

No. 754,493.

PATENTED MAR. 15, 1904.

T. F. ORMOND.
BALING PRESS.

APPLICATION FILED APR. 15, 1903.

NO MODEL.

3 SHEETS—SHEET 1.

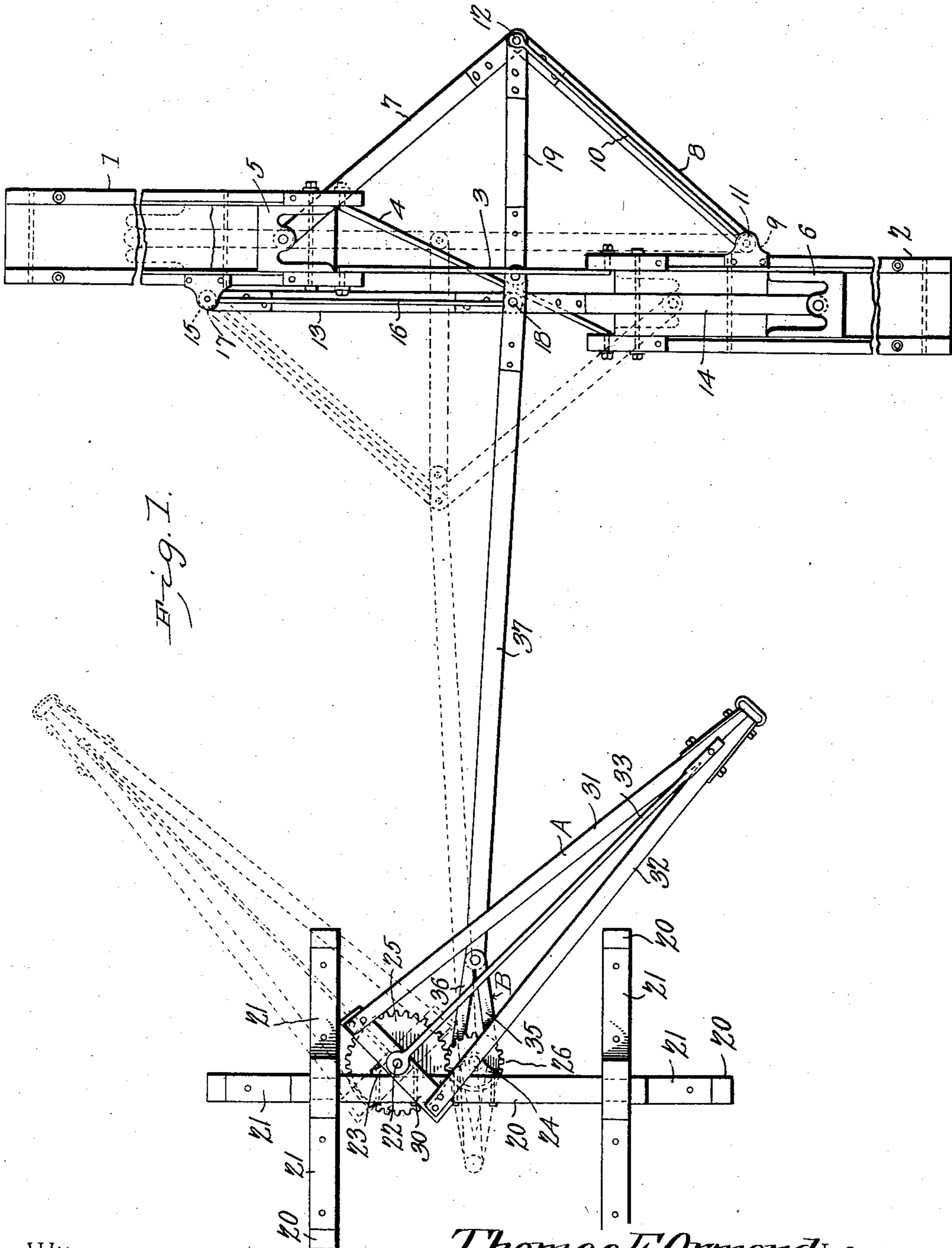


Fig. 1.

