

(No Model.)

3 Sheets—Sheet 1.

W. L. HAYES & L. W. JERNBERG.  
MACHINE FOR BUNDLING WIRE.

No. 536,990.

Patented Apr. 2, 1895.

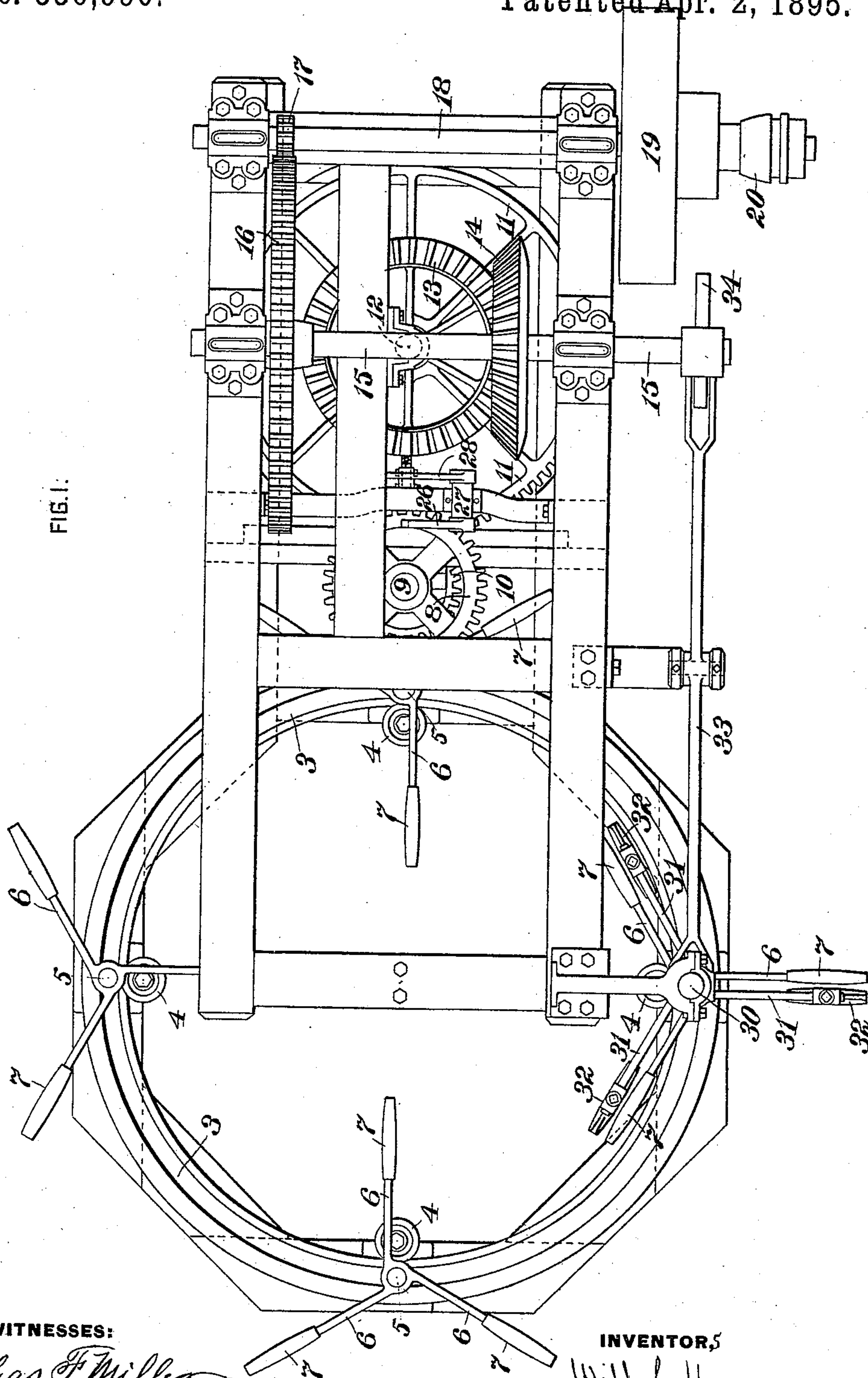


FIG. 1.

