

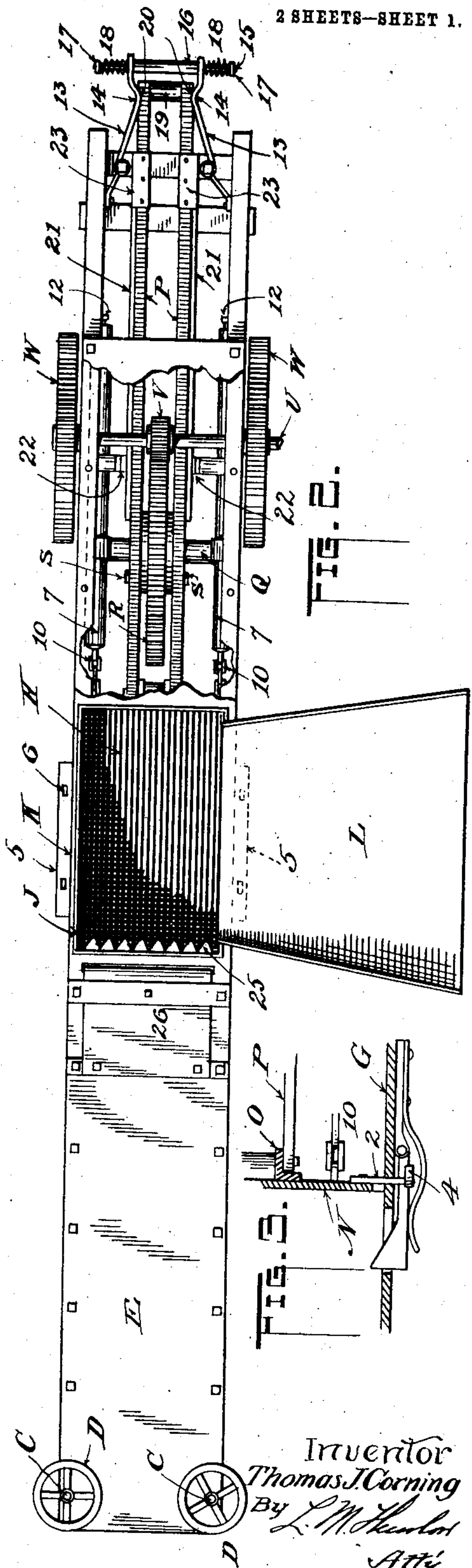
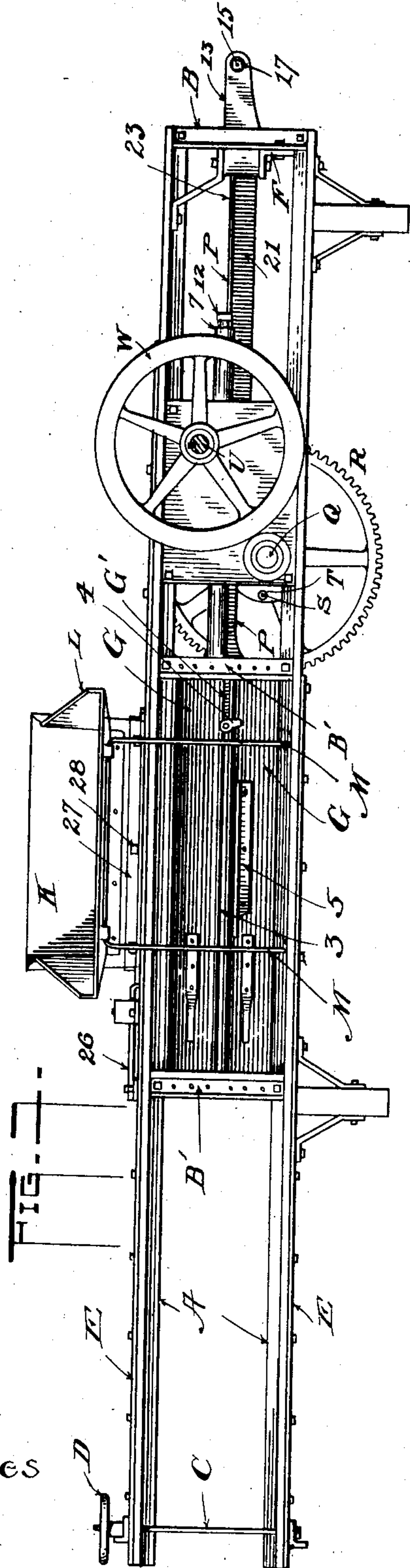
T. J. CORNING.
BALING PRESS.

