April 27, 1965 J. G. McKAY 3,180,259

MAGNETIC PRINTING WHEEL CONSTRUCTION

Filed June 14, 1963

Fig. 1

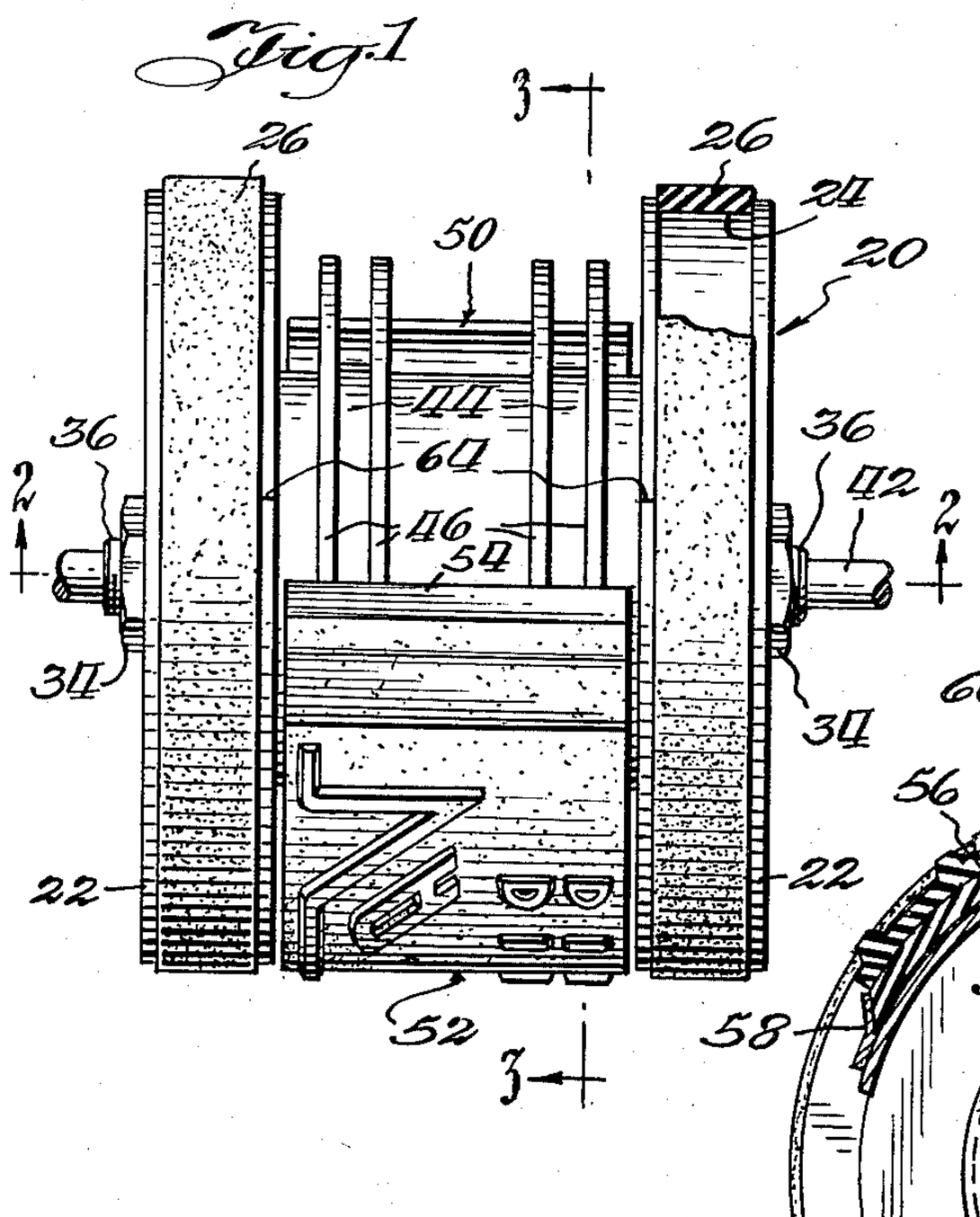
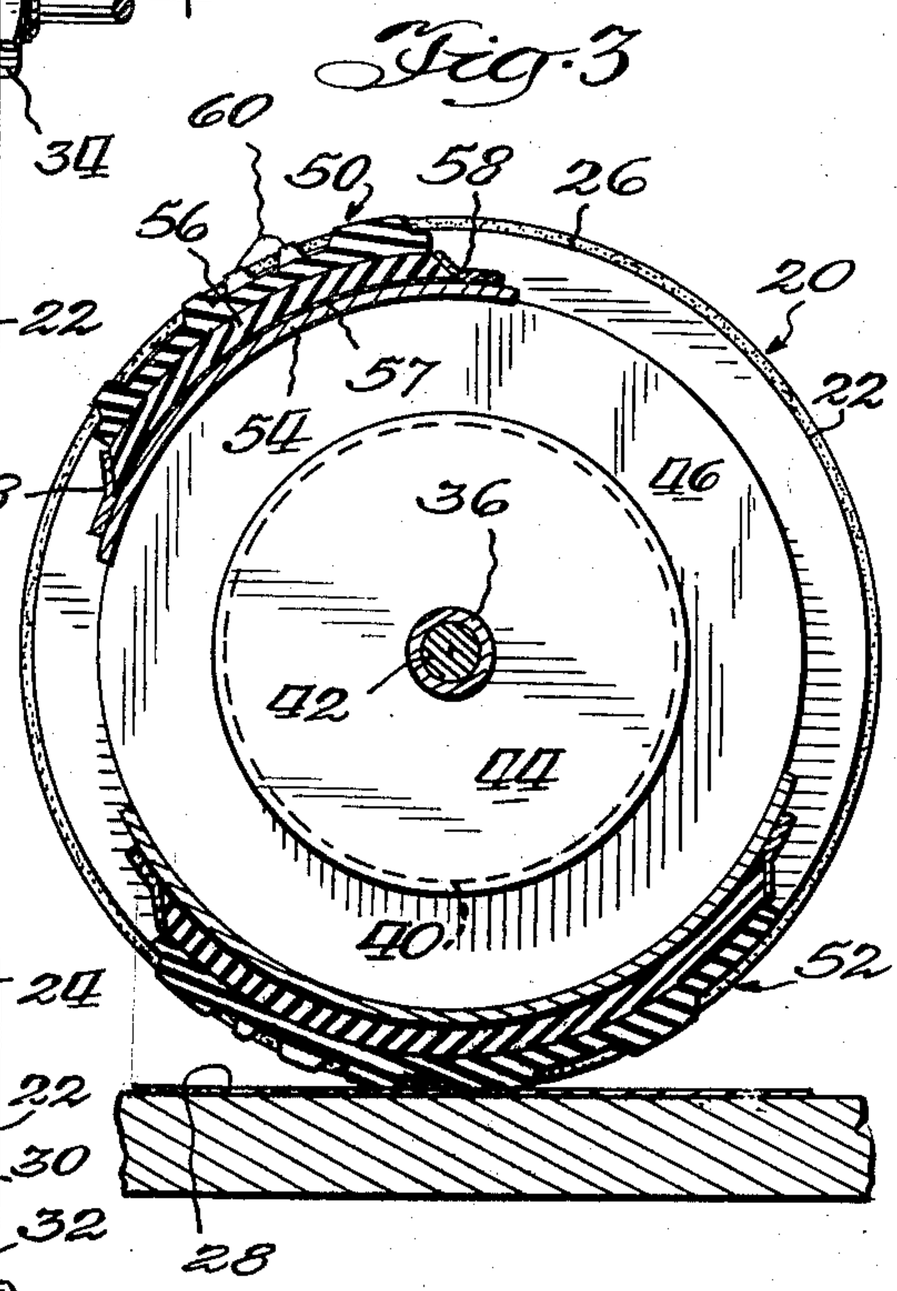