WITNESSES:

*Chas F. Miller.*  
*J. E. Gaither*

INVENTOR,

*Will L. Hayes*  
*Laurence W. Jernberg.*  
by *Danin S. Wolcott* Att'y.

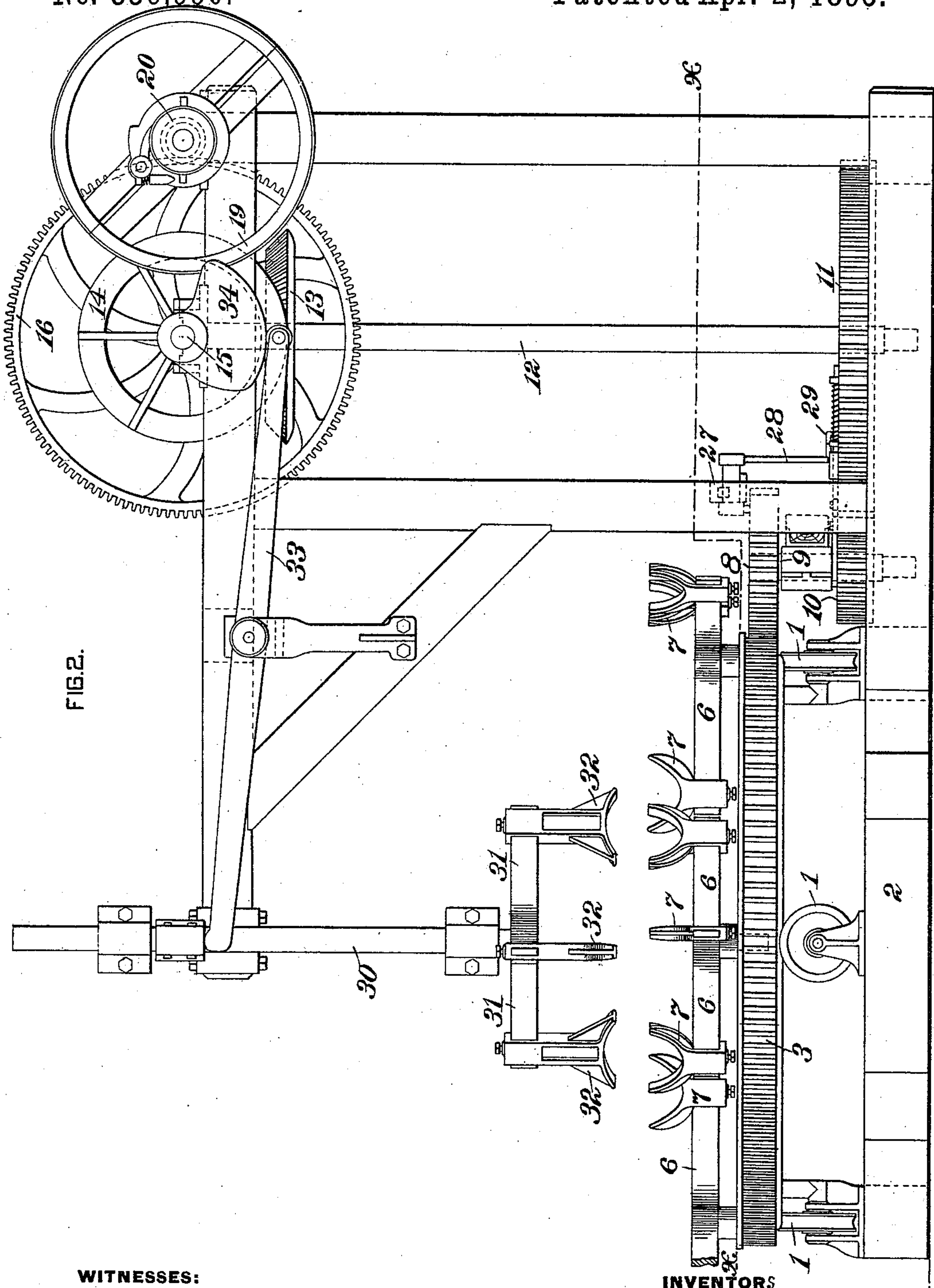
