IMPROVED FEATHERING PADDLE WHEEL.

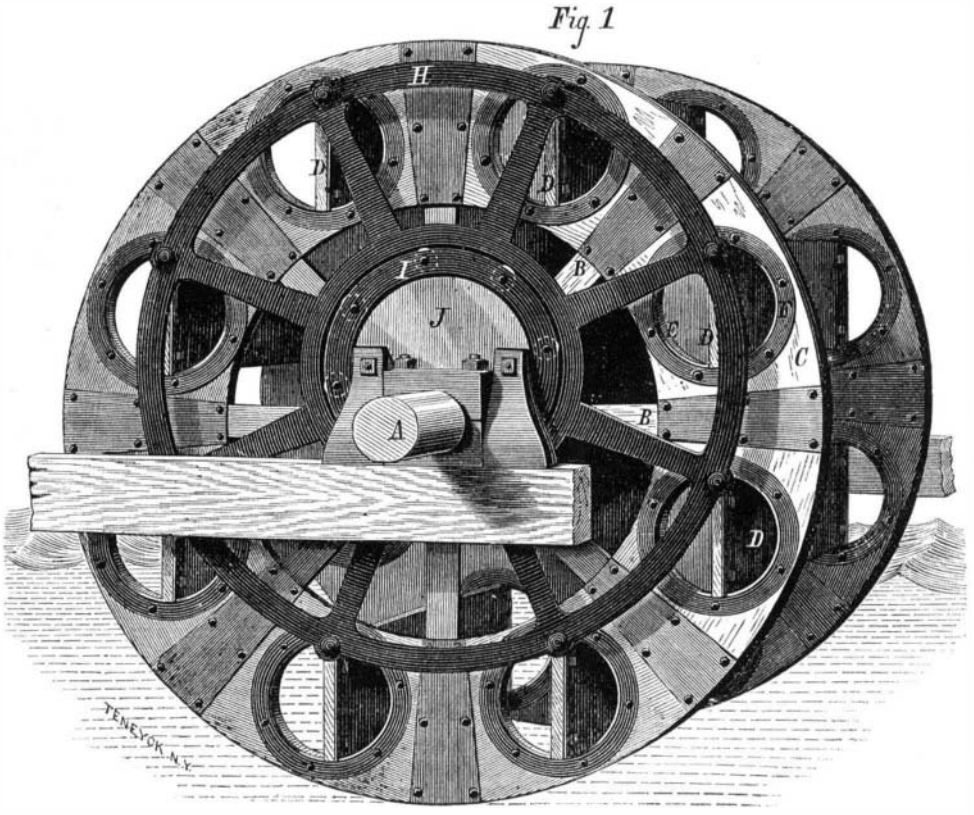
The invention illustrated in the accompanying engraving is a feathering paddle wheel, or, in other words, a wheel in which the paddles are so arranged as to remain during their motion in a vertical or very nearly vertical position. They are thus prevented from lifting up bodies of water or from striking the water without acting fully and fairly to propel or otherwise give a useful effect.

Fig. 1 gives a general perspective view of the device, and Fig. 2 shows the manner of supporting the paddles in the wheel rim. A is the axle held in suitable bearings upon the frame. B B are the wheel arms connected with the axle and supporting the rims, C. D, the paddles, are secured by bolts passing through flanges of the semicircular cast iron segment, E, Fig. 2. The latter form, when combined, a narrow cylinder which turns in the wheel rim, C, and is guided by the flanges, F, secured thereto. By means of the journals shown, the segments are connected to the eccentric ring, H, which forms a united body with radial arms and an inner ring. J is a center bearing permanently attached and supported by braces to the wheel frame, having on its outer circumference a number of friction rollers, so that the inner eccentric ring rotates freely around it.

It is evident from the foregoing construction that, as the wheel is revolved by the shaft, the rim, C, and the paddles, D, are rotated about the axis of said shaft. But the paddles, being connected with the eccentric ring, H, will be moved relatively to the wheel rim, C, in accordance with the eccentricity of the ring as it revolves about the bearing, J. The result of the combined motions is that the paddles and segments, E, are so turned in the wheel rim as to preserve a vertical position during a full revolution thereof. The segments, E, rotating in their housings, are always firmly guided and supported on all points of the circumference, thus resisting strains and contusions, whether arising from currents of water, ice, drift wood, or other obstacles.

