

(No Model.)

3 Sheets—Sheet 1.

J. B. HASTINGS.  
WIRE NAIL MACHINE.

No. 419,944.

Patented Jan. 21, 1890.

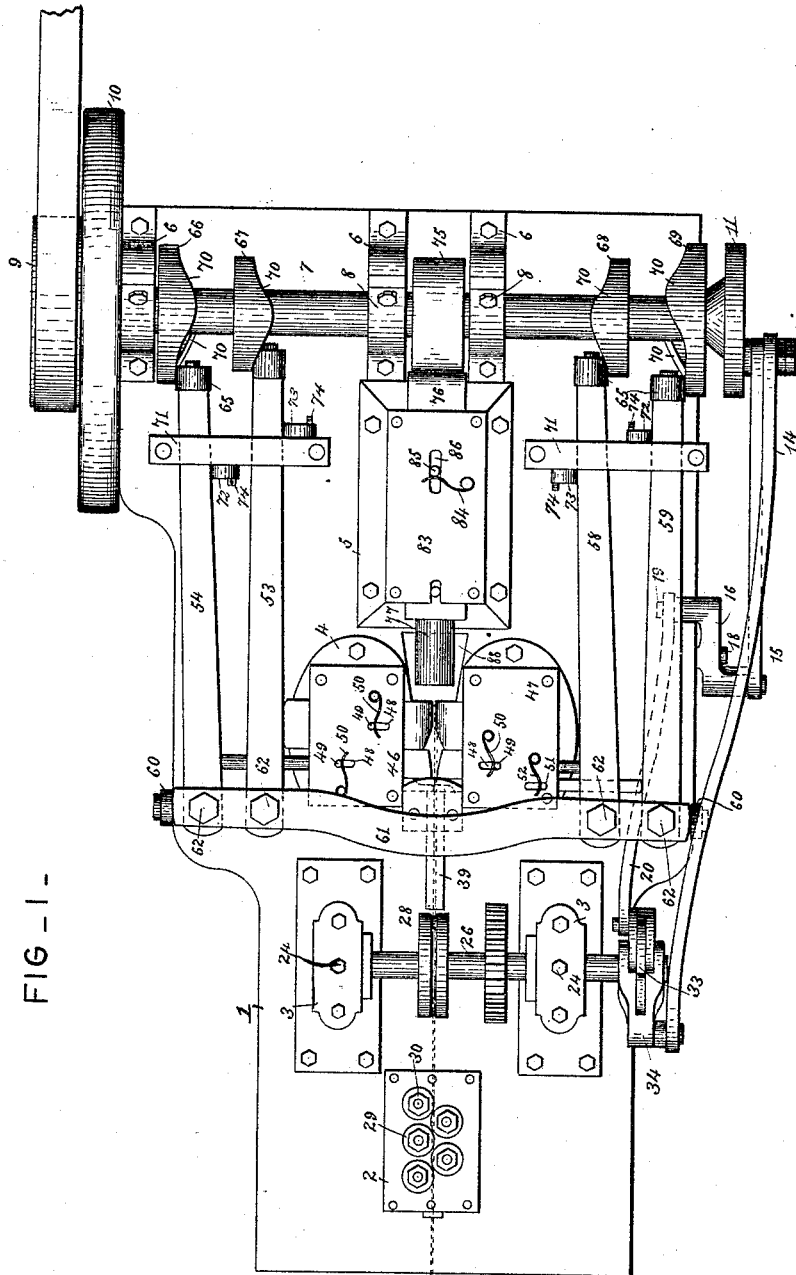


FIG - I -