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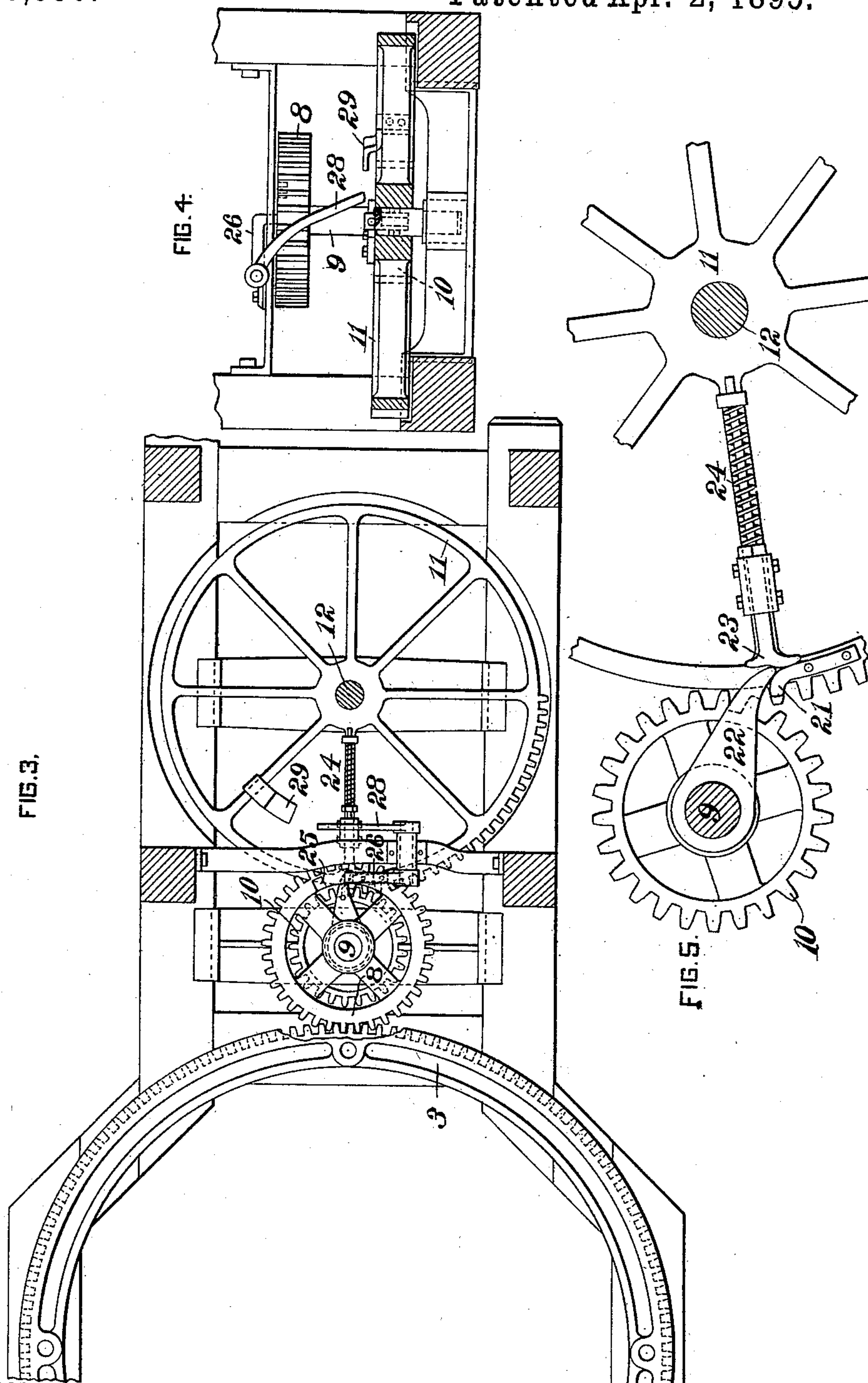
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by Danm. S. Wolcott Att'y.