APPLICATION FILED FEB. 10, 1908. RENEWED SEPT. 24, 1909.

947,375.

Patented Jan. 25, 1910.

2 SHEETS—SHEET 1.



Witnesses
m. Hiller.
L. Dray

Inventor
Thomas J. Corning
By L. M. Hiller
Atty.

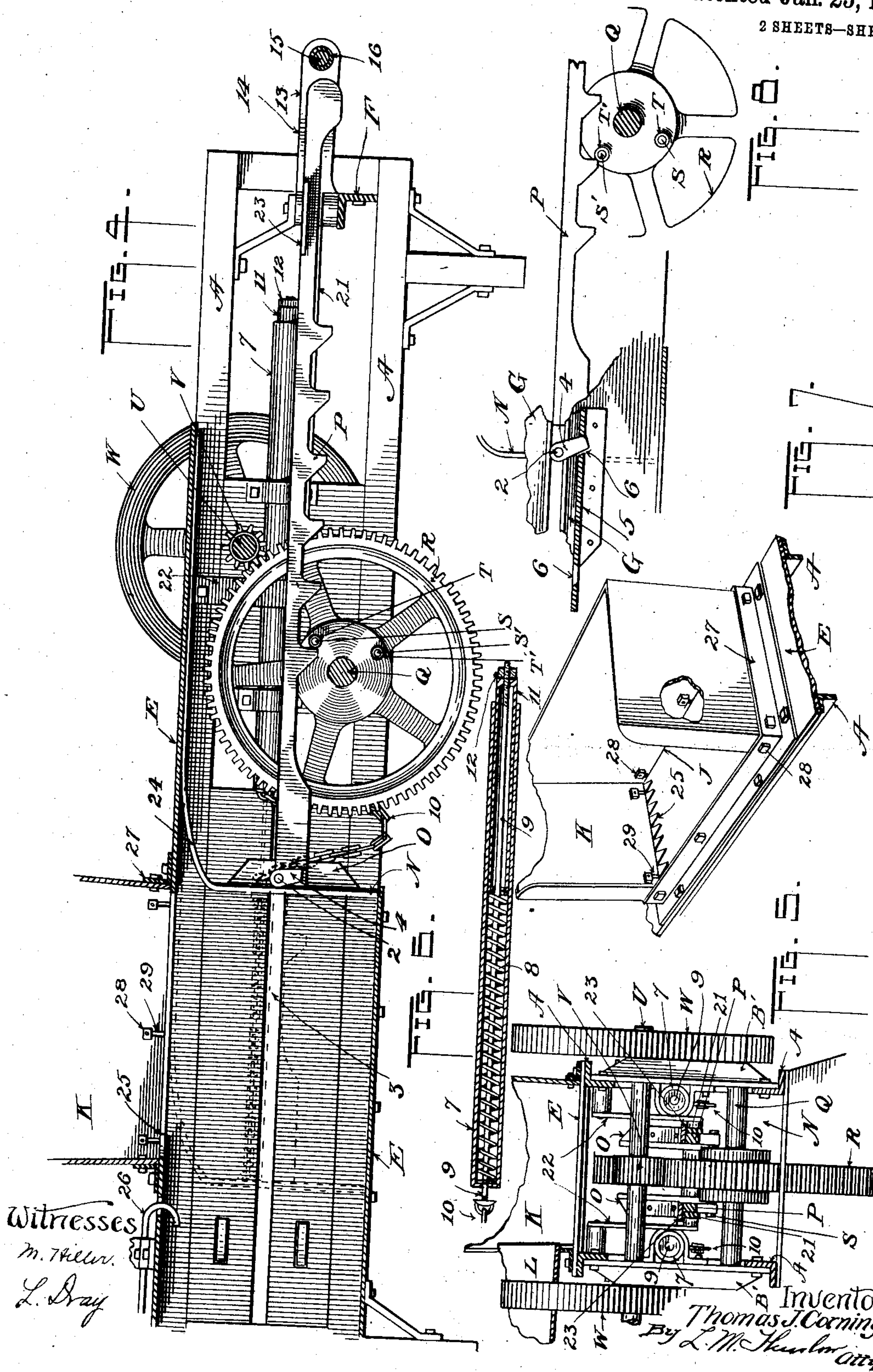
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UNITED STATES PATENT OFFICE.

