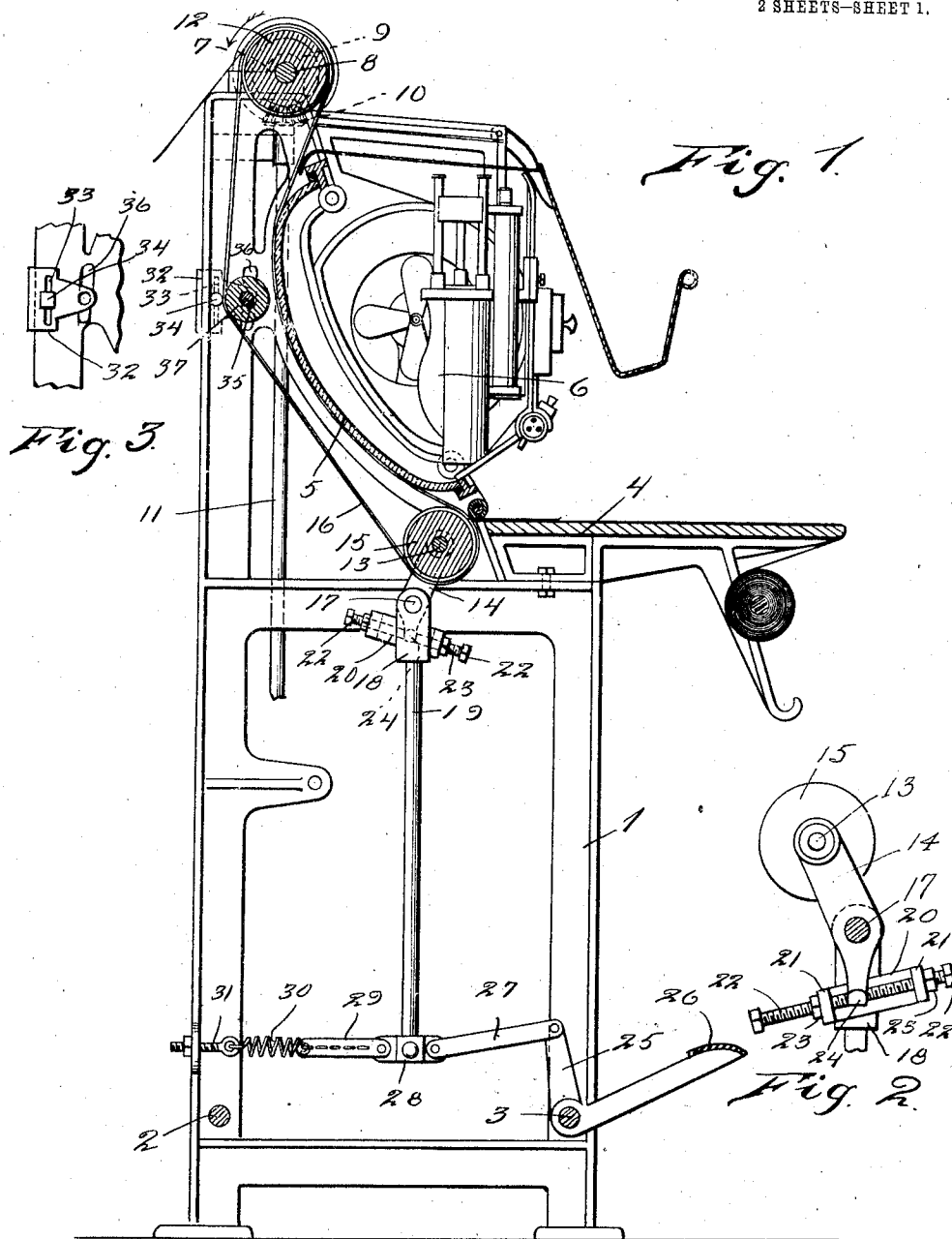


1,054,140.

Patented Feb. 25, 1913.

