(No Model.)

4 Sheets—Sheet 1.

M. C. NIXON.

BALING PRESS.

No. 372,636. Patented Nov. 1, 1887.

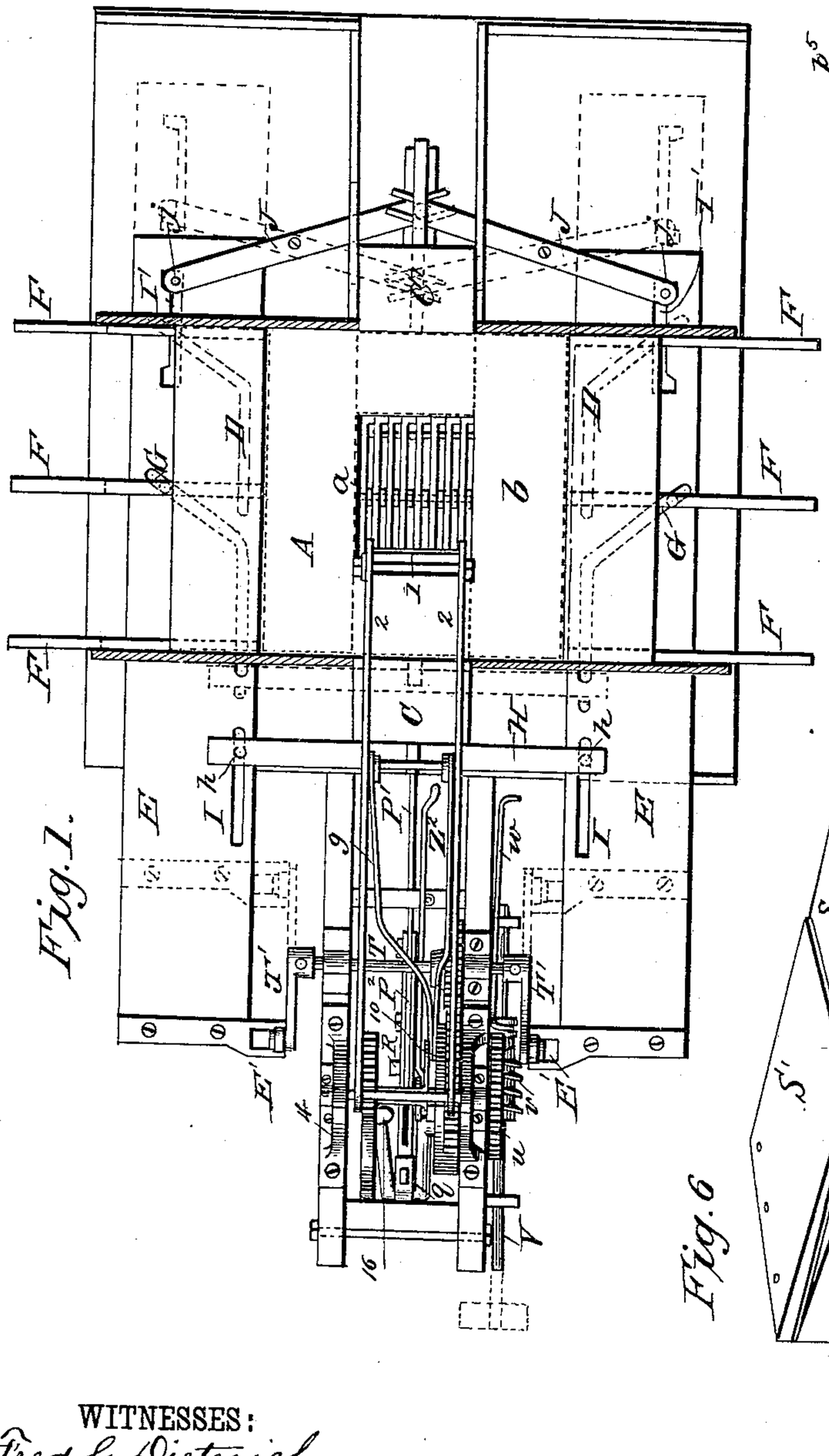

Fig. 1.

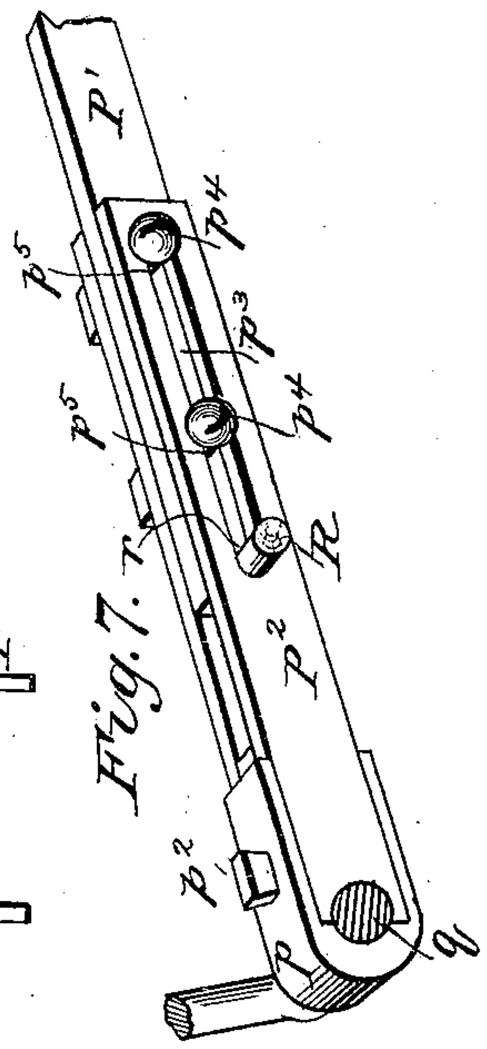

Fig. 7.

