

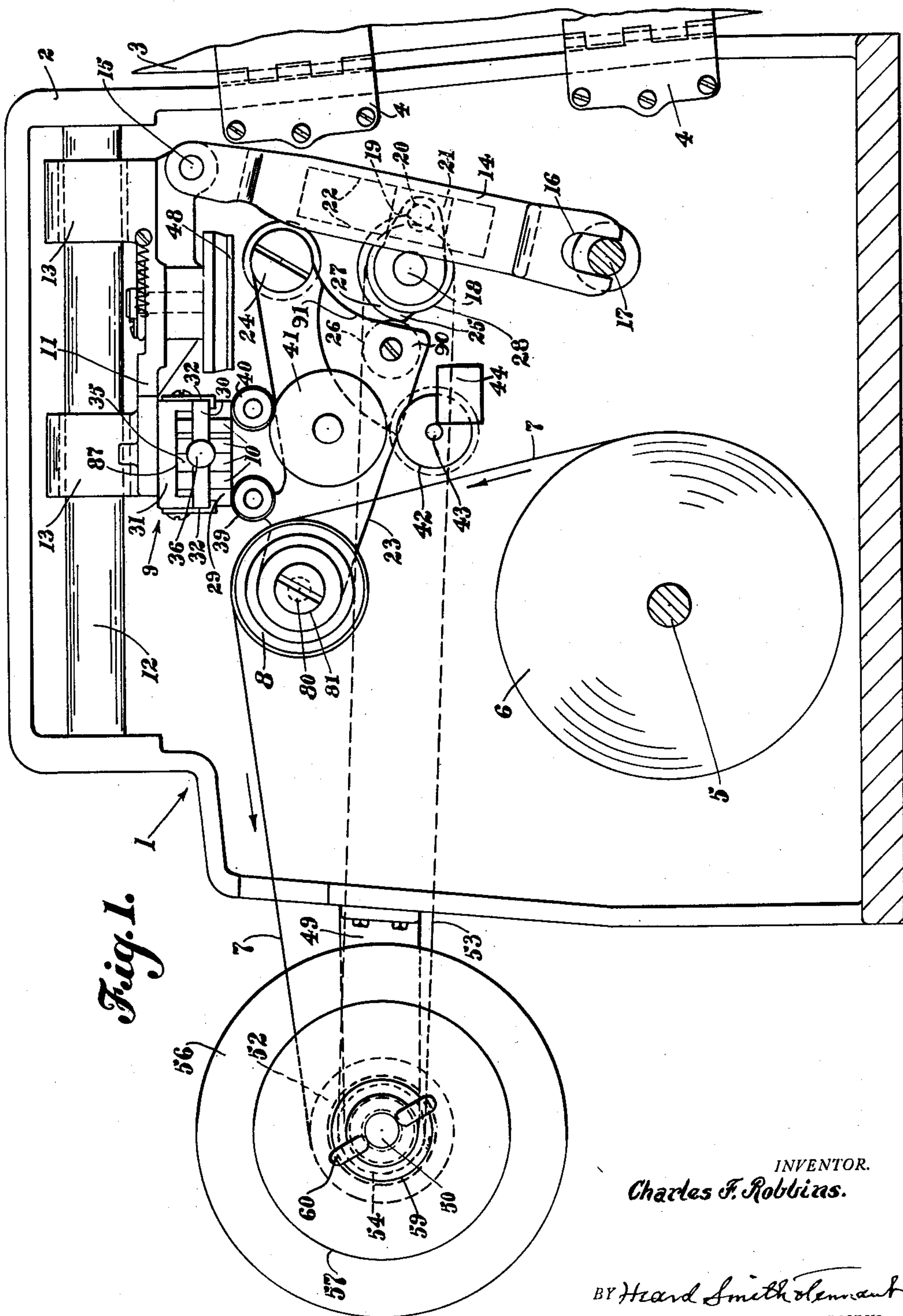
Jan. 6, 1953

C. F. ROBBINS
MARKING MACHINE

2,624,278

Filed Oct. 22, 1948

6 Sheets-Sheet 1



INVENTOR.
Charles F. Robbins.

BY *Hard Smith Clement*
ATTORNEYS

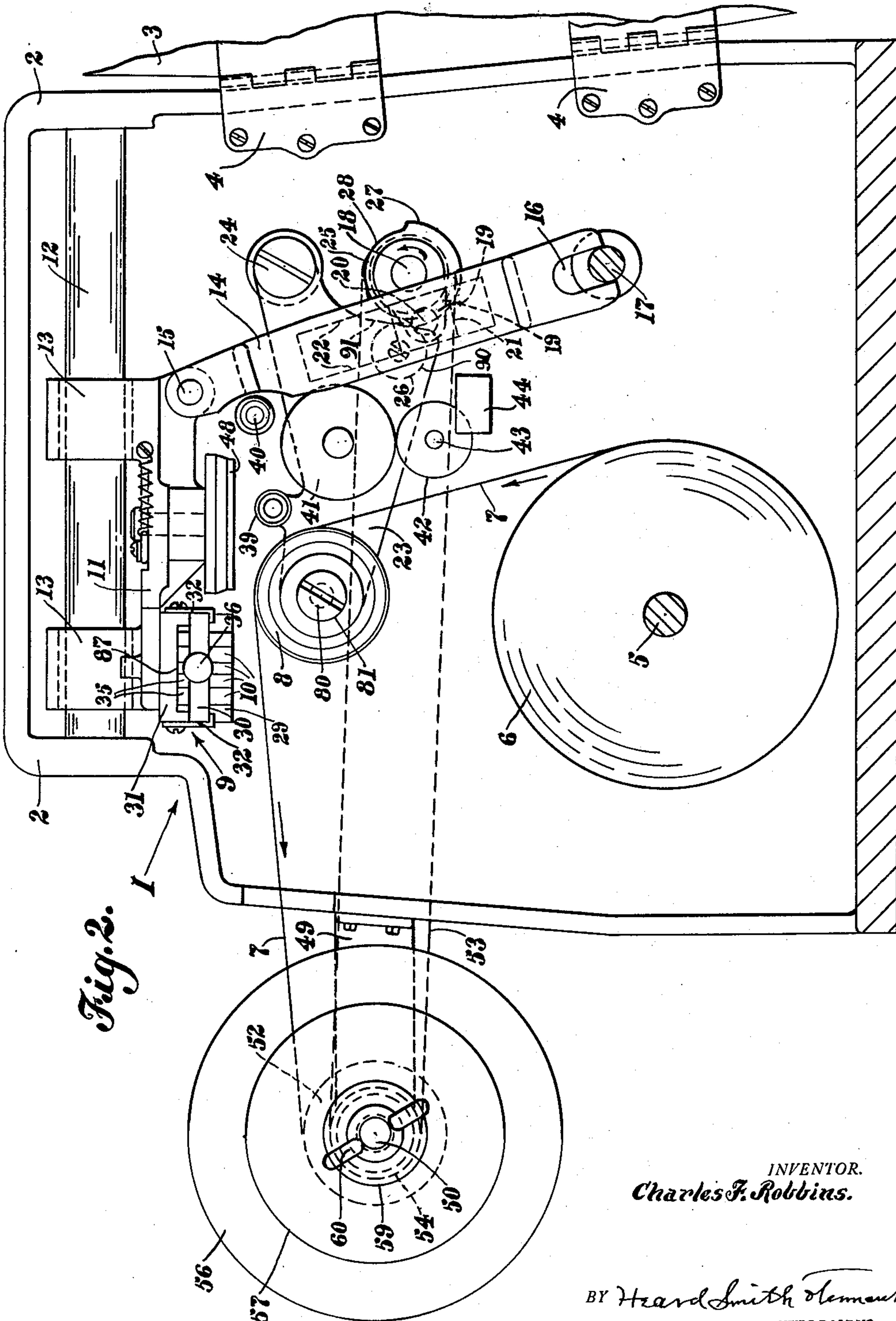
Jan. 6, 1953

C. F. ROBBINS
MARKING MACHINE

2,624,278

Filed Oct. 22, 1948

6 Sheets-Sheet 2



INVENTOR.
Charles F. Robbins.

