No. 774,020. PATENTED NOV. 1, 1904.

G. ADSIT.

QUILLING MACHINE.

APPLICATION FILED AUG. 13, 1904.

NO MODEL. 3 SHEETS—SHEET 1.

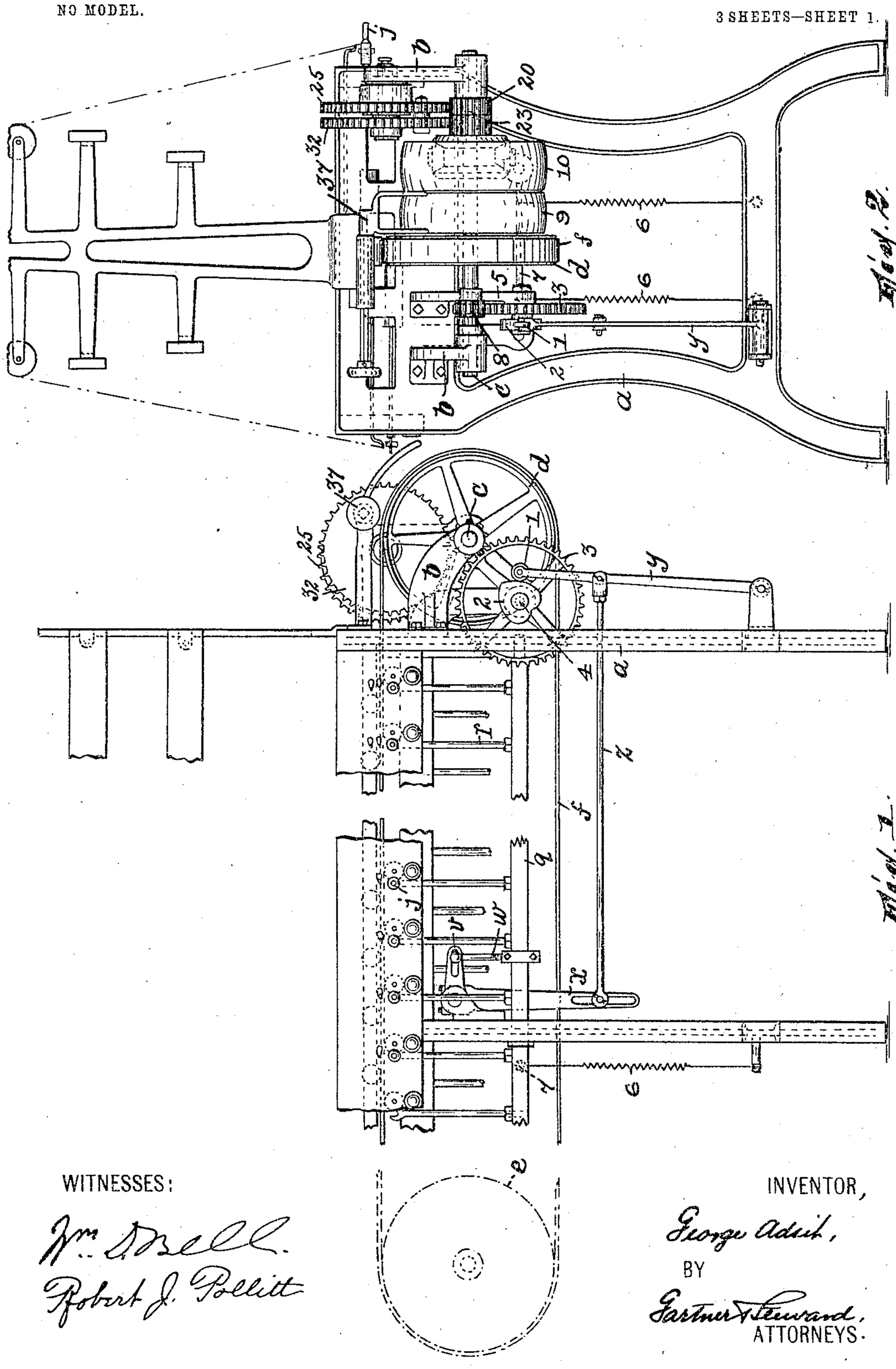

Fig. 1.

