

Science and Art.

New Improvements in Cut-offs.

The inventions that form the subject of the accompanying illustrations are the subjects of two patents, and to insure perspicuity we will describe them separately.

Fig. 1 illustrates the first invention by a section of the steam chest of an horizontal engine, with governor attached. Small flap valves are added to the sliding induction valves to cut off the steam at any point regulated by a governor. *a* and *a'* are the valve seats containing steam ports, *c c'*, communicating with the cylinder and exhaust ports leading to the exhaust pipe, the arrangement of the ports being the same as is common when separate slide valves are used for induction and eduction to and from each end of the cylinder. *B B'* are the slide valves (one for each end of the cylinder), constructed with the additional shield, *b b'*, to the outer side, of each, so as to form passages, *d d'*, outside the valve as usually constructed, these passages terminating in the faces of the valves which fit the seats, *a* and *a'*, and in faces, *e e'*, that serve as seats for the flap valves, *C C'*, which are hinged to the valves at *f f'*, and that close the passages, *d d'*. The flap valves are each provided with a pointed arm or lifter, *g g'*, which points to the back of the chest, and in the chest over the two pairs of exhaust and steam ports are two stuffing boxes, *j*, through which pass rods, *i*, provided at their lower ends with jointed toes, *h h'*, beveled on the ends farthest from the ends of the steam chest, and fitted to their guides in the back of the steam chest in such a manner as to permit them to swing from a vertical position toward the nearest end of the steam chest, but not in the opposite direction. The rods, *i*, are connected with two levers, *k k'*, that work on fulcra, *l l'*, outside the chest, and whose opposite ends are connected with a governor, *G*, in such a manner that a diminution of the speed of the governor will cause the toes, *h h'*, to project further into the steam chest, and an increase of velocity produce the opposite effect. The two slide valves are connected by a rod, *m*, and motion is given from the eccentric by the rod, *n*. The movement of the slide valve causes their respective flap valves, *C C'*, to be opened, as the former respectively move in a direction to open their respective ports by the arms, *g g'*, striking the toes, *h h'*, but as the slide valves move in the opposite direction, the toes, *h h'*, swing and permit the arms, *g g'*, to pass them. The valves, *C C'*, close by gravitation with a tripping motion as the arms, *g g'*, escape the toes, *h h'*, in moving in the first direction, and thus cut off the steam suddenly, as the only passages for the steam from the chest to the cylinder are those in the valves covered by *C C'*. The escape of the arms, *g g'*, and cutting-off of the steam take place sooner or later in the stroke, according as the toes, *h h'*, are projected less or more into the chest. During the first part of the stroke of the valves in either direction, the steam which fills the chest passes under the shield, *b* or *b'*, of the slide valve, *B* or *B'*, whose steam port, *c* or *c'*, is to be opened by that stroke, and into the passage, *d* or *d'*, of said valve, so that the trap valve, *C* or *C'*, belonging to the slide valve, is exposed to steam both above and below, and is consequently balanced, and this continues to be the case until the time for admitting the steam to the cylinder; and hence, at the proper moment, *C* and *C'* are opened without difficulty, but as soon as it leaves its seat and the passage, *d* or *d'*, communicates with the cylinder, the lower opening of the passage is closed to the chest by *b* or *b'* coming on the valve seat. The toes may be adjusted to cut off at any desired point without a governor, and is equally adapted to vertical as horizontal cylinders. The patent is dated Nov. 30, 1858.

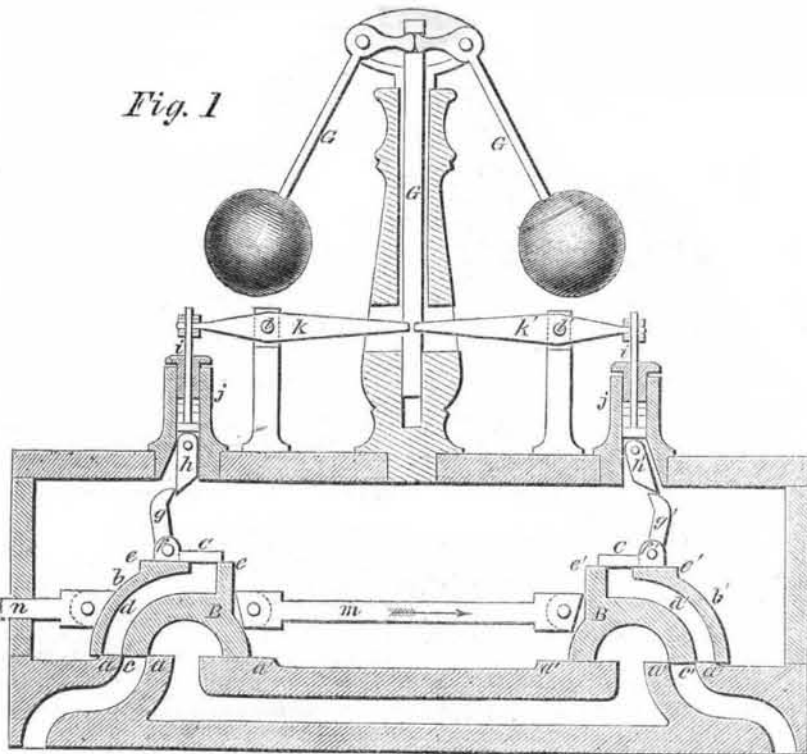
Fig. 2 illustrates another invention, which