BY *Harold Smith Clement*
ATTORNEYS

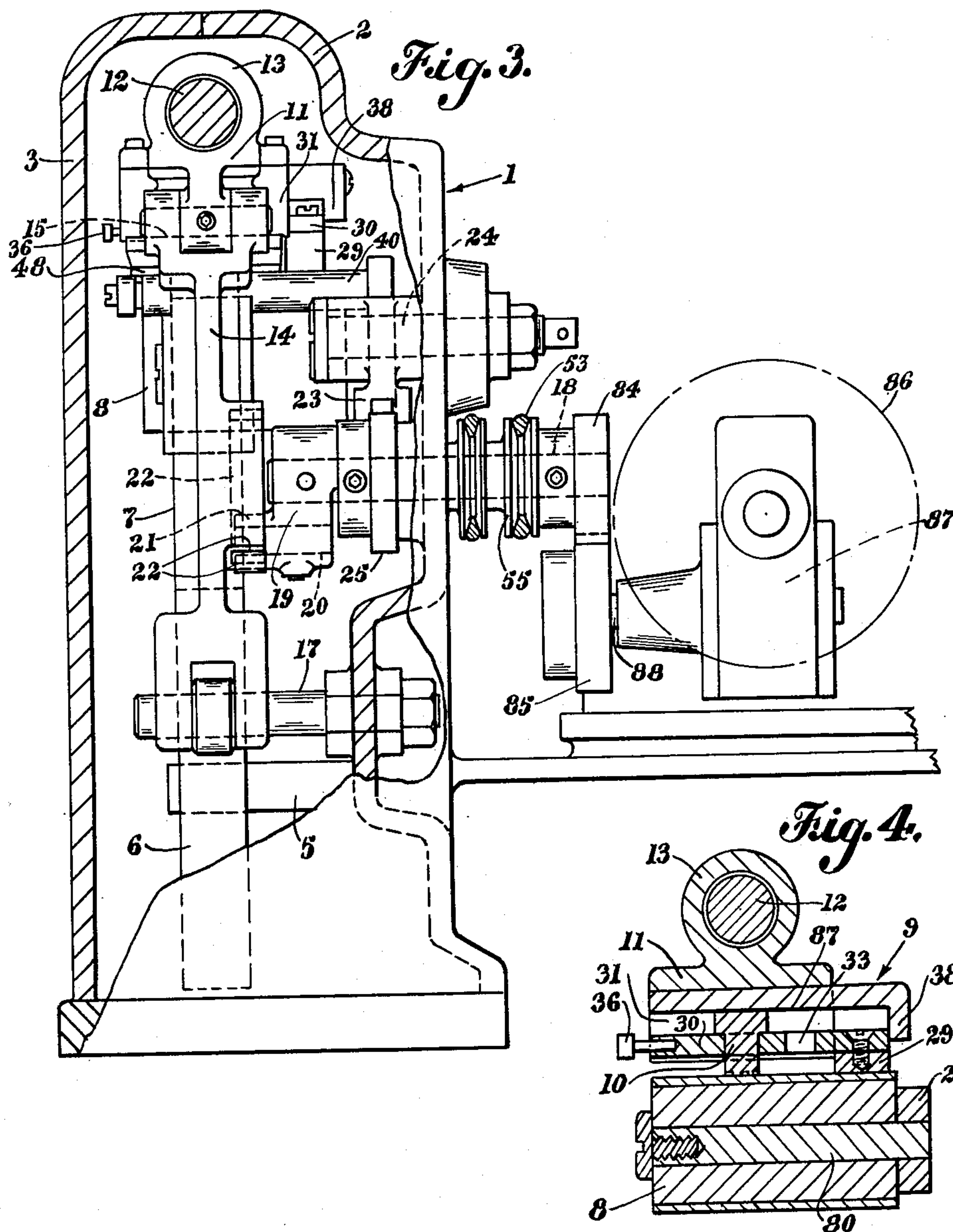
Jan. 6, 1953

C. F. ROBBINS
MARKING MACHINE

2,624,278

Filed Oct. 22, 1948

6 Sheets-Sheet 3



INVENTOR.
Charles F. Robbins.

