H. AIKEN.

PUG-MILL.

No. 181,890. Patented Sept. 5, 1876.

Fig. 1

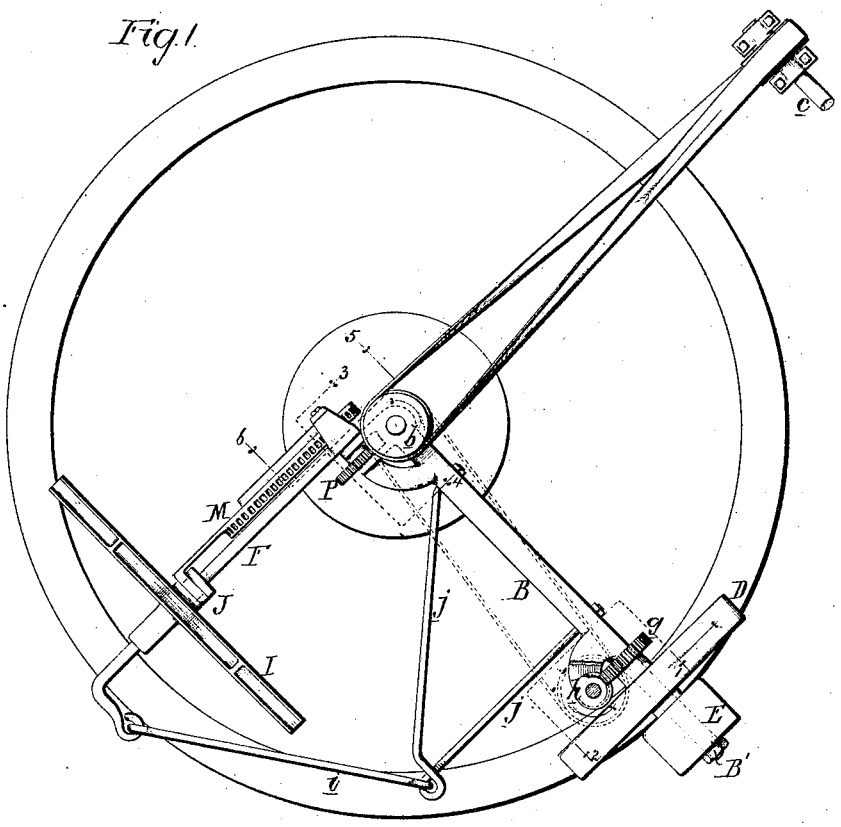


Fig. 3

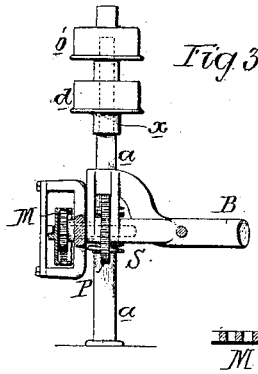


Fig. 4

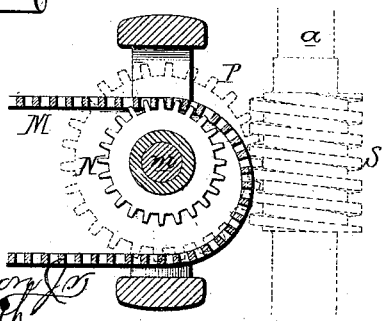
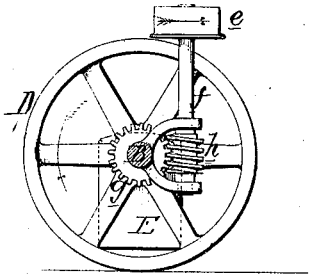


Fig. 2.



Witnesses
Henry Howson
Harry Smith

Henry Aiken
by his Attorneys
Howson and Sons

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HENRY AIKEN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-THIRD OF HIS RIGHT TO WILLIAM H. IRVIN, OF SAME PLACE.

IMPROVEMENT IN PUG-MILLS.

Specification forming part of Letters Patent No. **181,890**, dated September 5, 1876; application filed August 9, 1876.

To all whom it may concern:

Be it known that I, HENRY AIKEN, of Philadelphia, Pennsylvania, have invented certain Improvements in Operating the Tempering-Wheels of Clay-Pits, of which the following is a specification:

My invention relates to improvements in that class of clay-pits in which the tempering-wheel is caused to traverse round the pit by power derived from a stationary engine or other motor; and the main object of my invention is to dispense with complex driving-gearing, and to apply the power more advantageously than usual, a further object being to simplify the devices by which the radial movement of the tempering-wheel on its shaft is effected, and to so construct the same that a vertical movement of the wheel is allowed without danger of throwing the operating mechanism out of gear. These objects I attain in the manner which I will now proceed to describe, reference being had to the accompanying drawing, in which—

Figure 1 is a plan view of a clay-pit with my improvements; and Figs. 2, 3, and 4, sections on the lines 1 2, 3 4, and 5 6, Fig. 1, respectively.