Fig. 3



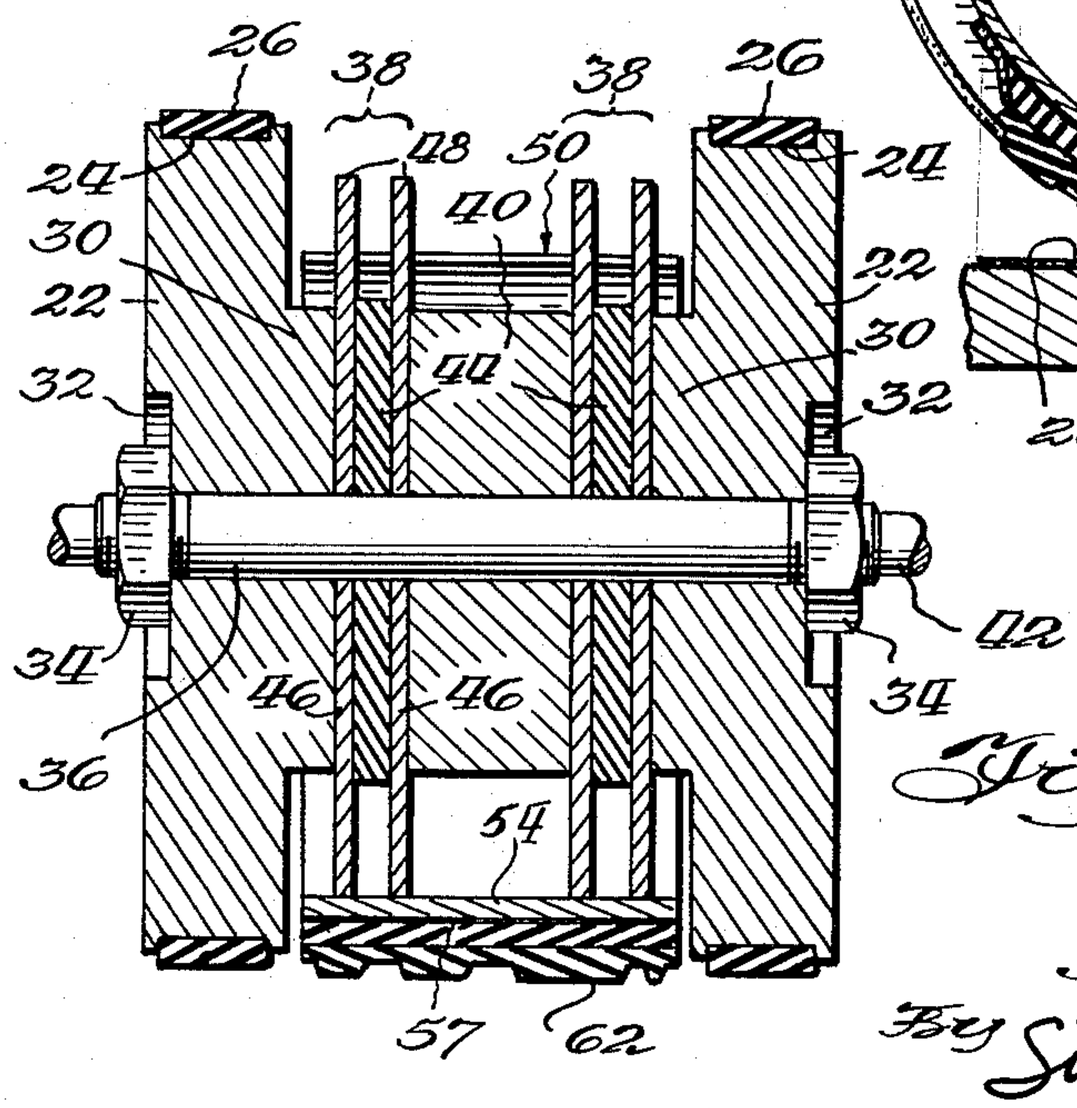


Fig. 2

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MAGNETIC PRINTING WHEEL CONSTRUCTION

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This invention relates generally to printing wheels and more particularly is concerned with the construction of a printing wheel such as used on a code dater or similar printing apparatus where it is necessary often to change the printed matter, such as, to make a change in names of flavors, colors, numbers, dates, etc. The invention is thus especially intended for application where the printing plate or type need be quickly and readily removed. Although providing this advantage the plate securing means of the invention provides an almost locked attachment to the printing wheel.