BY *Heard Smith & Tennant*
ATTORNEYS

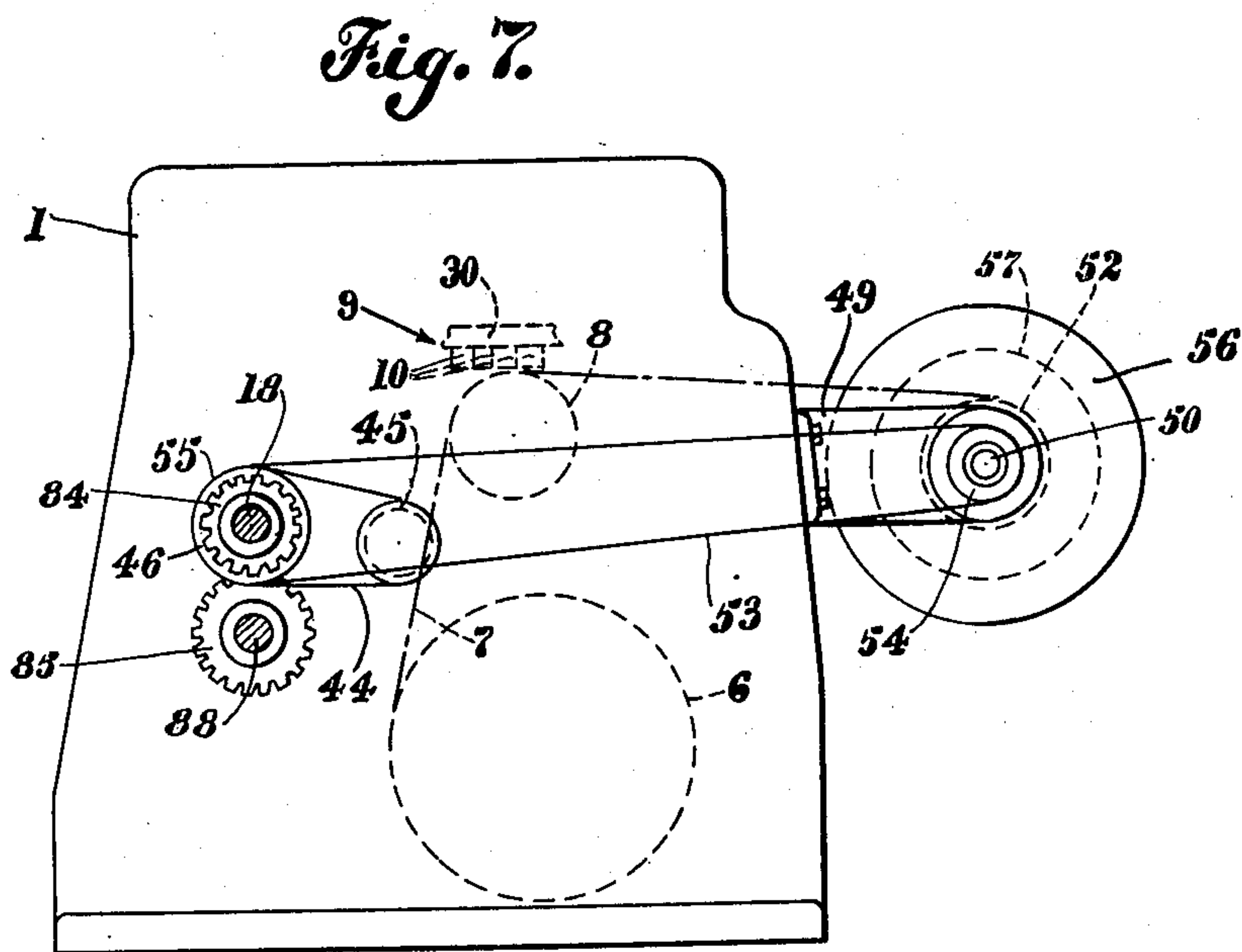
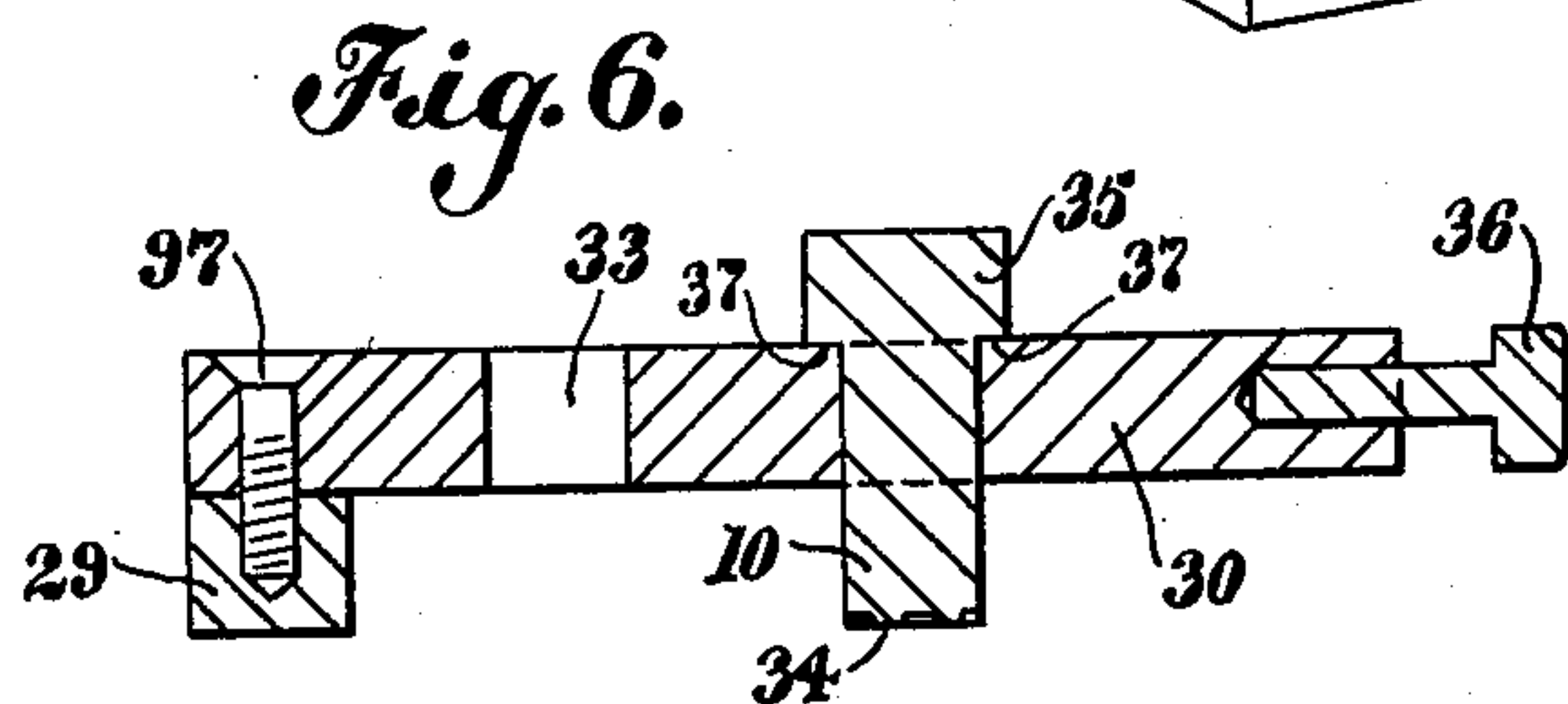
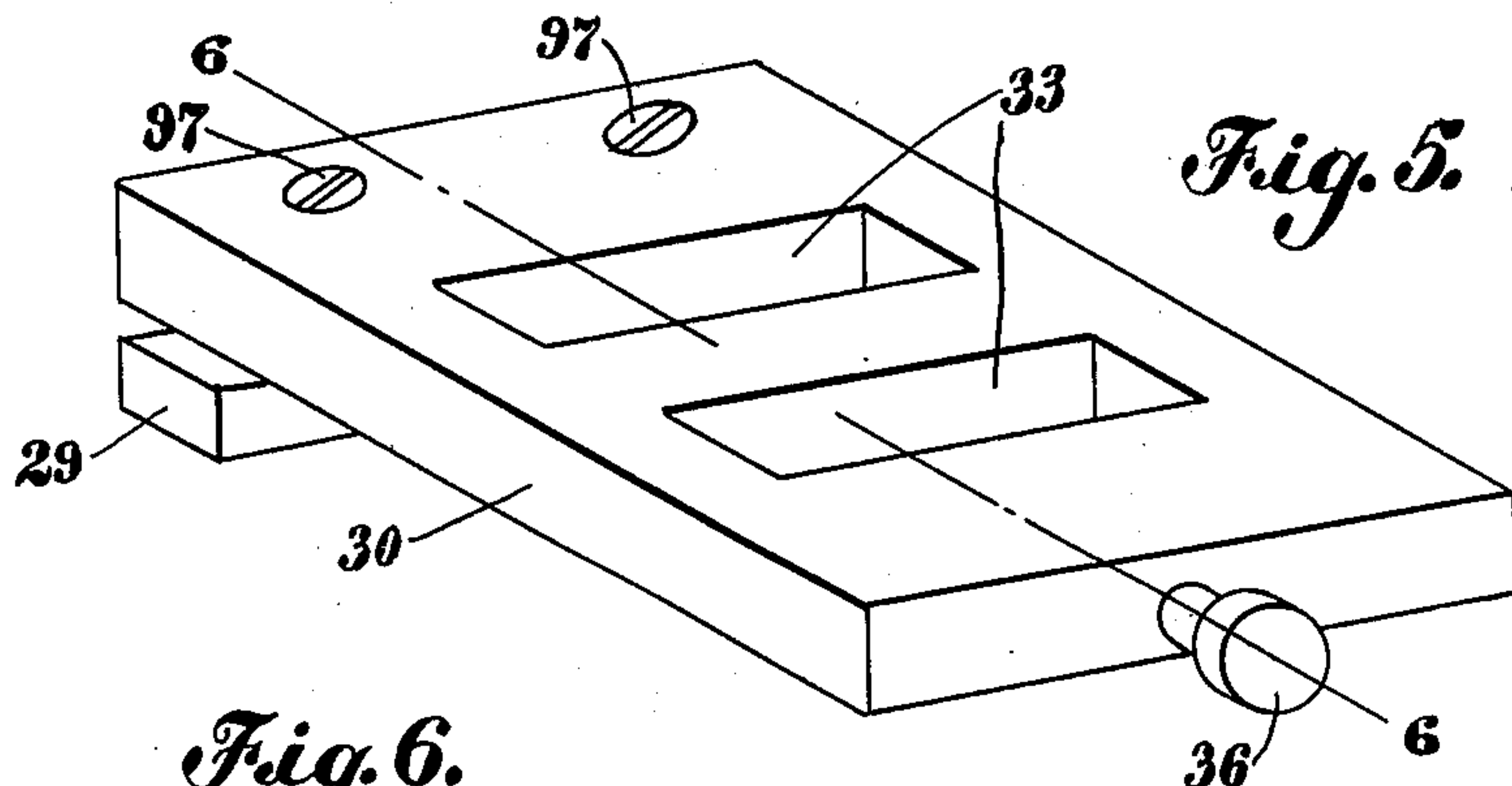
Jan. 6, 1953

C. F. ROBBINS
MARKING MACHINE

2,624,278

Filed Oct. 22, 1948

6 Sheets-Sheet 4



INVENTOR.
Charles F. Robbins.

