This invention relates to improvements in wire drawing machines.

The primary object of this invention is the provision of a continuous wire drawing machine which consists of a plurality of relatively detachable wire drawing units mounted upon a single base in an improved relationship which will permit of ready access to the base attached portions of the machine, as well as the portions associated with the different units.

A further object of this invention is the provision of an improved worm and worm gear drive mechanism for continuous wire drawing machines, in which the drawing blocks are relatively detachably mounted upon a single base.

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

In the accompanying drawings, forming a part of this specification, and wherein similar reference characters designate corresponding parts throughout the several views,

Figure 1 is a side elevation of the improved wire drawing machine.

Figure 2 is a plan view of the improved continuous wire drawing machine.

Figure 3 is a plan view, partly in section, showing the worm and worm gear drive of the machine, and improved associated features, the view being taken on the line 3-3 of Figure 4.

Figure 4 is a vertical cross sectional view taken thru one of the wire drawing blocks of the improved machine, substantially on the line 4-4 of Figure 1.

Figure 5 is a side elevation of one of the detachable units of the improved machine.

Figure 6 is a fragmentary cross sectional view of the unit of Figure 5.

Figure 7 is a plan view of a portion of the unit.

Figure 8 is a cross sectional view taken thru the one piece casing or body of the machine which supports the detachable wire drawing blocks or units, looking in the direction of the front of the machine.

Figure 9 is an enlarged fragmentary sectional view showing the detailed construction of the soap box and die holder.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of the invention, the letter A may generally designate an improved continuous wire drawing machine, which may include a plurality of wire drawing block units B mounted upon a single piece body C; the latter being supported upon suitable bases D and D'.

The wire drawing blocks B are of similar construction, except for the speed of rotation of the drums thereof, and each includes a rotary wire drawing drum E, drive means F thereon, and other features to be hereinafter detailed.

The supporting body or casing C includes a bottom wall 10, and front and rear upstanding walls 11 and 12. These upstanding walls 11 and 12, as shown in Figure 4, at their upper ends are socketed or provided with offset supporting shelves 14 adapted to receive the supporting plate or base of each of the units B, as shown in Figure 4. The bottom wall 10 is reinforced by depending ribs or flanges 15, shown in Figures 4 and 8 of the drawings, and at the front and rear the casing portion C is provided with depending skirt walls 16 contiguous with the casing walls 11 and 12. End walls 17 and 18 are provided. The walls 11, 12, 17 and 18 define a compartment 20 adapted to receive the drive gearing, oil mechanism and other associated features of the wire drawing machine.

The base portions D and D' are located at each end of the single piece body or casing C and are provided with flanges 22 adapted to receive thereagainst attaching flanges 23 of the body C. Bolts 25 attach these flanges together, as shown in Figure 1. As a part of the base D', an extension 26 is provided upon which the drive motor G may be mounted.

Referring to the detailed construction of the units B, each of the same includes a preferably square or rectangular supporting plate 30 which is adapted to marginally rest upon the supporting shelves 14 of the casing or body C at the front and rear walls of said body C, and preferably they are bolted detachably in place as shown at 31 in Figure 2 of the drawings. The units B are located side by side, and in line, as shown in Figures 1 and 2 of the drawings. Each supporting plate is provided with upstanding and depending sleeve portions 32 and 33, respectively supporting a vertically disposed rotatable drive shaft 34 by means of thrust anti-friction roller bearings 35 and 36. The shaft 33 at its lower end supports, in detachable manner, a worm gear 37, comprising part of the drive means F.

The sub-structure 40 of the plate 30 rotatably supports a horizontal drive shaft section 41 having a worm 42 thereon which meshes with the teeth of the worm gear 37, as shown in Figures 3 and 4 of the drawings. This gearing is of course located in the compartment 20 of the casing C.

The unit B includes a wire drawing drum E,
having a side wall 50; a top wall 51, and a de-
pending hollow hub portion 52. The latter is
keyed internally at 53 with the upper end of the
cylindrical shaped wall 51 which extends into
the drum 50; terminating at its upper end just
short of the lower surface of the top wall 51 of
the drum, and of course spaced from the inner
wall of the drum which defines the compartment
60, as shown in Figure 4. Suitable upstanding
outer walls 73 are provided to define a compart-
ment 75 adapted to receive water. A lateral ex-
tension 77 may be provided at the rear of the
machine; the compartment 75 being extended
thereinto. This portion 77 extends beyond the
outer surface of the rear wall 12 of the casing
and is provided with a depending drum con-
duct 80, the lower end of which is positioned
above the drum water receiving cup 81 of a con-
duct 82. The wall 59 of the cast basin is bolt-
ed, as at 83, to the unit plate 30, as shown in
Figure 4.