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NO MODEL. 3 SHEETS—SHEET 2.

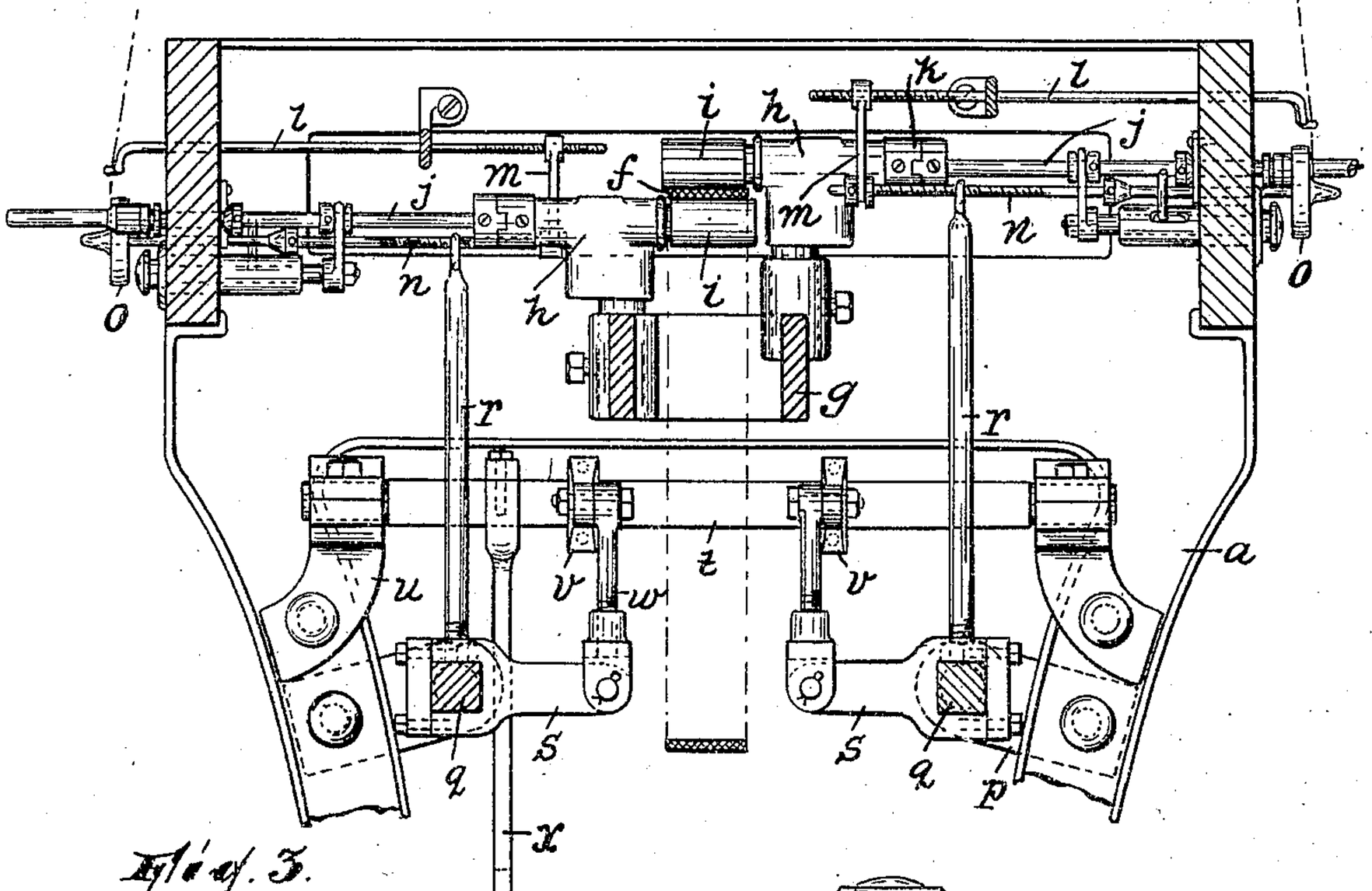

Fig. 3.