In U.S. Patent No. 3,086,461 there is disclosed a printing wheel in which steel type comprising conventional printing blocks with the characters formed on the ends thereof, are retained in suitable recesses provided in a printing wheel and held in place by magnetic means. The invention herein enables one to use economical rubber type, or any form of design in rubber, and results in a more economical wheel.

Further, it has been found that by supporting the rubber type faces on steel plates which are curved to conform to the curvature of the wheel and utilizing multiple magnetic supports, it is possible to provide a degree of securement which is so firmly fixed that it requires a tool to pry the same loose.

The achievement of the above comprises one of the principal objects of the invention.

Another important object of the invention is to provide a construction for a printing wheel in which there are a pair of disc magnets each sandwiched between a pair of steel plates and thereby providing a concentrated field across the juxtaposed peripheral edges of the pairs of plates whereby a steel member in the form of the arcuate plate support means closing the magnetic circuit across the peripheral edges of each pair will have a very strong attachment thereto.

Other objects and advantages will become apparent to those skilled in this art as a preferred embodiment is described hereinafter in connection with which a printing wheel constructed in accordance with the invention is illustrated in the enclosed drawing.

In said drawing:

FIG. 1 is a side elevational view of a printing wheel constructed in accordance with the invention with a portion being shown in section.

FIG. 2 is a sectional view taken through printing wheel of FIG. 1 along the line 2—2 in the direction indicated.

FIG. 3 is a sectional view taken generally through the printing wheel along the line 3—3 of FIG. 1 and in the direction indicated.

Generally, the invention comprises a printing wheel made up of a small number of relatively simple parts bolted together. A pair of non-magnetic end plates have disposed between them two magnetic assemblages each being formed of a magnetic disc sandwiched between a pair of steel plates of greater diameter than the disc. Each pair of plates is separated about its periphery by a distance equal to the thickness of the magnetic disc with a result that there is a highly concentrated magnetic flux available about the periphery of the discs. Arcuate type-carriers are provided each having an arcuate steel base and mounting a grooved rubber member or a plurality thereof of the kind for mounting loose type, for example of the so-called base-lock construction. In lieu of such an arrangement a molded rubber member having

text, designs and the like, may be mounted upon the arcuate steel plate. This may be done by brackets welded to the plate ends. Suitable cement aids in the securement of the rubber bases, either for the molded member or the track.

The curvature of the steel plates is such as to conform to the curvature of the peripheral edges of the pairs of steel plates sandwiching the magnets between is such that the magnetic circuit through the pairs of steel plates is completed by the bridging of the steel plate mounting the rubber type. This provides a very strong securement and yet one which enables removal of the arcuate type-carriers by means of a suitable tool prying the same loose.

Referring now specifically to the drawings, the reference character 20 designates generally a printing wheel constructed in accordance with the invention. The printing wheel is formed of a pair of end discs or plates 22 of some non-magnetic material, preferably aluminum, each being grooved about its periphery as indicated at 24, and having rubber friction bands known as tracks 26 engaged in said grooves 24. During rotation, the tracks 26 are adapted frictionally to engage the printing surface shown at 28 to rotate the wheel as the surface and wheel move relative one to the other.

Each of the annular discs 22 is provided with a reduced diameter portion 30 adapted to be disposed axially inwardly relative the ends of the printing wheel 20. Each disc 22 has an outer coaxial recess 32 to seat the nuts 34 by means of which the parts of the printing wheel 20 are secured to an elongate sleeve 36. A pair of magnetic assemblages designated generally 38 are coaxially mounted on the sleeve 36 adjacent each of the reduced diameter portions 30 and are separated by a non-magnetic spacer 40 also of aluminum. The entire wheel 20 of the parts just described is clamped together by the nuts 34, and the wheel is adapted to rotate upon a suitable shaft 42 which may pass through the sleeve 36.