The units B each include a central spindle 103
axially aligning with a drive shaft or spindle
33, screw threaded upon a drive plate 101
which is attached or bolted, as at 102, upon the
top plate 51 of the drum E. Auxiliary supporting
posts 105 are mounted upon the top of drum
50. At their upper ends the supporting posts 105
and the central spindle 103 detachably support
a guide plate 110, nuts 111 being provided upon
the upper end of the spindle 103 to hold the
plate 110 in position. As is usual, an annular
groove is provided in this plate 105 to rotateably
support a ring-shaped member 112 having a guide
eye 113, for a purpose well known to those skilled
in this art.

As is shown in the drawings, the units B are
mounted in line with the shafts 41 of the units
in axial alignment. The ends of these shafts
are connected together by means of flexible cou-
plings 420. The motor G of course has a shaft
123 which is detachably connected with the shaft
41 of the end unit B by means of a similar flex-
ible coupling 120.

An improved oil system is provided for the
machine consisting of an oil pump 131 shown
in Figures 2 and 3 of the drawings, mounted upon
the end wall 18 of the casing C. This oil pump
is provided with a supply line 131 and an out-
let line 132 which leads lengthwise of the ma-
chine within the compartment 28 of the casing
or body portion C. For each unit the conduit 132
is provided with a branch conduit 140 having a
detachable coupling connection 141 with a short
conduit 142. The latter is provided as a part
of each unit B detachably connected upon the
dependent sleeve portion 39, as shown in Figure
6 of the drawings and provided with suitable duct
passageways 144 leading to the anti-friction bear-
ings 35, and to bearings 36 not shown in Fig. 6.

The rear wall 12 of the casing C is provided
with handholes 150, normally covered as at 151,
and thru which access may be obtained in the
pipe couplings 120 and the oil pipe couplings
141, when it is desired to detach the units
at these couplings and connections for removal
of the unit or units from the single piece casing
C. It should be noted that there are no lateral
extensions upon any of the units, after detach-
ment of these couplings and connections, which
would interfere with the complete detachment
of any unit without disturbing an adjacent unit.

The motor G is provided with a switch mech-
anism 160 controlled by operating mechanism
161 running along the length at the front of the
machine.

While in the preferred instance I use individ-
ual overhead pulleys for the units, I may pro-
vide a single transfer roller for the machine.
The latter consists of a horizontal roller 186, supported upon uprights or standards 165 and 167 adjacent the ends of the
machine, and over which the wire is trained for
transferring from one unit to the next unit.

For each unit B there is provided a soap box
and die holder construction. The soap box is
designated at 170 in Figure 9 of the drawings.
It is pivoted at 171 upon upstanding brackets of
a supporting plate 172. This horizontal pivot 171
provides for vertical adjustment of the soap box.
Regulation of the vertical adjustment of the soap box box
is had by means of thumb nuts 173 threaded upon a screw
threaded shank 174. The latter is attached to
the base 172 and extends loosely thru an opening
in a lateral projection 175 provided integral upon
the soap box 176, as shown in the drawings.

The base 172 is pivotally mounted upon a ver-
tically positioned pivot bolt 178, detachably
connected upon the rail flange of the front wall
11 of the casing C. The soap box may be ad-
djusted laterally upon this pivot 178 by means
of an L-shaped screw threaded member 189
which is loosely hooked in an eye 181 upon the
casing C, at one end, as shown in Figure 4 of
the drawings. At its screw threaded end it ex-
tends thru an opening in a depending portion
182 of the base portion 172 of the soap box-die
holder. Wing nuts 184 are screw threaded upon
this member 188 at each side of the depending
portion 182.