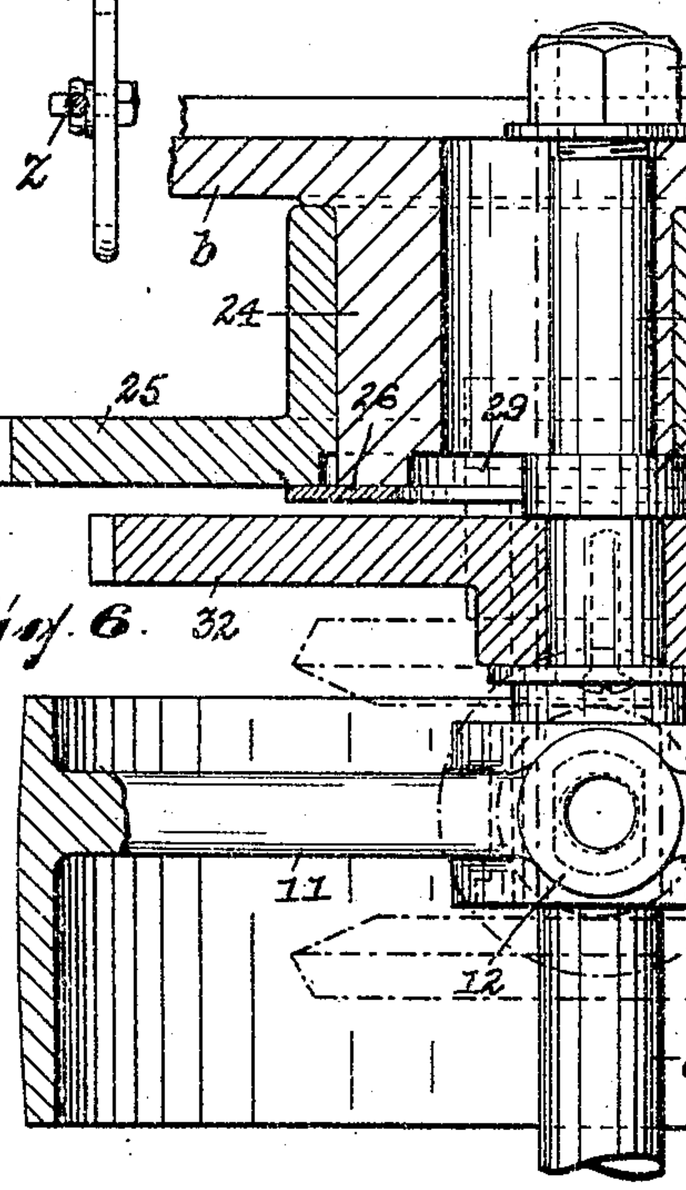

Fig. 6.

