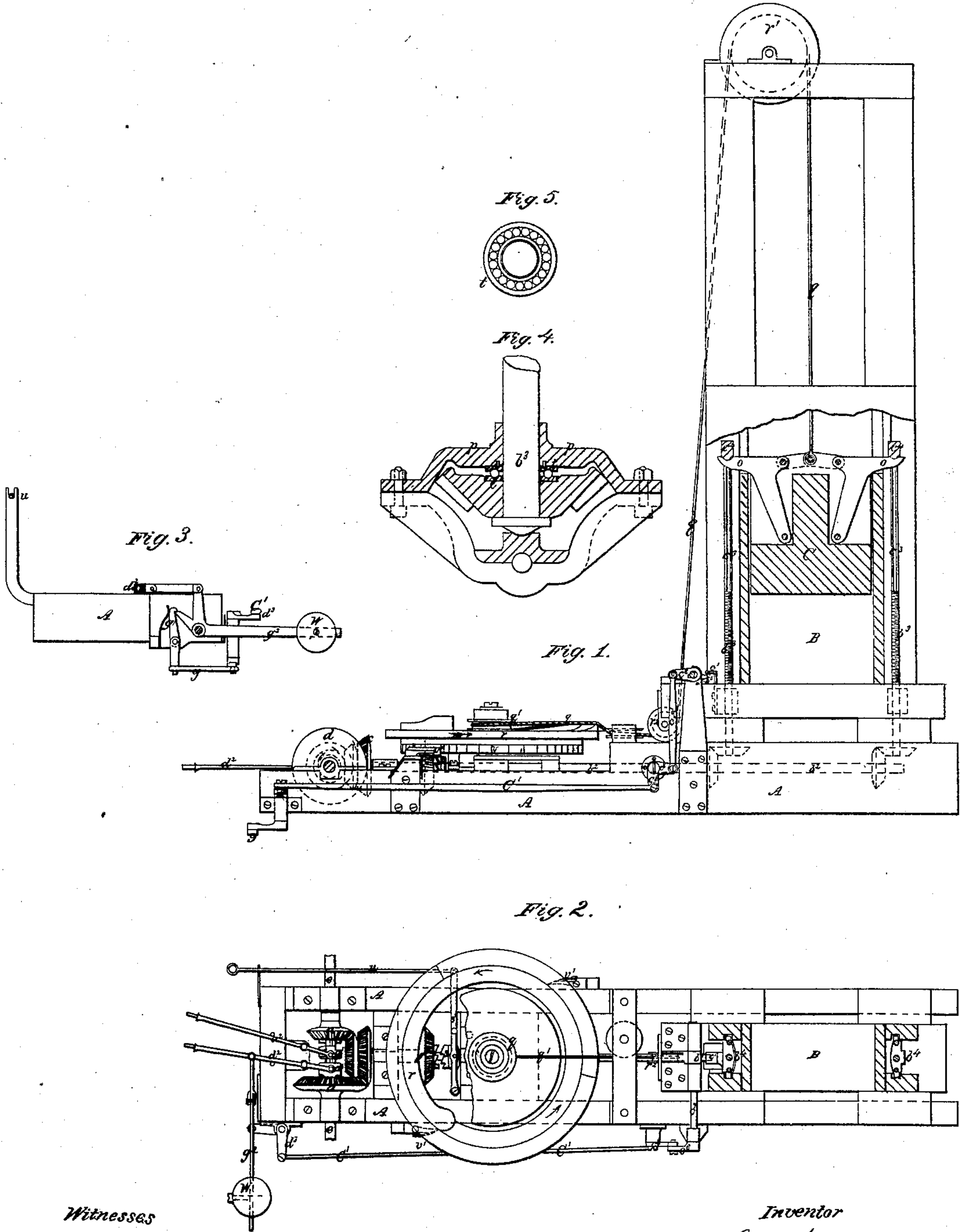


Sheet 1-2 Sheets.

C. Nelson,
Hay Press,

No 55,779,

Patented June 19, 1866.



Witnesses
R. T. Campbell
Edw. Schaefer

Inventor
Chas. Nelson
by his Atty
Mason, Parich & Co.

