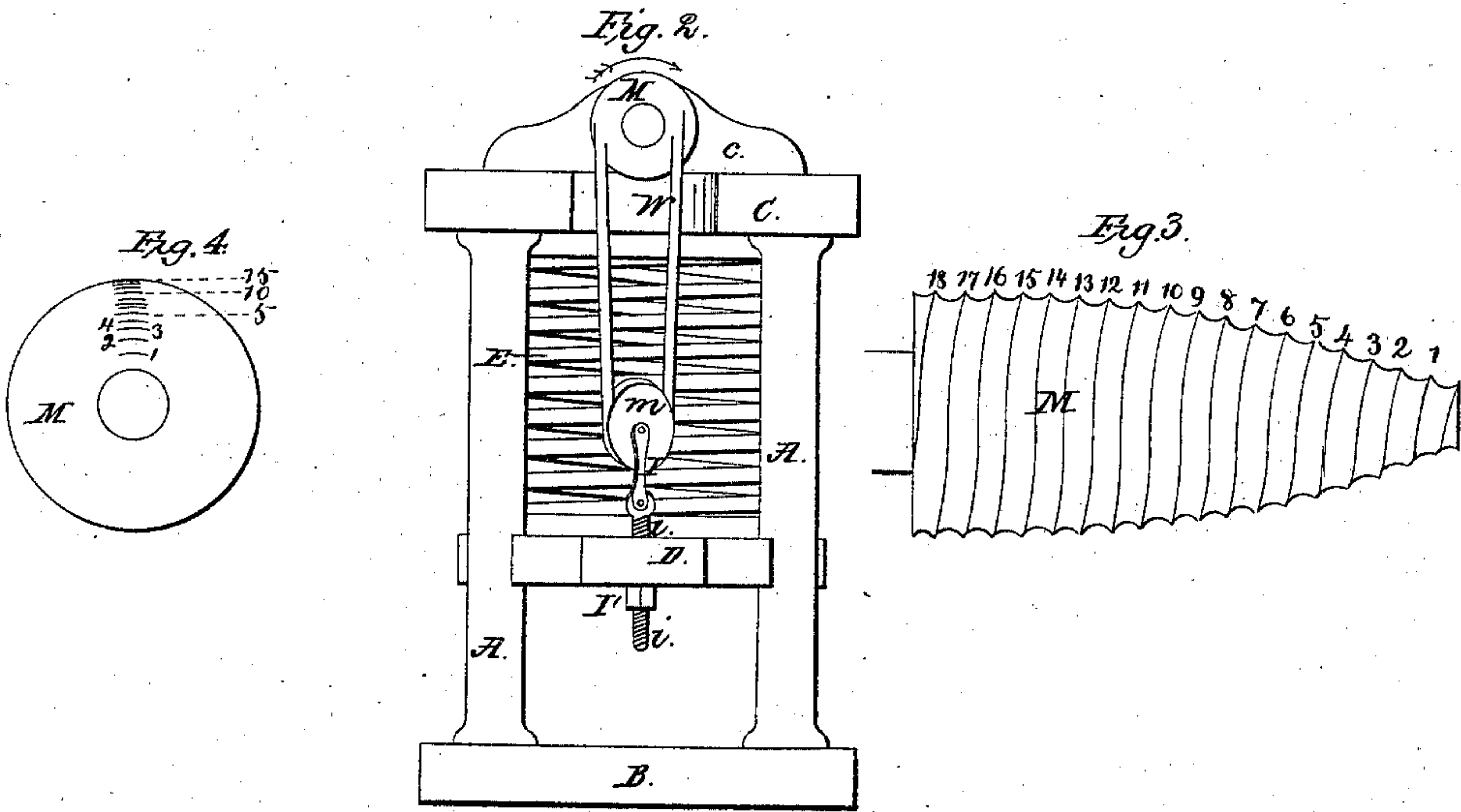