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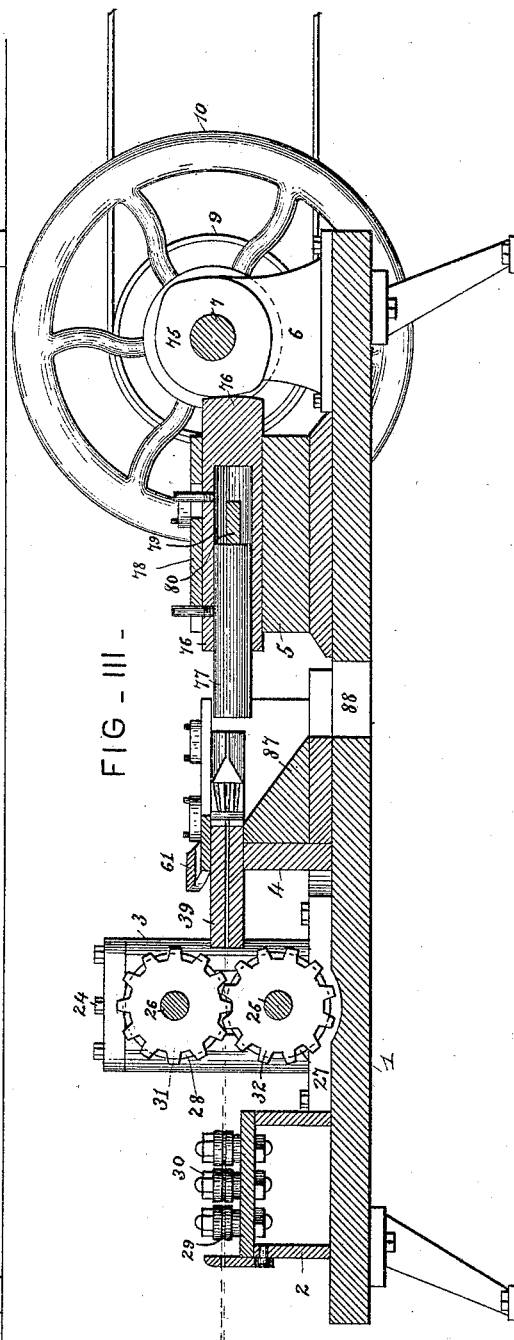
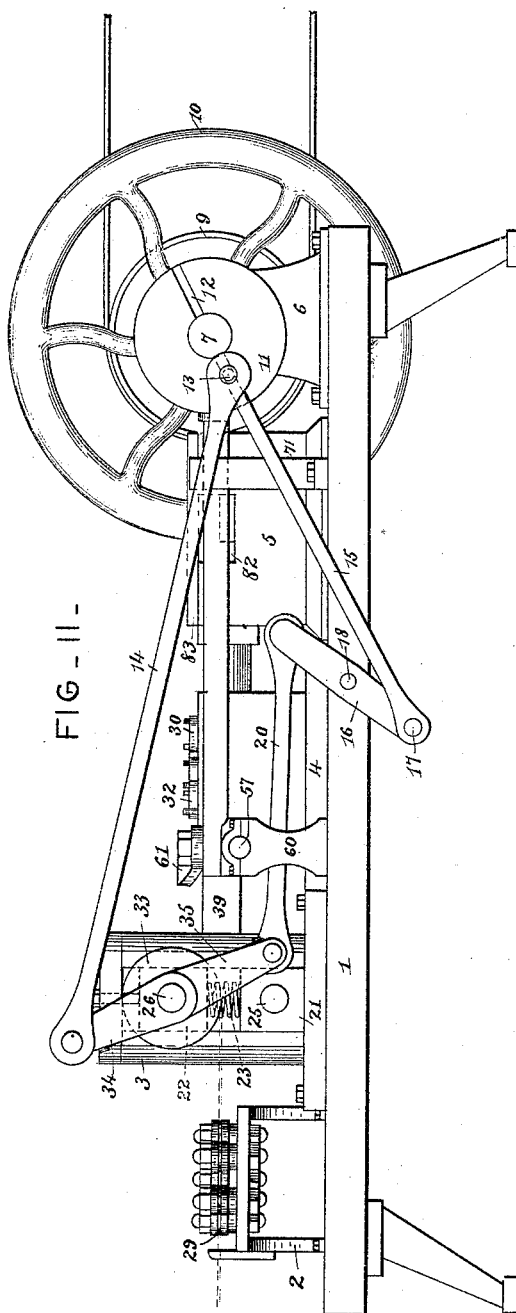
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