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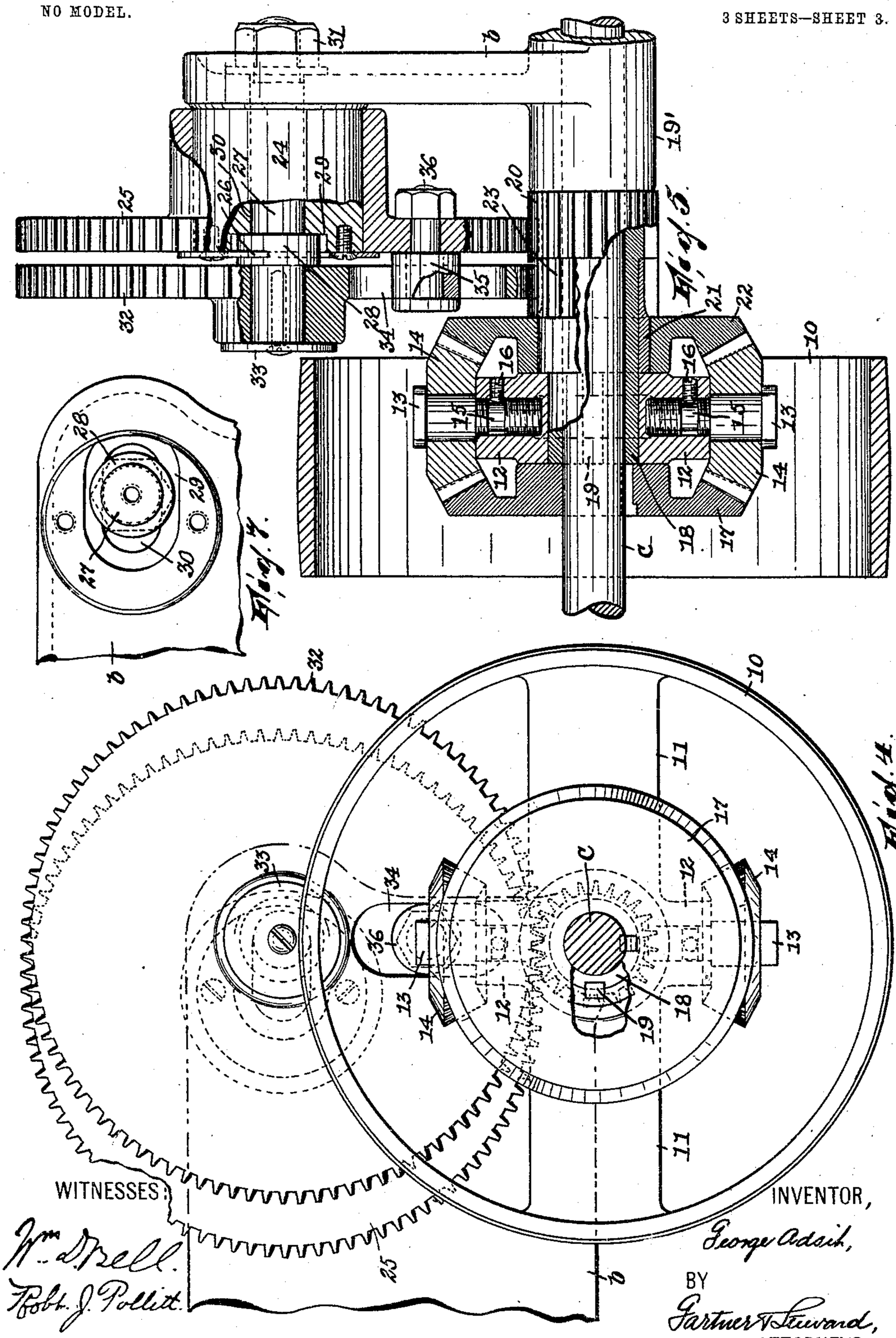
NO MODEL. 3 SHEETS—SHEET 3.



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No. 774,020. Patented November 1, 1904.

UNITED STATES PATENT OFFICE.

GEORGE ADSIT, OF PATERSON, NEW JERSEY, ASSIGNOR TO BENJAMIN EASTWOOD COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

QUILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 774,020, dated November 1, 1904.

Application filed August 13, 1904. Serial No. 220,597. (No model.)

To all whom it may concern:

Be it known that I, GEORGE ADSIT, a citizen of the United States, residing in Paterson, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Quilling-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to characters of reference marked thereon, which form a part of this specification.

My present invention consists in certain improvements in quilling or other similar machines of the type of that illustrated in my United States Letters Patent No. 757,081.

Said improvements are directed, first, to constructional features of the means for reciprocating the thread-guide carriers, and have for their object in that instance to simplify the construction and perfect the action of said means.

Said improvements are directed, secondly, to the means generally for forming the cops or quills and as to this last-named means contemplate that a more or less objectionable intermittent variation in the tension and pull-off of thread from the supply attends the winding of a conical quill or cop, owing to the fact that the leverage is more or less, according as the point of laying on the thread is at the small or large end of the cone of the quill. They have for their object in this instance to make possible maintaining the tension and pull-off approximately uniform by causing the quill-carrying spindles to rotate intermittently fast and slow—fast when the threads are being fed onto the small parts of said cones and slow when they are being fed onto the large parts of the cones—and for a further object to synchronize the movements of the thread-guide carriers to the rotary action of the corresponding quills, so as to preserve regularity in the winding notwithstanding the changes in velocity of rotation of the quills.

