

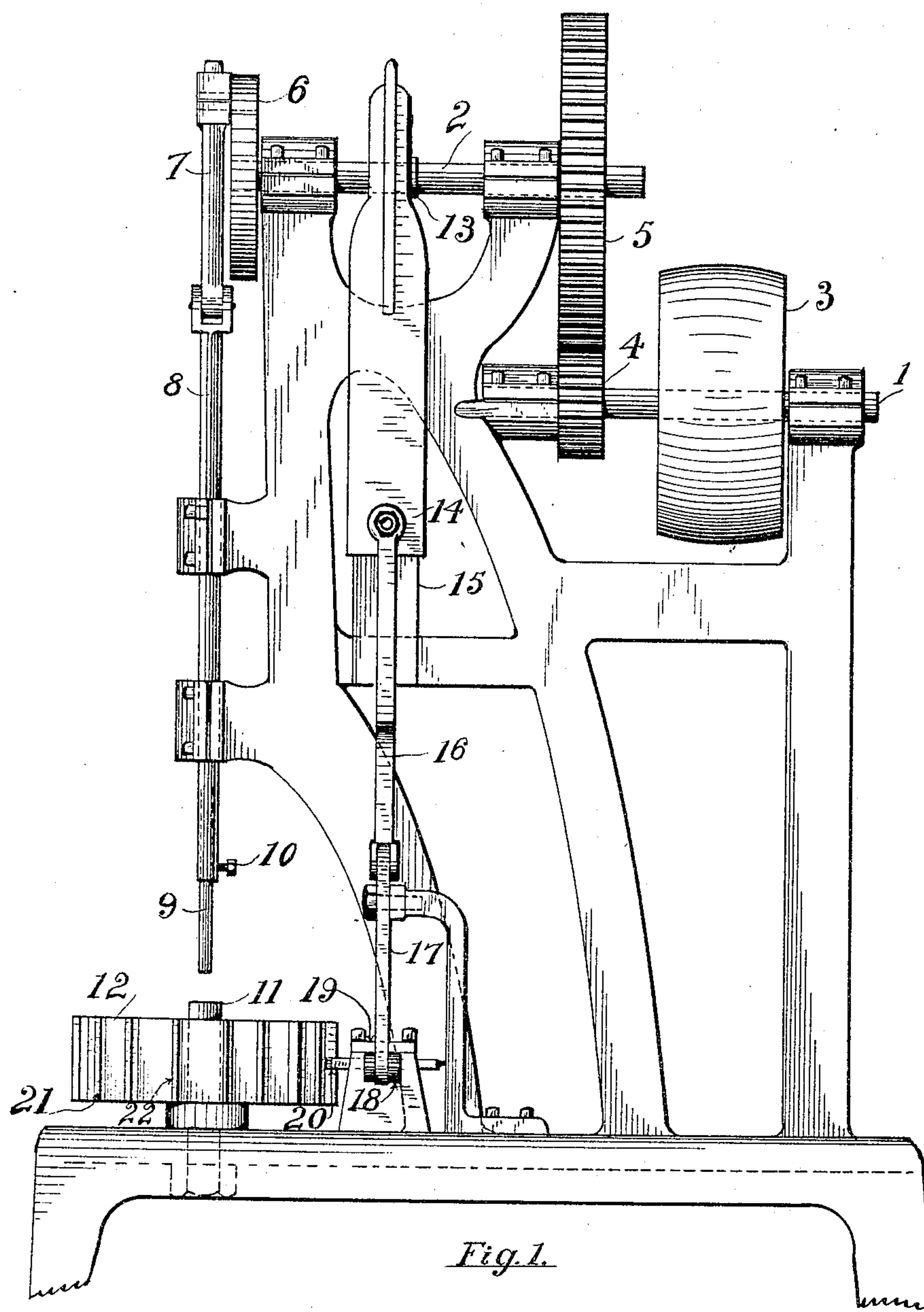
No. 773,929.

PATENTED NOV. 1, 1904.

B. DANHOF.  
DOWEL PIN MACHINE.  
APPLICATION FILED MAR. 31, 1904.

NO MODEL.