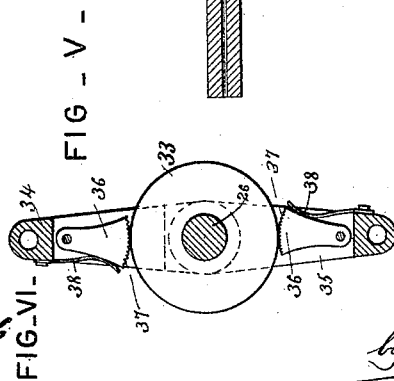
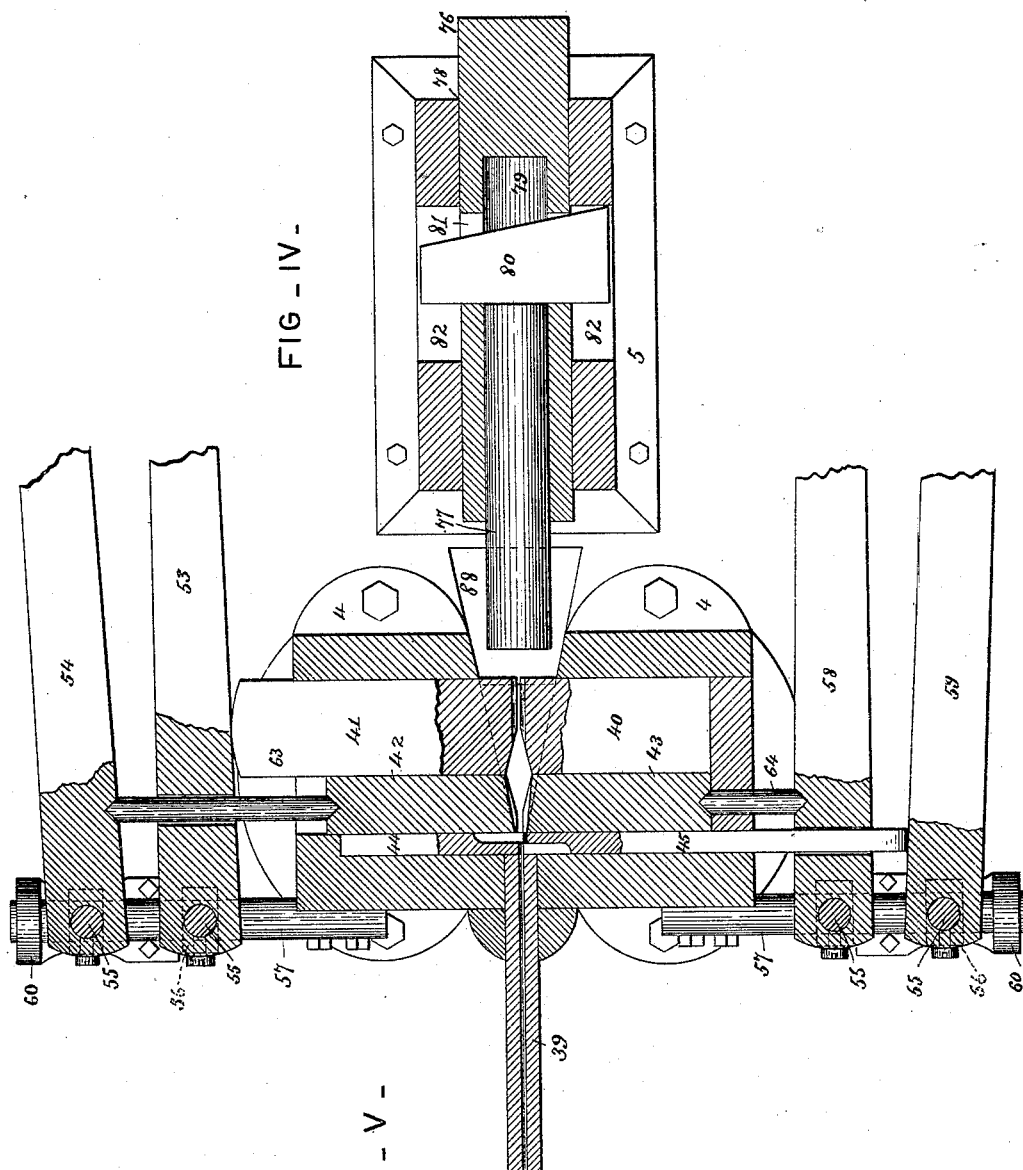
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# UNITED STATES PATENT OFFICE.