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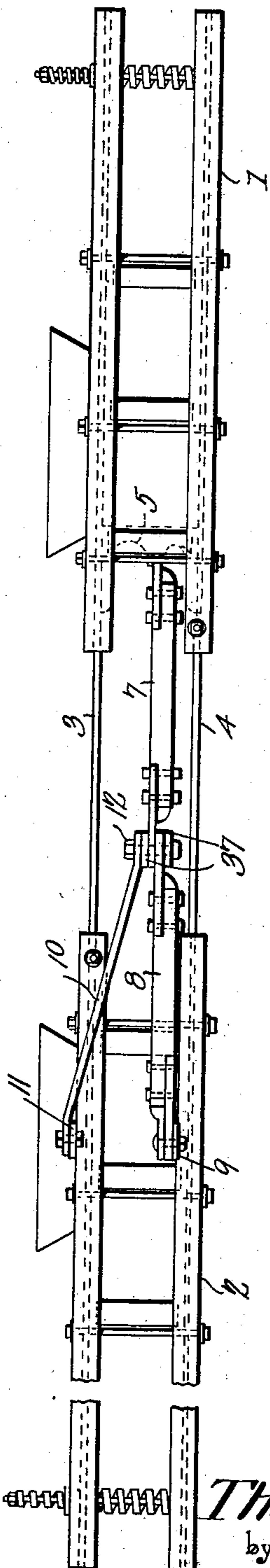


Fig. 2.

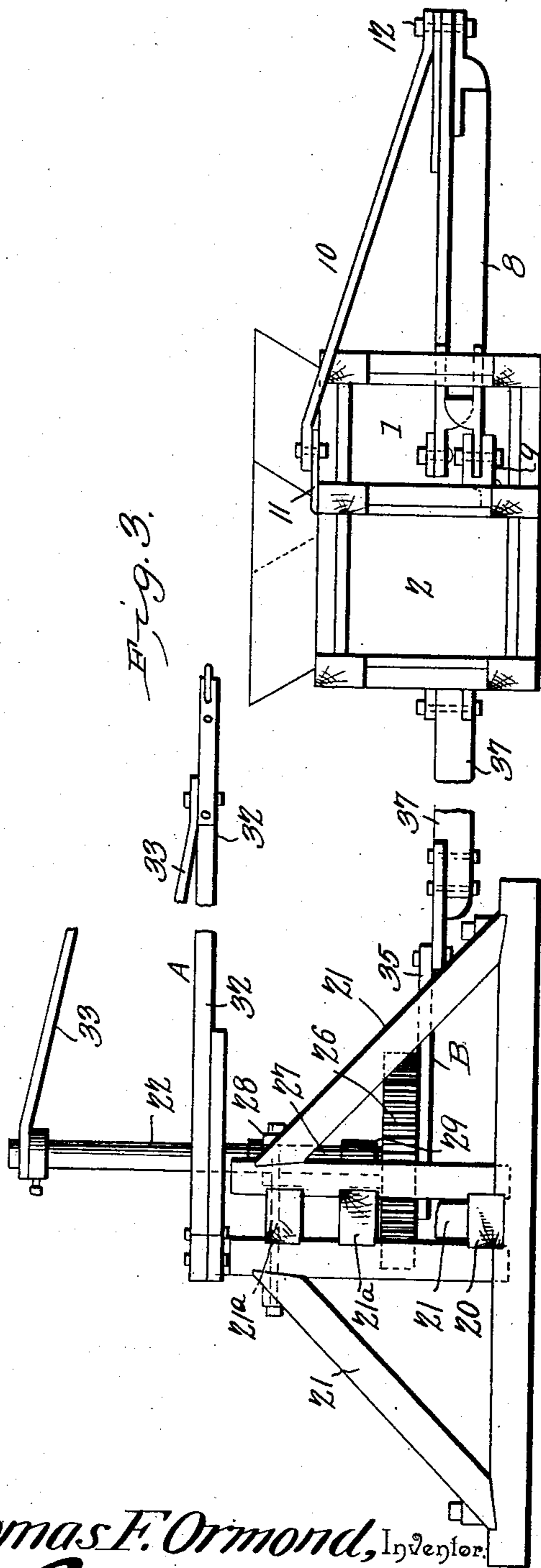


Fig. 3.

