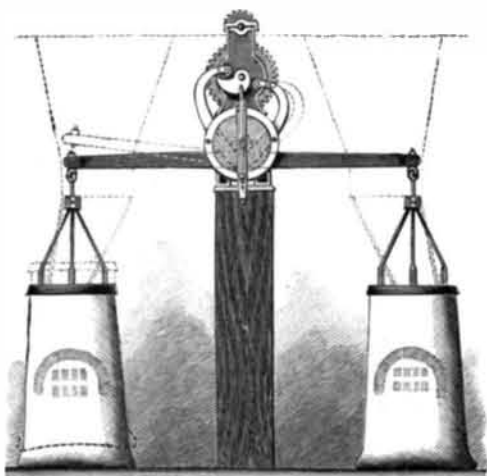


**A MACHINE TO FACILITATE FILLING OF BAGS.**

The filling into bags of granulated sugar, grain, etc., is designed to be efficiently and conveniently effected by the machine shown in the illustration, which has been patented by Mr. Jose R. Mesa, of St. Catalina, Correl Falso, Macuriges, Cuba. Its frame is attached to a post or other suitable support, and has a transverse pivot, on which are fulcrumed oppositely extending levers, the inner ends of which are upwardly curved, and carry at their extremities friction rollers. These rollers are adapted to be engaged by a cam on the front end of a shaft turning in bearings in the frame, and carrying a gear wheel meshing with a pinion on a main driving shaft, whereby the cam imparts a continuous swinging motion to the levers. On the free end of each lever is a bag holder, supported from an eye, and having three outwardly extending arms connected with the inside of a ring, having an outer beveled edge, around which the upper edge of the bag is held by another similarly formed ring, having grooves to accommodate the seam of the bag, the mouth edge of the bag being turned over upon the outside of the outer ring. The bag is filled by a spout, as shown in the dotted lines, or by other



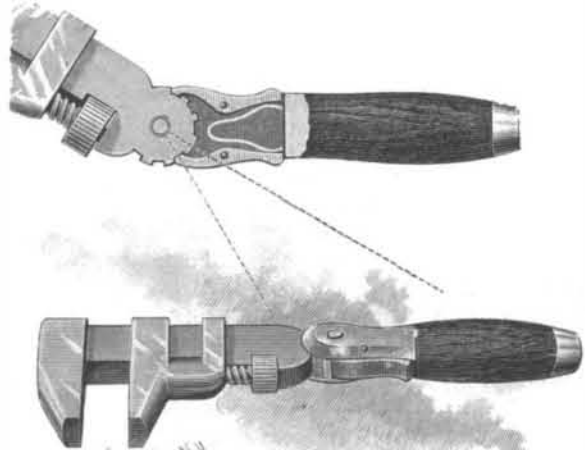
MESA'S PACKING MACHINE.

means, and, as the filling progresses, the bag is constantly swung up and dropped down upon the floor, by the action of the cam upon the levers, whereby the contents are very firmly packed. The bag is readily disconnected from the holder by a slight movement of the outer ring, just before it strikes the floor, and an empty bag is just as readily attached in position to be filled. The motion of the machine and the rate of feed are designed to be so regulated that the bag will be lifted and dropped any desired number of times before being completely filled and detached from the holder. Either of the levers may, if desired, be operated singly.

Further information, relative to this improvement, may be obtained of Mr. Henry Mesa, No. 591 Lexington Avenue, New York City.

**AN IMPROVED WRENCH.**

A wrench, especially adapted for use in cramped, obstructed situations, as in corners and other locations where the space is limited, is shown in the accompanying illustration, and has been patented by Messrs. William F. Parsons and Andrew Davis, of New Kamille, Washington. The handle bar has a fixed and a sliding jaw of the usual form, and the inner end of the bar has a notched curvilinear edge, there being pivoted upon this end two parallel jaws of a grip piece, the intervening slot receiving the curved ratchet head of the handle bar. Two similar, oppositely located locking dogs are pivoted between the jaws, adapted to interlock with



PARSONS &amp; DAVIS' WRENCH.

the notches in the ratchet head, a spring between the limbs of the dogs causing the toes of the latter to simultaneously enter the notches of the ratchet head, and retain the grip piece at any desired point of angular adjustment. The wrench is ordinarily employed in the usual manner; but in use within contracted spaces, as in turning a bolt or nut close to a corner or near a ver-

tical wall, the handle may be swung around, as shown in full and dotted lines in one of the figures, the grip piece being manipulated by pressing in upon the limbs of the dogs, their subsequent release causing the grip piece to be locked at the desired angle to the handle bar.

