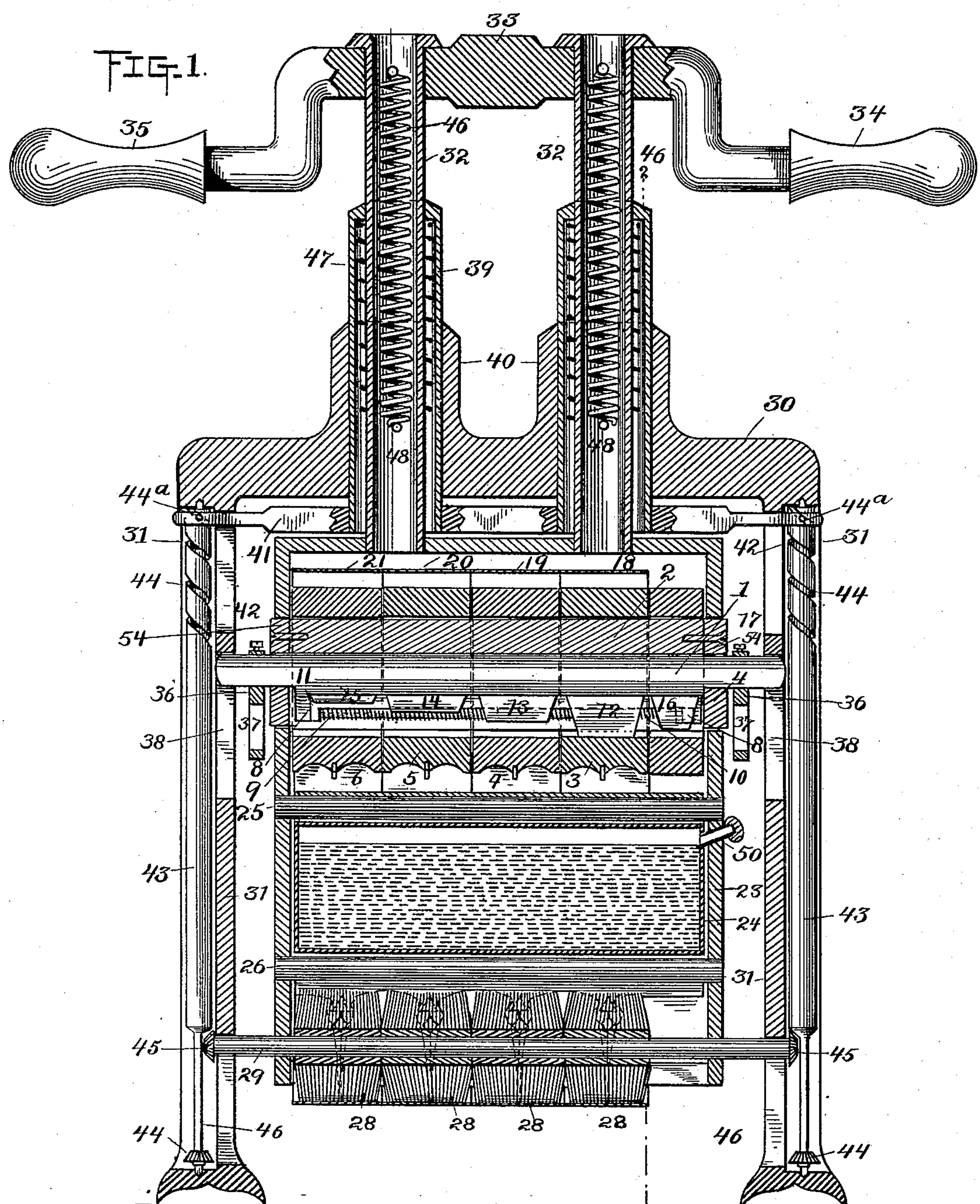
(No Model.) 2 Sheets—Sheet 1.

E. G. BATES.

MACHINE FOR PRINTING STENCIL CHARACTERS CONSECUTIVELY.

No. 486,964. Patented Nov. 29, 1892.

FIG. 1.



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[illegible]

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

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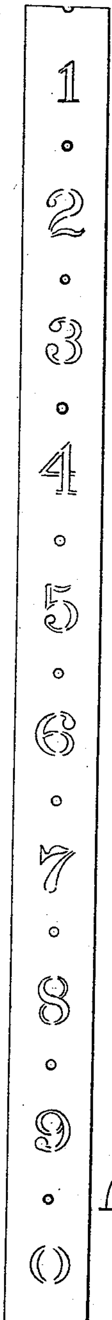


FIG. 5.