BY *Harold Smith Tennant*
ATTORNEYS

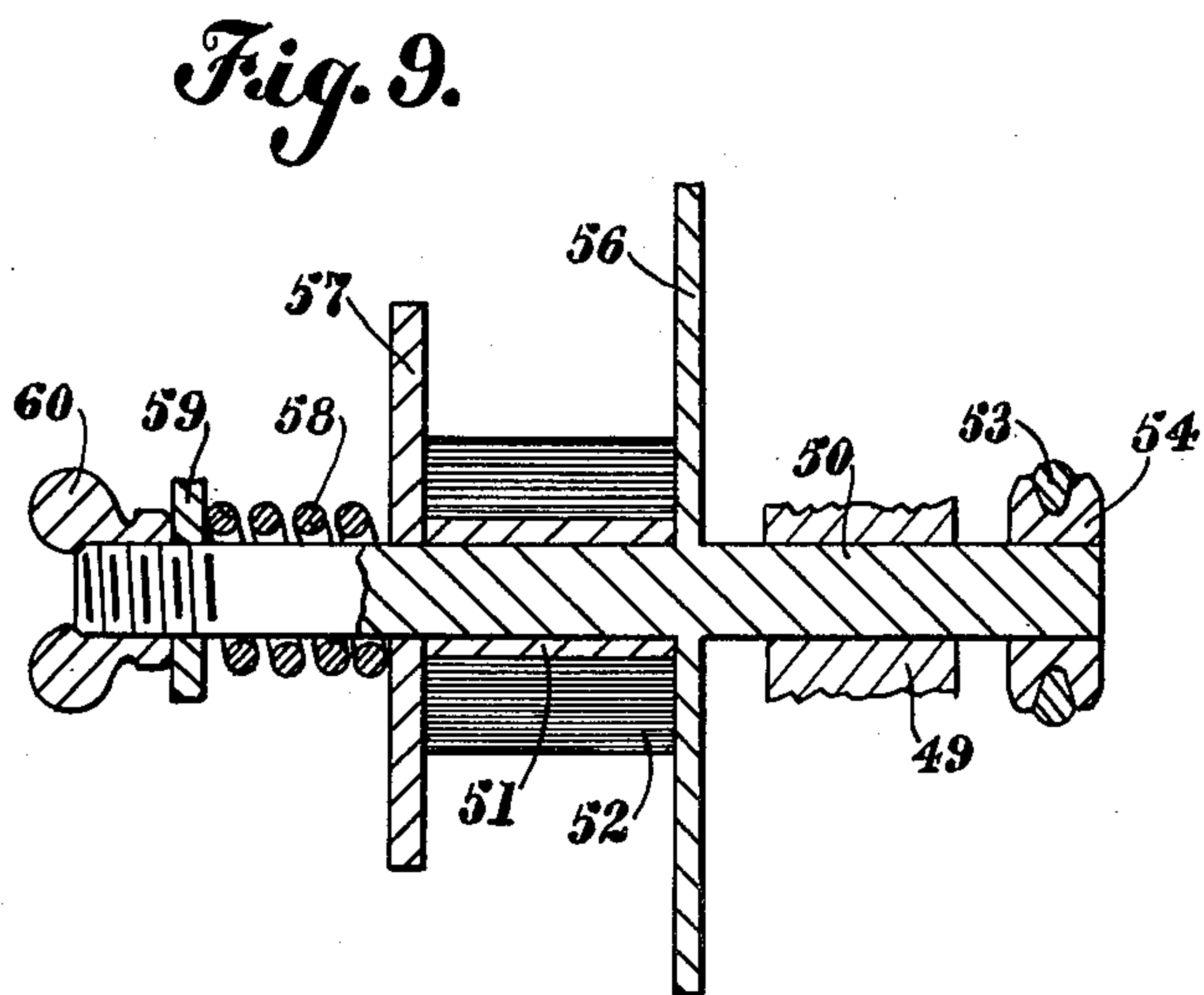
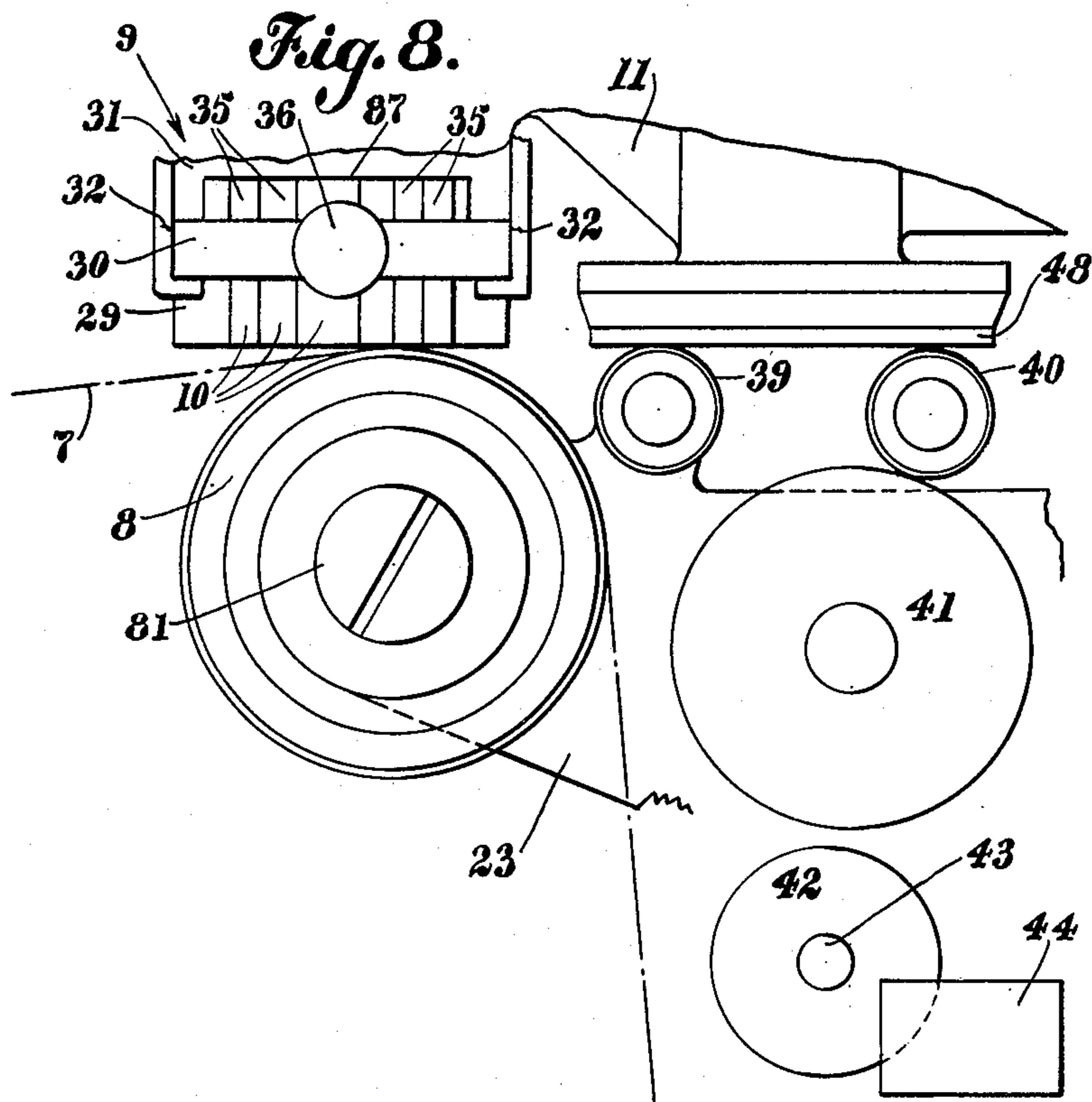
Jan. 6, 1953