THOMAS J. CORNING, OF ORION, ILLINOIS.

BALING-PRESS.

947,375.

Specification of Letters Patent.

Patented Jan. 25, 1910.

Application filed February 10, 1908, Serial No. 415,256. Renewed September 24, 1909. Serial No. 519,408.

To all whom it may concern:

Be it known that I, THOMAS J. CORNING, citizen of the United States, residing at Orion, in the county of Henry and State of Illinois, have invented certain new and useful Improvements in Baling-Presses; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to baling presses.

An object of the invention is to construct a baling press that will require but a very light form of power for its operation.

A further object is to construct a baling press in which the power is made to impart a progressive step-by-step movement to the plunger.

A further object is to construct a baling press in which the operating power will be cumulative in that between each step-by-step movement imparted to the plunger said power will be automatically freed from the plunger and revolved to gain momentum before again imparting its movement.

A further object is to simplify the construction of baling presses generally so that but a very small driving power will be required in the operation of the same and depend considerably upon the momentum of balance wheels.

Further objects will appear as the following specification proceeds.

In the appended drawings, Figure 1 is a side elevation of my improved baling press. Fig. 2 is a top view of the same. Fig. 3 is a horizontal section of a part of a press showing part of the plunger. Fig. 4 is a longitudinal section of the main portion of the press on a much larger scale than that of the first two figures. Fig. 5 is an end elevation in part section of the press as viewed from its rear end. Fig. 6 is a longitudinal section of a spring plunger and its case. Fig. 7 is a perspective view of a reversible hopper, and Fig. 8 is a view of certain portions of Fig. 4 shown in different positions from those of said figure.

The body of the press is preferably constructed of what is known as "angle iron" and "channel iron", readily found in the open market and which makes a comparatively cheap and thoroughly rigid frame.

A indicates four longitudinal members of

angle iron which constitute the main portions of the frame and which are suitably spaced apart to form the top and bottom members by means of vertical stays or braces B and B', also of angle iron, as shown in Fig. 1, the forward extremities of the bars A being provided with the usual upright threaded bars C having the hand wheels D by which to contract the space between the upper and lower parts of the frame, this being common to most machines of this class.

The bottom and top of the press are suitably covered with sheet iron as indicated by E.

Extending between and having their ends secured to the members B' are two "channeled" members G, the flat sides of which form the walls of the usual compression chamber indicated at H in Fig. 2. In the top of the machine is an opening J, and mounted above and surrounding the opening is a hopper K open on one of its sides and provided with a chute L, the latter being removably attached to the hopper in any suitable manner and having supporting legs M whose free extremities rest upon some convenient part of the frame. This chute is used in order that the hay or straw may be placed thereon and afterward dragged into the hopper by the operator thus saving loss of the material in transit from the source of supply to the hopper and provides a convenient resting place for it until wanted.

N indicates the plunger corresponding to that used in nearly all presses, and a part of this is shown in horizontal section in Fig. 3, the rear side having attached thereto suitable vertically disposed angle bars O, Figs. 3 and 5, to each of which is rigidly secured a toothed rack P corresponding to the pitman usually employed. Beneath the racks just mentioned is a horizontal shaft Q, suitably journaled in the frame, which carries a spur wheel R positioned between the two racks described. This wheel is provided with two studs S and S', at each side, which are provided with friction rollers T and T' respectively. These rollers are provided for imparting longitudinal movement to the racks, or pitman, for the purpose of imparting movement to the plunger N for compressing the hay or straw being baled.