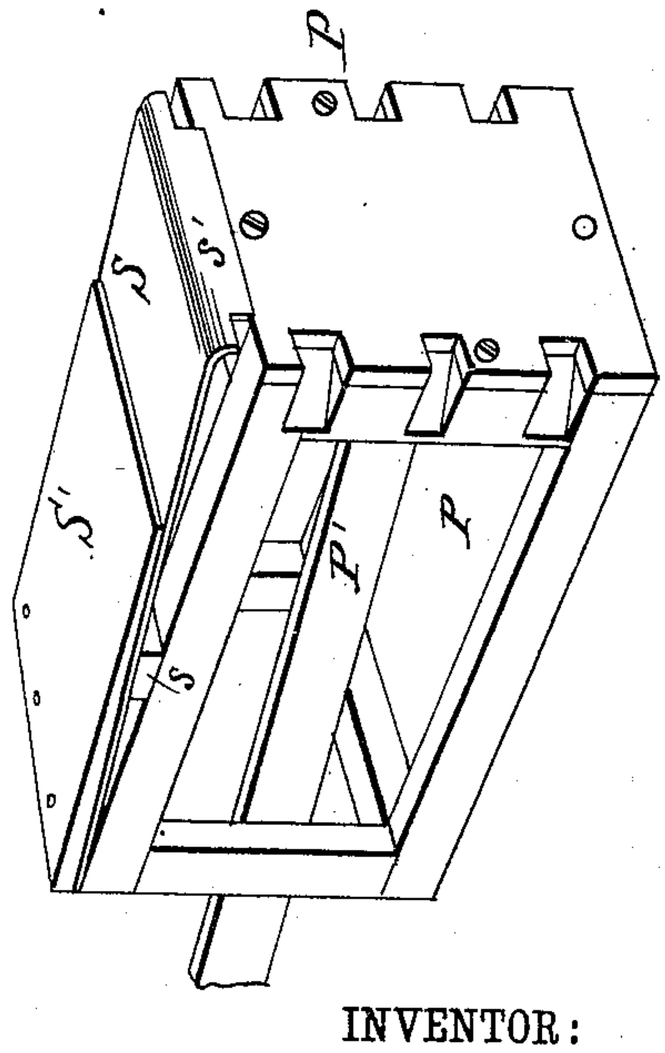

Fig. 6

WITNESSES:

Fred G. Dieterich

P. B. Turpin.

INVENTOR:

M. C. Nixon

BY Munn & Co

ATTORNEYS.

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4 Sheets—Sheet 2.

M. C. NIXON.

BALING PRESS.

No. 372,636. Patented Nov. 1, 1887.

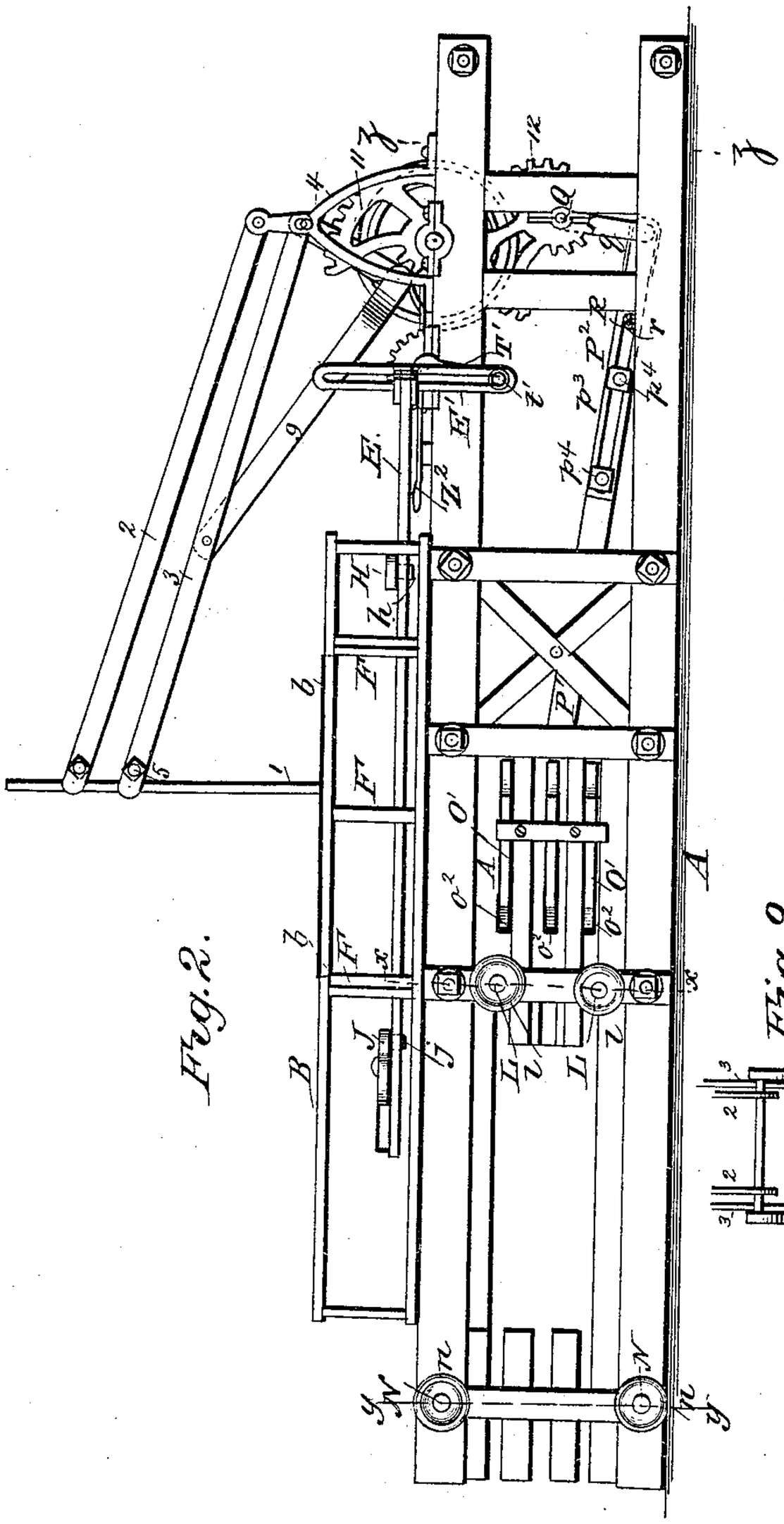


Fig. 2.

