W. I. TATE.

PRESS.

No. 108,208. Patented Oct. 11, 1870.

Fig. 1.

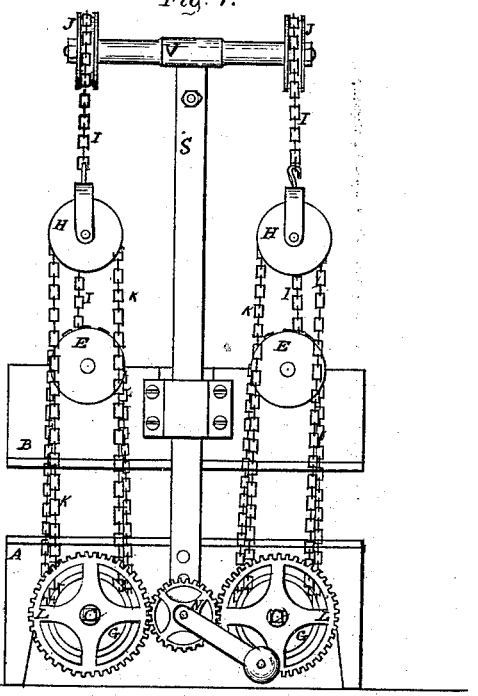


Fig. 3.

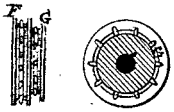
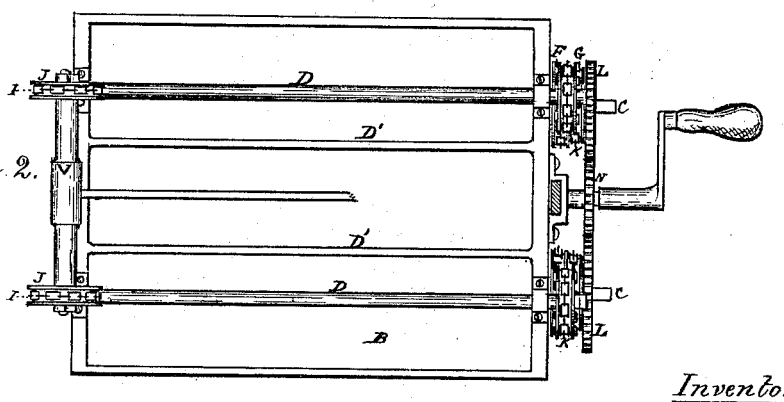


Fig. 2.



Witnesses:

Wm Dennis

Wm. H. Dennis.

Inventor:

William I. Tate.

By his Atty. J. Dennis Jr.

United States Patent Office.

WILLIAM I. TATE, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO HIMSELF AND HENRY R. MITCHELL, OF SAME PLACE.

Letters Patent No. 108,208, dated October 11, 1870.

IMPROVEMENT IN PRESSES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, WILLIAM I. TATE, of Philadelphia city and county, in the State of Pennsylvania, have invented certain new and useful Improvements in Presses; and I hereby declare the following to be a full and exact description thereof, reference being had to the accompanying drawing forming part of this specification.

The nature or essence of my invention consists in constructing a press in which the compressing force is applied by means of pulleys of different diameters, known as differential pulleys, and also in a particular combination and arrangement of pulleys, chains, and gears, for the convenient and effective operation of the press, as will be fully set forth below.

In the drawing hereinbefore mentioned—

Figure 1 is an elevation of an end of one of my improved presses;

Figure 2, a plan or top view, with the top frame left off at one end; and

Figure 3 is an edge and sectional view of the differential pulley.

A is the bed of the press, and

B, the follower.

These may be made of cast-iron, in box form, as shown, and strengthened by flanges or divisions D', or otherwise, as may be preferred.

To draw the follower down toward the bed, and produce such an amount of pressure upon the substance placed between them as may be required, I place in the bed A the shafts C, and in the follower B the shafts D, these shafts all having proper journals, to turn in boxes provided for them, in the bed and follower respectively.

Upon the ends of the shafts D I fasten the pulleys E, and upon the shafts C, the larger pulleys F, and also the smaller pulleys G, thus forming differential pulleys. (See fig. 3.)

The pulleys H are suspended on the chains I, which pass over the fixed pulleys J, and are fastened to the follower B.

Each of the endless chains K passes over the pulley E, then down under the larger pulley F, then up over the suspended pulley H, then down under the smaller pulley G, and up to the pulley E again, where we began to trace its course.

The pulleys F and G are provided with projections or teeth, shown in fig. 3, which take into the links of the chains K, and prevent their sliding on these pulleys.

The gears L, fastened on the shafts C, are turned by the pinion N, which may be operated by a crank and hand-power, or by any other motive force adapted to such a purpose.

Operation.

Motion being given to the shafts C and the pulleys fastened thereon, the chain K is delivered by the small pulley G, passes up over the pulley E, and is taken up by the larger pulley F; but as the pulleys G and F are fastened on the same shaft and turn together, it is evident that the chain will be taken up by the pulley of larger circumference somewhat faster than it is delivered by the smaller one, and that, consequently, the loop or bite, passing over the pulley E, will be continually shortened by this operation. The follower B will, therefore, be drawn down toward the bed A, and the compressing force thus produced, by the application of a given motive power, will be inversely proportionate to the difference between the diameters of the pulleys F and G; moreover, the force obtained directly from the action of the differential pulleys is doubled (theoretically) by the use of the movable pulleys E.

To turn the follower up again, it is only necessary to reverse the motion; and it will be seen that if, in that case, the crank be transferred to one of the shafts C, a much more rapid motion may be given to the follower, the crank being then turned in the same direction as before instead of backward.

The opposite end of the press to that presented in the drawing is precisely similar to the front end, excepting the gears and pinion; the shafts C extending through the bed, so as to carry the pulleys on that end, those parts are not required there.

When the loops of the chains K, passing over the pulleys E, are shortened or lengthened, the opposite change will, of course, take place in the slack loops passing over the pulleys H, and the rise and fall of the follower will accordingly let this latter loop down or take up the slack, as in each case required, by means of the chains I, passing over the pulleys J.

In many cases the posts S and cross-bars V may be dispensed with, and the pulleys J suspended from the floor-joists or other fixtures at the top of the room where the press is used.

These presses can be very cheaply constructed, and are very durable, portable, and easy to operate; and I contemplate providing them with boxes and all other needful appendages to adapt them to the compression of cotton, hay, and every other kind of product or material to which they are capable of being applied.

It is evident that no specific number of sets of pulleys is required for the construction of a press, but that either four or more, or fewer, may be employed, as preferred.

For pins on the pulley-wheels, to hold the chain,

projections or ribs on the wheel, to fit between the links, may be substituted.

The foregoing being a description of my improvements in presses,

What I claim, and desire to secure by Letters Patent, is—

1. The combination, with a bed, A, shafts C and D, and follower B, of the pulleys E, F, and G, and the chain K, all constructed and arranged substantially as and for the purpose specified.

2. In combination with the pulleys E, F, and G, and the chain K, the pulleys H and J, and the chain or cord I, arranged to operate substantially as described.

3. In combination with the pulleys E, F, and G, and the chain K, the gears L and pinion N, for operating the same, substantially as described.

WM. I. TATE.

Witnesses:

MICHAEL QUIRK,

JOS. A. CALVERT.