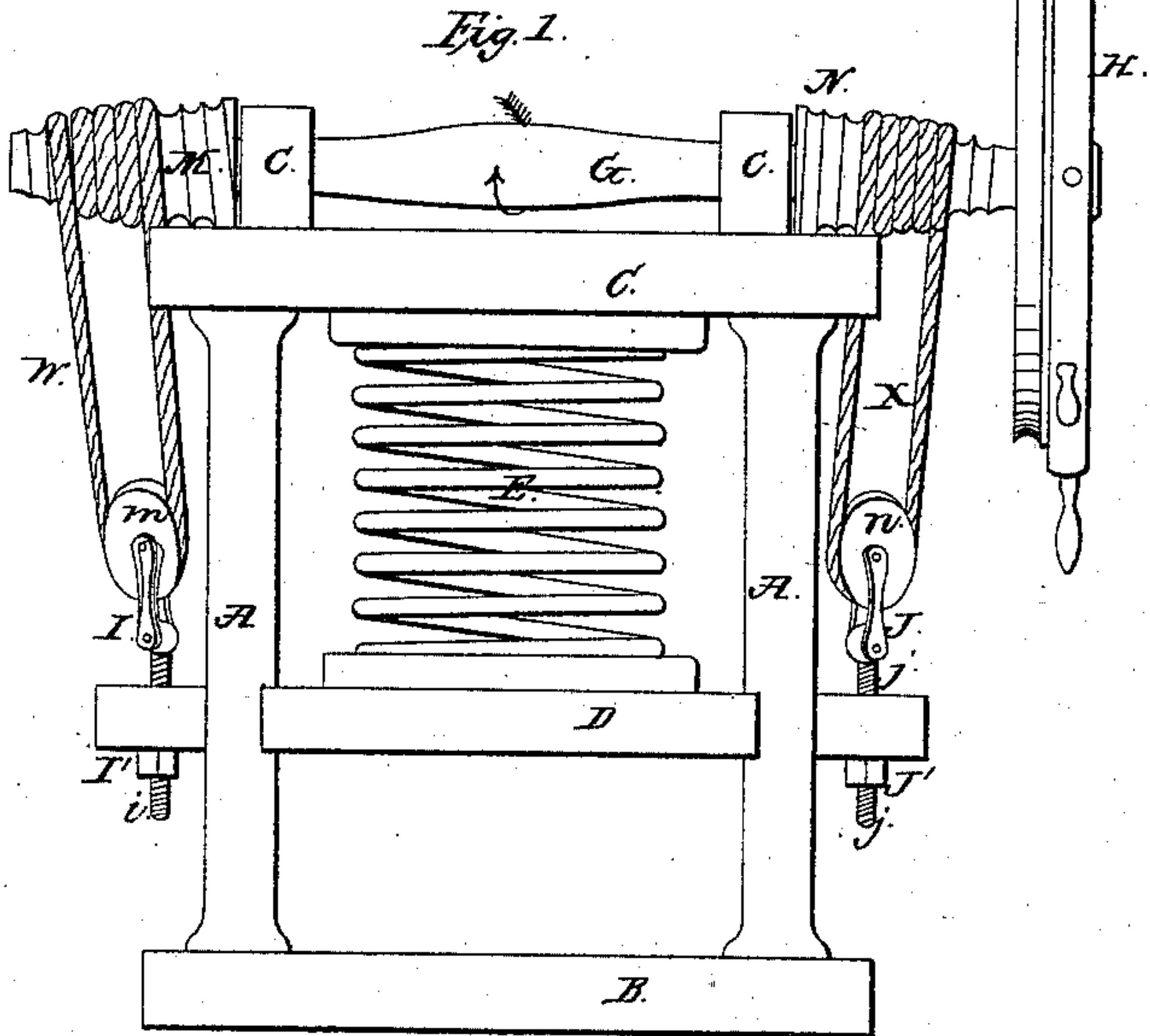