JOHN B. HASTINGS, OF JACKSON, OHIO, ASSIGNOR OF TWO-THIRDS TO JAMES M. TRIPP AND JAMES M. LIVELY, BOTH OF SAME PLACE.

## WIRE-NAIL MACHINE.

SPECIFICATION forming part of Letters Patent No. 419,944, dated January 21, 1890.

Application filed February 21, 1889. Serial No. 300,654. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN B. HASTINGS, a citizen of the United States, residing at Jackson, in the county of Jackson and State of Ohio, have invented certain new and useful Improvements in Wire-Nail Machines, of which the following is a specification.

The present invention relates to certain improvements on a similar machine for which I filed application for patent on the 31st of October, 1888, Serial No. 289,624, and the special and most important improvement is in making two nails instead of one at each revolution of the drive-shaft.

In order that my invention may be fully understood, I will now proceed to describe it, reference being had to the accompanying drawings, in which—

Figure I is a plan of my improved wire-nail machine. Fig. II is a side elevation. Fig. III is a central longitudinal section of the machine. Fig. IV is a detail view, in horizontal section, of the sliding header-block seat, said block, and header. Fig. V is a horizontal section of the bed in which the gripper-blocks, pointers, and cutters are mounted, also taken through the front ends of the cam-levers which operate said devices. Fig. VI is a detail vertical section taken through the swinging yokes.

In the drawings, 1 represents the base of the machine, which may be suitably supported, and fixed to it are the table or support 2, the frames 3, the supporting-bed 4 of the gripper-blocks, &c., the housing-frame 5, and supports or standards 6, in which latter is journaled the main drive-shaft 7 at the rear of the machine, and which is confined therein by boxes 8. On one end of the drive-shaft is fixed a belt-pulley 9, from which the operative parts of the machine may be driven. Adjacent to pulley 9 is a fly-wheel 10. On the other end of shaft 7 is fixed a wheel or disk 11, having on its outer face a T-groove 12, in which is adjustably fitted a headed crank-pin 13, with which is loosely connected one end of a rod or pitman 14; also, loosely connected with the crank-pin 13 is a pitman 15, which extends downwardly and forwardly, and is connected to the lower end of rock-arm 16 by means of a pivot-bolt 17. The rock-arm 16 is

pivoted intermediately of its ends to the base 1 of the machine by means of pivot-bolt 18. To the upper end of the rock-arm is loosely connected by pivot-bolt 19 the rear end of pitman 20.

The frames 3 at the front end of the machine have vertical openings, in which are fitted lower boxes 21 and upper sliding boxes 22, spiral springs 23 being arranged between the upper and lower boxes, which act upwardly on the upper boxes. The upper boxes are held down at the desired position against the upward pressure of the springs by set-screws 24. Journaled in the boxes 21 and 22 are horizontal shafts 25 and 26, adapted to be intermittently rotated by mechanism to be presently described. On the lower shaft 25 is fixed a grooved wheel or roller 27, above which and in contact therewith is a similar grooved wheel or roller 28, fixed on the upper shaft 26. Between these grooved rollers is fed the wire of which the nails are to be made, said wire being first straightened between the set of vertical rollers 29, journaled on vertical arbors 30, projecting from the table 2 at the front end of the machine.

Intermeshing cog-wheels 31 and 32 are fixed, respectively, on the upper and lower horizontal shafts for the purpose of causing both shafts to move in unison and feed forward at the same time a length of wire sufficient for one nail.

The devices for intermittently moving the feeding-rollers are constructed as follows: 33 is a friction-wheel fixed on one end of the upper horizontal shaft 26. The bifurcated forks of the swinging yokes 34 and 35 straddle the friction-wheel 33, and through their ends the shaft 26 passes. Dogs 36, having roughened cam-faces 37, are pivoted between the forks of the yokes near the closed ends of the latter, and the cam-faces 37 come in frictional contact with the periphery of the friction-wheel 33. The backs of said dogs are engaged by the free ends of springs 38, which are fixed to the yokes, and thus engagement of the cam-faces with the periphery of the friction-wheel when the yokes are moved in one direction is secured. One of the dogs should act when the other is not acting, and to this end the upper and lower ends of the yokes are con-

connected, respectively, with the front ends of the pitmen 14 and 20, respectively, the pitman 14 moving forward when the pitman 20 is moving backward, and vice versa, so that to one revolution of the drive-shaft 7 two feed movements of the rollers 27 28 are obtained.

