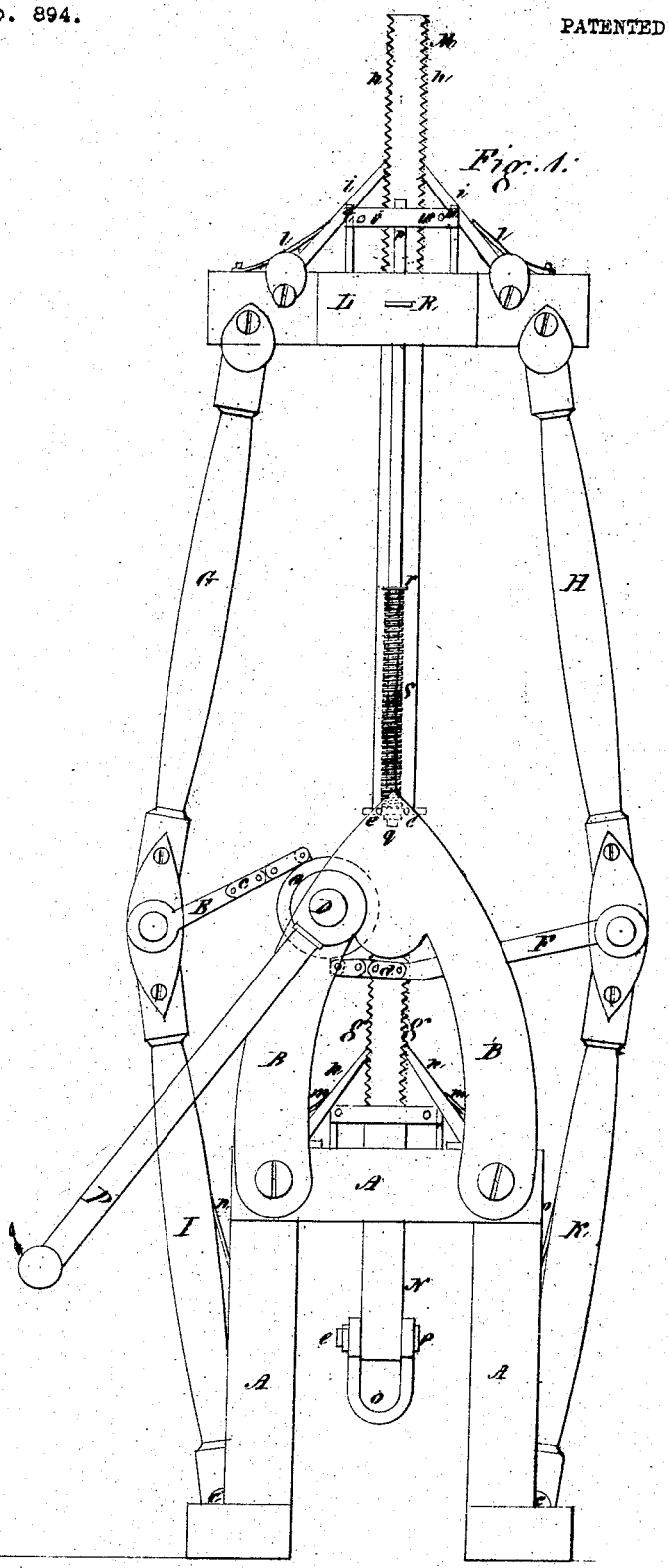
G. KILBURN.
MACHINERY FOR RAISING HEAVY BODIES.

No. 894. PATENTED AUGUST 25, 1838.

Fig. 1.



Only part of Drawing Accessible 1914.

UNITED STATES PATENT OFFICE.

GEO. KILBURN, OF WALPOLE, NEW HAMPSHIRE.

MACHINERY FOR RAISING HEAVY BODIES.

Specification of Letters Patent No. 894, dated August 25, 1838.

To all whom it may concern:

Be it known that I, GEORGE KILBURN, of Walpole, county of Cheshire, and State of New Hampshire, have invented new and useful improvements in machinery, to be applied to raising heavy bodies of various descriptions and to such other purposes in which the same may be successfully used, such as pressing substances, &c.