C. F. ROBBINS
MARKING MACHINE

2,624,278

Filed Oct. 22, 1948

6 Sheets-Sheet 5



INVENTOR.
Charles F. Robbins.

BY *Heard Smith & Lemont*
ATTORNEYS

Jan. 6, 1953

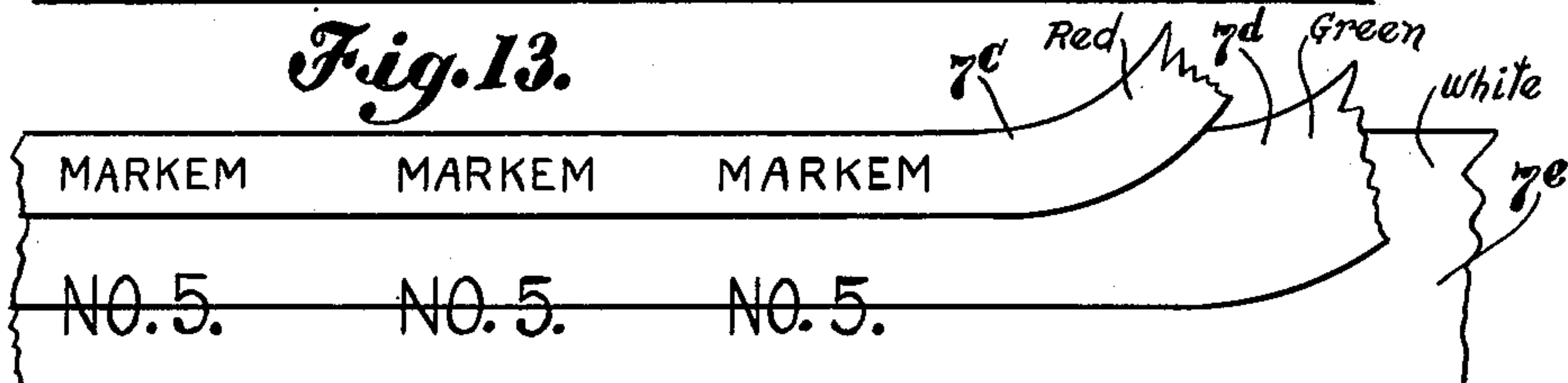
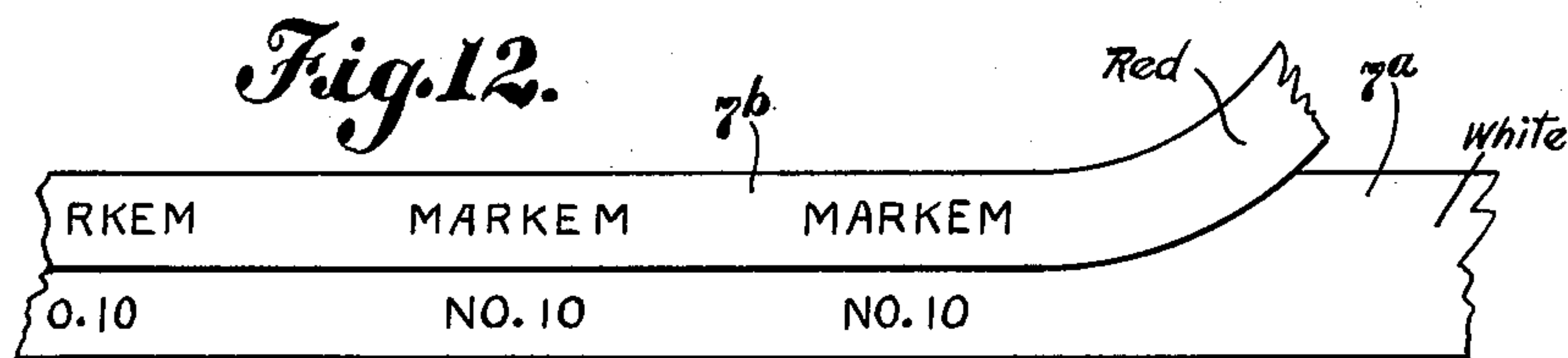
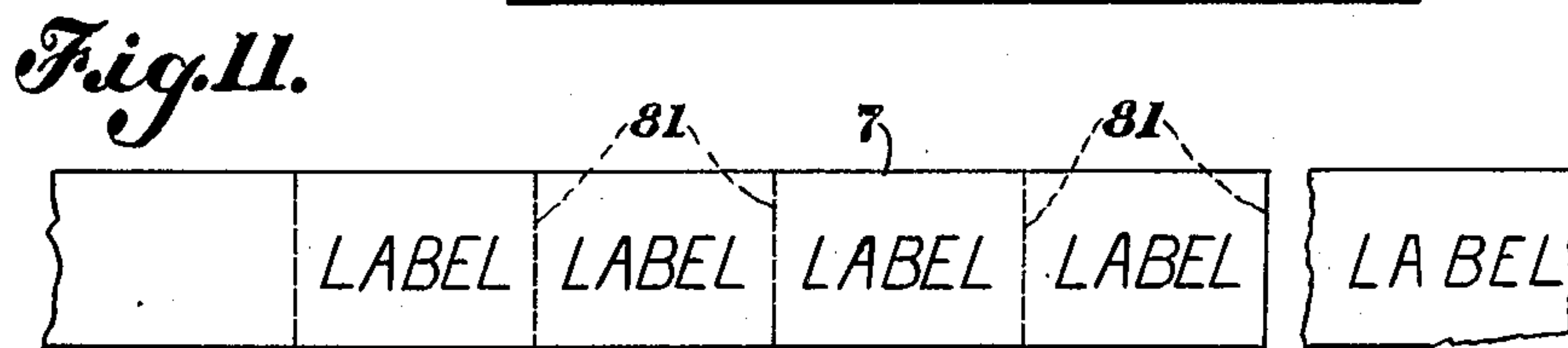
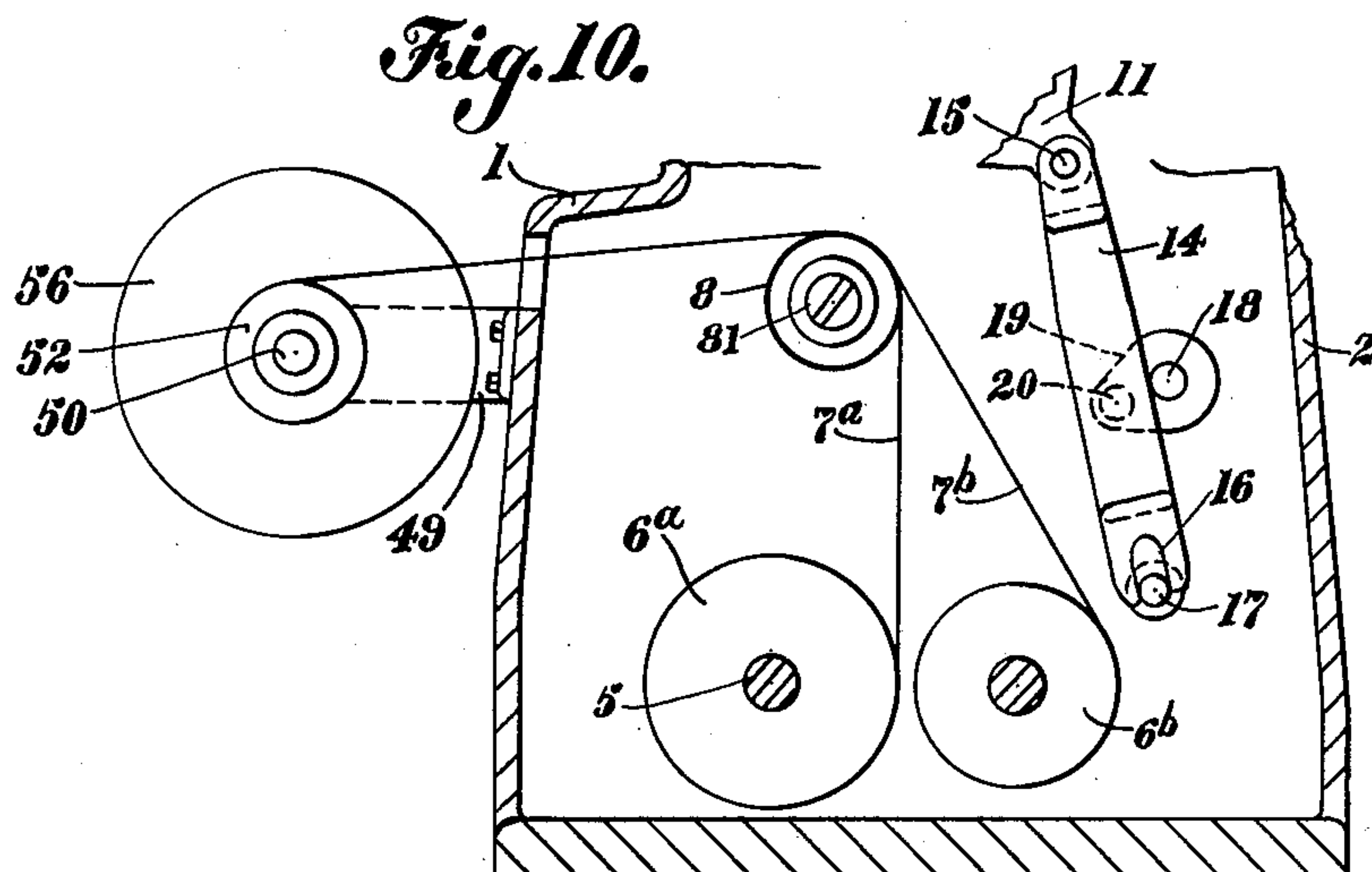
C. F. ROBBINS