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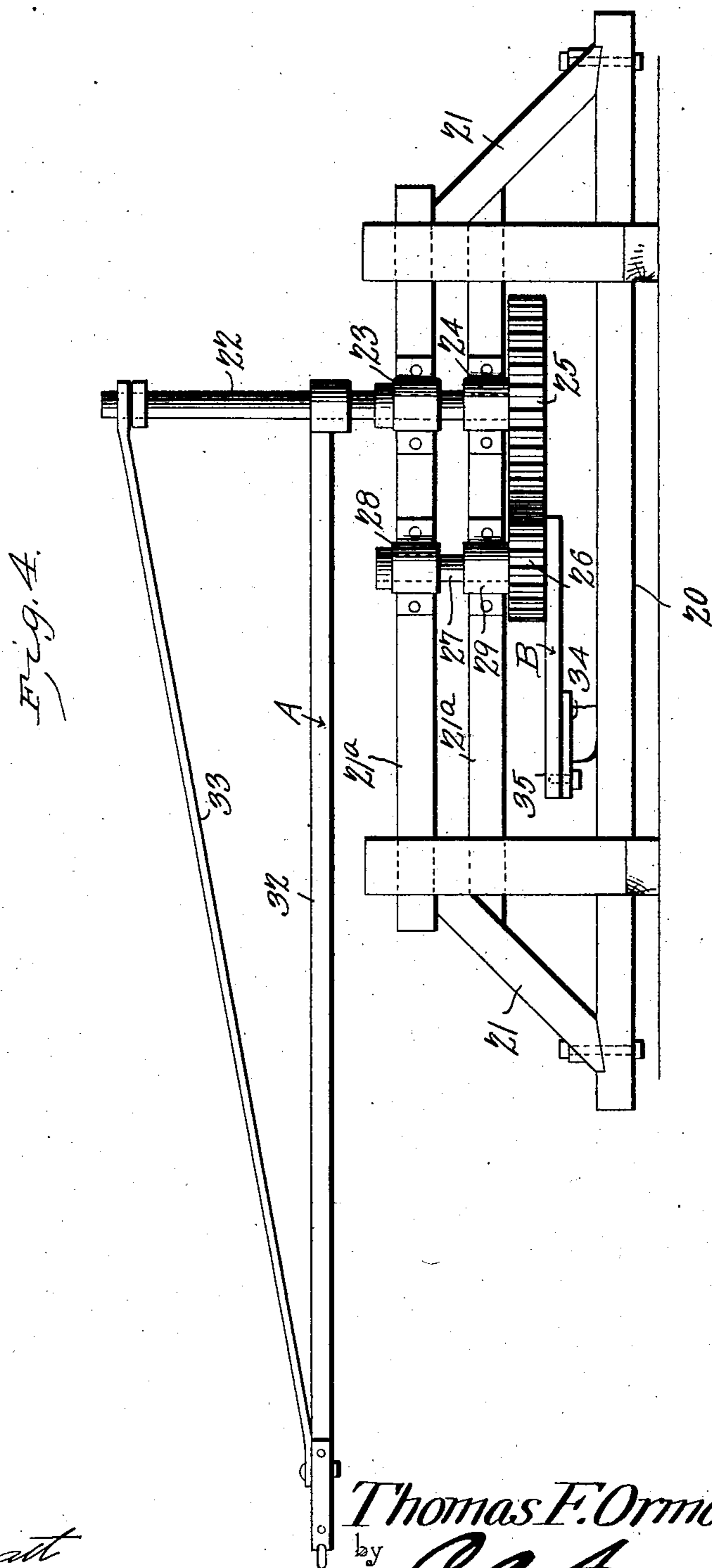
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

THOMAS F. ORMOND, OF HUNTSVILLE, ALABAMA.

BALING-PRESS.

SPECIFICATION forming part of Letters Patent No. 754,493, dated March 15, 1904.

Application filed April 15, 1903. Serial No. 152,782. (No model.)

To all whom it may concern:

Be it known that I, THOMAS F. ORMOND, a citizen of the United States, residing at Huntsville, in the county of Madison and State of Alabama, have invented a new and useful Baling-Press, of which the following is a specification.

My invention relates to baling-presses, especially to those adapted to be transported from place to place and to be operated by horse-power; and it consists in the construction and combination of elements hereinafter fully described and claimed, and shown in the accompanying drawings, in which—

Figure 1 is a plan view of the press and the horse-power motor operatively connected therewith. Fig. 2 is a side view of the press alone, the view being taken from the side opposite to that on which the motor is located. Fig. 3 is an end view of the press and the preferred form of motor. Fig. 4 is a side elevation of the preferred form of motor alone.

The various parts are indicated by similar reference characters throughout the above-mentioned views.