FIG. 3.

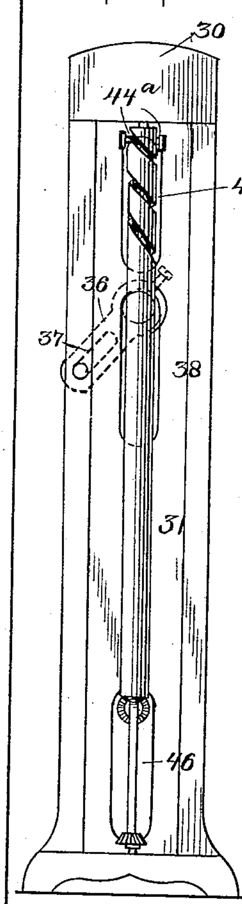


FIG. 2.

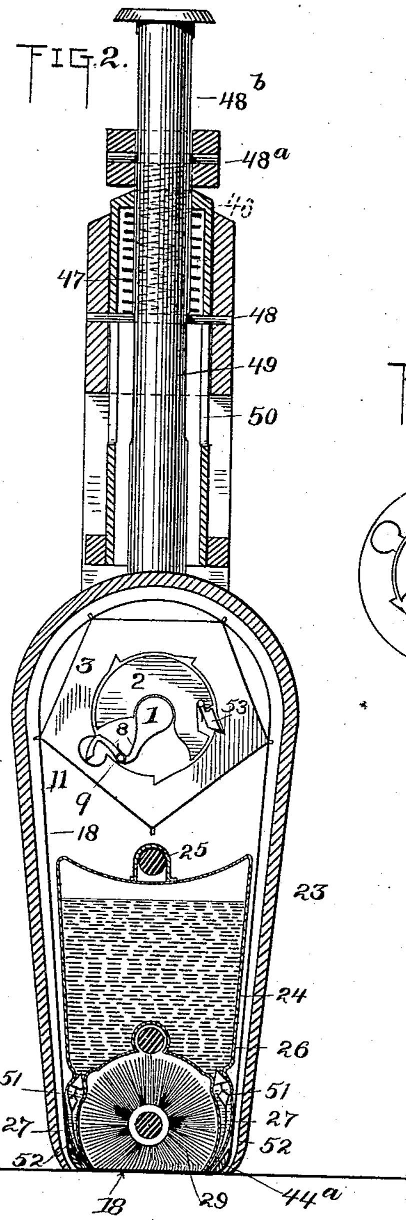
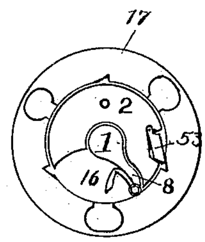


FIG. 4



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UNITED STATES PATENT OFFICE.

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MACHINE FOR PRINTING STENCIL CHARACTERS CONSECUTIVELY.

SPECIFICATION forming part of Letters Patent No. 486,964, dated November 29, 1892.

Application filed June 3, 1889. Serial No. 312,959. (No model.)

To all whom it may concern:

Be it known that I, EDWIN G. BATES, a citizen of the United States, residing at New York city, in the county and State of New York, have invented a Machine for Printing Stencil Characters Consecutively, of which the following is a specification.

The object of my invention is to provide improved apparatus with which to number packing-boxes, bales, &c., consecutively.

My invention consists, first, in the use of a number of endless tapes having the numbers to be printed stencil-cut thereon and mechanism for feeding the same to an inking apparatus to apply the ink to print consecutively; second, in including in the space inclosed by the endless stencil-tapes the inking apparatus and the mechanism for feeding said stencil-tapes; third, in actuating the feeding mechanism for the stencil-tapes by the movement which brings them into the printing position; fourth, in the mechanism for operating the inking-brushes after the stencil-tapes have been brought into the printing position; fifth, in the mechanism for supplying a determined quantity of ink to each printing character when in the printing position and shutting off the supply when the printing character is out of the printing position; sixth, in the adaptation of mechanism for feeding the stencil-tapes to enable the inking apparatus to be arranged within the space inclosed by said tapes.