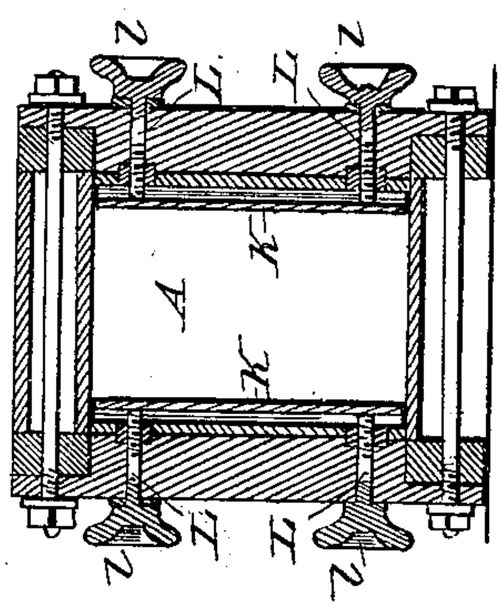


Fig. 8.

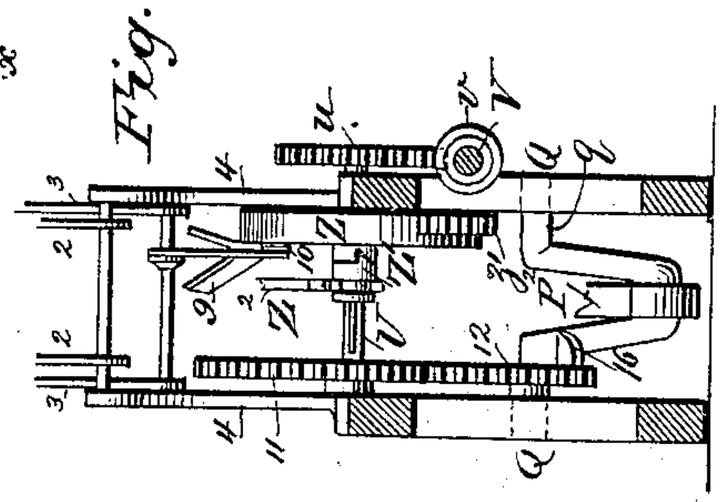


Fig. 9.

WITNESSES:
Fred G. Dieterich
P. B. Turpin.

INVENTOR:
M. C. Nixon
BY Munn & Co

ATTORNEYS.

(No Model.)

4 Sheets--Sheet 3.

M. C. NIXON.

BALING PRESS.

No. 372,636. Patented Nov. 1, 1887.

Fig. 3.

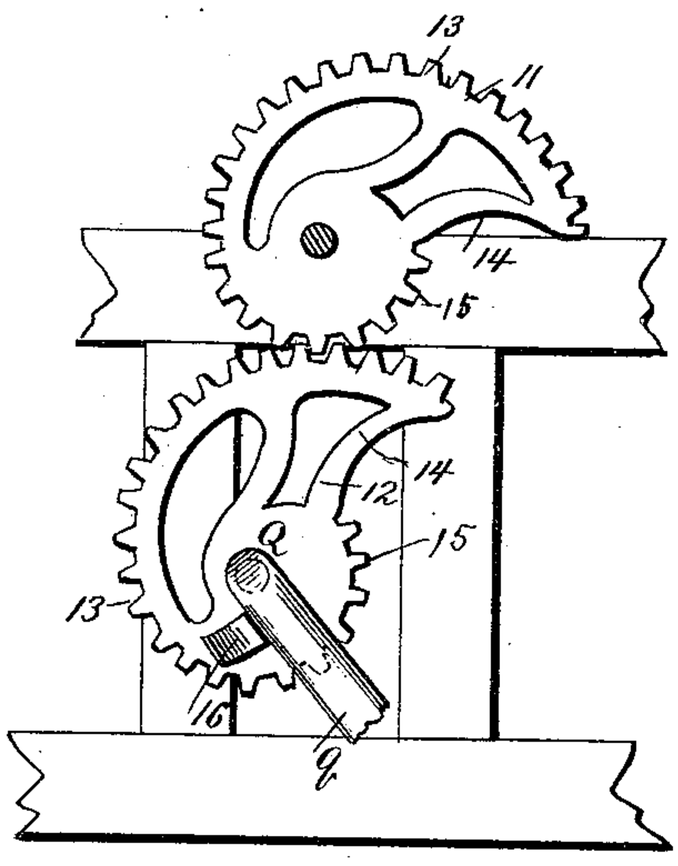


Fig. 4.