In baling-presses of the type to which my invention relates difficulties have been heretofore experienced in doing away with sudden shocks and strains upon the pressing mechanism and in making the necessary draft of the horses uniform. For the most part in presses of this character the effort required of the animals used to operate the press varies from a minimum of almost nothing at the beginning of the stroke of the press to an effort approximating the maximum of which the draft-animals are capable toward the end of its stroke. These constant variations in effort on the part of the draft-animals are not only more fatiguing to the animals, and consequently effective to reduce the output of the press with a given expenditure of power, but the rapid increase and decrease of strain upon the operating mechanisms tends to rack the press and in a short time to cause its operation to become defective.

In the form of press and operating mechanism hereinafter described I have endeavored to obviate all of the defects above mentioned,

and in attaining those ends I make use of a pair of baling boxes oppositely disposed and having the baling-plungers which reciprocate therein so connected that the pressing movement of one plunger is always synchronous with the releasing movement of the other plunger, the elastic force of the pressed hay upon one side being used to counterbalance, in a measure, the resistance opposed by the hay upon the other side. By this arrangement of boxes and plungers and the employment therewith of suitable operating means, presently to be described, I obviate completely any rapid variation in the strain upon the operating parts of the press and keep the draft effort required of the horses operating the horse-power motor tolerably uniform.

Referring to the drawings by reference characters, 1 and 2 represent the baling-boxes of my improved press. These boxes are oppositely disposed, as shown, but slightly disaligned, so that the longitudinal median line of each box would, if produced, pass outside of and at a little distance from one side of the other. The boxes are braced in this position by means of brace-rods 3 and 4, the former being parallel with the median longitudinal lines of the baling boxes and the latter being arranged at an angle thereto, as shown.

5 and 6 are plungers which reciprocate in the boxes 1 and 2. The plunger 5 is pivotally connected to one end of a toggle composed of the members 7 and 8 and having its other end pivotally mounted in brackets 9 upon the side of the box 2. The member 8 of the toggle is braced by means of a truss-rod 10, extending from a bracket 11 immediately above the bracket 9 to the joint 12, where the two members of the toggle are pivotally connected. The plunger 6 is provided with a similar toggle composed of the members 13 14, pivotally mounted at the end opposite the plunger in brackets 15, similar to the brackets 9, and a brace member 16, extending from a bracket 17 over the brackets 15 to the joint 18, at which the members 13 and 14 of the toggle are united, serves to brace a second toggle in a manner similar to that employed on the first-mentioned toggle. Connecting the joints 12 and 18 of the two toggles is a

cross-bar 19 of such length that when the members of one toggle are in alinement the members of the other are at the opposite extreme of their movement. Power is impart-
 5 ed ordinarily to the two toggles and through them to the plungers 5 and 6 by means of a horse-power motor, which is preferably of the form shown in the drawings, in which 20, 21, and 21^a are members forming a frame upon
 10 which the operating parts are supported.

22 is the main shaft of the horse-power supported in suitable bearings 23 24 and having rigidly secured thereon, near its lower end, a gear 25, which is in mesh with a pinion 26,
 15 half the diameter of the gear 25, which is carried by a shaft 27, upon which the pinion is rigidly mounted. The shaft 27 is shorter than the main shaft and is supported in bearings 28 29. Mounted upon the main shaft at
 20 a suitable height above the base of the motor is a power arm A, consisting of the cross member 30 and the two converging arms 31 32, rigidly fastened at the ends of the cross-arm 30 and bolted together at their opposite ends, as
 25 shown. The power-arm is braced by a truss-rod 33, adjustably mounted on the main driving-shaft and bolted to the outer end of the power-arm. Rigidly secured to the shaft 27,
 30 below the pinion 26, is an arm B, similar in construction to the power-arm A, being composed of a cross-piece 34 and two converging members 35 36, fastened to the ends thereof. The arm B has pivotally connected to the outer
 35 end thereof a connecting-rod 37, which is also pivotally connected with the proximal end of the cross-bar 19, connecting the two toggles, and the arm B is of such length that the motion imparted through the connecting-rod 37
 40 to the cross-bar 19 in a half-revolution of the shaft 27 will move the toggles from the position of alinement to the opposite extreme of their movement, or vice versa.