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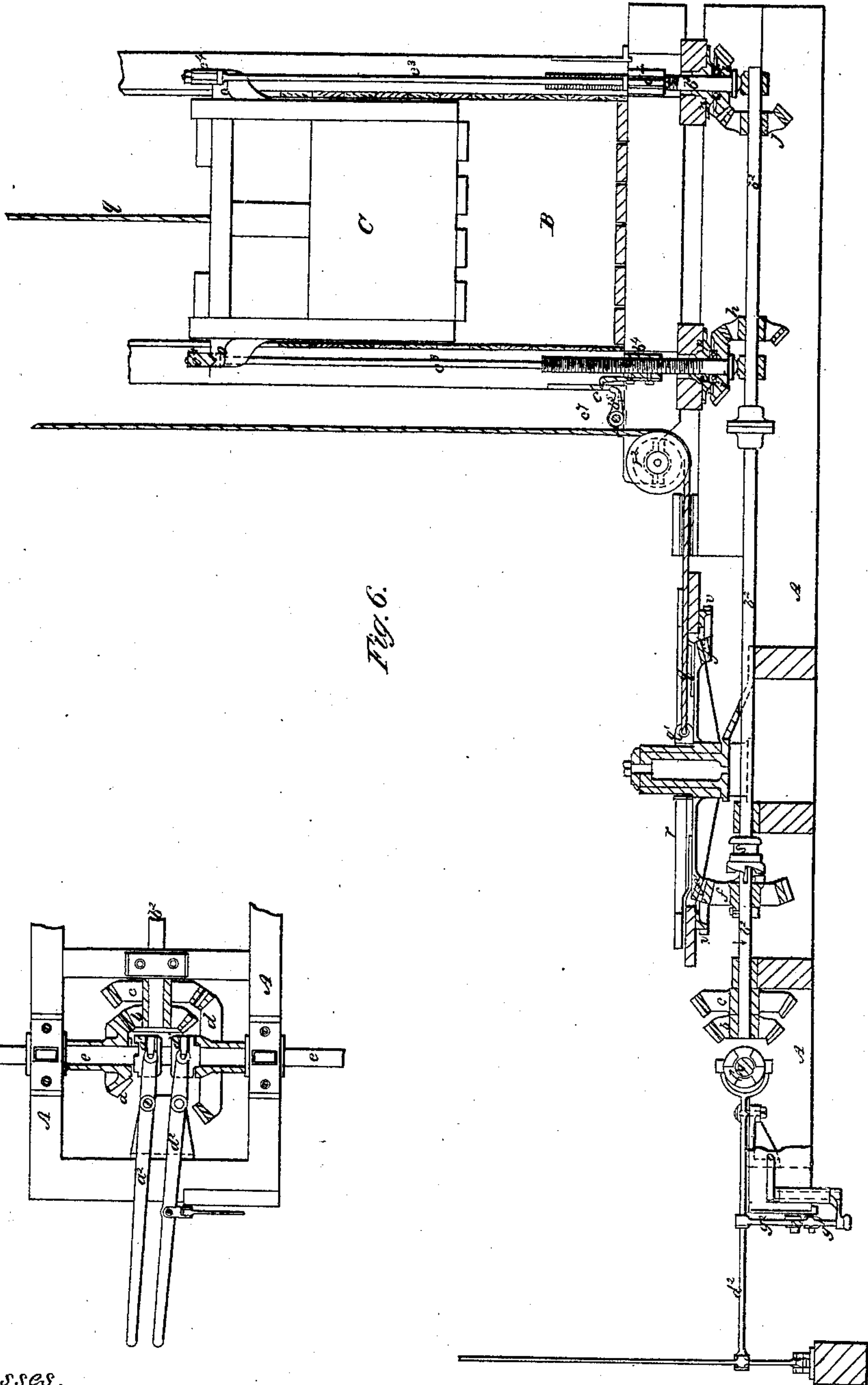


Fig. 6.

Fig. 7.

Witnesses.

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UNITED STATES PATENT OFFICE.

CHARLES NELSON, OF NEWBURG, NEW YORK, ASSIGNOR TO HIMSELF,
JAMES W. TAYLOR, WM. R. BROWN, AND FREDK. W. BANKS.

IMPROVEMENT IN OPERATING BEATER OR POWER PRESSES.

Specification forming part of Letters Patent No. 55,779, dated June 19, 1866.