*J. Christison,
Cotton Press.*

N^o 39885.

Patented Sep. 15, 1863.



Witnesses:

My Thomas L. Nelson
D. W. Stinson

Inventor:

James Christison

UNITED STATES PATENT OFFICE.

JAMES CHRISTISON, OF NEW YORK, N. Y.

IMPROVEMENT IN PRESSES.

Specification forming part of Letters Patent No. 39,885, dated September 15, 1863.

To all whom it may concern:

Be it known that I, JAMES CHRISTISON, of the city and county of New York, in the State of New York, have invented a certain new and useful Improvement in Presses; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

Figure 1 is a side elevation, and Fig. 2 is an end elevation, of a press constructed according to my invention. Fig. 3 is a side elevation of a part on a larger scale, and Fig. 4 is a diagram intended to represent part of an end elevation corresponding to Fig. 3.

Similar letters of reference indicate like parts in all the figures.

It is well known in the arts that if a rope or chain is let off from a part of any given diameter and wound with an equal angular velocity upon a part of a greater diameter such rope or chain will be gradually absorbed or accumulated upon the windlass, and the portion which is left free will be contracted with immense force. This law lies at the foundation of my invention, which consists in the application thereof to presses with certain modifications to adapt it specially thereto. The modification lies in making the windlass or windlasses tapering, so as to allow the "purchase" or mechanical advantage to be varied to suit the variations in the resistance as the work proceeds.

My invention may be applied to all presses whether for the compression of cotton, hay, or other material, and may be operated by any kind of power. It is more especially adapted, however, to be used in cheap presses. It may be constructed almost entirely of wood, if desired, and the cordage and pulleys employed may be very readily disconnected and stored under cover when the press is not in use.

To enable others skilled in the arts to which this is most nearly allied to make and use my invention, I will proceed to describe its construction and operation by the aid of the drawings and of the letters of reference marked thereon.

A A are posts which support and connect the fixed parts B and C. These parts, as also the platen or movable platform D, are arranged in the ordinary manner, and may be open, as represented, or may be boxed and

provided with one or more doors, &c., as preferred. The stout movable platform D is supported laterally by the posts A, and is thereby guided as it moves up and down during the working of the mechanism.

E represents the bale of hay or the resisting mass of whatever character which is to be compressed.

In the drawings, E is a powerful coiled spring, and the useful work which the press is now prepared to accomplish is to effect the compression of this spring, to allow it to be introduced under a railroad-car or wherever else it may be required to be used in a compressed condition.

M and N are tapering windlasses, fixed on a single stout shaft, G, so that they taper in opposite directions. Each is an exact counterpart to the other, and is finished with a spiral groove, adapted to receive a strong rope or chain, as represented. The shaft G is mounted in suitable bearings, *c c*, on the fixed framework, and is provided with a wheel, H, which is adapted to receive motion from the hands of the operator or from any other power, either directly or through the aid of machinery of any ordinary character. An endless screw, for example, may be fitted to give motion to the worm-wheel *h*, which is bolted upon or forms a part of H, and such endless screw (not represented) may be thrown into and out of gear at pleasure, according to the power at command, the amount of resistance, &c.

W is a stout rope of a proper length, having its ends spliced together. It is rove through the block or pulley *m* and coiled several times around the tapering windlass M. The block *m* is connected by a clevis or strap, I, to a staple or bolt, *i*, which passes through one end of the movable platform D, and may be adjusted therein by turning a nut, I', as represented.

X is a rope similarly coiled on the opposite tapering windlass, N, and similarly rove through the block *n*, which latter is similarly connected to the end of platform D opposite to the block *m* by means of a clevis, J, staple or bolt *j*, and nut J'. The form which I give to the tapering windlasses M and N is not a uniform taper. The portion near the small end of each is a frustum of a cone, in which the diameter is greater in proportion to its length than the cone of which the portion near

the large end is a frustum; or, in more common language, my taper is swelled, so that it tapers faster near the small end than near the large end.