At U is a driving shaft to which the power is connected in any good manner, and which is provided with a pinion V and the

ends of the shaft outside the machine carry balance or fly wheels W. Revolution of the pinion imparts movement to the spur gear R with which it is in engagement, thereby imparting an orbital movement to the studs S and S' and their rollers.

It will be noted in Fig. 4 that the friction roller T of the stud S is in engagement with one of the teeth of the racks or pitman. Movement of the stud toward the left will start the pitman forward. As the roller completes its movement in an arc and is about to leave the tooth the roller T' will have come into position to engage the succeeding tooth to continue the movement of the pitman and carry it a distance equal to that imparted to it by the first roller.

Carried by the plunger, at each side, is an arm 2, one of which is shown in Fig. 3, each of which extends horizontally from said plunger through a slot or opening 3 created by slightly separating the channel members G hereinbefore described as clearly shown in Fig. 1. The outer extremity of each arm 2 carries a dog 4 free to swing thereon. Secured to the lowermost of the members G at each side of the machine is a bracket 5 having a horizontal extension in which, as shown in Figs. 2 and 8, are two apertures 6 in line with the dogs 4 which drag over said bracket. As the plunger is given its movement by the means described and the friction roller T' is about to leave the teeth of the pitman the dogs 4 at each side drop into the said apertures 6 as indicated in Fig. 8. In this figure is clearly shown the position of the teeth of the rack or pitman with regard to the rollers. Having imparted their initial movement to the pitman and the latter being held by the dogs, the friction rollers now again complete an orbital movement and once more come into place to engage the teeth of the pitman which is advanced the same distance as before, the dogs 4 at the end of the movement entering the second aperture 6 of the bracket 5 where the plunger is held and prevented having a retracting movement due to the hay under compression. Once more the rollers leave the teeth and then engage succeeding ones and carry the plunger forward for the final act of compression.

Secured in a suitable manner to opposite sides of the press, behind the plunger, are two cylindrical spring-cases 7 within each of which is a compression spring 8 through which passes a rod 9 one end of which extends through the case 7 and has connection with the plunger by means of a chain 10. The opposite end of the rod carries a plunger 11 for receiving the rear end of the spring, through which the rod extends, the rear end of the latter having an adjusting nut or similar device 12 by which to obtain any degree of compressure of the

spring. At the time the plunger N starts forward for the final compression the slack in the chain, indicated in Fig. 4, is taken up and the spring is then put under more and more compression as the plunger reaches its limit of movement. When the roller T' has once more released the tooth with which it was in engagement the rack is liberated and the spring returns the plunger to its normal or starting position.

At the rear end of the press and suitably mounted upon a member F of the frame are two bent arms 13 each having near their rear ends an inward bend as at 14. Extending through the free ends of the arms is a rod 15 on which is a sleeve 16 lying between the arms for limiting the movement of the latter toward one another. The free ends of the rod carry adjusting nuts 17 and between these and the arms 13 is a compression spring 18. The rear ends of the racks P which form the pitman are rigidly connected as by a member 19 and the sides of the racks are grooved or recessed at 20 to receive the inward bends 14 of the said arms 13. The distance between the said arms as held by the springs 18 is less than the width of the pitman and as the latter is returned to the starting position through the medium of the springs 8, before described, the pitman enters between the arms 13 to separate them, said arms acting as a bumper to absorb the shock. As the arms are spread the pitman enters between them and the bends 14 of the arms enter the recesses 20. By this means the arms besides acting as a bumper as described, also hold the pitman and prevent any tendency to a "back-lash". In addition to this I may employ rubber bumpers G', or equivalent means, between the members G, for example, as shown in Fig. 1, to receive the impact of the arms 2 in the return movement.