I have illustrated my invention in the accompanying drawings, wherein—

Figure 1 is a view in side elevation of so much of a quilling-machine as is necessary to illustrate my invention. Fig. 2 is an end elevation of what is seen in Fig. 1. Fig. 3 is a transverse sectional view through the machine. Fig. 4 is a sectional view taken on Fig. 1 in a plane between certain pulleys 9 and 10 and looking toward the pulley 10. Fig. 5 is a view, partly in vertical section and partly in side elevation, of what is seen in Fig. 4. Fig. 6 is a view of what is seen in Figs. 4 and 5 looking from above and showing certain parts in section, some in elevation, and others in dot-and-dash outline and a certain pulley as partly broken away; and Fig. 7 is a view of a detail of the mechanism illustrated in Figs. 4, 5, and 6.

a designates the frame of the machine, and *b* brackets projecting from one end thereof, in which is journaled a horizontal transverse shaft *c*, on which is fixed a pulley *d*, over which and a similar pulley *e* at the other end of the machine, and which is shown in dot-and-dash outline in Fig. 1, extends an endless belt *f*. In longitudinal rails *g* of the machine are supported the bolsters *h*, in which are journaled certain shafts, which carry whirls *i* at one end and are adapted to be disconnectively connected with the spindles *j*, on which the cops are wound, by clutches *k*.

l designates thread-guide carriers, the same being suitably guided in the frame for movement parallel with the spindles and being connected by forks *m* with threaded rods *n*, which are also arranged parallel with the spindles, in such manner that said threaded rods can rotate and yet when reciprocated will impart reciprocating motion to the thread-guide carriers. Said threaded rods carry the usual friction-wheels *o*, which in the reciprocating movements of the rods *n* are peripherally engaged by the cops, and thus cause the rods *n* to be intermittently rotated from the revolving cops.

As in my patent above mentioned, my present invention contemplates the employment

of two sets of spindles and two sets of thread-guide carriers and their accessory mechanism, said sets projecting in opposite directions and the whirls of the two sets of spindles alternating with each other and arranged on opposite sides of the driving-belt *f*.

The foregoing is a sufficient description of the ordinary quilling-machine, the essential elements of which will be found fully described in my patent above referred to.

My improved means for reciprocating the thread-guide carriers may be described as follows: In brackets *p*, secured to the frame of the machine, are journaled squared parallel rock-shafts *q*, arranged, preferably, in the same horizontal plane. These rock-shafts carry the forks *r*, which in the manner peculiar to this class of machines engage the threads of the respective threaded rods *n*, so that while the forks as they rock are adapted to reciprocate said rods the latter by being rotated in said forks will advance therein. The rock-shafts *q* also carry cranks *s*, projecting toward each other. *t* is another rock-shaft, journaled transversely of the machine in brackets *u* and carrying cranks *v*. Each of said cranks *v* and the corresponding crank *s* are pivotally connected by an adjustable pitman *w*. Thus when shaft *t* rocks it acts, through cranks *v*, pitmen *w*, and cranks *s*, to rock the shafts *q*, so that the forks *r* oscillate alternately to and from each other.

x is a downwardly-projecting crank carried on the rock-shaft *t* and connected with a lever *y*, suitably pivoted in the frame, by a pitman *z*. The lever *y* carries a roller 1, which bears against the periphery of a cam 2, rigid with a gear 3, which is journaled on a stub-shaft 4, which is carried by a bracket 5, secured to the frame. Springs 6 connect cranks 7, projecting inwardly from the shafts *q*, with the frame, with the result that the roller 1 is normally held against the periphery of the cam 2, as will be obvious. Cam 2 is rotated, through gear 3, from a pinion 8 on shaft *c*.