consists in so combining the double seated or equilibrium valve with an ordinary slide valve, so as to have it act as a drop valve cut-off, variable in its action, and deriving its motions from the movements of the slide valve. Fig. 3 shows its application to an

horizontal engine, one valve only being shown. *A A* mark the usual induction or steam ports at the ends of the cylinder, and *B B* the exhaust ports. *C C* are the slide valves and *D* the stem, which may pass through the passage in the one valve (Fig.

COLMAN'S IMPROVEMENTS IN CUT-OFFS.

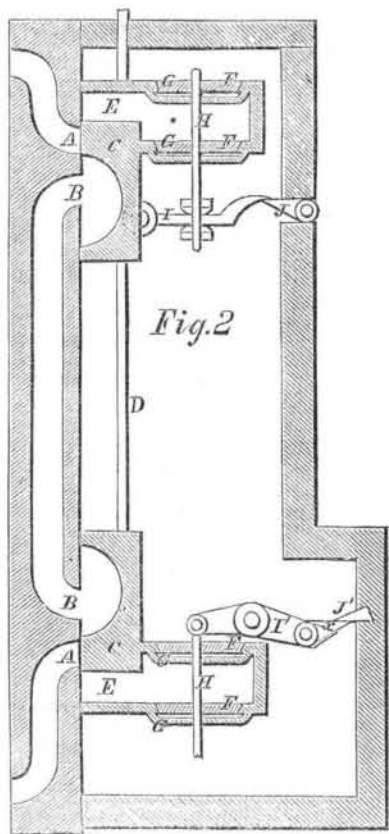
Fig. 1



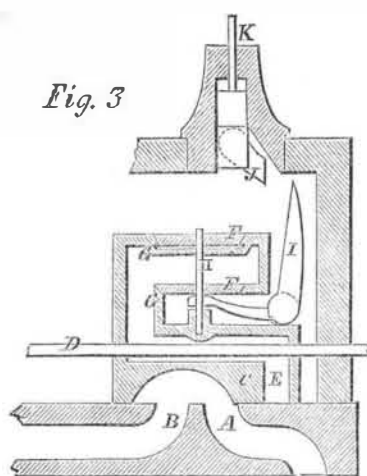
3), or may be attached to the ends of the valves. *E E* are the passages for the steam through the slide valves, *F F* the balanced valves, *G G* their seats, and *H H* their stems. *I*, Fig. 3, are angular forked levers, embracing the drop-valve stems, with their other ends pointing towards toes, *J*, projecting from the top of the valve chest. These toes are jointed to the lower ends of rods, *K*, which pass through stuffing boxes in the steam chest, and

such as will accommodate the invention to vertical engines, and admit of being adjusted by hand or a governor, as in Figs. 1 and 3.

It is evident that the invention is susceptible of being applied to the single or short slide valve, only one drop or balanced valve being used; but the two angular levers will be employed, one for lifting the valves at one end of the cylinder and another for the other end; Both these methods of arranging a cut-off are



they can be operated as in the previous invention. In Fig. 2 the levers, *I I'*, for operating the drop valves, are of different form in order to give the proper motions to the valves, the upper lever, *I*, being nearly straight, and having a bent or curved end toward the upper toe, *J*, and the lower lever, *I'*, having its fulcrum between the stem of the valve and the toe, *J'*; it will be seen that the lower toe, *J'*, is rigid, the end of the lever, *x*, being hinged instead of being rigid, as in the other levers. This change in the levers and toes is



susceptible of great delicacy and accuracy, and are remarkable for their ingenuity and simplicity. The last patent is dated April 12, 1859, and the inventor (J. M. Colman, of Milwaukee, Wis.) will be happy to furnish any further information upon being addressed as above.

Sanitary Precautions.

In the height of summer all persons are especially called upon to look around their dwellings and consider whether there is not something unfriendly to health that might and ought to be removed without delay. Constant attention is requisite that nothing offensive be suffered to remain within doors. Liquor in which vegetables have been boiled, soap-suds, dirty water of every kind should be immediately thrown away; also cabbage-stalks, potato-peelings, and offal of every kind. The liquor in which greens have been boiled, if suffered to remain even a few minutes, or thrown down a scullery drain, emits a most unpleasant and unwholesome smell, which pervades the whole house. Many very cleanly people are not attentive to this particular

Among other things that require attention fallen leaves should be frequently swept up and properly disposed of. In-doors every room should be swept and dusted daily, care being taken not merely to make a decent surface but thoroughly to cleanse under beds, drawers tables, and other furniture, and to clean out all closets and lumber holes.

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