Any means may be used, if needed, to hold the pitman in its proper working position, its weight, however, being sufficient to prevent it from rising from its horizontal position. In order to prevent it from falling below said horizontal position and that it will have proper relation with regard to the friction rollers, I mount a guide at each side thereof as indicated at 21, the rear ends of which are suitably secured to the member F, the means, however, not being shown. The forward ends of said guides are hung from the sides of the machine by supporting links 22, Fig. 5. Near and upon the rear end of each rack of the pitman is secured a plate 23 which projects at each side thereof and rests upon the said guides and slides therealong, this being readily understood by a study of Fig. 5.

The plunger is provided with an upwardly and rearwardly extending hood 24 which, as the plunger moves forward, is car-

ried beneath the hopper to close the opening J in order to prevent hay getting behind the plunger and into the working parts when the latter is passing beneath the said opening. But this is common to most baling presses. In connection with this hood I place a number of fixed teeth 25 at one end of the opening J and constituting what may be termed a comb which extends into the throat or opening of the hopper in substantially the position shown and pointing toward the rear or plunger-end of the press. The main duty of this comb as I use it is to thin down or separate excessive charges of hay, making the charges as finally pressed into the bale of a uniform size. The use of this device becomes essential in a press that does not contemplate the use of a self-feeder. It acts to comb or shred and separate each charge of hay. If it were not for this device a large mat, or chunk, or lump of hay might be forced in ahead of the plunger. But the comb divides it and makes the charges of uniform size.

At 26 is a folder for assisting in doubling the hay back and forth, but this is also common to baling presses and consequently nothing new is claimed in connection therewith.

The hopper K is preferably detachable and reversible and the means by which this is accomplished is clearly shown in Fig. 7. A vertical flange 27 is bolted to the top of the press to surround the opening J and this said flange carries a series of bolts 28. The hopper is designed to snugly fit within this flange and is provided at its bottom edges with slots 29 corresponding with and for receiving said series of bolts. By loosening said bolts, the hopper can be removed and reversed in position so that its opening may be positioned at the opposite side of the machine the hopper being replaced in the flange the slots coming opposite the position of the bolts so as to receive them. Any desired manner of detachably securing the chute L to the hopper may be used, it being preferable to do this by frictional engagement, however, so that there will be no parts to adjust or become lost.

It will have been understood from the foregoing that the main object of my invention is to construct a baling press that will require but a very small or light form of power for its operation. Contrary to most of the baling presses of which I am aware I gain power through the use of but three elements, viz: the spur gear R, the pinion P and the studs S and S'; providing two heavy balance wheels for the driving shaft, the purpose of which will be understood presently. I am enabled to use an engine or other source of power of but two or three horse power since, as I construct the machine, the gearing runs entirely free and without load at certain intervals so that the

balance or fly wheels can gain speed by which to store power and utilize the momentum as part of the power for a succeeding movement of the plunger.

As has been stated, the friction rollers T and T' give the initial movement to the plunger and at the end of that movement the plunger is held stationary by the dogs 4, the entire gearing then being liberated to gain speed. As the speed of the drive shaft U is very high the fly wheels are sufficiently heavy to carry the plunger forward against the hay at the next movement aided, of course, by the power itself. The pinions are very small as compared with the size of the spur gear R so that the power is given ample time in which to recover after each movement imparted to the said plunger. If the movement of the plunger were a continuous or unremitting one the power would be necessarily greatly decreased, but an intermittent movement permits the use of a very small power as compared with that usually required.

A power device of small horse power, and a system of gearing comprising but few parts makes the press very low in cost of manufacture and also makes it more easily portable by reason of its lightness.

I do not, of course, confine myself to the particular arrangement of the parts shown herein, since equivalent constructions may be used while accomplishing the object sought. I have not dwelt upon the manner in which the bales are started and formed and compressed since this is well understood. In effect, the toothed pitman and the friction rollers constitute a rack and mutilated pinion, the said rollers corresponding to two teeth of such a form of pinion. The gear R, therefore, or its shaft, could carry a pinion or pinions of this type for the purpose intended. It may be observed that I am not necessarily confined to the use of two rollers, or teeth, since one could be used, or even more than two could likewise be used. In one case the plunger would have more movements but shorter ones, and in the other case the plunger would have fewer movements and longer ones unless the distance between the teeth of the rack and the distance between the rollers were changed to suit the length of the compression chamber.