My improved spindle-rotating means may be thus described: On the shaft *c* are arranged two pulleys 9 and 10, the former being loose thereon and the latter positively connected up therewith through mechanism now to be described. Pulley 10, which has but two spokes 11, has its hub formed with two radial diametrically opposite bosses 12, into which are screwed studs 13, forming the bearings for miter-gears 14. Each stud is annularly grooved out, as at 15, to receive the end of a set-screw 16, which is tapped into the side of the corresponding boss, and thus holds the stud in place. On shaft *c* is keyed a miter-gear 17, which meshes with the miter-gears 14. Pulley 10 is not journaled directly on the shaft *c*, but is mounted on a sleeve 18, to which it is held fast by a key 19. This sleeve projects toward the right-hand bracket *b* (seen in Fig. 2) and abuts against the boss 19′ thereof. The end of said sleeve adjacent said boss is formed as a pinion 20. On the sleeve 18 as a bearing and between the pinion 20 and the hub of the pulley 10 is journaled a sleeve 21, onto which is shrunk another miter-gear, 22, which meshes with the miter-gears 14.

23 is a pinion which is formed as a part of the sleeve 21 and which abuts directly against the pinion 20.

On the right-hand bracket *b* is formed a boss 24, and this boss forms the bearing for a gear 25, which meshes with the pinion 20.

26 is a slotted plate which is held against the boss 24 and, being a little larger in diameter than the same, keeps the gear 25 on its bearing.

27 is a stud formed with a shoulder 28, which sits in an elongated recess 29, formed in the front face of the boss 24. With the shoulder 28 arranged as thus described the body portion of the stud penetrates a horizontal slot 30 in the boss and the bracket *b*, of which said boss forms a part, and said stud is adjustably held in the slot by a nut 31, which coacts with the shoulder to clamp the stud securely in place. The front or projecting end of the stud forms the bearing for a gear 32, which is held in place by a suitable disk 33 and meshes with the pinion 23. Said gear 32 has a radial slot 34, and in this slot travels an antifriction-roller 35, journaled on a stud 36, fixed in the gear 25. Arranged as thus described and with the gear 32 so adjusted that its axis is not coincident with that of the gear 25, the rotary movement of gear 25 will impart to gear 32 a rotary motion, which is intermittently fast and slow, according as the antifriction-roller 35 approaches or recedes from the axis of the gear 32.

Operation: The driving-belt is arranged to be shifted from pulley 9 to pulley 10 by a belt-shifter 37. When so shifted, it will rotate the shaft *c* through pulley 10, sleeve 18, pinion 20, gear 25, stud 36, gear 32, (which receives the antifriction-roller 35 on said stud in its slot 34,) pinion 23, miter-gear 22, miter-gears 14, and miter-gear 17, the rotary action of the shaft being intermittently fast and slow on account of the peculiar connection between the gears 25 and 32. This rotary action of the shaft will be transmitted to the various spindles by the belt *e*, which passes over the pulley *d*. While the spindles are rotating the thread-guides are reciprocated from shaft *c* through pinion 8, gear 3, cam 2, lever *y*, pitman *z*, crank *x*, shaft *t*, pitmen *w*, cranks *s*, rock-shafts *q*, and forks *r*, as above described. The reciprocating movement of the thread-guide carriers is not one which has a uniform speed, but is intermittently fast and slow on occount of said thread-guide carriers deriving their action, the same as the spindles, from the variable action of shaft *c*. Thus as

to any one thread-winding group of elements there is a synchronous action throughout. As the laying on of the thread approaches the large end of the quill-cone and the velocity of rotation of the quill decreases so the velocity of the thread-guide carrier correspondingly reduces, and, vice versa, when the laying on of the thread approaches the small end of the quill-cone and the velocity of the quill increases so the velocity of the thread-guide carrier is correspondingly augmented.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a suitable support, two sets of oppositely-projecting rotary spindles journaled therein, two corresponding sets of reciprocatory thread-guide carriers, a rotary shaft, means, operatively connecting said spindles and said shaft, for rotating the spindles from the shaft, and means, operatively connecting said shaft with the thread-guide carriers, for reciprocating said carriers from said shaft comprising two rock-shafts extending parallel each with a set of spindles, another rock-shaft extending transversely of said first-named rock-shafts, cranks projecting from said first-named rock-shafts toward each other, cranks carried by said other rock-shaft, and pitmen connecting the cranks on said first-named rock-shafts with those on the other rock-shaft, substantially as described.