2,624,278

MARKING MACHINE

Filed Oct. 22, 1948

6 Sheets-Sheet 6



INVENTOR.
Charles F. Robbins.

BY *Heard Smith & Hannan*
ATTORNEYS

UNITED STATES PATENT OFFICE

2,624,278

MARKING MACHINE

Charles F. Robbins, Keene, N. H., assignor to
Markem Machine Company, Keene, N. H., a
corporation of New Hampshire

Application October 22, 1948, Serial No. 56,008

3 Claims. (Cl. 101—253)

1

This invention relates to a marking or printing machine designed for making a series of similar imprints in spaced relation on the non-adhesive face of pressure sensitive adhesive tape, an example of which tape is that commonly known to the trade as "Scotch tape."

Pressure sensitive adhesive tape which is thus imprinted is frequently used for making pressure sensitive adhesive labels, this being done by cutting the printed tape transversely between the successive imprints to produce the desired labels.

A pressure sensitive adhesive label has the advantage over a gummed label that it can be applied to any article simply by pressing it against the article and without the necessity of activating the adhesive material. Furthermore the adhesion between a pressure sensitive adhesive label and the article to which it is applied is more permanent than that of a gummed label, because the pressure sensitive adhesive label is not affected by moisture or heat.

One of the objects of the invention is to provide a machine which will unwind a roll of pressure sensitive adhesive tape to be printed, make a succession of imprints in spaced-apart relation on the non-adhesive face of said tape, and then rewind the printed tape in roll form; all as a continuous operation.

A further object of the invention is to provide a machine of this type with novel means by which the successive imprints on the tape can be placed at varying distances apart, thereby providing for making labels of different lengths.

Still another object of the invention is to provide a machine of this type which is simple in construction and inexpensive to manufacture and easy to operate.

In the drawings, wherein I have illustrated some selected embodiments of my invention,

Fig. 1 is a side view of a machine embodying my invention with the front portion of the frame, which constitutes a door, in open position to illustrate the operative parts of the machine, said figure showing the printing head in its rearward position.

Fig. 2 is a similar view showing the printing head in its forward position.

Fig. 3 is an end view with the casing or frame broken out to better show the operative parts of the machine.

Fig. 4 is a vertical sectional view through the printing couple.

Fig. 5 is a perspective view of the type holder.

Fig. 6 is a section on the line 6—6, Fig. 5.

Fig. 7 is a back side view of the casing of the

2

machine showing the means for driving the wind-up roll.

Fig. 8 is a fragmentary view illustrating the printing couple during the operation of making an imprint on the pressure sensitive adhesive tape.

Fig. 9 is a sectional view showing the means for mounting and rotating the wind-up roll.

Fig. 10 is a fragmentary sectional view showing a different embodiment of the invention.

Fig. 11 is a view of a pressure sensitive adhesive tape on which imprints have been made by the machine and from which separate labels can be formed.

Fig. 12 shows a section of a laminated or two-ply tape from which a two-color label can be made.

Fig. 13 is a view illustrating another laminated three-ply tape from which a three-color label can be made.

In the machine herein shown the operative parts thereof are enclosed in a suitable housing 1 which is formed with the rear portion 2 on which the operative parts of the machine are supported, and a front portion 3 which is hinged to the rear portion 2 as shown at 4 in Figs. 1 and 2 and which constitutes a door which can be opened to give access to the operative parts.

The rear section 2 of the casing or housing is provided with means, such for instance as a laterally extending pin 5, on which may be mounted a roll 6 of the pressure sensitive adhesive tape 7 that is to be printed.

The printing couple by which the imprints are made on the non-adhesive face of the tape comprise a freely rotatable impression cylinder 8 over which the tape 7 passes with its adhesive face in contact with the cylinder, and a printing head 9 carrying type 10 which is mounted for reciprocating movement. The printing head 9 is shown as secured to a reciprocating carriage 11 which is supported by and reciprocates on a supporting stationary shaft 12 carried by the upper portion of the housing section 2, said carriage 11 having two apertured ears or bosses 13 through which the stationary shaft 12 extends.

The carriage 11 is movable on its support 12 from its rearward position shown in Fig. 1 to the forward position shown in Fig. 2. During the forward movement of the carriage, the face of the type 10 will come into tangential contact with the non-adhesive face of the portion of the tape 7 which rests on the impression cylinder 8, and during such forward movement of the printing

3

head, the freely rotatable impression cylinder is given a rotative movement by which the tape is fed forward and hence as the printing head passes across the upper face of the impression cylinder, the desired printed impression will be made upon the tape.