# UNITED STATES PATENT OFFICE.

WILL L. HAYES AND LAURENCE WM. JERNBERG, OF CLEVELAND, OHIO;  
SAID JERNBERG ASSIGNOR TO SAID HAYES.

## MACHINE FOR BUNDLING WIRE.

SPECIFICATION forming part of Letters Patent No. 536,990, dated April 2, 1895.

Application filed January 4, 1895. Serial No. 533,803. (No model.)

*To all whom it may concern:*

Be it known that we, WILL L. HAYES and LAURENCE WM. JERNBERG, citizens of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented or discovered certain new and useful Improvements in Machines for Bundling Wire, of which improvements the following is a specification.

In the manufacture of wire, the latter as it comes from the dies is wound upon drums or reels from which it is removed in bundles. In order to prevent tangling and to prevent bending or other injury during shipment, the coils forming the bundles are tightly bound together. The more compact or tightly bound the bundle, the more capable is it of resisting injury.

The object of the present invention is to provide mechanism for compressing the coils together and holding them in such position while being bound.

In general terms the invention consists in the construction and combination, substantially as hereinafter more fully described and particularly claimed.

In the accompanying drawings forming a part of this specification, Figure 1 is a top plan view of our improved machine. Fig. 2 is a side elevation of the same. Fig. 3 is a sectional plan view, the plane of section being indicated by the line *x, x*, Fig. 2. Figs. 4 and 5 are detail views.

In the practice of our invention a series of supporting rollers 1 are secured in proper position upon a suitable foundation frame 2, and upon these rollers is placed an annular frame 3, provided with teeth on its outer periphery, and held from being shifted off of the rollers 1 by anti-friction rollers 4, bearing against the inner periphery of the frame 3, as shown in Fig. 1. The frame is provided with a series of pins 5 on which are mounted radial arms 6, each carrying a V-shaped jaw 7 adjustable along the arms. A gear wheel 8 on vertical shaft 9, engages the teeth on the periphery of the frame 3, and on the opposite end of the shaft is keyed another gear wheel 10, with which a mutilated gear wheel 11 is adapted to intermesh. This mutilated gear wheel is keyed on a vertical shaft 12, having on its up-

per end a bevel gear wheel 13, adapted to intermesh with a corresponding gear wheel 14, on the countershaft 15, on which is secured the gear wheel 16, driven by the pinion 17 on the power shaft 18. This shaft is driven by a pulley 19, loosely mounted on the shaft and adapted to be locked to the latter by a suitable clutch mechanism 20.

In order to insure the proper engagement of the teeth of the mutilated wheel 11 with those of the wheel 10, a tooth 21 is secured on the side of the wheel 11 for engagement with an arm 22 on the wheel 10, or the shaft 9 carrying the latter as shown in Figs. 3 and 5. This arm projects beyond the periphery of the wheel 10, and the tooth 21 is arranged on the wheel 11 to engage the arm 22 so as to impart a movement to the wheel 10, equal to that of the wheel 11, before the teeth on wheel 11 engage those of wheel 10, and thereby insure the proper intermeshing of the teeth of the two wheels.

As the frame 3 is mounted so as to be easily moved, the sudden contact of the tooth 21 with the arm 22 is liable to cause a too sudden movement of the arm and the parts moved thereby. This movement is prevented by a shoe 23, on the end of a rod mounted in suitable bearings on one of the arms of the mutilated wheel 11 and held so as to cause the shoe to engage the end of arm 22 by a spring 24. This shoe engages the end of the arm 22 at about the same time that the tooth 21 strikes the arm, and serves to hold the arm against the tooth.