2. The combination of a suitable support, two sets of oppositely-projecting rotary spindles journaled therein, two corresponding sets of reciprocatory thread-guide carriers, a rotary shaft journaled transversely of said sets of spindles and thread-guide carriers, means, operatively connecting said spindles and said shaft, for rotating the spindles, a cam on said shaft, a lever fulcrumed in said support and engaging the periphery of said cam, means for maintaining the lever against said cam, and means, operatively connecting said lever and the thread-guide carriers, for reciprocating said carriers from said lever comprising two rock-shafts extending parallel each with a set of spindles, another rock-shaft extending transversely of said first-named rock-shafts, cranks projecting from said first-named rock-shafts toward each other, cranks carried by said other rock-shaft, and pitmen connecting the cranks on said first-named rock-shafts with those on the other rock-shaft, substantially as described.

3. In a quilling-machine, the combination of a suitable support, rotary spindles journaled therein, thread-guide carriers, a rotary shaft journaled in said support, power-transmitting means operatively connecting said shaft and said spindles whereby to rotate said spindles from the shaft, and a means for imparting a rotary motion having a varying speed to said shaft comprising a rotary driving and a rotary driven member relatively arranged to overlap each other and journaled in said support with their axes non-coincident and parallel and one of them having a radial slot, a projection on the other arranged to travel in said slot, and means for operatively connecting the driven member with said shaft, substantially as described.

4. In a quilling-machine, the combination of a suitable support, rotary spindles journaled therein, thread-guide carriers, a rotary shaft journaled in said support, power-transmitting means operatively connecting said shaft and said spindles whereby to rotate said spindles from the shaft, and a means for imparting a rotary motion having a varying speed to said shaft comprising a rotary driving and a rotary driven member relatively arranged to overlap each other and journaled in said support with their axes non-coincident and parallel and one of them having a radial slot, a projection on the other arranged to travel in said slot, and means for operatively connecting the driven member with said shaft, one of said members being mounted in said support for adjustment transversely of the axis of the other, substantially as described.

5. In a quilling-machine, a means for rotating the quills thereof comprising, with a suitable support, a shaft to be driven journaled in said support, a pulley, a sleeve journaled on said shaft and carrying said pulley, a pinion rigidly mounted on said sleeve, another sleeve journaled on said first-named sleeve, another pinion rigidly mounted on said last-named sleeve, means for operatively connecting said last-named sleeve and the shaft whereby to rotate said shaft from the sleeve, two gears relatively arranged to overlap each other and journaled in said support with their axes non-coincident and parallel and one of them having a radial slot, and a projection on the other gear arranged to travel in said slot, said gears being respectively engaged with said pinions, substantially as described.

6. In a quilling-machine, a means for rotating the quills thereof comprising, with a suitable support, a shaft to be driven journaled in said support, a pulley, a sleeve journaled on said shaft and carrying said pulley, a pinion rigidly mounted on said sleeve, another sleeve journaled on said first-named sleeve, another pinion rigidly mounted on said last-named sleeve, means for operatively connecting said last-named sleeve and the shaft whereby to rotate said shaft from the sleeve comprising two toothed members one of which is fixed to said shaft and the other to said last-named sleeve and a rotary toothed member journaled in said pulley and meshing with said first-named toothed members, two gears relatively arranged to overlap each other and

journaled in said support with their axes non-coincident and parallel and one of them having a radial slot, and a projection on the other gear arranged to travel in said slot, said gears being respectively engaged with said pinions, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 12th day of August, 1904.

GEORGE ADSIT.

Witnesses:
JOHN W. STEWARD,
ROBERT J. POLLITT.