3 SHEETS—SHEET 1.



*Fig. 1.*

Witnesses  
*Edward R. Monroe*  
*Mary S. Tucker*

Inventor  
*Berend Danhof*  
By *Edward Taggart*  
Attorney

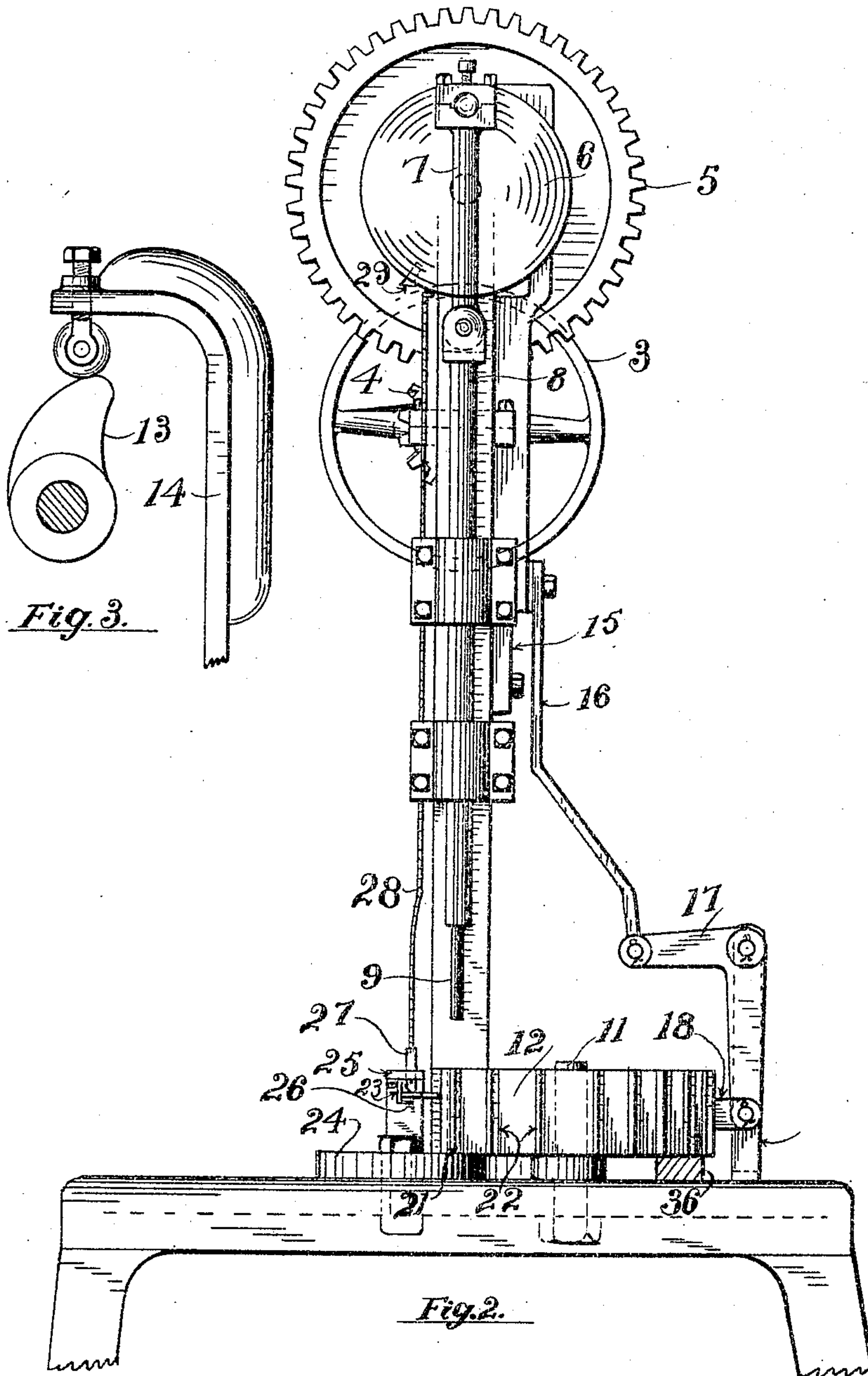
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NO MODEL.