2 SHEETS—SHEET 1.



Witnesses

E. Milton Lester
B. V. Whinn

By

C. H. Parker
 Attorney

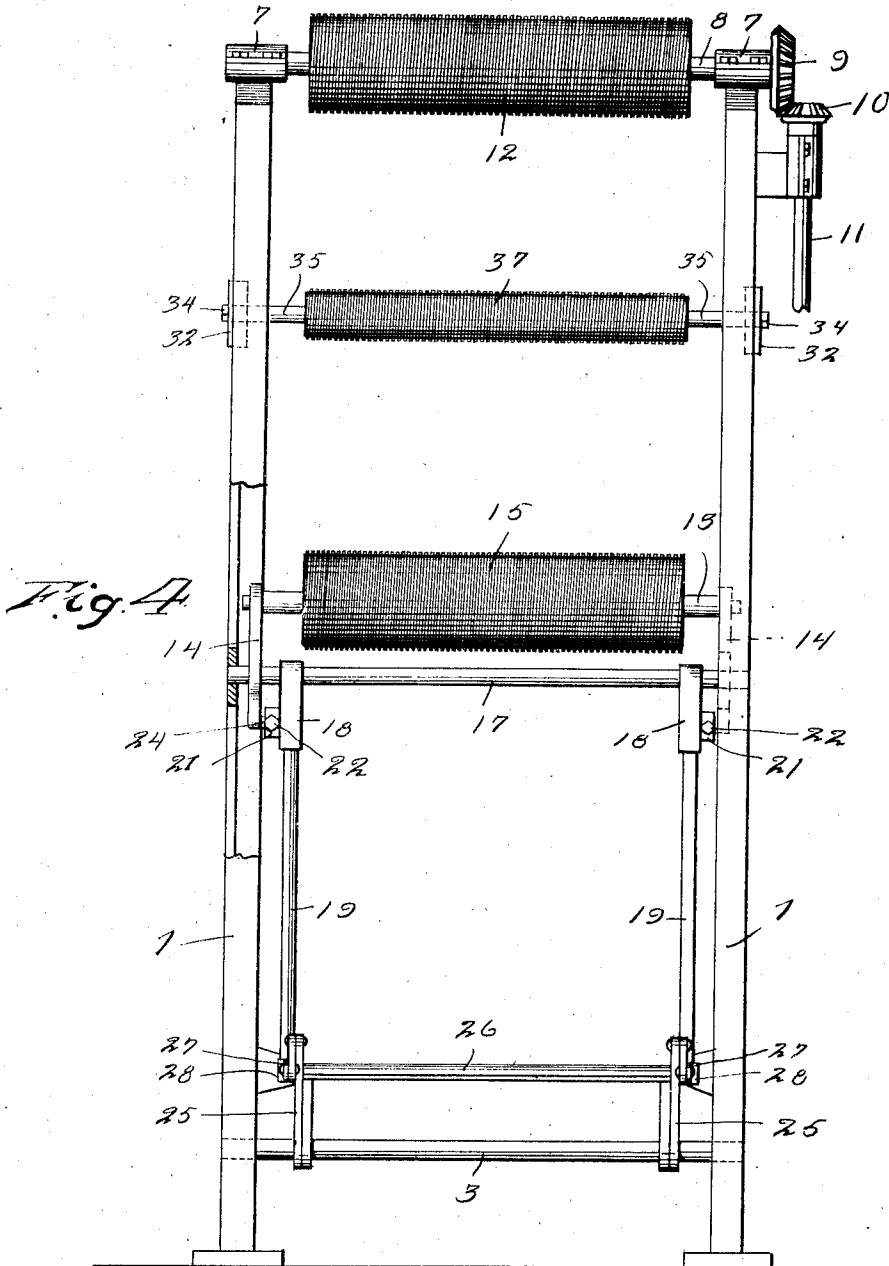
Inventor
C. F. Pease

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 BLUE PRINT MACHINE.
 APPLICATION FILED JULY 19, 1912.

1,054,140.

Patented Feb. 25, 1913.

2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

CHARLES F. PEASE, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE C. F. PEASE COMPANY,
OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

BLUE-PRINT MACHINE.

1,054,140.

Specification of Letters Patent.

Patented Feb. 25, 1913.

Application filed July 19, 1912. Serial No. 710,473.

To all whom it may concern:

Be it known that I, CHARLES F. PEASE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Blue-Print Machines, of which the following is a specification.

This invention relates to a machine for making photographic copies of drawings or the like.

In the construction of machines for making photographic copies of drawings, such as blue prints or the like, it is customary to employ an endless belt which is ordinarily formed of cotton duck. This endless belt is carried by rolls and travels in engagement with a transparent printing plate. I have found by experience that this endless belt formed of cotton duck will always creep or move laterally, either to the left or right, notwithstanding the fact that the rolls may be mathematically adjusted to be parallel so that the longitudinal edges of the endless belt will be exactly equal in length. This tendency of the endless belt to move laterally cannot be overcome even by turning the same wrong side out. Although the exact reason is not known, yet it is believed that the lateral movement of the endless belt is due to the way in which the duck is woven. A great many different means have been devised to overcome the above referred to difficulty. Means have been devised to angularly adjust the printing plate which engages the endless belt, to move one end of the printing plate into firmer engagement with such endless belt when it tends to creep in that direction. A great disadvantage encountered in the employment of such means and others of similar character, is that the endless belt is worn out very quickly.