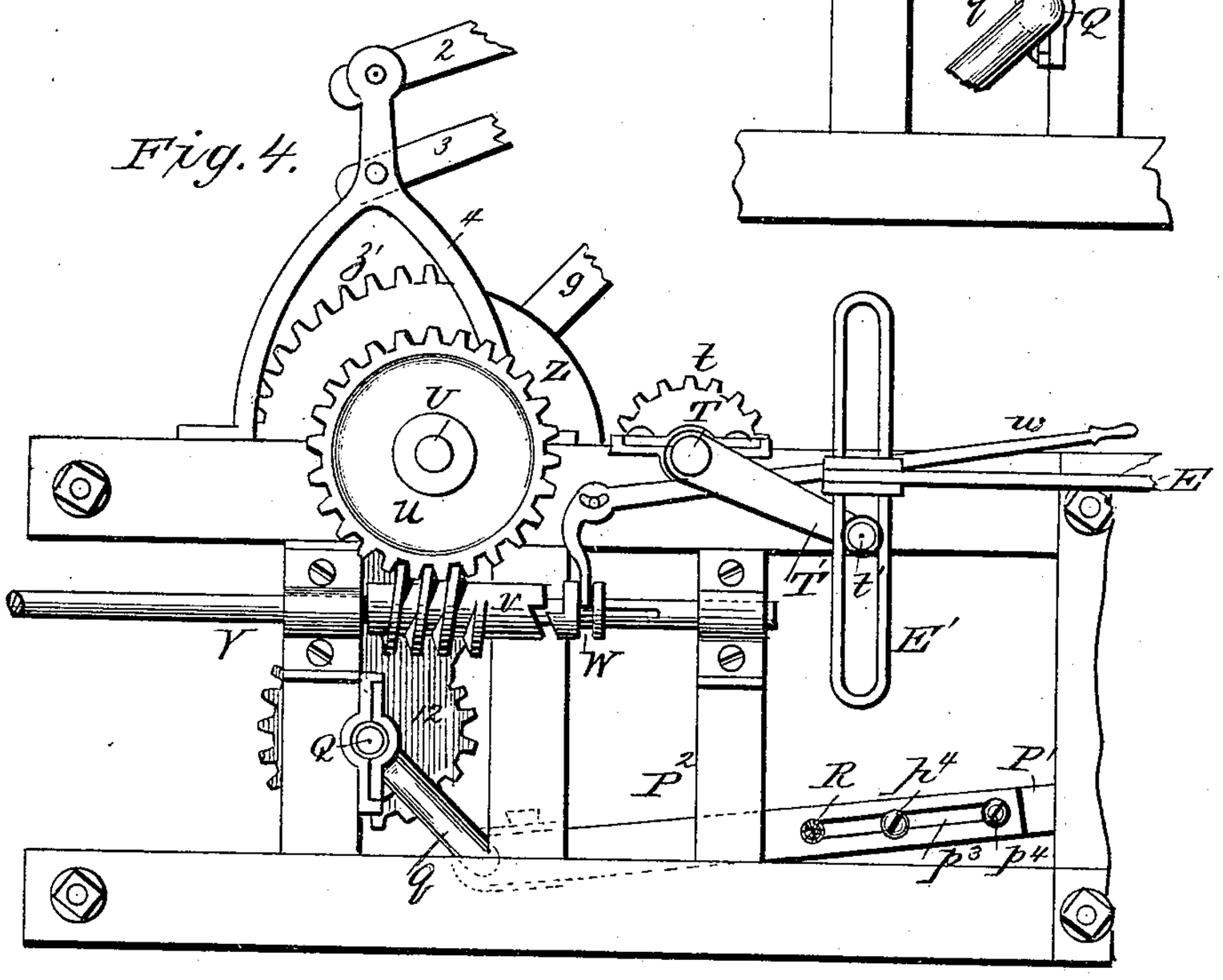
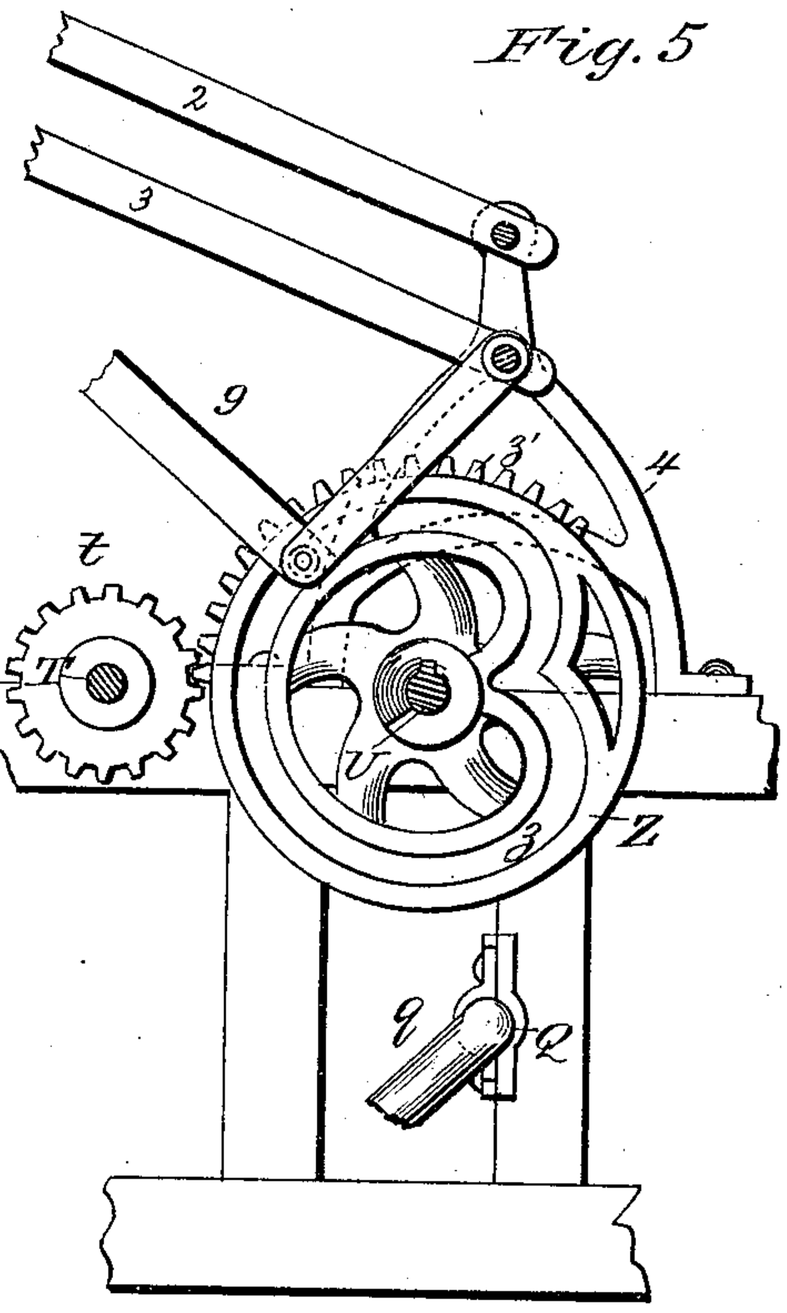


Fig. 5



WITNESSES:
Fred G. Dieterich
P. B. Turpin.

INVENTOR:
M. C. Nixon
BY Munn & Co
ATTORNEYS.

(No Model.)