My invention consists, further, in the various novel devices and combinations of devices hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, forming a part of this specification, Figure 1 is a central transverse sectional elevation of a stencil-machine embodying my invention with the parts in position to commence printing. Fig. 2 is a cross-section taken on the plane of the line 2 2, Fig. 1, with the parts in the printing position. Fig. 3 represents one of the legs of the frame viewed from the outside. Fig. 4 is an end view of the feeding mechanism, and Fig. 5 is a plan of one of the stencil-tapes developed.

In existing machines for numbering consecutively the numbers are formed on what are known as "type-wheels," the manner of feeding which to print consecutively is well understood. In the patent granted to F. W. Wicht, No. 391,289, dated October 16, 1888, the feeding mechanism is arranged outside of the type-wheels and in my application, Serial No. 428,780, filed April 12, 1892, is shown a feeding mechanism arranged within the type-wheels.

My present machine, being designed for the printing upon packing-boxes, bales, &c., where a type-wheel would be difficult, if not impossible, to use, employs in lieu of type stencil-cut numbers, the mechanism for feeding which to print consecutively may be on the principle of any of the well-known forms.

In the machine shown in the accompanying drawings, illustrating my invention, I have shown feeding mechanism of the same general character as that shown in my application above referred to, modified to meet the requirements of stencil-printing and to economize space. 1 is the rock-shaft of this feeding mechanism, upon which is mounted a hub 2, partially cut away, as shown in Fig. 2, to permit of the oscillations of shaft 1. Mounted to rotate upon the sleeve 2 are a number of annular sprocket-wheels 3 4 5 6, each of which is pentagonal in form on its outer periphery, and has five pins, one pin being located at the apex of each angle of the wheel. On its inner periphery each of these wheels has formed upon it four shallow notches and one deep notch. The rock-shaft has depending lugs 8 8, which carry a shaft 9, a coiled spring 10, and pawl 11. The tendency of this spring is to press the pawl downward at all times. The pawl carries teeth 12, 13, 14, and 15, adapted to engage with the notches cut on the inner periphery of the sprocket-wheels, and also an auxiliary tooth 16, for a purpose hereinafter to be explained. As will be seen, the tooth 12 of the pawl is longer than any of the other teeth, and is designed to operate the mechanism to feed the unit printing characters. The tooth 13 is next in size, and is designed to feed the tens printing characters. The tooth 14 is next in size, and is designed to feed the hundreds printing characters. The tooth 15 is the smallest of the teeth on the pawl, and is designed to feed the thousands-printing characters, thousands being

the limit of the machine shown in the drawings.

As is usual in consecutive-printing machines, the rate of movement of the tens printing characters with relation to the unit printing characters is as ten is to one, of the hundreds printing characters to the unit characters as one hundred is to one, and so on progressively. This movement is accomplished in existing numbering-machines by an arrangement of stepped teeth on a pawl engaging with notches on the type-wheels, the tooth of the pawl opposite the unit-wheel being longer than the other teeth of the pawl and serving to hold those teeth out of engagement with the notches opposite them, respectively, except when the unit-tooth drops into the deep notch of the unit-wheel, when the tens-tooth, being the next longest, will be permitted to drop into a notch of the tens-wheel and feed that wheel one step, and so on to feed the other type-wheels to print consecutively. The feed-wheels of my machine, however, being necessarily made small are provided with only five notches cut upon them. It is necessary, therefore, to provide a regulator to prevent the wheels for feeding higher denominations than units from being moved except every alternate time when a tooth of the pawl is in engagement with a deep notch of the wheel next below in denomination. This is accomplished by means of the auxiliary tooth 16 on the pawl which engages with an annular wheel 17, which has cut upon its inner periphery six notches alternately deep and shallow, and which is arranged on the hub 2, so that the tooth 16 of the pawl engages one of its shallow notches on the completion of the first revolution of the unit feed-wheel, and on the completion of the second revolution of said feed-wheel engages a deep notch. The tooth 16 of the wheel 17 being deeper than the tooth 13 of the tens feed-wheel will prevent the latter tooth from engaging with a notch on the tens feed-wheel until the tooth 16 drops into a deep notch on the wheel 17. 18, 19, 20, and 21 are endless tapes, which are preferably of sheet metal, and upon each of which is stencil-cut the numbers from "0" to "9" in the manner usual for forming stencil characters. These numbers are arranged at equal distances apart, and between each two numbers is a hole 22, with which the pins on the sprocket-wheels are designed to engage. The length of each of these tapes is twice the length of the perimeter of any of the sprocket-wheels, and as there are ten holes in the tapes and only five pins in the sprocket-wheels it is obvious that the sprocket-wheels must revolve twice to completely feed the tape.

