomes only a question of experiment, to determine whether benzoin be a true antiseptic to all fatty bodies.

POMADE CALLED BEARS' GREASE—The most popular and "original" bears' grease is made thus:—"Huile de rose, Huile de fleur d'orange, Huile d' acacia, Huile de tubereuse and; jasmin—of each, ½ lb; Almond oil, 10 lbs.; Lard, 12 lbs. Acacia pomade, 2 lbs.; Otto of bergamot, 4 oz.; Otto of cloves, 2 oz. Melt the solid greases and oils together by a water bath, then add the ottos." Bears' grease thus prepared is just hard enough to "set" in the pots at a summer heat. In very warm weather, or if required for exportation to the East or West Indies, it is necessary to use in part French pomatums instead of oils, or more lard and less almond oil.

CIRCASSIAN CREAM.—Purified lard, 1 lb.; Benzoin suet, 1 lb.; French rose pomatum, ½ lb.; Almond oil, colored with alkanet, 2 lbs.; Otto of rose, ¼ oz.

BALSAM OF FLOWERS.—French rose pomatum, 12 oz.; French violet pomatum, 12 oz.; Almond oil, 2 lbs.; Otto of bergamot, ¼ oz.

CASTOR OIL POMATUM.—Tubereuse pomatum, 1 lb.; Castor oil, ½ lb; Almond oil, ½ lb.; Otto of bergamot, 1 oz.

MARROW CREAM.—Purified lard, 1 lb.; Almond oil, 1 lb.; Palm oil, 1 oz.; Otto of Cloves, ½ drachm; Otto of bergamot, ½ oz.; Otto of lemon, 1½ oz.

MARROW POMATUM.—Purified lard, 4 lbs.; Purified suet, 2 lbs.; Otto of lemon, 1 oz.; Otto of bergamot, ½ oz.; Otto of cloves, 3 drachms. Melt the greases; then beat them with a whisk, or flat wooden spatula, for half an hour or more; as the grease cools, minute vesicles of air are inclosed by the pomatum, which not only increase the bulk of the mixtures, but impart a peculiar mechanical aggregation, rendering the pomatum light and spongy; in this state it is obvious that it fills out more pots than otherwise, and hence is more profitable.—*Piesse.*

## THE CLOCK.---HOW TO USE IT.

A clock is a machine composed of wheels and pinions, to keep up the oscillations of a pendulum.

The wheels of a clock are made to revolve by means of a weight or spring called the maintaining power. This power must be sufficient to overcome the resistance of friction, to move the wheels, and to maintain the motion of the pendulum. The wheels of the clock are connected to the pendulum by pallets, which, at the same time that they check the impetus of the wheels, receive their impulse to keep up the motion of the pendulum.

The escapement of a clock is that part by means of which the rotary motion of the escape wheel is made to produce an oscillating motion in the pendulum. Clocks are made with different kinds of escapements: the recoil or common pallets, the dead beat, and the free or detached. They are also made with the lever and pallets similar to watches, for clocks subjected to different motions, such as for ships' use, railroads, etc.; but these last are never made with a pendulum, but with a balance. Ordinary clocks, to which attention has been paid to the proper action, measure time more accurately than watches, the continuance of motion in the pendulum being better understood, and its irregularities more easily corrected than those of a balance. Long pendulums are preferable to short ones, for the greater the length the slower the motion, therefore error is less in a long pendulum. Heavy pendulums are the best, from being less under the variable influences of the impelling power, they are also less liable to be effected by external motion.

A light pendulum shows a clock badly constructed, or deficient in the power necessary for good performance. On selecting a clock, it should be observed whether the pendulum occupies the whole available length of the case; if not, it shows inattention to this advantage. The only exception to this rule is regulators and clocks which have the pendulums beating seconds, and measuring three feet three inches in length; this length is sufficient to insure accuracy. Although weight is preferable to spring as a maintaining power, yet fashion, perhaps, more than convenience, has caused a greater demand for spring clocks. Those which require to be wound oftener than once a week, having a less marked time, are objectionable from the same cause. Clocks are frequently made to go only thirty hours, on account of cheapness, and will keep tolerably good time; but those going eight days are to be much preferred, as in winding it will frequently alter the time a trifle. Small clocks have short pendulums, and from their lightness are liable to be stopped; they should therefore be made as heavy as convenient, and when lead can be put into the case to add to its weight, there is less risk of it being moved accidentally. The additional weight also steadies the suspension, and produces more equal motion in the pendulum, but when the expense can be incurred, it is better to have small clocks made with a balance, as they can be moved with-