Projecting forward from the incasing-bed 4 of the gripper-blocks, &c., toward the feed-rollers 27 and 28 is a guide-trough or conduit 39, through which the wire is conducted from the feed-rolls to the nail-forming mechanism.

The nail-forming mechanism is constructed as follows: On each side of the path of the wire are arranged in the incasing-bed 4 the gripping blocks or jaws 40 and 41, the block 40 being placed in the casing so as not to have any movement, whereas the opposing block 41 is capable of longitudinal movement, so that it may grip the wire against the opposite block. The meeting ends of these grippers are grooved and nicked crosswise of the grooves, so as to more effectually grip the wire. Alongside the gripper-blocks are placed the pointer-dies 42 and 43 for making the points of the nails. Both of these dies have longitudinal motion together. Alongside the pointer-dies are arranged the cutters 44 and 45, the former being immovable and the latter having longitudinal movement. For retaining the gripper blocks or jaws, the pointer-dies, and the cutters in place lids or covers 46 and 47 are placed thereover and secured to the casing 4. Projecting upward from the movable gripper-block 41 and the pointer-dies 42 and 43, and extending through slots 48 in the covers of the incasing-bed 4, are pins 49. Engaging these pins 49 are flat springs 50, which hold the gripper-blocks and pointer-dies normally from each other in position to receive the wire between them. Projecting from the movable cutter 45 is a pin 51, that is engaged by a flat spring 52 to hold the said cutter normally away from the opposite cutter.

On the left side of the machine two cam-levers 53 and 54 extend rearwardly, they being pivoted at their front ends on pins 55, which extend upwardly from collars or sleeves 56, secured movably on the bar 57, extending horizontally from the front of the casing-bed to the extreme left of the machine. Similar levers 58 and 59 are secured to similar devices (the reference-letters being the same) on the right side of the machine. The bars 57 are braced at their outer ends by standards 60, secured to the base of the machine. Extending from side to side of the machine is a brace 61, through which the pivot-pins 55 also pass and on which it is secured by nuts 62.

The movable gripping-block 41 extends through the side of its casing, and its rounded end is brought into engagement with the cam-lever 53 by means of its spring. The pointer-die 42, situated on the left side of the wire-passage, is engaged at its rear end by a plunger or reciprocating rod 63, which projects

through an opening in the casing and a transverse opening in the cam-lever 53 and engages the cam-lever 54 at the extreme left of the machine.

On the right of the machine the pointer-die 43 is engaged at its rear end by a plunger 64, much shorter than the one 63, which projects through an opening in the casing and engages the cam-lever 58 next to it on the right of the machine.

The movable cutter is considerably longer than the immovable cutter, and projects through the side of the casing, extends through a transverse slot in the cam-lever 58, and engages the cam-lever 59 at the extreme right of the machine. It will be seen that by means of these cam-levers when they are moved inwardly the respective devices engaged thereby will also be moved inwardly and bring into effective operation those parts of the nail-forming mechanism that have been described. To this end the rear ends of the cam-levers are provided with anti-friction rollers 65, which are engaged by suitable cams arranged on the main drive-shaft, whereby the levers are moved inwardly.

66, 67, 68, and 69 are disks arranged at suitable intervals on the main drive-shaft, the disks 66 and 69 being situated nearer the outer ends of the shaft than the disks 67 and 68. The inner faces of these disks—i. e., the faces presented toward the middle of the main shaft—are provided with diametrically-opposite cam projections 70, which engage the anti-friction rollers on the cam-levers, and at each revolution of the main shaft these cams will cause the mechanism operated by the cam-levers to go twice into operation, and hence two nails will be formed, the feeding-rollers, as previously stated, intermittently feeding at each revolution of the main shaft two lengths of wire sufficient for two nails.

At each side of the machine there is fixed to its base a frame 71, having near its top a transverse opening, through which the rear ends of the cam-levers pass. Springs 72 and 73, fixed at 74 to the frames, engage the rear ends of the cam-levers, the latter passing through transverse slots in said frames 71. These springs tend to press the levers outwardly for keeping them constantly in contact with the cam-faces of the disks 66, 67, 68, and 69.