These improvements, the principles thereof, the application of said principles by which the same may be distinguished from other inventions, the manner of using the same, together with such parts, improvements, or combinations, I claim to be my invention and hold to be original and new, I have hereinafter set forth and described. which description, taken in connection with the accompanying drawings, herein referred to, composes my specification.

Figures 1, 2, 3, Plates 1 and 2, represent my improved machinery, Fig. 1 being an elevation of one side; Fig. 2 a detailed view of some of the parts on the opposite side; and Fig. 3, an end view.

A A A, represents in Figs. 1 and 3 a strong frame of wood, iron, or other suitable material, shaped as seen in the drawings, or otherwise properly formed. To this frame, is connected a second frame or two standards B, B, of wood, iron, or other metal, answering the intended purpose, the said standards being connected together at their upper parts, by a cross bar or shelf C, C, 1, 2, 3.

A horizontal shaft D, is supported in suitable bearings or boxes, attached to the standards B, B, Fig. 3. On this shaft are two metallic pulleys or cams *a*, *b*, to the circumferences of which chain belts *c*, *d*, are attached at an extremity of each, as represented in the drawings. The opposite links of the chain belts connect with arms, or pitmen E, F, whose other extremities are attached to, and swivel on the center pins *b*, *b*, of a system of progressive levers, or toggle joints G, H, I, K. The lower ends of the toggles I K rest, and move in step pins *c'*, *c'*, or other suitable bearings. The upper ends of the toggles G H, also rest and move in a similar manner on step pins on bearings, near the extremities of a beam or bar L, of wood or metal.

M, N, is a square or other proper shaped metallic bar in the central part of the machinery, the same passing and moving freely through slots in the beam L, cross bar or shelf *c*, *c*, and top beam of the frame work A, A. To the lower extremity of the bar M N, an eye *o*, is attached by a bolt *e f*. To this eye, the body to be raised, may be connected in any convenient manner. The bar M N, has teeth *g*, *g*, *h*, *h*, of a proper shape, formed on two opposite sides, as seen in Figs. 1, 2, 3.

i, *i*, *k*, *k*, are sets of pawls vibrating in step pins, or proper joints, at their lower extremities, and pressed inward toward the bar M N, by springs *l*, *l*, *m*, *m*, placed and acting on them, as seen in the drawings; or instead of these springs the object of pressing these pawl toward the bar M N, may be attained by any other suitable system of springs applied to the same.

P, Figs. 1, 2, is a pendulum handle or rod, attached to the end of the shaft D. By raising the handle P, and of course turning the shaft D, attached thereto, the toggle joints G I, H K, are drawn into straight lines with each other, and thus lift, or push upward, the beam L. When the handle P, is lowered, the springs *n*, *o*, press outward the toggle joints, and thus cause them to come into angular directions with each other, and lower the beam L, again to its original position. By this alternate action of the toggle joints, the bar M, N, and any heavy body attached to the eye *o*, are raised or lowered at pleasure. This operation is effected by the action of the pawls *i*, *i*, *k*, *k*, and may be described as follows.

The ends of the pawls in contact with the bar M N, are notched, or have teeth formed on them to correspond with, and enter into, the interstices between the teeth *h*, *h*, *g*, *g*. As these pawls are always kept in contact, or pressed against the bar M N, when the toggles lift or push upward the beam L, by the springs *l*, *l*, *m*, *m*, the bar M N, is thus raised with the beam L, by the action of the toggle joints. During the above operations the ends of the pawls *k*, *k*, slide over the teeth *g*, *g*, and retain the bar M, N, at the height gained. As the toggles are pressed outward by the springs *n*, *o*, during the downward movement of the handle P, the ends of the pawls *i*, *i*, in their turn, slide over the teeth *h*, *h*, during the downward motion of the beam L, and thus when the beam L, is next raised by the toggles, act

again on the bar M N, as before. The operation of lowering the bar M N, is thus effected.