I have discovered that by providing the roll or rolls over which the endless belt operates, with screw-threads, the tendency of the endless belt to creep laterally is overcome. I have also found that the best results are obtainable by the employment of a preferably screw-threaded angularly adjustable roll, which engages the endless belt. The function of this angularly adjustable roll is to make the finer adjustments of the belt, to prevent its lateral movement. If this angularly adjustable roll were not provided,

the pitch of the screw-threads of the main roll or rolls would have to be different for each endless belt.

An important object of this invention is to provide novel and simple means to prevent the lateral creeping of the endless belt of a printing machine.

A further object of the invention is to provide novel and adjustable means by the manipulation of which the lower roll carrying the endless belt may be accurately adjusted so that the longitudinal edges of the endless belt will be of the same length and hence there will be no tendency of the belt to creep laterally, due to the improper adjustment of this roll.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same, Figure 1 is a central vertical sectional view through the machine, Fig. 2 is an enlarged side view of means for supporting the lower roll, viewed from the outer side of the machine, Fig. 3 is a similar view of an adjustable bracket for supporting the third smooth roll, and, Fig. 4 is a front elevation of the machine, parts being omitted for the sake of illustration.

In the drawings, wherein for the purpose of illustration, I have shown a preferred embodiment of my invention, the numeral 1 designates upstanding end pieces of castings forming the frame-work or supporting structure of the machine. The end pieces 1 are connected near their lower ends by horizontal transverse rods 2 and 3 and are connected between their ends by a horizontal table 4, as shown.

The numeral 5 designates a preferably inclined transparent printing plate which is disposed within the upper portion of the frame-work and held in place by suitable means. Disposed forwardly of this printing plate is a source of light 6, preferably an arc lamp, as shown.

The end pieces 1 are provided at their upper ends with bearings 7, through which is journaled an upper horizontal rotatable shaft 8, having a bevel-gear 9 rigidly con-

nected with one end thereof. The bevel-gear 9 is engaged by a smaller bevel-gear 10, rigidly connected with a vertical operating rotary shaft 11, driven by any suitable means. Rigidly mounted upon the rotatable shaft 8 is an upper horizontal roll 12, provided throughout its entire length with screw-threads, as shown. I prefer to have the pitch of these screw-threads comparatively low. There are preferably twenty-four turns of the screw-threads to each inch of the roll and these screw-threads preferably have a depth of one sixty-fourth of an inch.

Disposed below the printing plate 5 is a lower horizontal rotatable shaft 13, supported by adjustable swinging arms 14. Rigidly mounted upon the rotatable shaft 13 is a lower roll 15, provided throughout its length with screw-threads, as shown, preferably the same as those described in connection with the roll 12. Trained about the screw-threaded rolls 12 and 15 is an endless belt 16, preferably formed of canvas or what is known as No. 6 cotton duck.

Disposed near and below the roll 15 is a horizontal rock-shaft 17, journaled in openings formed through the end pieces 1, as shown. This rock-shaft 17 passes through openings formed in the adjustable swinging arms 14, which openings are disposed between the ends of these arms. The arms 14 are free to swing with relation to the rock-shaft 17. Rigidly connected with the rock-shaft 17 near and inwardly of the arms 14 are depending crank-arms 18, having connection with the upper ends of depending rods 19. Rigidly mounted upon the outer surfaces of the crank-arms 18 and preferably cast integral therewith are transverse brackets 20 provided at their ends with laterally extending ears 21. These ears have screw-threaded openings formed therethrough to receive adjusting bolts 22, carrying clamping nuts 23 adapted to lock the bolts 22 in adjustment at different positions. The arms 14 are provided at their lower ends with lateral extensions or fingers 24, disposed between the adjusting bolts 22. It is thus seen that by proper manipulation of the bolts 22 the arms 14 may be properly angularly adjusted with relation to each other and the shaft 17 and subsequently held in such adjustment at desired positions.

Pivottally mounted upon the horizontal rod 3 are bell-crank levers 25, upon the outer arms of which is mounted a treadle 26. Pivottally connected with the inner arms of these bell-crank levers are links 27, which in turn are pivottally connected with heads 28 attached to the lower ends of the rods 19. Pivottally connected with the opposite ends of the heads 28 are links 29, having connection with retractile coil springs 30, which are connected with fixed eye-bolts 31.

Disposed upon the outer surface of the upper portions of the end pieces 1 are vertically adjustable brackets 32, provided with elongated slots 33, for receiving clamping bolts 34. These brackets support an intermediate horizontal shaft 36, extending through elongated slots 26 and arranged between the main rolls 12 and 15. Rigidly mounted upon the shaft 25 is an auxiliary or third roll 37, which is preferably screw-threaded, as shown, and engages the inner surface of the endless belt 16, between the screw-threaded main rolls 12 and 15.