A is the pit, in the center of which is a vertical post or standard, *a*, and to the top of the latter is adapted a loose sleeve, *x*, carrying two pulleys, *b* and *d*, the former of which receives power from any adjacent shaft—for instance, that shown at *c*—while the pulley *d* transmits this power, by means of a suitable belt, to a pulley, *e*, carried by a vertical shaft, *f*, adapted to bearings at the outer end of a radial arm, B, the inner end of which turns on the central post *a*. From the outer end of the arm B projects a short shaft, B′, carrying a loose traction-wheel, D, the periphery of which is adapted to the rim of the pit, and a worm-wheel, *g*, on the hub of the traction-wheel gears into a worm, *h*, on the shaft *f*. (See Fig. 2.) For the sake of economy, I prefer to make the wheel D comparatively light, and to increase its traction power by hanging upon the outer end of its shaft a box of clay or other cheap weight, E. The arm B is connected to the outer end of the shaft F, which carries the tempering-wheel I, by means of the link *i* and rods *j j*, and the said tempering-wheel is hung to, or forms part of, a sleeve, J, so adapted to the shaft F that it can be moved from or toward the center of the pit, this movement being effected, as usual, by means of the double rack M and pinion N, Fig. 4, the direction of the movement depending upon whether the upper or lower rack is in gear with the pinion. Instead of rotating the pinion N from a central shaft by means of spur-gearing, as usual, however, I secure it to one end of a spindle, *m*, adapted to bearings at the inner end of the arm B, and carrying, near its opposite end, a worm-wheel, P, the teeth of which engage with a worm, S, secured to the stem *a*. (See Fig. 3, and dotted lines, Fig. 4.)

When power is applied to the shaft *f* at the outer end of the arm B, the traction-wheel D is caused to revolve, and travels round the rim of the pit, carrying with it the arm B, and consequently the shaft F and tempering-wheel I, while at the same time the movement of the worm-wheel P around the worm S on the central stem *a* causes the rotation of said worm-wheel and the operation of the mechanism which effects the radial movement of the tempering-wheel.

It will be evident that by the above-described arrangement the power required to effect the movement of the tempering-wheel is applied more directly, and with less loss by friction, than when this power is applied to the inner end of the tempering-wheel arm by means of gearing from a central rotating shaft, while the use of the simple traction-wheel D at the edge of the pit obviates the necessity of locating costly and inconvenient mechanism at this point.

By the use of the fixed worm S on the stem *a*, and the worm-wheel P carried by the arm B, the said wheel P can be caused to revolve at the required speed without the intervention of the usual system of gearing, which is complicated and expensive, and causes loss of power by friction.

It will be observed in Figs. 1, 3, and 4 that the inner end of the shaft F is pivoted to the shaft *m*, which carries the pinion N for operating the rack M, so that when the tempering-wheel rises or falls, owing to inequalities in

the bottom of the pit, the center of movement will be at the shaft *m*, thus preventing the risk of throwing the rack out of gear with the pinion, which this movement causes in machines of this class as usually constructed.

It is not absolutely necessary in carrying out my invention that both the arm B and shaft F should be used. For instance, the traction-wheel and its operating devices might be carried by the end of said shaft F, the belt which transmits power from the pulley *d* to the pulley *e* in such case being arranged at such a height that it will not interfere with the tempering-wheel I.

I claim as my invention—

1. The combination of the tempering-wheel I, hung to a radial shaft, with a traction-wheel, D, arranged to traverse in a circle outside the tempering-pit, and with mechanism whereby motion is communicated to the said traction-wheel from the center of the pit, all substantially as set forth.

2. The combination of the arm B and its traction-wheel D with the shaft F and its tempering-wheel I, and with devices, substantially as described, by which the two are connected together, as set forth.

3. The combination of the fixed worm S on the stationary stem *a* with the tempering-wheel I on the radial arm or shaft, and with devices through the medium of which the said worm is caused to slide the said tempering-wheel radially, as set forth.

4. A clay-pit in which the arm carrying the tempering-wheel is pivoted at a point in line with the center of the pinion which imparts radial movement to the tempering-wheel, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY AIKEN.

Witnesses:
HENRY HOWSON, Jr.,
HARRY SMITH.