To all whom it may concern:

Be it known that I, CHARLES NELSON, of Newburg, in the county of Orange and State of New York, have invented certain new and useful Improvements in Machinery for Operating Beater or Power Presses for Baling Purposes; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1, Sheet 1, is an elevation of one side of a beater-press having my invention applied to it. Fig. 2 is a top view of the same. Fig. 3 is an end view, showing the contrivance for automatically throwing out of gear the shaft which operates the pressure-screws. Fig. 4 is an enlarged vertical section of one of the anti-friction bearings for the pressure-screws. Fig. 5 shows the anti-friction balls of Fig. 4. Fig. 6, Sheet 2, is a longitudinal section taken in a vertical plane through the press. Fig. 7 is a top view of one end of the press-frame and the machinery which is applied thereto, the gearing being represented in section.

Similar letters of reference indicate corresponding parts in the several figures.

This invention is intended for operating baling-presses, and particularly such as are termed beater-presses, by means of steam-engines, without the necessity of reversing the engine when it is desired to apply a dead pressure upon the bale for binding it.

The invention provides for elevating and depressing the beater or follower of the press as rapidly as may be desired, and also for applying a steady downward movement to said beater or follower subsequent to said operation of beating without the necessity of stopping or reversing the movement of the main driving-shaft.

It also provides for automatically stopping the descent of the follower at the desired moment during the operation of pressing the bale for binding.

It also provides for relieving the screw-shafts, which are employed for the above-mentioned purpose, from undue friction by the employment of anti-friction bearings at the lower ends of said shafts.

It also provides for stopping and starting the main winding-drum, which is used for rapidly elevating and dropping the beater, at the pleasure of the operator, and for preventing the drum from being turned backward, as will be hereinafter described.

To enable others skilled in the art, I will describe the construction and operation of the new machinery when applied to the beater-press.

In the accompanying drawings, *e* represents the main driving-shaft, which passes transversely through the horizontal sill *A*, near one end of this sill, upon the opposite end of which latter is the press-box *B*, within which hay or other material is pressed and baled.

a is a pinion spur-wheel, which is placed loosely upon the main shaft *e*, and which can be engaged with this shaft by means of a sliding clutch, *a'*, which rotates with said shaft. The yoked lever *a²* is used for moving the clutch *a'* into or out of gear. *d* is a larger spur-wheel, which is also placed loosely upon the main shaft *e*, and engaged with it at pleasure by means of a clutch, *d'*, which is also provided with a lever, *d²*, for moving it. *b²* is a longitudinal shaft carrying two beveled spur-wheels, *b* and *c*, which are keyed on their shaft and which engage with their respective wheels *a* and *d*. The clutch of the wheel *a* is operated by hand, and the clutch of the wheel *d* may be operated by hand and also by certain devices, hereinafter to be explained.

The longitudinal shaft *b²* carries three beveled pinions, *f*, *h*, and *j*. The pinion *f* engages with a circular rack, *f'*, or spur-wheel on the bottom of the horizontal winding-drum *r*, and when this pinion *f* is engaged with the clutch *s* it moves the drum *r* in the direction indicated by the arrows in Figs. 1 and 2; but when the clutch *s* is disengaged from said pinion this pinion and the drum *r* are stationary. The lever *s'* and the draw-rod *u* are used to operate the clutch and throw the pinion *f* out of gear with its shaft *b²* or in gear with this shaft.

A rope or chain, *q*, is attached at one end to a loose collar, *q'*, on the hub of the drum *r*, and this rope passes off through an opening on the horizontal face of said drum to a pulley, *r'*, at the head of the press-box frame; but be-

fore passing over this pulley r' the rope passes under a pulley, r^2 , at the foot of said press-box frame. From pulley r' the rope q is carried down and attached permanently to the follower or beating-head C, as shown in Fig. 1.

When the drum r is moved in the direction indicated by the arrows in Figs. 1 and 2 the rope q winds upon it and lifts the beater C, and when this drum makes nearly one-half a complete revolution the rope slips from it and the beater C drops. This operation will be repeated as long as the pinion f is in gear with the clutch s and the shaft b^2 is turned in the direction indicated by the arrows.

When the shaft b^2 is reversed, by throwing the clutch of lever d^2 out of gear from pinion d and then throwing the clutch a' into gear with the pinion a , the drum r will be held by the ratchets v and pawls v' , (shown in Figs. 1 and 2,) and the clutch s will be disengaged of itself from its wheel f .