3 SHEETS—SHEET 2.



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NO MODEL.

3 SHEETS—SHEET 3.

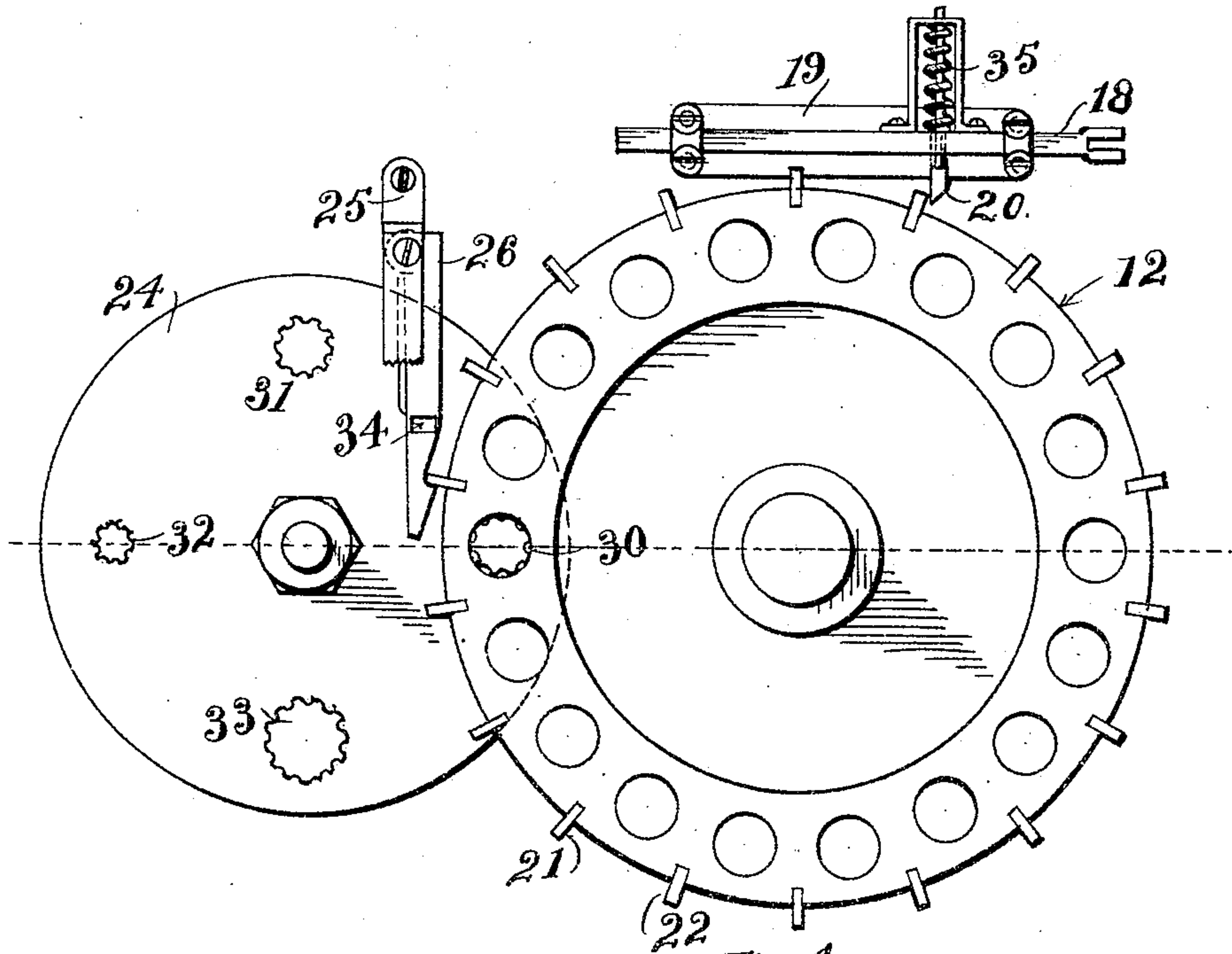


Fig. 4.