Having thus described my invention, I claim:

1. In a baling press the combination of a plunger and its pitman, a rotatable member adapted itself to directly and intermittently engage said pitman and impart a partial movement thereto at each revolution.

2. In a baling press the combination of a plunger and its pitman, a rotatable member having provision for and itself adapted to directly and positively, and intermittently engage said pitman at each revolution there-

of to impart a series of progressive movements to the plunger.

3. In a baling press the combination of a plunger and a pitman therefor, a continuously rotating member having means affixed thereto adapted to directly and intermittently engage the plunger-pitman.

4. In a baling press the combination of a plunger and its pitman, a rotatable member and means affixed thereto adapted to directly and intermittently engage said pitman and impart a partial movement thereto at each revolution of said member and power means for driving the latter.

5. In a baling press the combination of a plunger and its pitman, a member adapted for rotation in a plane parallel to the line of movement of the pitman and having means thereon adapted to positively engage and project the pitman forward one step at each revolution thereof.

6. In a baling press power means, a member driven thereby, a plunger adjacent to and lying in the path of movement of the member, there being provision for causing the member itself to positively and intermittently engage the pitman and impart a series of short progressive movements thereto for the purposes set forth.

7. In a baling-press, the combination with a plunger of a toothed pitman therefor, a continuously rotated power wheel having members to intermittently engage the teeth of the pitman and projecting it forward step-by-step, and means to prevent retracting movement of the plunger.

8. In a baling-press, the combination with a plunger and plunger retracting means, of a toothed pitman for the plunger, a power wheel adapted for a continuous motion, means thereon to intermittently engage the teeth of the pitman in the said continuous revolution of the teeth to impart a step-by-step forward movement to the plunger and means to hold the pitman and prevent retracting movement thereof after each movement imparted thereto.

9. In a baling-press, the combination with a plunger and plunger retracting means, of a toothed pitman for said plunger, a continuously driven power wheel, means thereon adapted to intermittently engage the teeth and impart a partial forward movement to the pitman and plunger at each engagement and disengage therefrom after each said movement; and means to hold the pitman and prevent retracting movement thereof at each time the means on the wheel liberates it.

10. In a baling press, the combination with a plunger of a toothed pitman for moving it, a continuously driven power wheel, means thereon having an orbital movement adapted to alternately engage and disengage the teeth by which to impart a series of stop and start movements to the pitman and

plunger, means for retracting the plunger, and means to prevent the rebound of the latter.

11. In a baling press, the combination with a plunger of a toothed pitman therefor, a continuously driven power wheel, means thereon arranged to describe an orbital path and adapted to engage certain of the teeth of said pitman to impart a single short movement to said pitman at each revolution of the wheel, means for retracting the pitman after it has made its full movement, and means to prevent its rebound.

12. In a baling press, the combination with a plunger of a pitman therefor and provided with a series of regularly disposed teeth, a member adapted to rotate in a path to engage one of the teeth and impart movement to the pitman in a rectilinear direction and then leave the tooth, means for retracting the pitman, and means to prevent its rebound.

13. In combination with a baling chamber, a plunger therefor, a pitman attached thereto, and provided with a series of regularly disposed teeth, a member rotatable at the side of the pitman and having means thereon to revolve in the path of and engage the teeth once during each revolution of said member for imparting a step-by-step movement to said pitman, means to retract the pitman and other means to prevent its rebound.

14. In combination with a baling press, a plunger, a pitman therefor having a series of teeth, revoluble means to alternately engage and leave certain of the teeth to project the pitman forward step by step at each revolution of said means, retracting means for the pitman, and means to prevent retraction between each two movements imparted thereto for the purposes described.

15. In combination with a baling press, a plunger a pitman therefor having a series of teeth, a wheel adjacent thereto and having means thereon to engage certain of the teeth to impart a short movement to the pitman at each revolution of said wheel, means to retract the plunger, means to prevent its rebound, a high speed shaft and means between said shaft and the wheel for causing a greatly reduced speed in the latter.