The soap box is provided with die holder por-
tion 190 providing a socket 181 for receiving a
die casing. The base portion 172 is provided with a
flange or stop portion 183 extending across the
die casing socket 181; as shown in Figures 9 of
the drawings, to act as a stop for the die casing.
This stop may have an adjustable stop screw 184
mounted thereon. A die casing clamping screw
190 may also be provided upon the soap box-die
holder, as shown in Figure 9 of the drawings.
The stringing 191 shown on the machine will be
apparent from the foregoing. The wire
of course extends thru the soap box and die of
one of the units; is wound around the drum E
of that unit; extends upwardly thru the guide
eye 115 and thence over the transfer roller 188
and then around the die box pulley 200 of an
adjacent unit, from whence the wire extends into
the soap box-die holder of the adjacent unit, etc.

Each unit is provided with a water supply line
210 having a detachable connection at 211, shown in
Figure 2 of the drawings, the water line being
connected to the catch basin wall 73 of the unit. A conduit enters into the compo-
artment 73 of the catch basin and is then
upturned as shown at 213 in Figure 4 of the
drawings. This conduit discharges water into
compartment 60.

The provision of the pocket or sump 60 permits
the water to assemble therein and stay warm for
a while after the unit has been stopped. This
prevents sweating and the arrangement of the
conduit 213 admits of a better cooling effect from
the inside surface of the block.

From the foregoing it can be seen that an
improved continuous wire drawing machine has been provided, in which the gear and oil mechanism are all located in a single case, but the wire drawing units are themselves readily detachable from this case. The arrangement is extremely simple, with all parts readily accessible and admits of a more efficient operation of the machine, with less time required to repair breakdowns, etc., than in conventional wire drawing machines.

Various changes in the shape, size and arrangement of parts may be made to the form of invention herein shown and described, without departing from the spirit of the invention or the scope of the following claims.

I claim:

1. In a wire drawing machine, a frame having an oil compartment and an upper edge defining a mouth to the compartment; a wire drawing unit comprising a supporting plate having engagement with said upper edge; a bearing in said plate; a spindle journaled in the bearing; a drum on the spindle; gear means for driving said spindle including a shaft section a worm gear on the spindle, and a worm on the shaft section; and bearings on the supporting plate for journailling said shaft section, said unit being normally supported by the plate with the worm gear and worm in mesh and within the oil compartment when the plate is resting on the upper edge of the frame, said unit bodily removable from the upper edge of the frame while said worm gear and worm are in mesh.

2. In a wire drawing machine a frame having a recessed upper edge; a wire drawing unit comprising a supporting plate adapted to seat in said recess and to close said upper end of the frame, a bearing in said plate; a spindle journaled in the bearing; a drum on the spindle; a worm gear on the spindle; a shaft section including a worm in mesh with said gear; and bearings on the supporting plate for journailling said shaft section, said unit being supported as a whole by the plate resting on the frame and being removable in assembled condition from the upper end of the frame.

3. In a continuous wire drawing machine, a frame having an open upper end and a peripheral upper edge; a series of wire drawing units each comprising a supporting plate for resting on the upper edge of the frame; a bearing in each plate; a spindle journaled in the bearing; a drum on the spindle; gear means for driving said spindle including a shaft section for each unit; bearings on each supporting plate for journailling its respective shaft section; and means for joining the several shaft sections in end-to-end relation with each other, said supporting plates lying in edge-to-edge relation with each other for closing the upper end of said frame.

4. In a continuous wire drawing machine, a frame having an open upper end and a peripheral upper edge; a series of wire drawing units each comprising a supporting plate for resting on the upper edge of the frame; a bearing in each plate; a spindle journaled in the bearing; a drum on the spindle having a water-receiving compartment; a catch basin beneath said drum having a portion projecting beyond the edge of the frame; gear means for driving said spindle including a shaft section for each unit; bearings on each supporting plate for journailling its respective shaft section; and means for joining the several shaft sections in end-to-end relation with each other, said units being individually supported by their respective plates resting on the frame, and being individually removable in assembled condition from the frame.

CURTIS VOIGTLANDER.
CERTIFICATE OF CORRECTION.


It is hereby certified that error appears in the above numbered patent requiring correction as follows: In the grant, line 1, in the heading to the drawings, and in the signature to the printed specification, last name of inventor, for "VOIGHTLANDER" read --VOIGHTLANDER--; in the grant, line 13, and in the heading to the specification, line 3, for "Voightlander" read --Voigtlander--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 1st day of February, A. D. 1944.

Henry Van Arsdale,
(Seal) Acting Commissioner of Patents.