PERPETUAL MOTION:

The Inventors' Paradox.

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THE seeker after perpetual motion has to the superficial observer apparently been engaged in as fruitless a task as the ancient alchemist, progenitor of the modern chemist who spent years of patient research for the elusive "philospher's stone" From time to time the solution of the problem has been boldly announced but no inventor has yet produced the desired result although unwearying toil and experimental research have, as in the case of the alchemists, led to other discoveries in the realm of physics which have proved of inestimable value to science and the industrial arts.

It is a settled principle in mechanics that perpetual motion, in its purely theoretical sense, can never be attained for the reason that it is impossible for a machine to exist in which the element of friction, involving wear and eventual destruction, is lacking Recent discoveries, however, appear to indicate that the great objective of so many earnest investigators may, in its practical sense, shortly be arrived at. The discovery of radium, for instance, has brought into the calculation a new element, a natural store-house of energy, which, from a human standpoint, is inexhaustible, and which one day may be utilised for practical purposes.

Experiments have already been made by scientists in the utilisation of radium for motive purposes, and amongst other experimental contrivances a radium clock has been constructed (by Mr. Harrison Martindale, of England) which, it is said, will keep in motion for an indefinitely long period. The apparatus is also interesting as exhibiting the dissipation of the negatively charged alpha and beta rays of radium. A minute quantity of radium supported in an exhausted glass vessel by a quartz rod, is placed in a small tube. An electroscope, formed of two long leaves or strips of silver, is attached to the lower end of the tube. A charge of electricty in which there are no beta rays is transmitted through the activity of the radium into the leaves. Thereby the latter expand until they touch the sides of the vessel, which are connected to earth by wires, these wires instantly conduct the electric charge and the leaves fall together Until the radium is exhausted, which, it is estimated, will not be for thirty-thousand years this simple operation will be repeated every two minutes. This may be one of the first faltering steps upon the part of practical experiment leading ultimately to the employment of the new element for motive purposes

Study of the efforts of inventors in connection with perpetual motion is not only interesting, but has an instructive influence, many mechanical problems being involved, the examination of which is most beneficial in broadening the views and enlightening the mind of the student. The reasons of failure of the various contrivances which are briefly described in these articles will be at once apparent to many readers who possess mechanical knowledge, but upon the other hand a few of the propositions look so feasible that skilled mechanical engineers may be momentarily at a loss to explain why the "wheels won't go round" interminably.

The illustrations are reproduced from the not-over-clear drawings filed with the applications for the several patents; but it has been necessary to much abbreviate the somewhat verbose descriptions of the inventions which were given by the patentees.

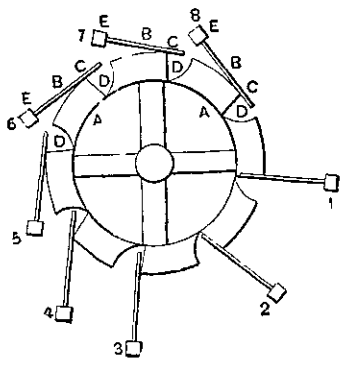

FIG. 1.

Figure 1 shows apparatus invented by the Marquis of Worcester towards the end of last century, and a forerunner of hundreds of motors which depend, for their alleged ability to "mote," upon the assumption that it is possible to arrange a number of equal weights upon the periphery of a revolvable wheel in such manner that the weights upon one side of the axle are always either more numerous, or, are further from the axle, than those upon the other side. The revolvable wheel, A, had the arms, B, pivoted at equal distances apart upon its circumferential periphery. Weights, E, were carried one at the end of each arm, and as the wheel revolved the arms turned upon their pivots under the influence of gravity, and the weights were thrown away from the centre of the wheel upon one side, and, fell towards the centre upon the other side. In Figure 2 the endless chain, A

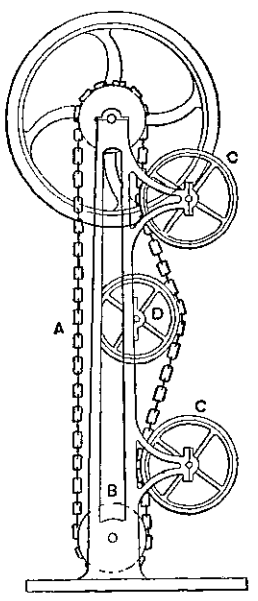

FIG. 2.

connected the chain wheels at the top and bottom of the frame, B. The idle wheel midway between the two wheels pushed the chain laterally so that there was always a greater length, and consequently greater weight, of chain upon one side of the wheels than upon the other side. The large wheel at the top of the frame was provided to convey the perpetual power which was expected to, but alas did not, eventuate.