R is a clamping screw, which confines a rod p, q, in the position denoted in the drawing. The rod p, q, has a spring s, wound around it, the same being confined at its upper extremity, by a pin or shoulder r, and resting at its lower end on the top of the shelf c, c, Fig. 1. On the top of the rod p q, is a cross piece t u, having two pins v, w, see Fig. 2, projecting at right angles therefrom, and extending under the pawls i, i. By loosening the clamp screw R, the rod p q, rises so that the pins v, w, are pressed or raised up by the springs, against the pawls i, i; the said pawls being held in position, or against the bar M N, by the weight of said bar, and heavy body attached to the same. On the opposite side of the bar M N, is another rod x y, see Fig. 2. This rod at top, enters into the lower side of the head piece L, and is loose therein, the top of the rod while the bar M N, is being lowered generally resting or bearing against the top of the cylindrical hole, as seen at z, Fig. 2. A cross piece a' b', spring x', pins e', e', Fig. 1, and clamp screw d', are attached to the rod x y, similar to those before described, as connected to the rod p q. The object of the clamp screws R, and d', is to confine the cross bars t u, a' b', in their lowest positions, while the operation of raising the bar M N, is going on; or in other words, to throw off the action of the projections v, w, e', e', from the pawls.

f f, g' g' are guides for steadying the motion of the rods p q, x y. By lowering the clamp screws d', R, the springs press the projections e', e', v, w, against the under side of the pawls i, i, k, k. When the toggles are brought in a straight line with each other, the upper pawls z', z', engage with the bar M N, the lower pawls at the same time being pressed away from the teeth g g, by the spring x', which rises with the head L. Then as the toggles recede, they bring down, the cross head L, and the bar M, N, a short distance. The rod x y, is also borne down at the same time, pressing down the cross piece a' b', with the projections e' e; so as to allow the ends of the lower pawls k k, to enter the teeth, and retain or catch the bar M N, just before the pawls i, i, by bearing on the projections v, w, spring outward from the teeth h, h. Then as the toggles are brought to their upright positions again, the upper pawls i, i, slide over the projections v, w, and enter the next succeeding notches or teeth, just before the lower pawls k, k, by the action of the spring x', are thrown out from the teeth g, g. Furthermore, as the toggles recede, the bar M N, is lowered again, a little, and so on until the operation is completed. If the same should be desired, another series of toggle joints with rising head bar and pawls, may be placed on the two other opposite sides of the machine, these to raise the bar M N, when the pendulum handle descends, so that at each vibration of the handle, the bar M N, may be raised or lowered. Or, if it should be preferred, to place the second series of toggle joints outside of the first, or on the same opposite sides of the frame A, A, the same can easily be accomplished.

Instead of a bar M N, as above represented and described with teeth, a chain properly constructed may be substituted therefor, and in many instances this will be found preferable. Instead of the pendulum handle attached to the shaft D, a crank or other proper machinery may be applied to give the shaft a rotary motion. And in order to cause it to operate on the toggle joints it may have bell cranks, cams or other suitable apparatus, which, by steam or other proper power applied to the shaft shall cause the toggles to advance and recede as before mentioned. The machine may also be applied to pressing substances—a piston or follower being fixed to the end of the bar M, N, working in a cylinder or box containing the substance to be pressed.

Having hereinabove explained my improvements I shall claim in the same as follows:

1. The combination and arrangements of machinery substantially as set forth and described to operate together and for the purposes before mentioned,—that is to say, the application of the toggle joints pawls and other machinery to the bar M N, to operate on the same as I have particularly described.

2. I also claim the application of the machinery that is connected to the pawls for producing the downward motion of the bar F which as before described was represented as similar to that above explained and seen in Figs. 1, 2, 3. The application of pawls on opposite sides of a toothed rack or bar, to operate on said bar so as to raise or lower the same by the aid or action of toggle joints in the various ways I have heretofore described, for raising weights or pressing substances.

In testimony that the above is a true description of my said invention and improvements, I have hereto set my hand this twelfth day of July, in the year eighteen hundred and thirty eight.

GEORGE KILBURN.

Witnesses:
R. H. Eddy,
John Noble.