The operation is as follows: The hay, cotton, crushed apples, or whatever else is to be compressed being properly in place on the platform D, and the ropes *m* and *n* being coiled on the small end of the corresponding tapering windlasses, and the nuts I' and J' adjusted to take up the slack as nearly as may be, I apply the power of steam or horse or of the hands to turn the shaft G through the aid of the wheel H. I turn in the direction indicated by the red arrow, and the first effect is to overhaul the ropes M and N, running each through its respective pulley and transferring it gradually from the small end of the windlass toward the larger end. Each revolution of the wheel H, and consequently of the tapering windlasses, lets off a coil from the windlass and winds on a coil at the same time on the same windlass, but on a different part thereof. The part which winds on the rope, being larger than that which lets off the rope the effect is to raise the platform D and compress the material E.

The tapering of the windlass or windlasses in my press I esteem a vitally essential feature of my invention.

I do not confine myself to the precise form of the parts shown in Figs. 3 and 4; but that form or one in which the taper is much greater at the small end than at and near the large end should be given it under all ordinary conditions. I can make it uniformly tapered if it is for any reason desirable, or I can, if preferred, give it a hollowed form, by which I mean a form increasing in size more rapidly near its large end than near its small end; but I should use such forms only in connection with some peculiar power or for some unusual purpose. The effect of the form represented is to raise the platform D rapidly and with moderate force at the commencement, when the resistance is slight, and to raise it more slowly and with greater force as the degree of compression of E increases. I can, by making the largest end of M and N almost perfectly cylindrical for some distance, increase the mechanical force of the power applied on the wheel H, almost infinitely, and this great increase may, by my invention, be applied either near the end of the action, as required in ordinary compression of hay, &c., or at the commencement or middle, as might be required in crushing some obstinate material which yields more readily after it is broken and the crushing has commenced than before, and I can produce this nice adjustment of the force to the end desired by simply giving the proper variation to the taper of the parts M and N. Any mechanic of skill will find no difficulty in calculating the proportions to any resistance, and the adjustment by

the bolts *ij* and the nuts I' J', or their equivalents, may be readily extended to any length required, so as to readily give the maximum purchase or advantage at the right moment, or when the press has contracted to the proper extent.

In addition to the variation of purchase attainable by giving irregular tapers, as described, the taper form of my windlasses, as distinguished from the two cylinders of unequal diameters previously known and used for purposes somewhat analogous, affords a very important advantage in another respect. This is a variation in the effect due to a change in the adjustment of the rope. If I coil the rope four and a half times around my tapering windlass, as represented, my press will operate with a certain speed, and with a certain inversely-corresponding mechanical advantage or purchase. Now, if I readjust the same rope, or apply another, which shall be coiled but three and a half, two and a half, one and a half, or, as an extreme case, only one-half around, or, in other words, simply hung upon the tapering windlass, the velocity and the purchase with which the press will operate will be very greatly changed. In the last case it will raise the platform D much slower and with much greater purchase than in any of the other cases. This is apparent on considering that the action of the press is due to the difference in diameter of the tapering windlass between the part where it is coiled on and the part where it is let off, and the purchase is inversely as such difference. If these points are widely removed by the presence of several coils of rope between, the action will be rapid and weak; if there are few or no coils between, the action will be slow and the multiplication in the intensity of the force much greater. By making the adjustment sufficient, the same rope may be used for all these conditions; but I prefer using a different rope or chain for each arrangement.

In those forms of press in which a lever is used to communicate the force to the platform D, or its equivalent, one tapering windlass and one rope and pulley might serve as well as two. I do not limit myself to any particular number, but,

Having now fully described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

The use, in presses, of the tapering windlass M, arranged to operate in combination with the rope W and block *m*, or their respective equivalents, so that the rope or chain W shall be simultaneously wound on and let off, in the manner and for the purpose herein set forth.

JAMES CHRISTISON.

Witnesses:

THOMAS D. STETSON,
D. W. STETSON.