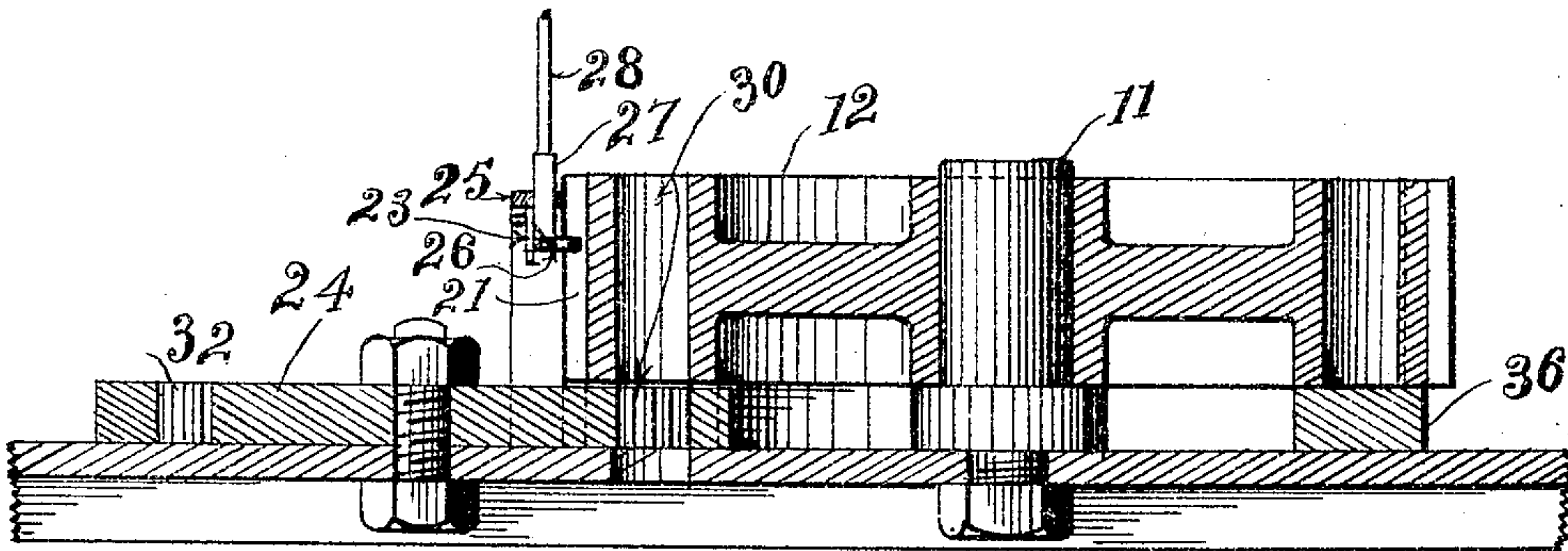


Fig. 5.

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# UNITED STATES PATENT OFFICE.

BEREND DANHOF, OF GRAND RAPIDS, MICHIGAN, ASSIGNOR TO ALBERT STICKLEY, OF GRAND RAPIDS, MICHIGAN.

## DOWEL-PIN MACHINE.

SPECIFICATION forming part of Letters Patent No. 773,929, dated November 1, 1904.

Application filed March 31, 1904. Serial No. 200,965. (No model.)

*To all whom it may concern:*

Be it known that I, BEREND DANHOF, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented new and useful Improvements in Dowel-Pin Machines, of which the following is a specification.

This invention relates to a new and useful machine for grooving or forming dowel-pins made of wood or other suitable material; and the invention relates more particularly to the manufacture of wooden dowel-pins used in joining together certain parts of wooden furniture.

The invention consists in the arrangement and combination of parts hereinafter described and claimed.