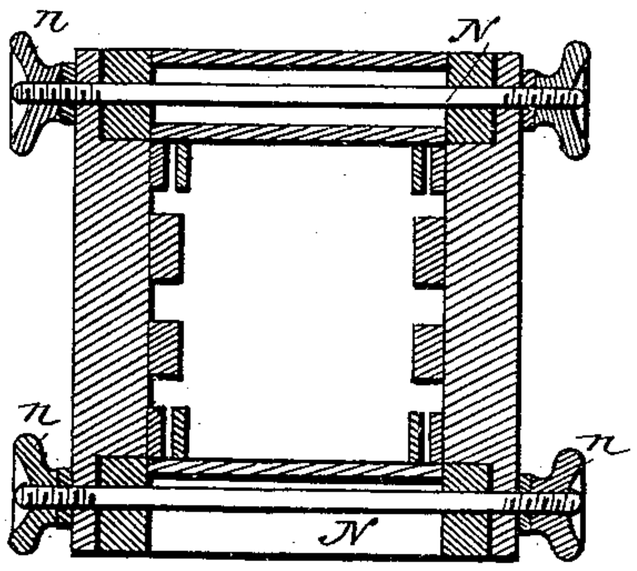
4 Sheets—Sheet 4.

M. C. NIXON.

BALING PRESS.

No. 372,636. Patented Nov. 1, 1887.

Fig. 10.



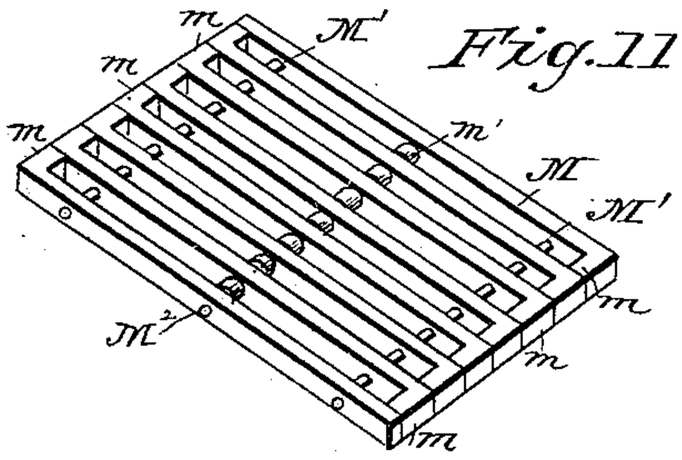


Fig. 11.

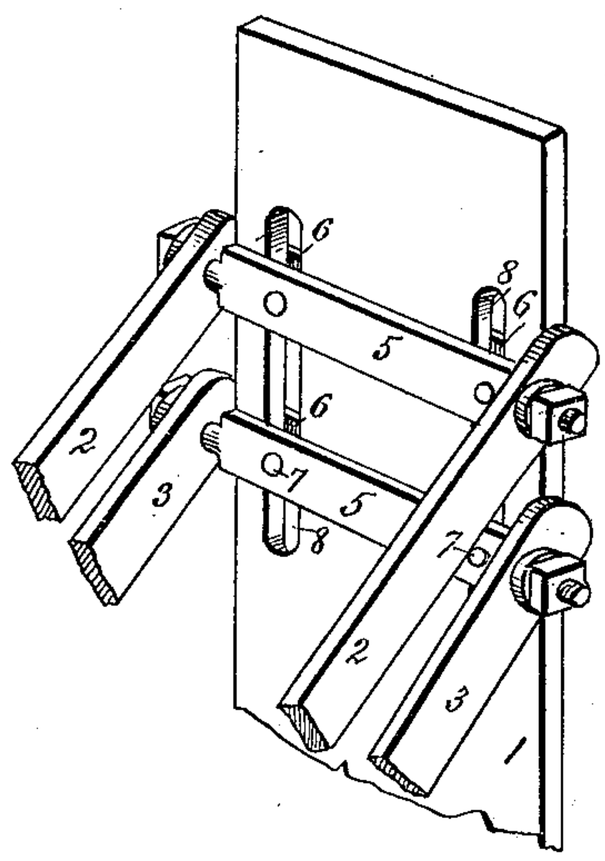


Fig. 12.

Fig. 13.

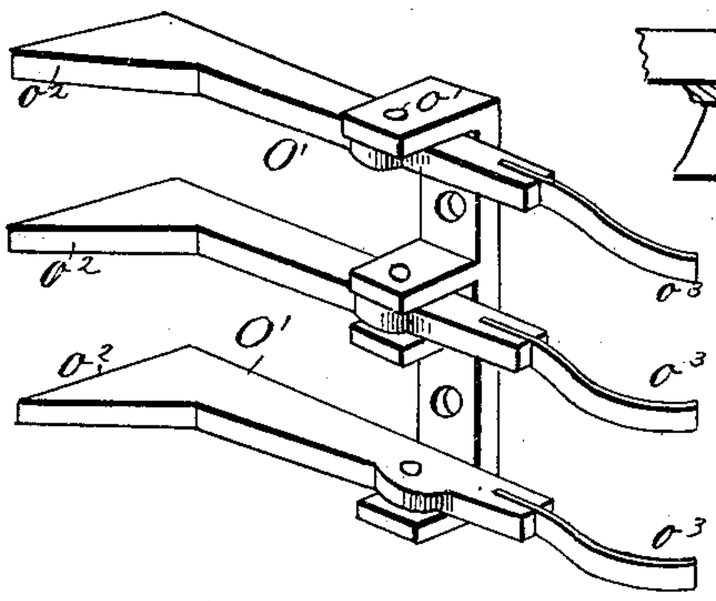


Fig. 14.