In the operation of the machine, the top roll 12 is rotated in the direction indicated by the arrow, whereby the endless belt 16 is moved in the same direction to conduct the sensitized paper and tracing fed to the lower end of said endless belt upwardly across the printing plate 5, where it is subjected to the action of the light. When the screw-threads formed upon the main rolls 12 and 15 are of the right pitch to overcome the lateral creeping of the endless belt, which is formed of cotton duck, the auxiliary roll 37 remains horizontal. When placing another endless belt upon the screw-threaded main roll, which belt may be formed of a slightly different kind of cotton duck, it may be found that the pitch of the screw-threads of the main rolls are either too low or too high, which results in the endless belt moving to the left or right, as the case may be. When this is the case the intermediate preferably screw-threaded roll 37 is angularly adjusted to raise or lower either end thereof, whereby the slight tendency that the endless belt will have to creep in that direction is entirely overcome. Attention is called to the fact that the slight angular adjustment of the intermediate roll 37 which is necessary to overcome the lateral creeping of the endless belt, is not sufficient to cause undue friction between said endless belt and the intermediate roll, whereby the endless belt will not be injured. The springs 30 through the intermediate elements hold the endless belt 16 in proper frictional engagement with the printing plate 5. By proper manipulation of the bolts 22, the arms 14 may be angularly adjusted so that the roll 15 will be parallel to the roll 12, whereby the longitudinal edges of the endless belt will be of the same length. By forcing the treadle 26 downwardly it is obvious that the lower roll 15 will be swung inwardly to slacken the endless belt 16.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same and that certain changes in the shape, size, and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described my invention I claim:—

1. In a machine of the character described, a supporting structure, a roll provided with screw-threads, a second roll, an endless belt engaging the first and second named rolls, a printing plate engaged by the endless belt, and a source of light disposed near the printing plate.

2. In a machine of the character described, a supporting structure, a printing plate, an endless belt engaging the printing plate, means to drive the endless belt including a roller provided upon its periphery with screw-threads, and a source of light disposed a suitable distance from the printing plate.

3. In a machine of the character described, a supporting structure, a printing plate, an endless belt operating in engagement therewith, a plurality of rolls engaged by the endless belt and provided upon their peripheries with screw-threads, and a source of light disposed a suitable distance from the printing plate.

4. In a machine of the character described, a supporting structure, a printing plate, a plurality of rolls provided upon their peripheries with screw-threads, an endless belt trained about the screw-threaded rolls and operating in engagement with the printing plate, an angularly adjustable roll engaging the endless belt, and a source of light disposed a suitable distance from the printing plate.

5. In a machine of the character described, a supporting structure, a printing plate, rolls provided upon their peripheries with screw-threads and disposed near the ends of the printing plate, a cotton duck endless belt trained about the screw-threaded rolls and operating in engagement with the printing plate, an intermediate roll disposed within the endless belt and engaging the same between the screw-threaded rolls, means to angularly adjust the intermediate roll, and a source of light disposed a suitable distance from the printing plate.

6. In a machine of the character described, a supporting structure, a printing plate, a plurality of rolls, an endless belt

engaging the printing plate and trained about the rolls, a source of light disposed a suitable distance from the printing plate, means for supporting one roll including arms, swinging crank arms, adjustable connecting means between the crank arms and arms, manually operated means to swing the crank arms in one direction, and a spring or springs to swing the crank arms in a reverse direction.

7. In a machine of the character described, a supporting structure, a printing plate, a plurality of rolls, an endless belt engaging the printing plate and trained about the rolls, a source of light disposed a suitable distance from the printing plate, means for supporting one roll including arms, a horizontal shaft upon which the arms are mounted, crank-arms mounted upon the horizontal shaft, adjustable connecting means between the crank-arms and arms, whereby the arms may be disposed at different angular positions with relation to the crank-arms, and means to move the crank-arms.

8. In a machine of the character described, a supporting structure, a printing plate, a source of light disposed near the printing plate, an endless belt operating in engagement with the printing plate, driving means for the endless belt, and an angularly adjustable screw-threaded roll engaging said endless belt.

9. In a machine of the character described, a supporting structure, a printing plate, a source of light disposed near the printing plate, an endless belt operating in engagement with the printing plate, driving means for the endless belt including a plurality of rolls, at least one of which is provided with screw-threads upon its periphery, and an angularly adjustable screw-threaded roll disposed between said rolls in engagement with the endless belt.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES F. PEASE.

Witnesses:

ELSIE B. MILLS,
THOMAS L. CRD.