The objects of the invention are, first, to produce a machine that will construct a superior dowel-pin; second, to furnish means for rapidly and effectively grooving the dowel-pins for the purposes claimed; third, other objects hereinafter described. These objects I accomplish by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 shows a side elevation of my preferred form of machine, with the dowel-pin driver raised. Fig. 2 shows a front elevation of the same, the dowel-pin former being in position to receive a dowel-pin driven down by the driver. Fig. 3 is a detail view of the cam and the roller that gives the intermittent motion to the feed-hopper. Fig. 4 is a plan view, on an enlarged scale, of the automatically-operating feed-carrier for the dowel-pins and the former which corrugates the dowel-pins. It also shows a part of the mechanism that gives the automatic intermittent rotary motion to the feed-carrier. Fig. 5 is a section view shown on the dotted line of Fig. 4.

Similar figures refer to similar parts throughout the several views.

In my preferred form of machine, which I will first describe, 1 shows the main shaft, upon which is mounted the power-pulley 3, which pulley 3 receives motion from any suitable source. The shaft 1 carries the pinion or gear 4, which pinion 4 engages with the gear 5

on the slow-speed shaft 2, as more fully shown in Fig. 1. On the shaft 2 is a disk or crank-wheel 6, which operates the pitman 7, said pitman 7 being connected to the crank-wheel 6 by a suitable pin and in the ordinary manner.

8 is a reciprocating rod or plunger connected to and supported in suitable guides, and is preferably provided with a driver 9 at its lower end, as shown in Figs. 1 and 2. The driver 9 is adjustably secured to the rod 8 by means of a set-screw 10 or by any other suitable means, said driver 9 being of suitable size to drive a dowel-pin through the opening in the feed-carrier and force the same through a corrugating die or former, as hereinafter described.

The automatically-operating feed-carrier 12 is journaled upon a vertical support or stud 11 and is automatically revolved thereon by means of the mechanism hereinafter described.

The automatically-operating feed-carrier 12, as shown, is in the form of a disk; but it is evident that it can be formed of suitable configuration, and said feed-carrier 12 is provided with a plurality of openings, which openings are of sufficient size to receive freely a dowel-pin before the same has been grooved.

The feed-carrier 12 is provided with a series of peripheral teeth, (indicated by the reference characters 21 and 22.)

The mechanism for automatically operating the feed-carrier 12 is as follows: On the shaft 2 is a cam 13, which cam revolves with the shaft and gives a reciprocating motion to the cross-head 14, the cross-head 14 moving in suitable guides or ways, such cross-head being connected by suitable means to a connecting-rod 16. The connecting-rod 16 is in turn connected to the bell-crank lever 17, as shown more fully in Fig. 2. The bell-crank lever 17 turns on an elbow-pivot as a fulcrum, and the lower end of 17 is pivoted to the shank 18 of the dog 35, the dog 35 being spring-actuated and having an incline bevel shape, as shown by 20. The rod or shank 18 is supported in guide-supports 19. When the dog 35 moves to the left, it gives the feed-carrier 12 a partial revolution, moving the same a distance equal to the distance between any two of the teeth 21 and 22, &c., of the feed-car-



rier 12. The backward movement of the dog does not engage with the feed-carrier 12, as its wedge shape allows it to pass backward over the intervening teeth. The former consists of a disk 24, provided with a plurality of openings 31, 32, and 33 of different sizes, having the walls thereof corrugated, and through the said openings the dowel-pins are adapted to be forced, thereby corrugating or grooving the same. The former 24 is placed under the feed-carrier 12 in position to receive the dowel-pin driven from the feed-carrier 12 by means of the driver 9.

A mechanism is provided to automatically stop the feed-carrier 12 in proper position, so as to bring its openings successively to register with one of the openings in the former 24, and this mechanism consists of a spring-dog 26, which engages in turn with the teeth on the periphery of the feed-carrier 12 and stops the feed-carrier 12 at the required point. This spring-stop is operated through the rod 28, which rod 28 is provided with an enlarged portion 27, which moves in a guide 25 and is provided with a beveled portion, which engages with the opening 34 in the dog 26, and as the said enlarged portion 27 descends withdraws the dog 26 from engagement with the tooth of the feed-carrier 12, allowing the advancing mechanism to move the said feed-carrier 12 to the next tooth. Immediately on the release of the dog 26 by the raising of the enlarged portion 27 the spring 23 returns the dog 26 to a locking position. The upper end of the rod 28 bears against the periphery of the wheel 6 when in normal position to engage each tooth of the feed-carrier 12; but the cam-lug 29 on the wheel 6 depresses the rod 28 at each revolution and in this way disconnects the dog 26 from the teeth of the feed-carrier 12 in the manner above described. The said rod 28 is supported by any suitable guides, such guides being shown in Fig. 2.