As it is necessary to stop each set of arms 6 at a predetermined position, the gear wheel 8 is provided on its upper side with a recess 25, with which a projection on an arm 26 is adapted to engage. This arm is attached to a shaft mounted in bearings 27 on a cross brace of the frame of the machine, and provided with a second arm 28 arranged in the path of a cam projection 29 on the mutilated wheel 11. The cam projection is so arranged on the wheel 11 as to raise the projection on the arm 26, just prior to the engagement of the tooth 21 with the arm 22. After the cam projection has passed from under the arm 28, the weight of the latter will hold the projection on the arm 26 against the side of the wheel 8, and force



it into the recess 25, on the completion of a rotation of the wheel 10.

As shown in the drawings, the annular frame 3 is provided with four sets of arms 6, and the gear wheels 8 and 10 and mutilated wheel 11 are proportioned to impart a quarter of a revolution to the frame for one complete revolution of said gear wheels. Upon a suitable bracket overhanging the annular frame, is mounted a vertically movable shaft 30, carrying at its lower end a head provided with a series of three or more radial arms 31, each having a V-shaped jaw 32, adjustably mounted thereon. This plunger is raised by means of a lever 33, one end thereof bearing against a collar on the shaft 30, while its opposite end is adapted to be operated by a cam 34, on the countershaft 15. By the operation of the cam and lever the plunger is raised and held in its elevated position while the annular frame 3 is being rotated by the mechanism hereinbefore described. The cam is so adjusted on the countershaft as to permit the plunger to drop as soon as the teeth on the mutilated wheel 11 have passed out of engagement with the teeth on wheel 10, and the latter locked by the means described. The locking of the wheel 10 will also lock the annular frame being in engagement therewith.

The parts of the machine and their movements relative to each other are so adjusted that each set of arms 6, on the annular frame is brought to rest under the vertically moving plunger, which then drops compressing together the coils of a bundle of wire placed in the V-shaped jaws 7, and remains down sufficiently long to permit the bundle to be bound, whereupon the plunger is raised, the frame rotated, bringing another set of arms 6, carrying a bundle in their jaws, under the plunger. Attendants remove, during the periods of rest, the bound bundles, and replace them with loose bundles.

The adjustability of the V-shaped jaws on their arms permits of the machine being used for different sizes of bundles. It will be understood that the number of sets of arms 6 on the annular frame may be increased or diminished, the mechanism for rotating the frame being correspondingly changed, so as to bring the frame to rest when the sets of

arms 6 are in position under the vertically movable plunger.

We claim herein as our invention—

1. In a machine for bundling wires, the combination of a series of two or more sets of arms provided with V-shaped jaws and intermittingly movable to and from a predetermined position and a vertically movable plunger provided with V-shaped jaws, adapted to press the coils of wire into the other sets of jaws, substantially as set forth.

2. In a machine for bundling wires, the combination of an intermittingly movable annular frame provided with a series of two or more sets of arms having V-shaped jaws, and a vertically movable plunger provided with V-shaped jaws and operative during the periods of rest of the annular frame, substantially as set forth.

3. In a machine for bundling wires, the combination of a movable annular frame provided with a series of two or more sets of arms having V-shaped jaws, a train of gearing having a mutilated member for intermittingly rotating the frame, means for insuring the proper engagement of the mutilated member with one of the gear wheels of the train, and a vertically movable plunger provided with V-shaped jaws and operative during the periods of rest of the annular frame, substantially as set forth.

4. In a machine for bundling wires, the combination of a movable annular frame provided with a series of two or more sets of arms having V-shaped jaws, a train of gearing having a mutilated member for intermittingly rotating the frame, means operated by the mutilated member for imparting the initial movement to the frame, means for preventing a too rapid initial movement, and a vertically movable plunger provided with V-shaped jaws and operative during the periods of rest of the annular frame, substantially as set forth.

In testimony whereof we have hereunto set our hands.

WILL L. HAYES.  
LAURENCE WM. JERNBERG.

Witnesses:  
THOMAS L. HOPKINS,  
WM. C. MARTIN.