The impression cylinder 8 is mounted for slight vertical movement between its raised operative position shown in Fig. 1 and its lowered inoperative position shown in Fig. 2. Said cylinder is held in its raised position during the forward movement of the printing head by which the imprint is made on the tape, and when the printing head reaches the limit of its forward movement, the impression cylinder 8 is lowered slightly so that during the backward movement of the printing head, the impression cylinder and the tape will be separated from the tape.

The carriage 11 is given its reciprocating movement through the medium of a lever 14, the upper end of which is pivoted to the carriage at 15 and the lower end of which is provided with a slot 16 that embraces a pin 17 extending from the casing section 2. The lever 14 is given an oscillating movement about the pin 17 as a fulcrum by means of a drive shaft 18 which is journaled in the housing section 2 and is provided with a crank 19 having a crank pin 20 on which is mounted a block 21 that is received between two cheek pieces 22 with which the lever 14 is provided. With this construction the rotation of the shaft 18 and crank 19 will operate to oscillate the lever 14 about the pin 17 as a fulcrum thereby giving the carriage 11 its reciprocating movement.

The impression cylinder 8 is mounted for free rotation on a stud 30 carried by and projecting laterally from a horizontally extending rocking supporting member 23 which is pivoted at one end to the housing section 2 as shown at 24. Said impression cylinder is mounted on the other end of the rocking member and as stated above is freely rotatable on its supporting stud 30. With this construction a swinging movement of the horizontally extending supporting member about its pivot 24 will produce a raising and falling motion of the impression cylinder 8.

Such up and down movement of the supporting member 23 is controlled by a cam member 25 on the drive shaft 18. The rocking member 23 has a downwardly extending portion 26 carrying a follower, herein shown as a roll 26, which projects slightly beyond the vertical face 91 of said downwardly projecting portion and which is engaged by the cam member 25. This cam is provided with a high portion 27 and a low portion 28 and is so constructed that when the crank 19 is passing its rear dead center as shown in Fig. 1, the high portion of the cam will come into engagement with the roll 26 thereby swinging the support 23 upwardly about its pivot 24 and placing the impression cylinder 8 in its raised operative position shown in Fig. 1 in which position the plane of movement of the face of the type 9 will be tangential to the impression cylinder.

When the carriage 11 has reached its forward position shown in Fig. 2 and the imprint has been made on the tape 7 and just as the carriage 11 is ready to begin its rearward movement, the high portion 27 of the cam 25 will pass off from the roll 26 thus allowing the support 23 to swing downwardly sufficiently to carry the impression cylinder below and spaced from the plane of movement of the face of the type so that during

4

the backward movement of the printing head, the type will be separated from the tape and the impression cylinder.

The printing head has means associated therewith for turning the impression cylinder 8 at a surface speed corresponding to the speed of translation of the printing head during the time that the type is in contact with the tape. This is accomplished by a feeding shoe 29 which is mounted on the printing head and which has frictional engagement with the impression cylinder during the forward movement of said printing head, such frictional engagement serving to rotate the impression cylinder with a surface speed equal to the speed of translation of the type and thereby feed the tape 7 forward, said tape being drawn off from the roll 6 during its forward movement.

In the present invention the type characters 10 are removably mounted in a type carrier element 30 which is removably mounted in the body portion 31 of the printing head. This body portion 31 has a channel shape and is provided in each side with a guideway 32 to receive the type carrier 30. Said type carrier is provided with one or more type-receiving openings 33 in which the type elements 10 may be placed. Each type element has a type character 34 formed on its printing face and is provided with an enlarged upper end 35 which presents downwardly facing shoulders 37 to engage the upper side of the type carrier 30 when the type elements are in position as shown in Figs. 4 and 6. The enlarged upper end 35 of each type element has such dimension that when the type carrier 30 with the type therein is introduced into the ways 32 of the printing head, the upper ends of the individual type will engage and be backed by the surface 37 of the body portion 31 of the printing head.

The type carrier is shown as provided with a thumb piece or knob 36 by which it can be withdrawn from the holder 31, and when so withdrawn the type elements can be reset in the type carrier 30 to provide for making any desired imprint.

The feeding shoe 29 by which the impression cylinder 8 is given its feeding movement is shown as detachably mounted on the type carrier 30 at its rear end by means of screws 37. The holder 31 is provided at its rear end with a depending stop flange 38 with which the type carrier 30 has engagement when the latter is properly inserted in the holder 31.

The extent of the feeding movement which is given to the impression cylinder 8 during the forward movement of the carriage 11 is determined by the length of the feeding shoe 29, and by making this shoe detachable from the carrier 30, it is possible to use feeding shoes of different lengths so as to vary the spacing of the imprints on the tape 7.

For supplying the printing face 34 of the type elements 10 with ink, there is provided an ink roll 39 which is mounted on the supporting member 23 and also ink distributing rolls 40 and 41. The roll 40 is rotatively mounted on a stud 40a stationarily carried by the housing section 2, but the roll 41 is carried by the supporting member 23 and thus moves up and down with said supporting member. In addition there is provided an ink supply roll 42 which is mounted on a shaft 43 that is carried by the section 2 of the housing frame and may be rotated by any suitable means, such for instance as a pawl and ratchet device (not shown) actuated from the lever 14.

5

The ink supply roll 42 receives ink from an ink reservoir 44.

When the supporting member 23 is in its lowered inoperative position shown in Fig. 2, the ink distributing roll 41 will be in its lowered position and in contact with the ink supply roll 42 and thus ink will be delivered from the roll 42 to the distributing roll 41. When the carriage 11 reaches the rear end of its movement as shown in Fig. 1 and the cam 25 becomes operative to raise the supporting member 23 into the position shown in Fig. 1, the ink distributing roll 41 is separated from the ink supply roll 42 and brought into contact with the distributing roll 40 so that ink is transferred from the distributing roll 41 to the roll 40.

The carriage 11 has an ink pad 48 mounted thereon which is positioned so that during the forward and backward movement of the carriage, said ink pad contacts with the roll 40. Hence at each forward and backward movement of the ink pad, it will receive ink from the roll 40, which in turn has received ink from the roll 41.

The ink roll 39, which is carried by the supporting member 23, is so positioned that when said supporting member is in its raised operative position, i. e., the position it occupies during the forward movement of the carriage 11, said ink roll 39 is tangential to the plane of the face of the type 10 and also to the under face of the ink pad 48. Consequently during the forward movement of the printing head 9 and ink pad 48, the type will contact with the ink roll 39 and will thus be properly inked, and the ink pad 48 will pass across the ink distributing roll 40 and then pass over and in contact with the ink roll 39, by which operation said ink roll 39 will be freshly inked.

As stated above, during the backward movement of the carriage 11, the supporting member 23 is in its lowered position shown in Fig. 2 so that the ink roll 39 will be below the path of movement of the type and the ink pad. During such backward movement, however, the ink pad will again move over and in contact with the ink distributing roll 40 and will thus receive additional ink.

During the backward movement of the carriage 11, therefore, the ink distributing roll 41 is in contact with the ink supply roll 42 and is thus receiving a fresh quantity of ink, while during the forward movement of the carriage the freshly inked roll 41 is in contact with the ink distributing roll 40 and is thereby supplying the latter with ink. At the same time the ink pad 48 moves across the ink roll 40 and receives ink therefrom and the type 10 is carried across and in contact with the ink roll 39 and is thus inked.

During the final portion of the forward movement of the carriage 11, the ink pad 48 comes in contact with the ink roll 39 while it is still in its raised position and thus supplies said roll with additional ink.

The apparatus is also provided with means for rewinding the printed tape 7 in roll form, such rewinding operation being carried on simultaneously with the printing operation.