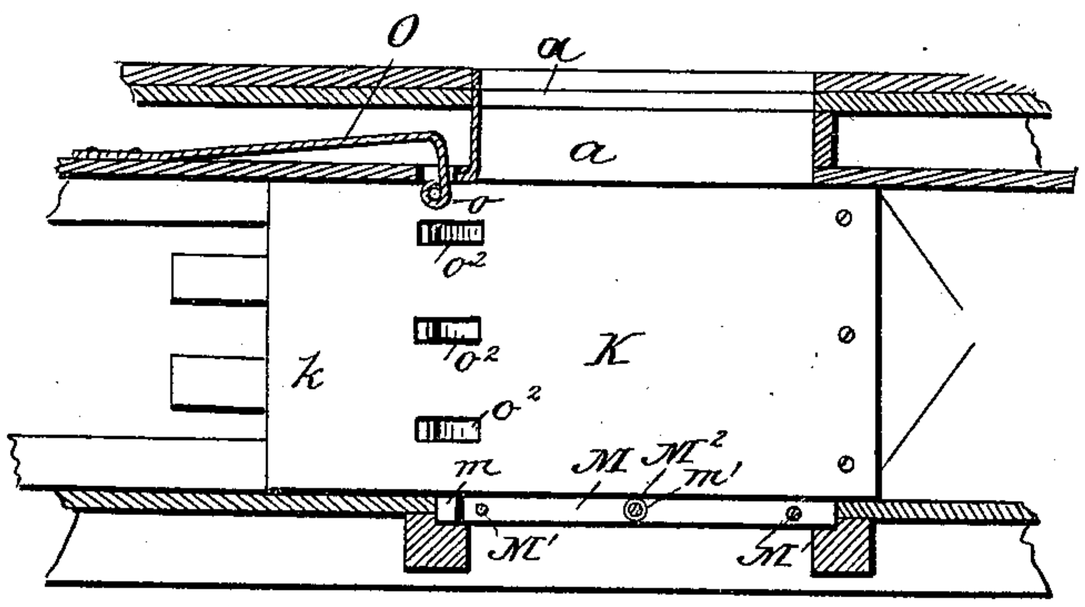
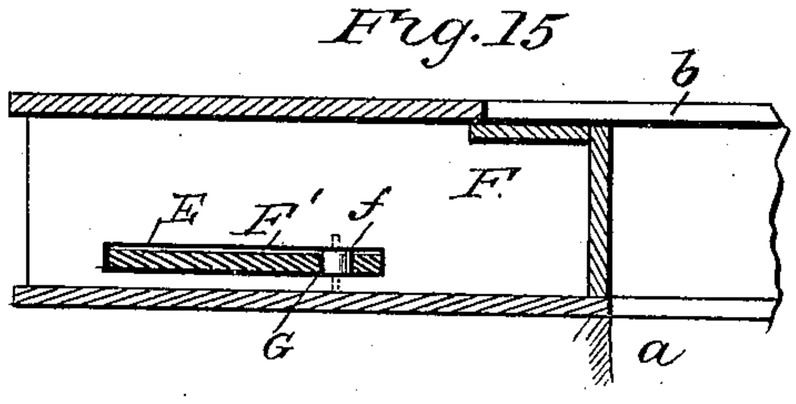


Fig. 15



WITNESSES:

Fred G. Dieterich

P. B. Turpin.

INVENTOR:

M. C. Nixon

BY Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

MOSES C. NIXON, OF PERU, INDIANA.

BALING-PRESS.

SPECIFICATION forming part of Letters Patent No. 372,636, dated November 1, 1887.

Application filed December 14, 1886. Serial No. 221,530. (No model.)

To all whom it may concern:

Be it known that I, MOSES C. NIXON, of Peru, in the county of Miami and State of Indiana, have invented a new and useful Improvement in Baling-Presses, of which the following is a specification.

My invention is an improved baling-press, and relates particularly to that class of presses commonly known as "continuous" or "perpetual" presses.

The invention seeks to provide novel constructions of condensing, feeding, and pressing devices, together with improved operating mechanism and further improvements, as will be hereinafter described in detail; and the invention consists in certain features of construction and novel combinations of parts, as will be first fully described, and then pointed out in the claims.

In the accompanying drawings, Figure 1 is a top plan view of the press, the top plate or platform being removed. Fig. 2 is a side elevation of the press. Fig. 3 is a detail view showing the eccentric gears and the connections of same with the plunger-shaft crank. Fig. 4 is a detail side view of a part of the gearing and frame. Fig. 5 is a detail view showing the cam-wheel and parts of the condenser-shaft and the feeder. Fig. 6 is a detail perspective view of the plunger. Fig. 7 is a detail view of the plunger-pitman. Fig. 8 represents a detail vertical cross-section of the press-box on line *x x*, Fig. 2. Fig. 9 is a detail sectional end view of the machine on about line *z z*, Fig. 2. Fig. 10 is a cross section at or near the end of the framing on about line *y y*, Fig. 2. Fig. 11 is a detail perspective view of the grating. Fig. 12 is a detail perspective view of parts of the feeder. Fig. 13 is a detail perspective view of the press-box hooks. Fig. 14 is a partial vertical longitudinal section of the press-box, showing the spring thereof; and Fig. 15 is a detached vertical section of a part of the machine, and illustrates one of the arms of the side compressors.

The main frame, consisting of beams suitably united, has the press-box A formed in it about midway its ends. This box has a receiving or feed opening, *a*, leading into its upper side, and above such box I support the feed-platform B and the condensers C C′ and D D. The feed-platform has a hopper or receptacle, *b*, formed larger than and surrounding the opening *a*, and the condensers move into this hopper from all sides. These condensers are arranged below the platform B, and operate one, C, at and into the front of, one, C′, at and into the rear of, the hopper, and the condensers D D into the hopper from the opposite sides at right angles to condensers C C′. In operation the two pairs D D and C C′ are operated successively into the hopper, those D being moved in first until their inner or bearing faces are in line with the sides of the condensers C C′, when the latter are moved toward each other between the condensers D. An important advantage results from this construction, in that thereby a double compression is attained, and by reason of the operation described I avoid hay or other material being pressed getting between the end and side condensers and so clogging the machine.

In carrying out this feature of my invention it will be seen that one pair, D D, of my condensers are formed to fit between the walls of the hopper and slide between said walls, while the condensers of the other pair are made narrower than the hopper and slide into and out of recesses leading therefrom.

I do not desire to limit the broad principles of this feature of my invention to the particular means for operating the condensers; but I prefer to operate such condensers by means of slides E, which, for convenience of reference, I denominate "condenser-slides." These slides are given a longitudinal reciprocating movement by proper connection with the drive mechanism, and are connected with the condensers, so the movement of the slides back and forth will adjust the condensers into and out of the hopper. To this end the side condensers have outwardly-projected arms F, one of which is provided with a stud, *f*, Fig. 15, which may, if desired, be fitted with rollers to avoid friction, and such stud operates in slots G, formed in the slides. These slots G are inclined for a portion of their length to the direction of movement of the slides, and for the remainder of their lengths are formed in the direction of such line of movement, so that the slides for a part of their movement do not operatively affect the side condensers, but do so

operate during the remainder of such movement. By preference the slides operate through slots F′, formed through the arms F, and studs *f* are arranged in said slots F′.

