This invention relates to improvements in apparatus for sorting metallic fastenings and is illustrated herein as embodied in a machine for sorting nails with respect to length.

In the manufacture of nails and other metallic fastenings, it sometimes happens that nails of different lengths become mixed either through inadvertence on the part of a workman or, in the manufacture of wire nails, through slippage in the operation of the wire feeding mechanism. Such a mixture of nails of varying lengths is practically unsalable even though each individual nail is perfect. Such mixed nails may be sorted for length by hand picking but this is a slow and tedious, and therefore expensive, operation. Such attempts as have been made to sort metallic fastenings for length by machinery have involved the handling of the different fastenings as individuals and the speed of the operation has accordingly been limited.

It is an object of the present invention to provide an improved apparatus applicable to the sorting of metallic fastenings in bulk without the necessity of first arranging the fastenings in an orderly series. As illustrated herein this sorting is done by presenting a mass of unsorted fastenings to gaging means provided with shallow pockets each of such dimensions that a fastening of greater than the desired length can not be completely received or inserted in a pocket. If an attempt is made to insert a fastening of greater than the desired length in one of the pockets, the fastenings will project therefrom and can be easily and expeditiously removed. Preferably and as illustrated, these pockets are circular and a multitude of them are formed in a receptacle into which a mass of the fastenings may be thrown. The receptacle is agitated and many of the fastenings which are not longer than the limit of tolerance enter the pockets. All the fastenings not completely within a pocket are then removed, for example brushed, from the pockets and the remaining fastenings, none of which is over the desired length, are deposited in a suitable receptacle. The sorting is continued in this fashion until substantially all of the fastenings no longer than the desired length have been removed. The process can be repeated with the longer fastenings if desired using pockets of larger sizes to sort out nails of other and greater lengths.

The apparatus disclosed, which is my preferred embodiment of the invention, comprises a rotary drum the interior of which is provided with a very large number (hundreds or even thousands) of shallow, circular pockets. As the drum rotates such of the nails as are completely within a pocket are carried upwardly, back of a retaining plate, and finally, when they pass beyond the retaining plate toward the top of the drum, are dropped into a trough extending through the drum lengthwise. The lower end of the retaining plate is preferably supplemented by a rotary brush which removes from the pockets such of the over long nails as are partly received within a pocket, these nails then sliding or falling back into the mass of nails in the drum.

With the above and other objects and features in view the invention will now be described with reference to the accompanying drawings and pointed out in the claims.

In the drawings,

Fig. 1 is a side elevation of a portion of a drum for machine sorting of nails;

Fig. 2 is a diagrammatic cross-section of the drum of Fig. 1; and

Fig. 3 is a detail view, also in cross-section, of part of the drum of Fig. 1.

The illustrated apparatus comprises a drum 20 rotated in any suitable manner and provided with a large number of shallow circular pockets 22. As illustrated, this drum is made up of a sheet metal cylinder 24 (Fig. 3) suitably reinforced and having secured to its inner surface a cylindrical perforated member 26 the sheet metal 24 forming the bottoms of pockets whose side walls are formed by the perforations in the cylinder 26. A mass of nails is placed in the drum. As the drum rotates such of the nails as are short enough enter the pockets and are carried upwardly as indicated at 28 in Fig. 3. Any of the nails of greater than the desired length which attempts to enter the pockets...
necessarily projects, as shown for example at
30. A retaining plate 32 formed as an arc of
5 a cylinder contacts with the interior of the
nails as are completely within the pockets
until they have been carried up pretty well
toward the top of the drum. As the pockets
pass beyond the top of the retaining plate
32 such of the nails as have been carried up are
0 dropped into a trough 34 extending length-
wise through the drum. The lower edge 36
of the retaining plate 32 is preferably
beveled and serves to remove from the pockets
such of the nails as project, this action prefer-
ably being supplemented by a rotary brush
38 (Fig. 2). After the nails have been
5 treated by the drum until no more (or no
stantial length) are carried up and deposited
into the trough 34, the nails are removed and
20 treated in a drum having pockets enough
larger to sort out the next desired length of
nails, or, if desired, the drum may be in-
closed at such an angle that the sorting will
be complete by the time the nails introduced
at the upper end have passed through to the
lower end of the drum in which case the drum
may be advantageously provided with a series
of openings 40 at its lower end through which
such of the nails as have not been carried up
30 and deposited in the trough 34 may pass.
The difference in the diameters of the pockets
of two successively used drums should be no
more than the tolerated variation of the
length of the nails of a given grade. Thus,
35 if a variation of \( \frac{1}{4} \) of an inch is all that is
permissible, after sorting, for example, in a
drum having pockets which will receive nails
\( \frac{3}{4} \) of an inch long and will reject those of
40 any greater length, they will next be sorted
in a drum having pockets which will receive
nails up to \( \frac{3}{4} \) of an inch long but of no
greater length.

Having described my invention, what I
claim as new and desire to secure by Letters
Patent of the United States is:
1. A machine for sorting metallic fasten-
ings having, in combination, a rotary drum
provided with a plurality of shallow, circular
pockets of a diameter to receive only those
fastenings that are not longer than the desired
length, a brush to remove from the
vicinity of the pockets, as the pockets move
up during the rotation of the drum, all fas-
tenings other than those completely within
a pocket, a retaining plate to hold such of the
fastenings as are completely received within
the pockets as they continue to move up
during the rotation of the drum, and a recep-
tacle arranged to receive the fastenings
as they pass beyond the retaining
plate.

2. A machine for sorting metallic fasten-
ings having, in combination, a rotary drum
provided with a plurality of shallow, circu-
lar pockets of a diameter to receive only
those fastenings that are not longer than the

3. A machine for sorting metallic fasten-
ings having a rotary drum arranged to re-
cieve fastenings in bulk and provided with a
plurality of shallow fastening-receiving
pockets of dimensions to receive only fasten-
ings that are not longer than a predetermined
length, a brush to remove from the
vicinity of the pockets all fastenings that
are not wholly within a pocket, and a retain-
ing plate arranged to retain in the pockets
such of the fastenings as are completely with-
in a pocket and are therefore not removed by
the brush.

4. A machine for sorting metallic fasten-
ings having a rotary drum arranged to re-
cieve fastenings in bulk and provided with a
plurality of shallow fastening-receiving
pockets of dimensions to receive only fasten-
ings that are not longer than a predetermined
length, a brush to remove from the
vicinity of the pockets all fastenings that
are not wholly within a pocket, a retaining plate
arranged to retain in the pockets such of the
fastenings as are completely within a pocket
and are therefore not removed by the brush,
and a receptacle positioned to receive the
fastenings from the pockets as the rotation
of the drum carries them beyond the retaining
plate.

In testimony whereof I have signed my
name to this specification.

BASIL POMEROY COOPER.