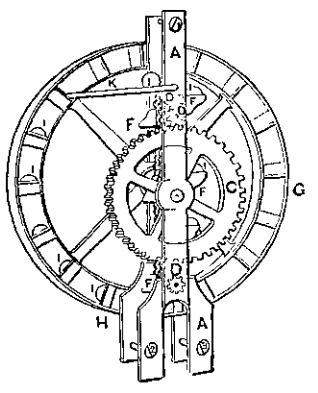

FIG. 3.

In Figure 3 the wheel G, which was fixed upon an axle journalled in the uprights A, had a number of cups around its circumference, and the aim of the inventor was to arrange matters so that while some of the cups upon one side of the wheel each carried a weight, in the form of a ball the cups upon the other side of the wheel were empty The ball weights, I, were raised to near the top of the wheel, each in one of the buckets, F, fixed upon an endless chain; as each bucket reached the top of its path the ball rolled from it down a shute, K, into one of the wheel cups; when the balls arrived, during the revolution of the wheel at the bottom of the apparatus, they rolled from the cups into the buckets, to be raised to the top of the apparatus for repetition of the operation. The endless chain was driven by the revolution of cup-wheel, G, through the medium of a spur wheel upon its axle which geared with pinions, D, upon the axles of the chain sprockets.

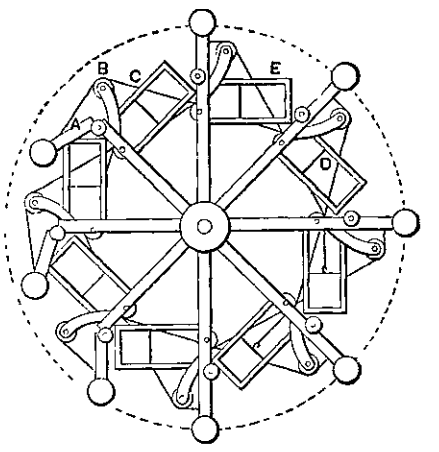

FIG. 4.

Figure 4 illustrates apparatus patented by Ferguson in 1770. A number of radial arms fixed to a revolvable boss have each a jointed end, A, which is weighted, and also a guide frame, E, in which slides a weight, D, As each arm reaches a horizontal position the weight, within its frame, slides down, and by means of a cord, C, which passes over a guide pulley, B, straightens out the jointed end, A, of one of the arms which is then vertical. Upon the upward travel (left hand) of each arm the weight to which it is connected falls back and the weighted end, A, being released from the pull of the cord turns upon its joint and falls nearer to the centre of the wheel. Thus the weights upon one side of the boss are farther from the axis than the weights upon the other side.

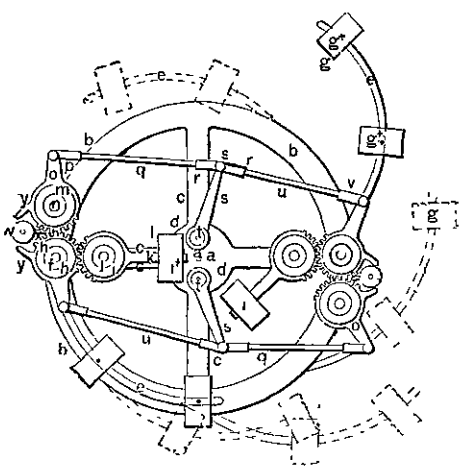

FIG. 5.

Figure 5 shows one only of a series of wheels which were all mounted upon the same axle, A. Each wheel had two curved arms, E, pivoted opposite one to the other upon the rim, and each arm carried two fixed weights, G, a boss, H, at the pivoted end of each arm had a number of teeth gearing with similar teeth upon the pivoted boss of a lever, C, carrying a weight, I. The weights I, caused the lever, E, upon the right hand side of the wheel to project outwardly while the similar lever upon the other side was drawn in by the other weight, I, thus causing a preponderance of weight upon one side of the wheel. The curved arms were connected by a system of rods, W, Q, pivoted to levers S, T, and levers, O, having toothed bosses in gear with the teeth upon the bosses of the arms,

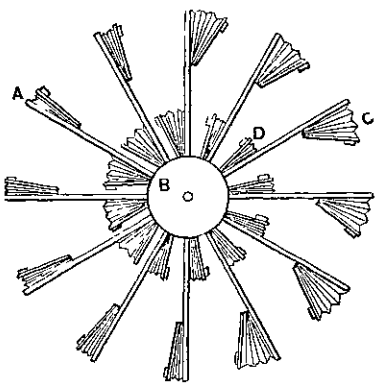

FIG. 6.

Figure 6 shows apparatus depending for its effect upon the automatic transfer of water from the periphery to near the axle of a wheel. The arms, A, project radially from the boss, B, which is mounted upon an axle, and each arm has a water