The pinion-wheels h and j engage with pinion-wheels i i , which are keyed on the lower ends of vertical screw-rods b^3 b^3 , and rotate these screws backward or forward, according to the direction in which the shaft b^2 is turned. These screws are tapped through cross-heads b^4 b^4 , which have vertical rods c^3 c^3 connected to their ends. Said rods are again attached at their upper ends to cross-heads c^4 c^4 , which move in grooves or guides in the upright posts of the press-box. These cross-heads and their connecting-rods are moved up and down by the back and forward movements of the screws b^3 b^3 .

The hooked toe c' , which is secured to the front cross-head, b^4 , is shown in Figs. 1, 2, and 6, and b^5 is an arm which is secured to a horizontal transverse rod, c^7 , that carries on its outer end an arm, c^6 , which is connected by a pitman, c^9 , to a crank, c^8 . This crank c^8 is connected by a rod, C' , to a crank-arm, d^3 , which operates, through the medium of a pitman, g , upon a tripping-catch, g' , which is intended for releasing a loaded arm or lever, g^2 , that is connected to the lever d^2 of the clutch d' , as shown in Figs. 2 and 3.

The follower or beating-head C has two horns, o o , projecting from its sides, which are connected together by means of jointed plates, to which the rope q is attached, as shown in Fig. 1. These horns o o are pivoted in recesses formed in the follower, and are susceptible of being thrown out a sufficient distance to come under the upper cross-heads, c^4 c^4 , as shown in Fig. 1, when it is desired to employ the screws for compressing the bale and confining the bale under pressure until it can be bound. When the rope q is drawn tight, in the act of commencing to lift the follower or beater C, the two horns o o will be retracted and brought within this beater, so as to be out of the way and allow the beater to rise and fall freely.

The lower ends of the screw-rods b^3 b^3 have

flanges formed on them for preventing them from being drawn up through the pinion spur-wheels i i during the operation of these rods in drawing down the follower upon the bale, and between the pinion-wheels i i and the upper bearing-plate, p , (shown clearly in Fig. 4,) steel plates t t are interposed, having annular grooves formed in them for receiving a number of balls, which serve as anti-friction bearings and prevent undue friction.

Having given a general description of the contrivances for operating the heater or follower without reversing the driving-shaft e , I will now briefly describe the operation of the machinery.

I propose to arrange a number of presses side by side and to operate all of them by means of a single driving-shaft, e , extending transversely through the foundation-frames, as shown in Fig. 1. This shaft e receives a rotary motion in the direction indicated by the arrows in Figs. 1 and 6.

The clutch s being in gear with the pinion f , this pinion will move the drum r , which, in turn, will lift the beater C to a certain height and then allow it to fall suddenly. During this operation of lifting and dropping the follower or beater C and the filling of the press-box with hay or other material to be baled the cross-heads b^4 b^4 and c^4 c^4 are elevated by the turning of the shaft b^2 and screws b^3 b^3 . When a sufficient quantity of the material to be baled has been put into the press-box and beaten down compactly the clutch of wheel a is released from this wheel and the clutch d' moved into gear with the wheel d . This will instantly reverse the motion of the shaft b^2 and throw the clutch s out of gear from its wheel f and stop the further movement of the drum r . The horns o o being extended, the follower C will be brought down forcibly upon the compressed mass in the press-box. When this follower has been depressed sufficiently the nose or hook c' will strike the arm b^5 and release the loaded lever g^2 from the catch g' , and allow the weight w to fall and disengage the clutch d' from the wheel d , thus stopping the further movement of the shaft b^2 .

The degree of pressure upon the bale can be regulated by adjusting the nose c' on the cross-head b^4 , so that this nose will strike the arm b^5 sooner or later, as may be required.

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

1. Automatically throwing the clutch d' out of gear from the wheel d by the descent of the follower during the operation of pressing, for the purpose of preventing said follower from descending too far, substantially as described.

2. The combination of the follower C, rope q , drum r , screws b^3 b^3 , shaft b^2 , and a continuously revolving-shaft, e , all arranged and operating substantially as described.

3. The combination of the loose wheels a d

and clutches $a' d'$ with the shaft e and the two wheels $b c$ on the reversible shaft b^2 , substantially as described.

4. So constructing a baling-press that a rapid vertical movement can be communicated to the follower, or the follower brought down upon the bale or compressed mass with a dead

pressure from a main driving-shaft which has a continuous movement in one direction, substantially as described.

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Witnesses:

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L. B. HALSEY.