Mounted on the housing is an arm 49 carrying a shaft 50 on which may be mounted a core member 51 which constitutes the core for the rewinding roll 52 of printed tape. The shaft 50 is driven from the driving shaft 18 by means of a non-positive driving connection which comprises a driving belt or sprocket chain 53 which passes around a pulley or sprocket wheel 54 on

6

the shaft 50 and another pulley or sprocket wheel 55 on the drive shaft 18. The shaft 50 is shown as having a flange 56 rigid therewith and loosely mounted on the shaft is a companion flange 57 which is held in frictional engagement with the core 51 and rewind roll 52 by means of a spring 58. Means are provided for adjusting the tension of the spring, and for this purpose there is shown a washer 59 on the shaft 50 which is backed by a nut 60 screw threaded to the end of the shaft 50 so that by adjusting the nut 60, the spring pressure of the disk 57 against the roll 52 may be varied.

It will be understood that the forward feeding movement of the tape 7 which it derives from the impression cylinder 8 is an intermittent or step-by-step movement. At each forward rotational movement of the impression roll which occurs during the forward movement of the printing head, the tape 7 will be fed forward and withdrawn from the roll 6. During the backward movement of the carriage 11, the impression cylinder 8 is separated from the feed shoe 29 so that said cylinder and the tape 7 will remain stationary.

During the forward feeding movement of the tape, the wind-up roll 52 will be rotated to wind up the tape 7 thereon but during the backward movement of the carriage 11 and while the impression cylinder 8 is stationary, the wind-up roll will also be held stationary and slippage will occur between the wind-up roll and the disks 56, 57. The friction between the ends of the wind-up roll 52 and the disks or flanges 56, 57 may be so adjusted by means of the nut 60 that while it is sufficient to rotate the roll 52 during the time that the tape 7 is fed forward, yet it will allow the slippage to occur between the forward feeding movements of the tape.

For making adhesive labels, it is desirable that the pressure sensitive adhesive tape 7 should be opaque so that the imprint made thereon can be readily read. For some purposes it is desirable to use a two-color or even a three-color adhesive label. If a two-color label is desired, I propose to feed to the impression cylinder two pressure sensitive adhesive tapes of different color, one of which is wider than the other, and to laminate the tapes as they pass over the impression cylinder 8. This is illustrated in Figs. 10 and 12 wherein 6a represents a roll of wide pressure sensitive adhesive tape 7a of one color, and 6b is a roll of narrow pressure sensitive adhesive tape 7b of another color. The two tapes 7a and 7b are fed to the impression cylinder 8 as shown in Fig. 10 and in such relation that the narrow tape 7b will be laid on top of the wider tape 7a. Because of the pressure sensitive adhesive nature of these tapes, they will become firmly united adhesively as they pass over the impression cylinder 8 thereby producing a two-color laminated tape as shown in Fig. 12. The type on the printing head may be so set as to make a printed impression on either the tape 7b or the exposed portion of the tape 7a or on both tapes depending upon the character of the label it is desired to produce.

By mounting three rolls of pressure sensitive adhesive tape of three different colors on the machine, it would be possible to provide a three-color laminated tape as shown in Fig. 13 which would comprise the narrow tape 7c of one color, another tape 7d wider than the tape 7c, and of another color, and a third tape 7e wider than both the other tapes of still another color. By

laminating these tapes as shown in Fig. 13 and then printing on the tape as above described, three-color printed labels may be produced.

The driving shaft 18 may be rotated by any suitable means. In Fig. 3 there is shown for this purpose a motor 86 which operates a shaft 88 through a reduction gear housed in a box 87, said shaft 88 having a gear 85 thereon which meshes with a gear 84 mounted on the shaft 12.

I claim:

1. In a printing machine wherein the printing couple includes a freely rotatable impression cylinder and a reciprocating printing head carrying type and wherein the impression cylinder is mounted on a vertically movable support by which it is moved toward and from the path of travel of the face of the type thereby to place the impression cylinder in an operative position with respect to the type during the movement of the printing head in one direction, thereby to make a printed impression on a tape supported by the cylinder, and in an inoperative position spaced from the printing head during the movement thereof in the opposite direction, the combination with said movable support, of an inking roll mounted thereon, an upper ink distributing roll supported separately from said movable support and mounted to rotate about a fixed axis, a lower ink distributing roll mounted on said support, an ink supplying roll situated beneath the support and mounted to rotate about a fixed axis, and an ink pad rigid with the printing head, said movable support when in raised operative position maintaining the inking roll in position to be engaged by the type and the ink pad and the lower ink distributing roll in position to engage the upper ink distributing roll, and when in lowered inoperative position maintaining the inking roll out of contact with the type and ink pad and the lower ink distributing roll in contact with the ink supplying roll, means to give the carrier its reciprocating movement and means to move the movable support between its operative and inoperative positions in timed relation with the reciprocating movement of the carriage.

2. A printing machine having a printing head comprising a body member, a type carrier removably supported thereby and type mounted on the type carrier, means including a drive shaft to give the printing head a forward and backward right line movement, a horizontally extending rocking support pivotally mounted at one end thereof and situated beneath the printing head, said rocking support having a vertically extending face at its pivoted end, a follower element carried by said rocking support and exposed on said vertical face, a freely rotatable impression cylinder carried by said rocking support at the other end thereof, a cylinder-feeding shoe secured to the type carrier and removable therewith from the printing head, means to feed a pressure-sensitive adhesive tape to the impression cylinder with the adhesive face of the tape in contact with said cylinder, a rotary cam on said drive shaft engaging said follower, and operative to maintain said rocking support during the forward movement of the printing head in a raised operative position in which the plane

of movement of the face of the type and of the face of the cylinder-feeding shoe is tangential to said cylinder, whereby during such forward movement the frictional engagement of the shoe with the cylinder gives the latter a forward rotative movement to make a printed impression on the tape, said cam also maintaining the rocking support during the backward movement of the printing head in a lowered inoperative position in which the impression cylinder is below and spaced from said plane of movement.

3. A printing machine comprising a horizontally extending rocking support pivotally mounted at one of its ends, and having a follower an impression cylinder mounted for free rotation on the other end thereof, means for feeding pressure-sensitive adhesive tape to the impression cylinder with the adhesive face of the tape in contact with said cylinder, a printing head situated above said impression cylinder, said printing head including a type carrier removable therefrom and type supported by the type carrier, means including a drive shaft to give the printing head a forward and backward right line movement, a cam on said drive shaft acting on said follower and controlling the turning movement of the rocking support about its pivot by which the impression cylinder is raised and lowered and is maintained during the forward movement of the printing head in a raised operative position in which the plane of movement of the face of the type is tangential to said cylinder and during the backward movement of said printing head in a lowered position in which the impression cylinder is below and spaced from said plane of movement, a cylinder-feeding shoe secured to the type carrier and removable from the printing head therewith, said shoe being situated to engage frictionally the impression cylinder when it is in its raised position and during the forward movement of the printing head thereby to feed the tape forward, whereby said type will make a printed impression on the tape during such forward movement, a wind-up roll on which the printed tape is rewound and driving means between the drive shaft and the wind-up roll to operate the latter to wind the printed tape thereon during the forward movement of the printing head.

CHARLES F. ROBBINS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
410,521	Jaeger	Sept. 3, 1889
773,766	Proctor	Nov. 1, 1904
947,303	Goeb	Jan. 25, 1910
1,096,036	Kelly	May 12, 1914
2,161,602	Von Pein	June 6, 1939
2,466,968	Ross	Apr. 12, 1949

FOREIGN PATENTS

Number	Country	Date
365,434	Germany	Dec. 15, 1922
583,301	Great Britain	Dec. 13, 1946