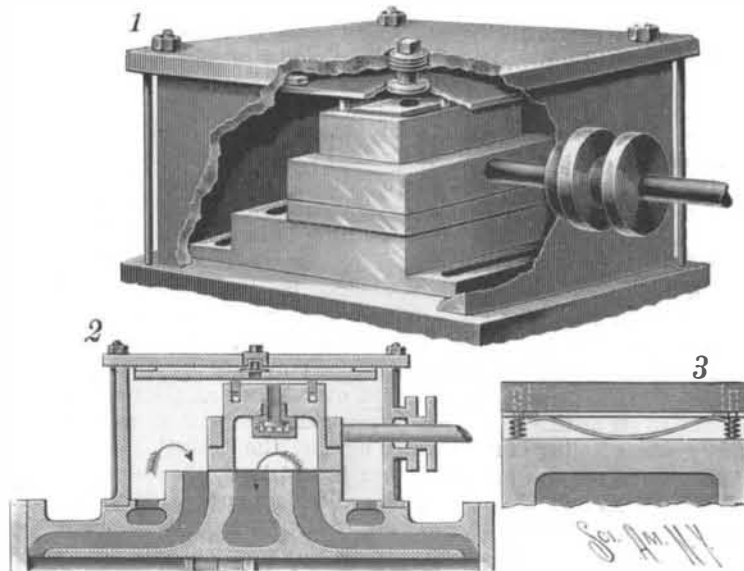
**A BALANCED VALVE FOR STEAM ENGINES.**

The improvement shown in the illustration is designed to render the balancing of the ordinary locomotive slide valve more perfect when the engine is moved by gravity, without steam, as when the locomotive descends a grade with steam shut off from the valve chest. Fig. 1 is a perspective and Fig. 2 a side sectional view of a steam chest in which the valve is provided with this improvement, which forms the subject of a patent issued to Mr. Daniel Kiley, of No. 12 Cooper Street, Brooklyn, N. Y. Under the lid of the steam chest is a pressure plate, held a short distance away from the lid by spacing blocks at each corner, thus affording a small steam space between the lid and plate, which is of less width and length than the inside of the steam chest. There are the usual steam ports and passages, as indicated by the arrows in Fig. 2, but in the top of the valve body are cut grooves near each side and end wall, intersecting each other at the corners to form a rectangular channel all around the top of the body, and in this channel is placed a washer plate of the same shape, there being below the plate, in each side and end channel, a semi-elliptic spring, as shown in Fig. 3, there being also at each corner a pin, around which is held a spiral spring. Upon the washer plate, in each groove, is inserted a joint bar, fitting practically steam tight, but free to slide vertically, the upper sides of the bars having a steam tight engagement with the lower side of the pressure plate, so that a shallow air tight chamber is produced between the plate and the top of the valve between the grooves, which is maintained when the valve is in motion. In connection with this chamber there is centrally formed an aperture in the top wall of the valve, in which is screwed a valve box having a disk valve that closes upwardly, but, when free to do so, drops slightly, opening a passage through lateral holes in the valve box. In the lid of the steam chest is also held a winged valve, sliding above a hole in the pressure plate by the loose engagement of its wings with a cupped recess in a cylindrical plug screwed in the lid, the hole in the pressure plate being thus sealed when the valve is held upon the plate by steam pressure. This winged valve and aperture in the pressure plate may be located at either side of the center, if desired, or anywhere within the air tight space under the pressure plate, and in the plug is located an oil cup or other means of supplying the lubricator required. When the locomotive is using steam and the wing valves close the aperture in the pressure plate, there will be only normal air pressure in the chamber under the plate, but when steam is cut off and the locomotive, in descending a grade, pumps air out of the steam chest, the wing valve is opened and the lower valve is closed by the vacuum. These valves thus allow the vacuum to get hold of the whole top surface of the main valves, the same as an ordinary valve without a balance, and lessen the friction between the joint bars and pressure plate.