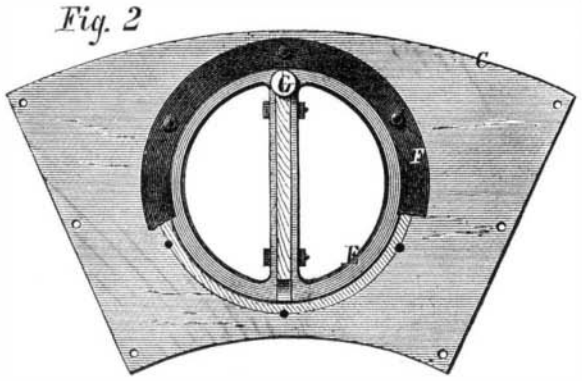
The journals by which the eccentric ring is connected being situated at the upper edges of the segments, the feathering movement of the paddles is in the direction of the water pressure, as produced by the current made by the wheel, so that to obtain such movement but little power is required. It is further claimed that, by the arrangement of the roller center, I, the power required in actuating the eccentric ring is reduced to a minimum.

Fig. 1



EMERSON'S FEATHERING PADDLE WHEEL.

Fig. 2



This invention is notably simple in form, in that it avoids the use of projecting cranks for feathering, while its general construction is such as to afford every requisite of strength and durability. It may be readily adapted to any form of wheel now in use. The inventor informs us that a similar wheel was placed upon the steam canal boat Port Byron, recently illustrated in our columns, which vessel has made a remarkably quick passage from Buffalo to New York.

Patented Sept. 28, 1869. For further information address the inventor, Mr. Primus Emerson, Carondelet, Mo.

Experiments with Disinfectants.

As the result of a series of experiments with disinfectants, Herr Eckstein, of Vienna, strongly recommends chloride of lime as the cheapest and best. Bleaching powders rapidly decompose all hydrogen compounds, such as ammonia, sulphuretted hydrogen, sulphide of ammonium, phosphoretted hydrogen; and these are the gases which occasion miasma. It acts rapidly by liberating oxygen, and its chlorine violently decomposes organic matter. At the same time bleaching powders are a cheap commercial article, and hence always accessible. In order to avoid the inconvenience often resulting from the liberated chlorine, the ingenious device has been tried of enclosing the bleaching powders in a bag made of parchment paper. This bag remains quietly where it is placed, and by the principle of endosmose and exosmose, the full effect of the liberated chlorine is attained without any inconvenience to the occupants of the house.

Herr Eckstein made comparative experiments with different disinfectants, for two years, with the following results:

1. Two pounds of sulphate of iron dissolved in water and poured into a saucer at first liberated sulphurettedhydrogen, and after twelve hours no longer produced any effect.

2. A solution of sulphate of copper behaved in the same way.

3. Two pounds of crystals of green vitriol retained its action for two days.

4 A mixture of sulphates of iron and copper and carbolic acid lasted two days.

5. Sulphurous acid was suffocating, and ceased to act in one day.

6. Carbolic acid produced a worse smell in the house than the bad gases of the sewer.

7. Two pounds of sulphate of iron in a parchment bag retained its valuable property longer than when exposed free.

8. Two pounds chloride of lime in a parchment bag continued to purify the air for nine days.

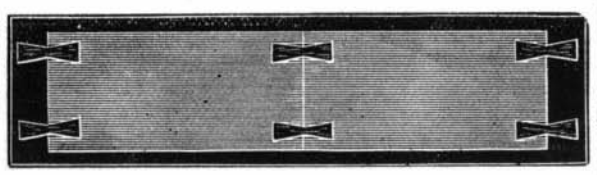
9. Permanganate of soda was successful as long as it lasted, but is too expensive.

Enclosing chloride of lime in a parchment bag, and suspending it in an out-house or leaving it in a sewer, is recommended, by the experimentor, as the best disinfectant to be obtained in the market.

Wooden Ties in Stone Edifices.

All the great temples of Egypt which have withstood the destructive tendencies of time and the assaults of man for four thousand years are of hewn sandstone, with a very few exceptions of aboutthe color and character of the brown stone houses of New York. But the only wood in or about them is ties, holding the end of one stone to another on its upper surface. When two blocks were laid in place, then, it appears that an excavation about an inch deep was made thus, this being a representation of two hewn blocks, into which the hour-glass-shaped tie was driven:

It is therefore very difficult to force any stone from its position. The ties appear to have been the tamarask, or shittim wood, of which the ark was constructed, a sacred tree in ancient Egypt, and now very rarely found in the valley of the Nile. Those dovetail ties are just as sound now as on the day of their insertion. Although fuel is extremely scarce in that country, those bits of wood are not large enough to make it an object with Arabs to heave off layer after layer of heavy stone for so small a prize. Had they been of bronze, half the old temples would have been destroyed ages ago, so precious would they have been for various purposes.