23 is a casing within which, besides the feeding mechanism and stencil-tapes, is located the inking apparatus.

24 is the reservoir of the inking apparatus supported in the casing upon cross-shafts 25 26 and having ducts 27, leading from the bottom of the reservoir downward and partially surrounding ink-brushes 28, which are mounted upon the shaft 29.

The entire inking apparatus is located within the stencil-cut tapes opposite the feed-wheels and serves to maintain the said tapes in proper position.

The rock-shaft 1 is operated in the following manner: 30 is the top plate of a stationary frame which has the side standards 31. Working through the top plate of this stationary frame are two hollow followers 32, with which, at the top, engages the cross-bar 33, having handles 34 and 35. At the bottom these followers carry the casing 23. The ends of the rock-shaft 1 project beyond the sides of the casing 23 and have at each end a piece 36, secured thereto by a set-screw, as shown. This piece 36 has a straight slot 37, into which projects a pin from the standard 31. On each of the standards 31 is a straight slot 38, into which the ends of the rock-shaft 1 project. Now as the plungers 32 are pressed downward by the handles 34 and 35 the frame 23, and consequently the rock shaft 1, will also be carried downward. During this downward movement the pin in engagement with the slot on the piece 36 will rock the rock-shaft in one direction. On the upward movement of the casing this pin will rock the rock-shaft in the opposite direction. The downward movement of the casing 23 is limited by the cross-bar 33 striking the top of other followers 39, within which the followers 31 slide. A further downward movement of the cross-bar 33 will push the followers 39 before them, the limit of the downward movement of the followers 39 being determined by the contact of the elevations 40 of the plate 30 and the cross-bar. The object of the followers 39 is to actuate the ink-brushes.

41 is a cross-bar carried at the bottom of the plungers 39, forked at each end and projecting at each end through a slot 42 in each of the standards 31, so as to surround a spindle 43, having a worm 44 cut upon it, with which engages an inwardly-projecting pin 44^a on the forked portion of the cross-bar 41. The bottom of this spindle 43 is cut away, as shown, and carries a bevel-wheel 44. The ends of the shaft 29 on which the ink-brushes are mounted carry bevel-gears 45, the shaft projecting through a slot 46 in the standards. Now as the followers 39 are pushed downward the cross-bar 41 will be carried with them, and the pins of the cross-bar, working in worms 44 of the spindles 43, will cause the said spindles to be rotated, and the bevel-wheels 45 of the shaft 29 of the ink-brushes having been brought into engagement with the bevel-wheels 44 of the spindle 43 by the downward movement of the follower 32, carrying the casing 23, the ink-brushes will be rotated by the rotary movement of the spindle.

To properly time the movements of the various parts so that the number to be printed will be brought into the printing position before the ink-brushes are caused to revolve to

spread the ink, the spring 46 is arranged within each of the plungers 32 and the spring 47 is arranged within each of the plungers 39, the latter springs being stiffer than the former and each set of springs acting at one end against the same point, which is a pin 48, passing through both the followers, the followers being formed with the slots 49 and 50 to permit the pin to work. Now the spring 47 being stiffer than the spring 46, the latter may be compressed until the cross-bar strikes the head of the plunger 39, when that plunger will be forced down, compressing the spring 47. The followers 32 being connected to the cross-head 33 by pins 48^a and slots 48^b, the followers 32 will remain stationary while the followers 39 are being forced down. On the return movement the spring 47, being the stiffer, will force the plunger 39 upward first, thereby reversing the rotation of the brush and insuring the thorough spreading of the ink over the stencil. The spring 46 will then force its plunger and the casing upward into the printing position. (Shown in Fig. 1.)

The ink-reservoir is filled from the outside of the casing through the tube 50, closed by a suitable cap. The quantity of ink contained within the ducts is governed by means of double-seated valves 51, having the valve-stems 52. When the ink-reservoir is in its highest position, the upper valves are withdrawn from their seats by gravity and a quantity of ink admitted to the ducts; but when the ink-reservoir is in the downward position the stems of the valves will have been forced upward by contact with the surface to be printed upon and the valves closed, permitting, however, the quantity of ink in the ducts to run out on the surface to be printed and to be brushed thereon by the ink-brushes.