Midway of the main shaft is fixed the double cam-wheel 75, the periphery of which engages and operates the header-block 76, which carries the cylindrical header 77, which is adjustable in said block. The header-block is loosely mounted, so as to have longitudinal movement in its seat 78 in the housing-frame 5. The header-block has a longitudinal bore 79, in which the header is fitted so as to be adjustable by reason of the wedge 80, which passes transversely through an opening 81 in the header-block and engages its rear end. This wedge at each end projects into recesses

82, formed in the sides of the housing-frame. The housing-frame has a removable cover 83, so that the header-block and header may be removed from the same when desired. The header is held in retracted position and against its double cam by reason of the flat spring 84, that engages a projection 85 on the header-block, extending through a slot 86 in cover 83.

10 In order that the gripper-blocks and the pointers may be operated a little in advance of the header (which engages the ends of the gripper-blocks when they are brought together) and the cutters, the cams which operate the levers of the former devices are arranged to engage these levers in advance of the cams which operate the levers of the latter devices, and the feeding-rollers are so adapted to the nail-forming mechanism as 15 that when the latter is at rest the former will feed a length of wire suitable for one nail.

Below the nail-forming mechanism is an inclined way 87, that leads to an opening 88 in the base of the machine, through which 25 the nails may be deposited into a suitable receptacle.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

30 1. In a wire-nail-making machine, the combination of the main driving-shaft and the nail-forming mechanism, with double cams arranged on said shaft for operating said nail-forming mechanism twice during one 35 revolution of the shaft, intermittently-rotatable wire-feeding rollers having an automatic friction device, and pitmen connecting the main driving-shaft and said friction device, whereby the rollers are also adapted to move 40 twice during a single rotation of the driving-shaft, substantially as set forth.

2. In a wire-nail-making machine, the combination of the vertical straightening-rollers, the smooth-grooved intermittently-rotating 45 horizontal wire-feeding rollers, means for so rotating the latter, and the nail-forming mechanism, substantially as set forth.

3. In a wire-nail-making machine, the combination of the nail-forming mechanism, the 50 intermittently-rotated feeding-rollers having a friction disk or wheel, and automatically-operated friction-shoes engaging said disk having connection with the main driving-shaft, whereby said feed-rollers are adapted 55 to be intermittently rotated during a single

revolution of the main driving-shaft, substantially as set forth.

4. In a wire-nail-making machine, the combination of the main driving-shaft, the wire-feeding rollers and shafts, a friction-wheel on 60 one of said shafts, a pair of yokes having their bifurcated ends mounted on said shaft, dogs carried by the yokes and adapted to engage at different times the periphery of said friction-wheel, and pitmen connecting the ends 65 of said yokes with the main driving-shaft, substantially as and for the purpose set forth.

5. In a wire-nail-making machine, the combination of the main driving-shaft, the wire-feeding rollers and shafts, a friction-wheel on 70 one of said shafts, and mechanism connected with the main driving-shaft having dogs adapted to alternately engage said friction-wheel, substantially as and for the purpose set forth. 75

6. In a wire-nail-making machine, the combination of the main driving-shaft, the wire-feeding rollers and shafts, a friction-wheel on 80 one of said shafts, mechanism connected with the main driving-shaft having dogs adapted to alternately engage said friction-wheel, and springs engaging said dogs and pressing them into contact with the periphery of the friction-wheel, substantially as and for the purpose set forth. 85

7. In combination with the grippers, pointer-dies, and cutters, the header, the header-block having a longitudinal bore into which the header is inserted, a wedge inserted in a transverse opening in said block and adapted 90 to engage and adjust said header, a frame or housing for said header-block having slots in which the ends of said wedge work, and mechanism for operating the header, substantially as set forth. 95

8. In combination with the grippers, pointer-dies, cutters, and header, cam-levers for operating the grippers, pointer-dies, and cutters, transversely-slotted frames through which the levers project, springs engaging 100 said levers and tending to force them outwardly, the main driving-shaft, and cams mounted on said shaft and adapted to engage the rear ends of said levers, substantially as and for the purposes set forth.

JOHN B. HASTINGS.

Witnesses:

T. A. JONES,

J. W. FRANKS.