In the drawings I have shown only a single pair of baling-boxes and a horse-power motor
 45 to impart motion to the operating parts thereof; but I wish it to be understood that I may, if it is desirable, employ another pair of boxes arranged on the opposite side of the motor without modifying the structure thereof in any
 50 way, and if sufficient power be employed it would be possible by slight modification of the supporting-frame of the motor to provide for the simultaneous operation of four pairs of baling-presses arranged symmetrically around
 55 the motor. I wish it further understood that while I have shown a horse-power motor for driving my improved press I do not wish to be limited to the use of a motor of this kind, as the strains are rendered so nearly uniform
 60 in my improved press and the variation in said strain is so gradual that a steam-engine may be successfully employed in driving it.

By means of the arrangement of parts above described the compressing movement of one
 65 plunger is not only always synchronous with

the releasing movement of the other plunger, but when the movement of the compressing-plunger is slowest and the resistance greatest the withdrawal movement of the other plunger
 70 is most rapid. This relation in the movements of the two plungers is advantageous in facilitating the introduction of hay into one pressing-box before the pressing in the other box is entirely complete, and so permitting a more
 75 rapid action of the press as a whole.

Another advantage obtained by the combination of toggles and plungers with driving mechanism of the class described is that owing
 80 to the reactive effect upon one toggle of the elastic force of the compressed hay during the pressing operation being performed by the other toggle no springs are required to cushion the action of the plungers and a more
 85 positive and accurate motion is obtained.

The general advantage always obtained by
 90 using toggle-joints—namely, rapid movement of the operative parts when the strain thereon is least and slow movement when it is greatest—is of special value in machines of this class in relieving them from all shock or
 95 jar.

Another advantage contemplated in the arrangement of the motor and press, as described
 100 and shown, is that when the horses attached to the power-arm A cross the connecting-rod 37 they are making their minimum exertion. This result is brought about by having the
 105 diameters of the gear 25 and pinion 26 in the ratio of two to one and arranging the arms A and B in the position shown in the drawings. In consequence of this arrangement the
 110 two toggles are in similar position when the horses cross the connecting-rod, and consequently the pressure upon the two plungers is most nearly balanced.

It will be observed that in the construction
 115 of my press the various parts have all been united by bolts in such a way that it is very easy to disassemble the various parts of the structure, and when it is desired to transport
 120 the press from one place to another all that is necessary is to disconnect the toggles from the brackets on the sides of the boxes, disconnect the connecting-bar from one of the toggles,
 125 push the plungers into their respective boxes after swinging the free ends of the toggles over the ends attached to the plungers, and mount each box upon wheels in any desired
 130 manner so that each may be separately hauled.

The operation of my improved press is so
 135 clearly obvious from the drawings and foregoing description that no detailed account thereof is deemed necessary.

Having now fully described and pointed
 140 out the advantages of my improved press, what I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination in a baling-press, of a pair of baling-boxes oppositely disposed and
 145 slightly disalined, plungers movable in said

boxes, a pair of toggle-links associated with each of said plungers and having the ends opposite the plungers fixed in position, connecting devices between said pairs of toggle-links whereby the pairs of toggle-links are so held that the extension of one pair is accompanied by the contraction of the other, and means connected with one pair of toggle-links for alternately extending and contracting it.

2. The combination in a baling-press, of a pair of baling-boxes oppositely disposed and slightly disalined, plungers movable in said boxes, a pair of toggle-links associated with each of said plungers, a bar disposed between said pairs of toggle-links and forming a connection whereby the insertion of one plunger is always accompanied by the withdrawal of the other, and means for alternately expanding and contracting one pair of toggle-links.

3. The combination in a baling-press, of a pair of boxes oppositely disposed and slightly disalined, plungers movable in said boxes, a pair of toggles each having one end secured to the plunger in one box and the other end secured to a side of the other box, and means for applying power to said toggles, substantially as described.

4. The combination in a baling-press, of a

pair of boxes oppositely disposed and slightly disalined, plungers movable in said boxes, a pair of toggles each having one end secured to a plunger in one box and the other end secured to a side of the other box, said toggles being connected by a cross-bar to keep their joints at a constant distance apart, and means for applying power to said toggles, substantially as described.

5. The combination in a baling-press, of a pair of baling-boxes oppositely arranged and slightly disalined, plungers movable in said boxes, a pair of toggles, each of said toggles having one end pivotally secured to a plunger in one box and the other end pivotally mounted in a bracket on the side of the other box, a cross-bar connecting the joints of the two toggles to keep them a constant distance apart, a motor, and a connecting-rod pivotally connected with the cross-bar and a crank-arm on the motor, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

THOMAS F. ORMOND.

Witnesses:

J. E. HIXSON,
R. E. SMITH.