53 are detents for preventing backward movement of the feed-wheels, and 54 are caps for preventing dust, &c., from getting into the casing 23.

What I claim is—

1. In a numbering-machine, the combination, with a series of endless tapes having numerals cut therein, of mechanism adapted to move said tapes along one after another, whereby the stencil-openings are brought into position to print numbers consecutively, and an inking apparatus located within said tapes, substantially as set forth.

2. In a numbering-machine, the combination of the reciprocating casing, endless stencil-cut tapes mounted thereon, feeding mechanism located within said tapes, operated by the reciprocation of the casing, and an inking apparatus also located within said tapes, substantially as set forth.

3. In a stenciling-machine, the combination, with a series of endless stencil-cut tapes, of feed-wheels located within said tapes, adapted to move said tapes to print consecutively, and an inking apparatus also located within said tapes opposite said feed-wheels and serving to maintain said tapes in proper position, substantially as set forth.

4. In a stenciling-machine, the combination of a stencil-cut endless tape, feeding mechanism for moving it, and a pivoted brush located within the tape for inking it, substantially as set forth.

5. In a numbering-machine, the combination, with a reciprocating casing and endless stencil-cut tapes mounted thereon, of mechanism located within said tapes, operated by the reciprocation of the casing to move said tapes to print consecutively, and means for applying ink to the stencil-tapes on the inner surface and in line with the stencil-openings which are in printing position, substantially as set forth.

6. In a numbering-machine, the combination of a series of endless stencil-cut tapes, a series of feed-wheels engaging with said tapes, each wheel adapted to make two revolutions to effect a complete revolution of the tape fed by it and having four shallow notches and one deep notch, a pawl having stepped teeth adapted to engage with said notches, and a regulator adapted to prevent a tooth of the pawl dropping into the deep notch of its wheel, except on every alternate revolution of the wheel next below in denomination, substantially as set forth.

7. In a numbering-machine, the combination, with a stationary frame and movable casing, of notched feed-wheels, a toothed shaft upon which said feed-wheels are mounted, a straight slot in said stationary frame, in which an end of said shaft slides, and a piece 36, provided with slot 37, mounted on said shaft, engaging with a pin on the stationary frame, substantially as set forth.

8. In a numbering-machine, the combination, with a reciprocating casing and inking apparatus contained thereon, of a stationary frame, means for reciprocating said casing with relation to said frame, a gear on a spindle supported in said stationary frame, a gear on the shaft of the ink-brushes of the inking apparatus, said gears being adapted to be brought into engagement by the downward movement of said casing, and means for rotating said spindle, substantially as set forth.

9. In a numbering-machine, the combination, with a series of endless stencil-cut tapes, of a series of feed-wheels for said tapes, each adapted to make two revolutions for each revolution of the tape fed by it, means for moving said wheels to feed the tapes to print consecutively, comprising four shallow and one deep notch cut on the inner periphery of said feed-wheels, a rock-shaft, a pawl carried by said rock-shaft, having stepped teeth and one auxiliary tooth of greater length than any tooth but the units-tooth, and an annular wheel having alternate deep and shallow notches, with which said auxiliary tooth engages, substantially as set forth.

10. In a consecutive-numbering machine,

the combination, with endless moving tapes, of an inking apparatus comprising an ink-reservoir, ink-ducts, valves controlling the supply of ink from the reservoir to the ducts, and ink-brushes for applying the ink, substantially as set forth.

11. In a consecutive-numbering machine, an inking apparatus comprising an ink-reservoir, ink-ducts, double-seated valves located within said ink-ducts, and ink-brushes for applying the ink, substantially as set forth.

12. In a consecutive-numbering machine, an inking apparatus comprising an ink-reservoir, ink-ducts, and double-seated valves adapted to operate by gravity to close the bottom valve and by pressure of the printing-surface on the valve-stem to close the upper valve, substantially as set forth.

13. In a numbering or stenciling machine, the combination of a reciprocating body or casing, endless stencil-cut tapes mounted thereon, feeding mechanism located within said tapes, operated by the reciprocation of the body or casing, and a single-inking apparatus within and common to all of said stencil-tapes, substantially as set forth.

This specification signed and witnessed this 29th day of May, 1889.

EDWIN G. BATES.

Witnesses:
D. H. DRISCOLL,
WILLIAM PELZER.