16. In a baling press the combination with a plunger, a pitman therefor having a series of teeth, a rotating member adapted to engage the teeth, once at each revolution to carry the plunger forward in a step-by-step movement, means to retract the pitman and plunger, means to receive the impact of and hold the pitman and means to prevent its rebound.

17. The combination in a baling press, of a traveling plunger pitman provided with an indentation of a member pivotally carried on the frame of the press and provided with

an extension, and means to yieldingly hold the member in the path of the pitman and cause the extension of the latter to engage the indentation.

5 18. The combination in a baling press, of a traveling plunger pitman provided with an indentation in one side, of a pair of members pivoted on the frame of the press, one of them provided with an extension, and
10 means to yieldingly hold the members in the path of the pitman and adapted to be separated by the latter entering between them, said means causing the said extensions to engage the indentations of the pitman.

15 19. The combination in a baling press of a traveling plunger pitman provided with an indentation at each side, of a pair of members pivoted on the frame of the press their adjacent sides each having an extension thereon and means carried by said members to hold them yieldingly in the path of
20 the pitman and to cause the extensions to engage the indentations of said pitman.

20. In a baling press the combination with
25 a plunger and its pitman, of means to engage and impart a series of progressive step-by-step movements thereto, a member carried by the plunger, a member in the path of the first said member to receive and hold it at
30 the end of each movement of the plunger and means to retract said pitman.

21. In a baling press, the combination with a plunger, of a pitman therefor, means to engage and move the pitman in a series of
35 short progressive movements and liberate the same at the end of each movement, a pawl carried by the plunger, means in the path of the pawl to receive and hold the plunger from retracting when liberated and means
40 to retract said plunger.

22. In a baling press the combination with a plunger, of a pitman therefor having a series of teeth, a rotating member adapted to intermittently engage the teeth and impart
45 a series of short progressive movements to the plunger, a pawl carried by the latter, means to receive the pawl at the end of each movement to hold the pitman from a retracting movement and means to retract the
50 pitman at the end of its full movement.

23. In a baling press the combination with a plunger, of a pitman therefor having a series of teeth, a rotating member adapted to intermittently engage the teeth and impart a
55 series of short progressive movements to said pitman, a pawl carried by the plunger, means to receive the pawl at the end of each movement to hold the pitman from a retracting movement, means to retract the pit-
60 man at the end of its full movement and means to receive the impact of the pitman,

and adapted to engage and hold it from rebounding.

24. In a baling press the combination with a compression chamber having a receiving
65 opening in its top, and a single series of teeth fixed in position and secured at said opening and extending partially thereinto, the points thereof being directed toward the rear end of the press and away from the end
70 having said compression chamber.

25. In a baling press the combination with a compression chamber and a plunger, the former having a receiving opening at its top at one end thereof, and a single series of
75 teeth fixed in a position and secured to the top of the chamber and extending into said opening and having their points directed toward the rear end of the machine or away from said compression chamber for the pur-
80 poses set forth.

26. The combination with a baling chamber of a baling press having an opening in its top, of a vertically disposed member at said opening, a hopper member to fit the first
85 described member and open at one side, there being a slot in one of the members adjacent to the other and means carried by the said other member to engage the slot for holding both members relatively stationary.
90

27. The combination with a baling chamber of a baling press having an opening in its top, of a vertically disposed flange at said opening, a hopper to fit said flange and open at one side, there being a series of open
95 slots in said hopper next to the flange, and members carried by the flange to engage the slots.

28. The combination with the baling chamber of a baling press having an opening
100 in its top, of a vertically disposed member at said opening, a hopper to fit the first described member, and open at one side, means to detachably secure the hopper to the member, and a detachable chute to slidably en-
105 gage the hopper.

29. The combination with the baling chamber of a baling press having an opening in its top, of a vertically disposed member at said opening, a hopper to fit the first
110 described member, and open at one side, and having a vertically disposed flange thereon at each side of the opening, means to secure the hopper to the member, and a detachable chute to slidably engage the flanges of said
115 hopper.

In testimony whereof I affix my signature, in presence of two witnesses.

THOMAS J. CORNING.

Witnesses:

E. J. ABERSOL,
L. M. THURLOW.