Probably all those monster edifices were raised, course after course, secured in that manner, carefully adjusted by being admirably jointed above and below, but left rough inside and out. When carried to the proposed elevation, then, supported on moveable stays, the workmen dressed both surfaces from top to bottom, leaving figures in relief or the deeply cut symbolic characters which so puzzle archæologists in these latter days.

If our stone buildings were reared in the same manner, of blocks the thickness of the walls, they would certainly be more substantial than those slightly built houses which have their weakness concealed by a casing of thin sheets of brown stone. A difference of climate necessarily modifies architecture, but it is undeniably true that the architects of a remote antiquity, whose structures are monuments of their practical wisdom, were men of genius and extraordinary attainments in a department of art and science combined, not to be undervalued in these times of haste which end in waste.

The Importance of Drawing.

The Select Committee of the House of Commons on Scientific Instruction recommend, in their report, that instruction in drawing should be given in elementary schools. The disregard of such elementary instruction, as a branch of general education, is surprising. Drawing is a universal language; it is easier of acquirement than writing. By the use of a ruler, pencil, and compasses, a child may become self-educaated, and acquire a handicraft of essential service in after life.

The exclusion of drawing and geometry from the subjects of examination by the Council of this Society on the recent revision of the subjects of local examination, is greatly to be deplored. Encouragement in this acquirement might thus be given to those who can never attain mediocrity either in reading, writing, or arithmetic; and who can tell what may be the aid to development thereby afforded to the natural born talent of an artist?

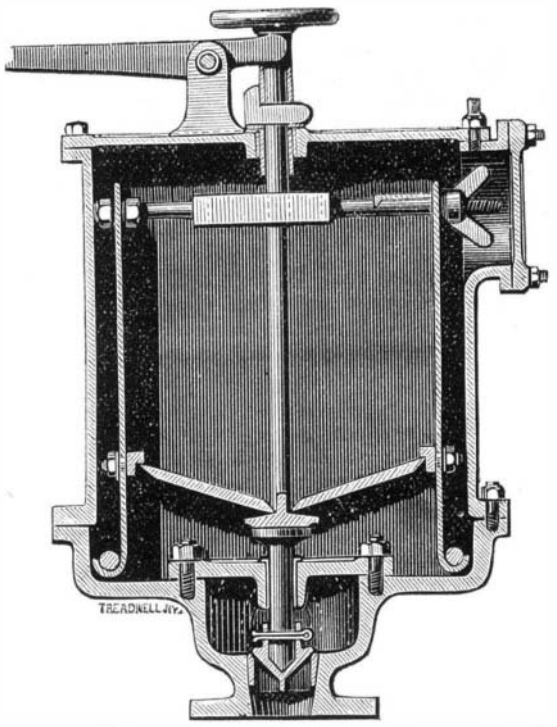
I look upon linear drawing and geometry, says Mr. Buckmaster, as the very foundation of instruction, and as affording, at a more advanced stage, the means of separating and classifying minds into orders or classes, so as to utilize each to the utmost, according to the powers with which it is endowed.

The neglect of drawing, at the earliest stage of the use of a pencil by a child, may be regarded as a great defect in our system of teaching, which our educational authorities have done much to remove.

What reason can be suggested why a child should not commence geometrical and mechanical drawing contemporaneously with learning to write? Indeed, so soon as it has the power of handling a pencil, the discipline of learning to draw would be equal to the discipline of learning to write. The want of this simple first elementary knowledge is declared by competent authority to be a great barrier to the success of artizan students.

TURTON'S COMPENSATED SPRING SAFETY VALVE.

The object of the peculiar arrangement of the safety valve illustrated herewith is to diminish the load on the valve as



the latter rises, and thus to allow a greater amount of lift than is possible so long as this load remains constant. The device, which we extract from *Engineering*, is the invention of Mr. Thomas Turton, of the Liverpool Forge Company.

The spindle, as shown bearing on the valve, is prolonged upwards into a casing, and, between a collar on the spindle and a pair of single plate springs contained in the casing, are disposed a pair of strut bars. These bars form a togglejoint, and as the valve rises they assume a more nearly horizontal position, the effect being that the downward thrust they exert on the valve is diminished. The plate springs are hinged at the bottom to fixed fulcra, and at the top they are connected by an adjusting screw, by means of which the pressure they exert can be regulated.

Further details will be readily understood from the engraving. The invention seems to be one of utility, and, if properly proportioned, should act well. There is a great demand for an efficient device of this kind.

THE President of the Royal Society of Agriculture, England, offers a prize of $500 for the best treatise on the diseases of the potato and the means of avoiding and remedying the same. The conditions of the competition may be obtained by addressing Mr. H. M. Jentrins, Secretary, 12 Hanover Square, London