To the front condenser is connected a bar, H, which extends to the opposite sides and has studs *h*, which enter slots I in the slides, so that during the advance stroke of the slides the condenser C will not be moved into the hopper until the condensers D will have completed their inward movement, when the rear walls of the slots I, by engaging studs *h*, will move the condenser C forward into the hopper between condensers D. The rear condenser, C′, is connected with the inner ends of pivoted levers J, the outer ends of which have studs *j*, entering slots I′ in the slides, and which operate the condenser C′ in and out of the hopper at the same time with the front condenser, C.

The press-box has its sides provided with metallic (usually steel) linings K, having their ends at *k* engaged by screws L, working through threaded bearings, and having hand-wheels *l*, by which they may be turned. By means of these screws the linings may be pressed inward to in part prevent the hay from rebounding. The bottom of the press-box is formed of a number of bars, M, having their ends bent at *m*, forming separating parts, which hold the bars apart, and are secured by bolts M′ at their ends and centrally by a bolt, M², washers *m′* being secured on the bolt M² between the bars M. At the discharge end of the machine I provide bolts N and hand-wheels *n*, for producing pressure at the rear end of the press.

A spring, O, is arranged immediately in rear of the opening *a*, and has a rib, *o*, which projects down into the press-box from above. This spring is preferably a plate secured at one end to the press-box, and has a rib at its opposite end, which projects into the press-box to fold loose hay to the center of the bale, and serves in a measure to prevent the backward movement of the pressed hay. As a further means of preventing this back movement of the pressed hay, I provide the bars O′, pivoted at *o′*, and having points *o²*, which enter the press-box through plate K, immediately in rear of opening *a*. To the opposite ends of bars O′ from points *o²*, I secure springs *o³*, which give points *o²* an inward tension, as will be understood from the drawings.

The plunger P has a pitman or rod, which is formed in two sections, P′ P². The section P² is connected, through the medium of strap *p*, with the crank *q* of crank-shaft Q, and such connection may be tightened up from time to time by a wedge, *p²*. The section P′ fits between the arms of section P², and the latter has slots *p³* for the passage of bolts *p⁴*, which pass through bolt-holes *p⁵* in the section P′. Now it will be seen that the sections P′ P² are not held from movement longitudinally one upon the other, because the bolts *p⁴* will travel in the slots *p³*. To normally prevent such travel of the bolts and the movement of the sections P′ P², I provide a break-pin, R, which passes through the slots *p³* and through an opening, *r*, in the section P′, the said pin and the bolts *p⁴* serving to hold the sections P′ P² from movement on each other; but when any unusual obstruction gets into the press-box, which prevents the full stroke of the plunger, the break-pin is broken and the sections P′ P² slide on each other, avoiding any damage to the machine, and on removal of the obstruction a new break-pin can be inserted and the operation proceed.

The plunger P has on its upper side a transverse bearing-bar, *s*, and a spring-plate, S, is secured at its rear edge to the plunger in rear of the bearing, extends thence forward over the bearing-bar *s*, and has its forward edge provided with a depending flange, *s′*, which extends down in front of the plunger or beater, such forward edge forming a spring, as will be seen, which, bearing under the spring O, prevents the return of hay with the plunger on the return-stroke of such plunger. To the plunger and over the rear side of the plate S, I secure a wedge-shaped block, S′, which forms the top of the plunger, approximately flat, as shown.

To the framing in front of the press box I journal the condenser-shaft T, the main shaft U, the side or power shaft, V, and the crank-shaft Q, which are geared together in the manner I will now describe. The main shaft has a worm-wheel, *u*, meshed by a worm, *v*, on the power-shaft V. This worm is sleeved on shaft V, and is arranged to be engaged by a clutch, W, keyed and movable on such shaft, and which clutch may be operated by a lever, *w*, from the platform B, so the machinery may be stopped and started as desired. The power-shaft may be driven in any suitable manner. On the main shaft is sleeved a wheel, Z, having a cam-groove, *z*, and such wheel is fixed to the shaft, when desired, by means of a clutch, Z′, keyed and movable on the main shaft, and which clutch may be operated from the platform by means of a lever, Z². The cam-wheel Z also has a segment, *z′*, of gear-teeth, which, in the operation of the device, meshes a gear, *t*, on the condenser-shaft, whereby this shaft and its cranks T′ are operated.

Instead of providing segment *z′* and gear *t* with teeth, they may be friction gears, without departing from my invention. The cranks T′ on the opposite ends of the shaft T have wrists *t′*, operating in slotted plates E′, attached to or formed on the slides E, so that the revolution of the shaft T will effect the desired longitudinal movement of the slides E. The feeder-head 1 is supported on the ends of two frames, 2 3, being pivoted on the outer ends of said frames, and such frames being pivoted at their opposite ends to standards or supports 4 4, mounted on the main frame. The pivotal connection of the head 1 and the frame is preferably secured by means of bars 5 5, fitting on one side of the head 1 and having their ends extended

through the frames 2 3, and threaded to receive the retaining-nuts.

Plates 6 6 are arranged on the opposite sides of head 1 from the bars 5, and are connected with bars 5 by bolts 7, which pass through slots 8 in head 1, so the head can be adjusted on the frames 2 and 3.

A pitman, 9, is pivotally connected with one of the frames 2 and 3 at one end, and has at its opposite end a stud, 10, which enters the cam-groove *z*. Thus as the cam-wheel is revolved the head 1 is lowered at intervals, by reason of the eccentric portion of the cam-groove *z*, and as the head is lowered into the press-box its lower end is given a downward movement, by reason of the two frames 2 3, which form a support for such head, this downward movement operating to feed the material to be pressed downward into the pressing-compartment, as will be seen.