**AN IMPROVED ORE WASHING JIGGER.**

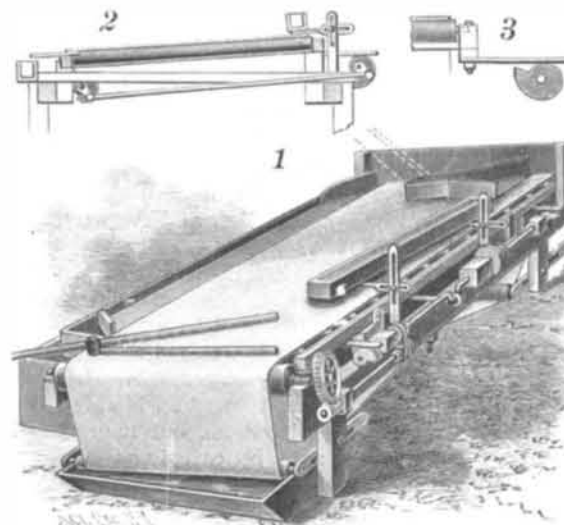
The illustration represents an ore washing machine designed to be simple and durable in construction, and very effective in operation, completely separating the ore from the tailings. It has been patented by Mr. Thomas Rowe, of the East Fork Concentrator, Triumph P. O., Alturas County, Idaho. Upon a suitable frame are blocks, on which rests the jigging frame, supporting transverse rollers over which passes the endless carrier belt, also passing over rollers journaled at the ends of the main frame, one of the latter rollers receiving motion to move the belt. The jigging frame is slightly inclined longitudinally, and is also inclined transversely, the belt being correspondingly inclined in the two directions. After the belt leaves the roller at the high end of the table, toward which its top portion always travels, it passes under a roller in a depositing trough beneath, filled with water or other suitable liquid, and adapted to receive the precious metals separated from the tailings. The belt passes from this trough upward, over an intermediate roller, and thence around an adjustably journaled roller, whereby its tension may be conveniently regulated, before passing over the roller at the other end of the table. On the sides of the jigging frame are transverse strips resting on the tops of cams, as shown in section in Fig. 3, these cams being secured on longitudinal shafts, one of which has a cone pulley connected by belt with a power shaft, while

each of the shafts, one on each side of the machine, has a crank arm, and the crank arms are connected with each other by a link, as shown in Fig. 2, whereby, as the machine is operated, the cams are continuously lifting and suddenly dropping the jigging frame, thereby imparting to it a jigging motion. A belt from the longitudinal shaft rotates a short shaft, on which is a worm in mesh with a worm wheel on one end of the shaft carrying the roller over which the carrier belt passes at the high end of the table, giving a traveling



KILEY'S BALANCED VALVE.

motion to the belt as the jigging frame is operated. At the high side of the frame, but near its lower end, directly over the belt, is the inlet chute, through which the ore is passed on to the belt, a trough to supply water being also adjustably supported at the desired distance above the high side of the belt by means of transversely extending slotted arms connected with vertical slotted posts. One or more perforated water supply pipes also extend over the belt near its high end, for the further washing of the pulp and clearing of the ore. At the low side of the frame is an inclined board discharging the tailings into a longitudinal trough, having a partition near its high end forming a second compartment, the latter discharging into a receptacle, into which some of the heavier tailings are washed, to be treated over again, while at the lower end of the frame is a transverse board to prevent the material flowing off that end of the belt. As the pulp is fed on to the carrier belt against the pitch of the latter, the jigging motion and the flow of water cause the heavier particles to be



ROWE'S ORE WASHING JIGGER.

gradually separated from the tailings as the belt advances, the tailings passing into the trough on the low side. The ore, however, settling upon and adhering to the belt, is carried forward in almost a straight line, adhering to the belt when the latter passes over the roller at the high end, to be washed off and deposited in the settling tank.

**The Language of Monkeys.**

Professor Garner, who has acquired reputation as a student of the monkey language, proposes to visit Africa, with such appliances for a residence among the gorillas as will enable him to become acquainted with their speech, the vocabulary of which is likely to be richer than that of ordinary monkeys. He intends to occupy a large and strong iron cage, in which he can be safe from the attacks of the powerful animals, while he listens to their remarks and preserves them by the phonograph. Professor Garner thinks that he will be able to ascertain the views of leading gorillas with less difficulty and more precision than is possible in the case of some distinguished persons who speak with great facility on topics of vital interest.