Each of the assemblages 38 is formed of a central disc of highly magnetic material and comprising a permanent magnet 44 sandwiched between a pair of steel discs 46 all suitably perforated to enable the same to be coaxially mounted upon the sleeve 36. Flux from the magnet 44 will be concentrated in the steel discs and provide a strong field at the peripheries of the discs 46 as indicated at 48.

A plurality of type-carriers such as shown at 50 and 52 are removably secured to the printing wheel by magnetic attraction.

Each of type-carriers is formed of a steel base plate 54 of arcuate configuration. The inner curvature is identical to that of the peripheries 48 of the assemblages 38. Mounted upon the steel base plate 54 is a support backing 56 of rubber or the like held in place by cement 57 and having its ends tapered and anchored by the brackets 58 which are welded at each end of the steel base plate 54. Suitable type 60 is secured to the base 56 so that as the wheel 20 rotates the type 60, after being suitably inked by means not shown, will engage the printing surface 28.

It is believed that novelty resides in the construction of the type-carriers 50 and 52 and hence it is desired to emphasize that no limitation is intended by the specific description of the type mounted thereon. One form of type-carrier has a backing member 56 cemented to the convex surface of the steel base plate 54 which has a plurality of parallel grooves in its outer surface. Individual rubber type characters or, as most usual, molded strips of rubber type characters have their undersides provided with conforming parallel protrusions or tracks which mate with the surface grooves to enable the locking of

the type to the backing. Such backing may have fabric vulcanized therein.

A second form of type-carrier uses a molded rubber plate, including the backing (with or without fabric) as an integral part thereof. This entire plate has its rear surface cemented to the steel base plate **54** and its ends likewise tapered and clamped by the welded brackets **58**.

It will be obvious that each of the magnetic assemblages **38** will securely hold the right and left arcuate edges of the carrier members **50** and **52** as indicated in FIG. 1. It has been found that this securement is so strong that it requires the use of a prying tool to remove the same.

Obviously the dimensions are chosen so that the bare tips of the type as indicated at **62** protrude past the outer circumferential locus of the tracks **26** so that the type will just touch the printing surface **28** in rolling over the same. There may be index marks **64** engraved in the end discs **22** marking 180° locations to help position the type-carriers.

The structure illustrated has two magnetic assemblages **38**, but wheels may be built with more than two. A wide type-carrier may use three or four, or two side by side plates may be mounted on four assemblages. It is feasible to use one assemblage for a narrow plate.

In order to enable one to obtain a general idea of the proportionate size of the wheel **20**, the diameter of a commercial embodiment thereof which is illustrated was approximately 3¾ inches.

What it is desired to secure by Letters Patent in the United States is:

1. A printing wheel comprising, non-ferrous friction disc means mounted for rotation at each end of central shaft means, a pair of magnetic assemblages axially spaced apart and disposed between said friction disc means to rotate therewith, each of said assemblages comprising

an annular magnetic disc, and

thin, coaxial ferromagnetic disc means of diameter substantially greater than that of said magnetic disc engaging in face to face contact with said magnetic disc, and

an arcuate type carrier having a rigid arcuate ferromagnetic base plate and rubber printing means secured to its convex surface, the concave surface of the base plate having the same curvature as the circumference of said ferromagnetic disc means, said base plate being magnetically adhered to parallel peripheral segments of the ferromagnetic disc means of both assemblages, bridging and straddling the space therebetween.

2. A structure as claimed in claim 1, in which said ferromagnetic disc means comprise a pair of discs and each magnetic disc is sandwiched between its pair of discs.

3. In combination with claim 1, said rubber printing means comprising a type mounting member conforming in curvature to the convex surface of said base plate and being adhered thereto, moving tapered ends, and the base plate having unitary end brackets engaging said tapered ends to secure the rubber printing means to said base plate.

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EUGENE R. CAPOZIO, *Primary Examiner.*

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,180,259 April 27, 1965

James G. McKay

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 4, line 21, for "moving tapered ends" read -- having tapered ends --.

Signed and sealed this 14th day of September 1965.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

EDWARD J. BRENNER
Commissioner of Patents