On the main shaft T, I also secure a variable gear, 11, which is revolved by such shaft, and which meshes a similar variable gear, 12, journaled on or concentric with the crank-shaft Q. These gears 11 and 12, as stated, are similar and have portions 13, which depart gradually from the axis of the gears and are joined abruptly at 14 with the portions 15 of the gears, nearer their centers. On the gear 12, or suitably connected therewith, I provide a stud, 16, which is practically the wrist of a crank and engages the crank *q* of shaft Q, so that in the revolution of its crank or support the stud 16 engages the crank *q* and forces the same and the attached plunger into the extreme stroke of the plunger; but on the return of the plunger it is freed from the stud or wrist 16, and may be forced back by the rebound without any contact with and resulting damage to the machinery.

It will be noticed that the gears 11 and 12 are so meshed and arranged with reference to the crank *q* that the gear 11 operates with slowest speed and greatest force on the gear 12 while the latter is forcing the plunger in its operative stroke, and with greatest speed when it is turning said gear 12 for a fresh stroke of the plunger.

The operation will be fully understood from the foregoing. As the power-shaft is turned, it transmits its motion to the main shaft, which in turn communicates motion to the crank-shaft, and the latter drives the plunger in and out. If, now, the cam-wheel be clutched with the main shaft it will be revolved. Suppose the condensers all to be in their outward position—that is, out of the hopper. As the cam-wheel is turned, its gear-segment will turn the condenser-shaft, and through the connection described the condensers will be forced inward, compressing the hay or other material into a bulk equal in size to the opening *a*. Now the feeder is operated and its head lowered against such material, forcing it into the press-box, when the head 1 will be withdrawn and the plunger will be forced in to press the hay. When it is desired to give two or more strokes of the plunger for each feed of material, the cam-wheel may be unclutched from the main shaft until it is desired to condense and supply a new feed of material to the press-box.

Having thus described my invention, what I claim as new is—

1. The combination, in a baling-press having a hopper, of condensers arranged in pairs at right angles to each other, one pair of condensers being movable between the other pair, substantially as set forth.

2. The combination of the hopper having recesses to receive the condensers C C′, the condensers D D, fitted to move flush between the walls of the hopper, and operating means whereby the pairs of condensers may be operated in succession, substantially as set forth.

3. In a baling-press, the combination, with a pair of condensers movable toward and from the feed opening, of a second pair of condensers arranged and movable at right angles to the first pair, substantially as set forth.

4. The combination of the condensers D D, provided with lateral arms having studs, and the slides having inclined slots to receive said studs, substantially as set forth.

5. The combination, with the condensers D D, having arms F, provided with slots F′, and studs *f* therein, of the slides E, movable through slots F′, and provided with slots to receive the studs *f*, substantially as set forth.

6. The combination of the condensers C C′ and D D, the slides E, connections between the same and the condensers D, the levers J, and the bar H, substantially as set forth.

7. The combination of the condensers C C′ D D, the condenser-shaft having cranks provided with wrist-pins, the slides having slotted plates fitted to receive said pins, and connections between the slides and the condensers, substantially as set forth.

8. In a baling-press, the combination of the press-box, the lining-plates having movable ends *k*, and the screws L, engaging said ends, substantially as set forth.

9. In a baling-press, a press-box provided with a grated bottom consisting of bars M, having right-angled ends *m*, forming separating parts, and bolts uniting said bars, substantially as set forth.

10. In a baling-press, a plunger-pitman consisting of a section, P^2, slotted at p^3, the section P′, having holes for the fastening-bolt and for a break-pin, and a fastening-bolt and break-pin, the parts being combined substantially as set forth.

11. An improved plunger for baling-presses, provided with a bearing, *s*, a spring-plate, S, and a block, S′, all substantially as and for the purposes specified.

12. The combination of the cam-wheel having a cam-groove, the feeder-head, the support for such head, and a pitman connected at one end with such support and provided with a pin or stud fitted to enter the cam-groove, substantially as set forth.

13. The combination, with the operating

mechanism, the supporting-frame, and the feeder-head, of the frames 2 and 3, pivoted at one end to the feeder-head and at their opposite ends to the supporting-frame, and a pitman connecting one of said frames with the operating mechanism, substantially as set forth.

14. The combination of the condensers, the slides connected therewith, the condenser-shaft having cranks for operating said slides, the wheel Z, having cam-groove *z*, and a segment-gear, *z'*, the feeder, and a pitman connected with the feeder and provided with a pin or projection entering the groove *z*, all substantially as described, whereby the condensers and feeder may be operated in proper order, substantially as set forth.

15. In a baling-press, the combination of the plunger, its pitman, a crank for operating such shaft, the variable gear 11, secured on the main shaft, and the gear 12, journaled concentrically with the crank-shaft and meshed with gear 11, substantially as set forth.

16. The combination of the feeder-head 1, having slots 8 8, the frames 2 3, constituting a support for such head, the bars 5 5, connected with the supporting-frames, the plates 6, and the bolts 7, connecting plates 5 and 6, and passed through slots 8, substantially as set forth.

17. The combination of the main shaft, the crank-shaft connected with the plunger-pitman, the gear 11, secured on the main shaft, and the gear 12, such gears 11 and 12 being similar and being formed with portions 13 and 15, substantially as described, and for the purposes specified.

18. In a baling-press, a plunger-pitman provided at one end with a strap to embrace the drive-crank and with a wedge to take up the wear, and provided with a section, P^2, slotted at p^3, the section P', having holes for the fastening-bolt and for the break-pin, and a fastening-bolt and break-pin, the said parts being combined substantially as set forth.

19. The combination of the power-shaft, a worm thereon, a clutch whereby to connect said worm at will to the power-shaft, the main shaft provided with a worm-wheel engaged by said worm, a clutch on said main shaft, a cam-wheel arranged on said shaft and in position for engagement by the clutch thereof, the condensers, the plunger, and connecting means, substantially as set forth.

20. The combination of the power-shaft provided with a worm, the main shaft provided with a worm-wheel engaged by said worm and with a gear, 11, the cam-wheel Z, supported on said main shaft and provided with a cam-groove and with a segment-gear, the condenser-shaft having cranks, the variable feed-gears, the plunger, its operating crank-shaft, the condensers, the slides, and the feeder, substantially as set forth.

MOSES C. NIXON.

Witnesses:
J. W. MITTEN,
JOHN FITZMAURICE.