30 shows the dowel-pin openings in the feed-carrier 12, which is in position to register with the openings in the former. This is shown in Fig. 4. The openings in the feed-carrier 12 are arranged, preferably, in an exact circle, so that the dowel-pins in these openings may be fed to the former-openings one at a time or rather successively to the operation of the machine. The dowel-pins are retained in the openings in the feed-carrier through the medium of a curved member 36, arranged below the same, and said member 36 supports the pins in the feed-carrier until each pin is brought in turn over the former or die. As before stated, the former 24 is preferably provided with a plurality of openings of different sizes, as shown by 31, 32, and 33. Each opening is provided with internal peripheral projections, said projections engaging with the dowel-pin as the same is driven through the former, thereby grooving the dowel-pin, said dowel-pin emerging from the former in a perfect fin-

ished condition. This former 24 is supported on the central shaft, upon which it may be adjusted so as to bring any one of its openings in position to register alternately with the openings in the revolving feed-carrier 12. In order to construct dowel-pins of different sizes, it is necessary to remove the feed-carrier 12, which is supported on a central shaft and to replace a feed-carrier 12, containing openings to correspond with the size of the dowel-pin required. As many varieties, however, of dowel-pins may be made by the former as it contains varieties of openings.

By the construction above described I am enabled to rapidly groove dowel-pins from end to end and produce a very superior article for use, especially where the dowel-pins are used in connection with glue in joining together different pieces of furniture.

It will be understood that the operation of the several parts is such that the several openings in the feed-carrier bring the unfinished dowel-pins one at a time in position to receive the driver 9 and that all parts operate together by merely setting the machine in motion.

Having thus described my invention, what I claim to have invented, and desire to secure by Letters Patent of the United States, is—

1. In a dowel-pin machine, the combination of an automatically and intermittently operable feed-carrier provided with a plurality of openings adapted to receive unfinished dowel-pins, said carrier further provided with a series of teeth, a corrugating device arranged below said feed-carrier and adapted to receive successively dowel-pins from the openings in the carrier, a reciprocatory driver for forcing an unfinished dowel-pin from one of the openings in the carrier into said corrugating device, means for operating the driver, a reciprocating spring-actuated dog, adapted to engage with the teeth of the carrier when moving in one direction thereby imparting movement to the carrier and adapted to ride over the teeth of the carrier when moving in the opposite direction, means for intermittently operating said dog, a shiftable dog adapted to engage the teeth of the carrier for arresting the movement thereof in one direction, and means for moving said shiftable dog out of the path of the teeth of the carrier so that motion can be imparted to the carrier by the spring-actuated dog.

2. In a dowel-pin machine, the combination of an automatically and intermittently operable feed-carrier provided with a plurality of openings adapted to receive unfinished dowel-pins, said carrier further provided with a series of teeth, an adjustable corrugating device arranged below said feed-carrier and adapted to receive successively dowel-pins from the openings in the carrier, a reciprocatory driver for forcing an unfinished dowel-pin from one of the openings in the carrier into said corrugating device, means for operating the driver,



a reciprocating spring-actuated dog, adapted to engage with the teeth of the carrier when moving in one direction, thereby imparting movement to the carrier and adapted to ride  
5 over the teeth of the carrier when moving in the opposite direction, means for intermittently operating said dog, a shiftable dog adapted to engage the teeth of the carrier for  
10 arresting the movement thereof in one direction, and means for moving said shiftable dog

out of the path of the teeth of the carrier so that motion can be imparted to the carrier by the spring-actuated dog.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses. 15

BEREND DANHOF.

Witnesses:

EDWARD TAGGART,  
MARY S. TOOKER.